SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

INNER HARBOR NAVIGATION CANAL LOCK REPLACEMENT PROJECT

ORLEANS PARISH, LOUISIANA

US Army Corps of Engineers®

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FINAL
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INNER HARBOR NAVIGATION CANAL LOCK REPLACEMENT PROJECT
U.S. ARMY CORPS OF ENGINEERS, NEW ORLEANS DISTRICT

ABSTRACT. The existing Inner Harbor Navigation Canal (IHNC) Lock was completed in 1923; is 640 feet long, 75 feet wide, and 31.5 feet deep; and connects the Mississippi River with the IHNC, Gulf Intracoastal Waterway (GIWW) and Mississippi River – Gulf Outlet. Because of maintenance issues and its relatively small size, the IHNC Lock is subject to closures and congestion, leading to long delays for waterborne traffic. A total of eight sites for a new lock have been evaluated through planning efforts and public involvement beginning in 1960. A 1997 Environmental Impact Statement (EIS) was prepared and evaluated two action plans in detail. In 2007, the Federal District Court, Eastern New Orleans District enjoined the project and required the preparation of a Supplemental EIS to describe changes in existing conditions after Hurricane Katrina and to analyze impacts from the recommended plan and alternatives on these existing conditions. The 1997 EIS Plan, and two revised lock replacement plans, the Cast in Place and Float in Place plans as well as a No-build/Deauthorization Plan are evaluated. The 1997 EIS Plan would replace the existing lock with a new 110-foot wide, 1,200-foot long and 36-foot deep lock in the IHNC north of the Claiborne Avenue Bridge and extend Mississippi River floodwalls and levees from the existing lock to the new lock location. The 1997 EIS Plan includes the replacement of the existing St. Claude Avenue Bridge with a low-level double-bascule bridge and modifications to the North Claiborne Avenue Bridge to make it compatible with a new lock. The 1997 EIS Plan would construct lock monoliths at an off-site construction area and dispose of material dredged during lock construction.

The lock design and location, and bridge modifications in the Cast-in-place Plan would be similar to the 1997 Plan, except the Cast-in-place Plan would construct seven lock monoliths founded on piles within a cellular sheet pile cofferdam, instead of floating lock monoliths to the new lock site. The Float-in-place Plan, which is the recommended plan, is very similar to the 1997 EIS Plan. The Float-in-place Plan requires two separate construction locations, the off-site construction area and new lock site. The off-site construction area would allow for lock module construction in dry conditions. Lock modules would be floated to the lock construction site in the IHNC. Additional evaluation has further refined the location and design of the confined disposal facility for contaminated dredged material, the location and size of the off-site construction area, and the methods for disposal of all dredged material, including an option for disposal of contaminated dredged material in a Type I landfill. Although project modifications have been made to minimize socioeconomic and noise impacts and alterations to traffic patterns during the lock and bridge construction, short-term adverse impacts are anticipated to housing, business and industrial activity, community services, tax revenues, and vehicle transportation. Additionally, long-term adverse impacts would occur on aesthetics and recreational resources from the IHNC Lock Replacement project due to the modification of levees and floodwalls. Although the demographics of nearby neighborhoods have changed dramatically due to Hurricane Katrina, a community impact mitigation plan was implemented as part of the 1997 EIS Plan and would continue to provide $43 million in funding for numerous projects to avoid, minimize and compensate for adverse impacts on socioeconomic resources in the nearby neighborhoods.

Please send your comments to the District Engineer by May 4, 2009. For further information please contact Mr. Richard Boe, U.S. Army Corps of Engineers, P.O. Box 60267, New Orleans, Louisiana 70160-0267. Telephone (504) 862-1505.

ABBREVIATIONS AND ACRONYMS

ADT – average daily traffic
BMP – Best Management Practices
CBMC – Community Based Mitigation Committee
CDF – confined disposal facility
CEMVN – New Orleans District
CFR – Code of Federal Regulations
CO – carbon monoxide
CO_2 – carbon dioxide
CoC – contaminants of concern
CPI – Consumer Price Index
cy – cubic yard
dB – decibel
dBA – A-weighted decibel
DMMU – dredged material management unit
DNL – day-night average sound level
DO – dissolved oxygen
DOTD – Louisiana Department of Transportation and Development
EIS – Environmental Impact Statement
EMS – emergency medical services
EO – Executive Order
EPA – U.S. Environmental Protection Agency
F – fill
FEMA – Federal Emergency Management Agency
FHWA – Federal Highway Administration
GIWW – Gulf Intracoastal Waterway
GNO – Greater New Orleans
HSDRRS – Greater New Orleans Hurricane and Storm Damage Risk Reduction System
HUD – U.S. Department of Housing and Urban Development
Hz – Hertz
I-10 – Interstate 10
IER – Individual Environmental Report
IHNC – Inner Harbor Navigation Canal
ITM – Inland Testing Manual
JRB – Joint Reserve Base
LA – Louisiana Highway
LDEQ – Louisiana Department of Environmental Quality
LDNR – Louisiana Department of Natural Resources
LDWF – Louisiana Department of Wildlife and Fisheries
LOS – level of service
LPV – Lake Pontchartrain and Vicinity Project
LSU – Louisiana State University
MSA – Metropolitan Statistical Area
MRGO – Mississippi River - Gulf Outlet
N – native material
NN – non-native surface material
NAAQS – National Ambient Air Quality Standards
NAS – Naval Air Station
NASA – National Aeronautics and Space Administration
NAVD – North American Vertical Datum
NEPA – National Environmental Policy Act
NOAA – National Oceanic and Atmospheric Administration
NOAA Fisheries – National Marine Fisheries Service

NO_2 – nitrous dioxide
NO_x – nitrous oxides
NOPD – New Orleans Police Department
NPDES – National Pollutant Discharge Elimination System
NRCS – Natural Resources Conservation Service
NWG – neighborhood working group
NWR – National Wildlife Refuge
O_3 – ozone
OSHA – Occupational Safety and Health Administration
PAH – polynuclear aromatic hydrocarbons
PCB - polychlorinated biphenyls
Pb - Lead
PK – Pre-kindergarten
PL – Public Law
PM-2.5 – particulate matter less than 2.5 microns in size
PM-10 – particulate matter less than 10 microns in size
RECAP – Risk Evaluation/Corrective Action Program
RTA – Regional Transit Authority
SEIS – Supplemental Environmental Impact Statement
SHPO – State Historic Preservation Officer
SWPPP – Stormwater Pollution Prevention Plan
U.S. – United States of America
USPS – U.S. Postal Service
USACE – U.S. Army Corps of Engineers
USC – United States Code
USFDA – U.S. Food and Drug Administration
USFWS – U.S. Fish and Wildlife Service
VOC – volatile organic compounds
WBV – West Bank and Vicinity
WRDA – Water Resources Development Act
WVA – Wetland Value Assessment

SECTION 1.
SUMMARY

1. SUMMARY

1.1. MAJOR CONCLUSIONS AND ALTERNATIVES

1.1.1. Purpose and Alternatives

The current lock is too small and congested to accommodate existing traffic and impedes future growth of the navigation industry in the Inner Harbor Navigation Canal (IHNC). The IHNC Lock is a vital component of National navigation connecting the Mississippi River to the Gulf Intracoastal Waterway (GIWW), and transporting important commodities such as coal, petroleum and industrial chemicals. A new IHNC Lock capable of greatly reducing delays to the navigation industry and increasing the availability to Port of New Orleans resources in the IHNC is of local and National interest. The purpose of this project is to determine the best action for relieving navigation traffic congestion associated with the existing IHNC (*i.e.*, Industrial Canal) Lock, located between the St. Claude Avenue and North Claiborne Avenue bridges in New Orleans, Louisiana (Figure 1-1). The IHNC Lock allows for navigation between the higher water surface elevation of the Mississippi River and the lower water surface elevation of the IHNC, the eastern portion of the GIWW and the Mississippi River-Gulf Outlet (MRGO) (Figure 1-2).

A total of eight sites have been evaluated during the long history of various planning efforts and public involvement. A 1997 Environmental Impact Statement (EIS) was prepared to comply with the National Environmental Policy Act of 1969 (NEPA) and the implementing regulations used by the President's Council on Environmental Quality, and evaluated two action plans in detail. In 2007, the Federal District Court, Eastern New Orleans District enjoined the project and required the preparation of this Supplemental EIS (SEIS) to describe changes in existing conditions after Hurricane Katrina and analyze impacts from the recommended plan and alternatives on these existing conditions.

Three plans (1997 EIS Plan, and two revised lock replacement plans, the Cast-in-place and Float-in-place plans) and the No-build/Deauthorization Plan are evaluated in detail in this SEIS. The 1997 EIS Plan would replace the existing lock, which is 75 feet wide, 640 feet long and 31.5 feet deep, with a new 110-foot wide, 1,200-foot long and 36-foot deep lock in the IHNC north of the Claiborne Avenue Bridge and extend Mississippi River floodwalls and levees from the existing lock to the new lock location. The 1997 EIS Plan includes the replacement of the existing St. Claude Avenue Bridge with a low-level double-bascule bridge and modifications to the Claiborne Avenue Bridge to make it compatible with a new lock. The 1997 EIS Plan also includes the construction of lock monoliths at an off-site construction area (previously referred to as a graving site) and the disposal of large volumes of material hydraulically dredged during lock construction.

All three lock replacement plans include the completion of sampling and data analysis associated with the Water Quality and Sediment Evaluation Report (Appendix C), and the associated construction of a confined disposal facility (CDF) for placement of both stockpiled sediments and contaminated sediments (Appendix E). Additionally, the 1997 EIS Plan assumes that a new high-level bridge would be constructed along the Florida Avenue corridor; however, due to funding issues it is highly unlikely that the new Florida Avenue Bridge would be constructed prior to the initiation of lock construction.

The lock design and location, and bridge modifications in the Cast-in-place Plan would be similar to the 1997 EIS Plan, except the Cast-in-place Plan would construct seven lock monoliths founded on piles within a cellular sheet pile cofferdam site, instead of floating lock monoliths to the new lock site. The Float-in-place Plan is very similar to the 1997

Figure 1-1: Vicinity Map for the Inner Harbor Navigation Canal Lock Replacement Project

Figure 1-2: Project Location Map

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EIS Plan, and the Float-in-place Plan requires two separate construction locations, the off-site construction area and new lock site (Appendix D); the off-site construction area located on the south bank of the GIWW at the Paris Road Bridge would allow for lock module construction in a dry environment and lock modules would be floated to the lock construction site.

1.1.2. Rationale for the Recommended Plan

The recommended plan in the 1997 EIS would construct a new lock north of Claiborne Avenue with a usable draft depth of 36 feet, a length of 1,200 feet and a width of 110 feet. This recommended plan was a larger lock than the plan which maximized the National Economic Development benefits. The National Economic Development Plan was a lock with a usable draft depth of 22 feet instead of 36 feet, and a length of 900 feet instead of 1,200 feet. However, it was determined that the deeper lock would accommodate deep-draft vessels which could utilize the Port of New Orleans facilities in the MRGO and IHNC, and a deep-draft lock is authorized by the Congress in the Water Resources Development Act (WRDA) of 1986. This recommended plan was also the locally preferred plan.

The Float-in-place Plan has less construction-related impacts on the community than the Cast-in-place Plan. Because the lock module fabrication would take place at an off-site construction area located along the GIWW, noise, traffic and aesthetic impacts from pile driving and lock module construction would be reduced compared to the Cast-in-place Plan where lock module construction would occur at the lock replacement site. Based upon an analysis of impacts and costs of the alternative plans at the North of Claiborne IHNC Lock Site, the Float-in-place Plan was determined to be the new recommended plan. Although this plan is, for the most part, the same as the plan recommended in the 1997 EIS, additional evaluation has further refined the location and design of the CDF, the location and size of the off-site construction area, and the method for disposal of contaminated sediments. These design refinements and more analysis of impacts on the post-Hurricane Katrina natural and human environment reflect the concerns expressed during a public scoping meeting, which was held on 4 April 2007 (Appendix P).

1.1.3. Environmental Impacts

The recommended plan (Float-in-place Plan) would have adverse impacts on wetlands, bottomland hardwood forest habitat and wildlife habitat. The construction of the off-site construction area and fill cell of the CDF would have temporary impacts on these habitats, while the disposal cell of the CDF would have permanent impacts. It is anticipated that these impacts would be fully mitigated by restoring approximately 85 acres of wetlands near the IHNC Lock project site, in a triangular-shaped area between Florida Avenue and Bayou Bienvenue. Dredged material from the lock replacement project would be used to restore wetlands. However, available dilution in the mitigation site and Bayou Bienvenue is insufficient to meet applicable water quality criteria and a waiver would be required for discharge to Bayou Bienvenue for wetland restoration. The recommended plan would have some temporary, acceptable impacts on aquatic organisms near the dredging operations and during discharge of sediments into the Mississippi River. Suspended sediment concentrations would temporarily increase during dredging operations in the IHNC. Also, only material determined to be suitable for freshwater disposal based upon biological analysis of the dredged material would be discharged into the Mississippi River (Appendix C). The daily sediment load discharge for the Mississippi River ranges from 436,000 tons per day to 219,000 tons per day, with an average of 341,000 tons per day (Louisiana Department of Natural Resources 2008). The total proposed sediment discharge into the Mississippi River for the entire project is 324,000 tons. Assuming the length of dredging would be 300 days, approximately 1,080 tons would be discharged into the Mississippi River per day, which represents 0.33

percent of the of the river's sediment load. If dredging activities take longer than 300 days, the daily volume of sediment discharge would be less than predicted. Given the high ambient suspended sediment concentration in the river and high flow rates, suspended sediments would rapidly be carried downstream and equilibrate to ambient suspended sediment concentrations.

The recommended plan would have adverse temporary socioeconomic impacts, primarily due to traffic detours and congestion and potential lost revenue to businesses from reduced access and construction noise. However, a comprehensive community impact mitigation plan has been implemented to reduce these impacts. Furthermore, since Hurricane Katrina, many of the businesses in the adjacent neighborhoods have not reopened and nearby residences damaged or destroyed have not been rebuilt. Although there would still be adverse impacts on those remaining businesses and residences during construction, the number of affected businesses and residences affected is greatly reduced since Hurricane Katrina.

There would be short-term beneficial socioeconomic impacts from the IHNC Lock construction project. Between $800 million and $1 billion would be spent over the 11 to 12 year period on the new lock construction and existing lock demolition; much of this money would be spent locally on labor, materials, equipment and supplies. This would provide an economic benefit for local and regional business and job development during the construction period.

1.1.4. Environmental Features

Dredged material unsuitable for open water discharge would be placed in a CDF for permanent upland disposal. By placing all unsuitable material in a CDF, impacts from fill activities on aquatic and benthic organisms and on human health would be minimized. Material deemed to be suitable for freshwater disposal would be discharged into the Mississippi River, temporarily stored in a CDF and then used as backfill around the new lock, and used to create wetlands to mitigate for impacts from the use of the off-site construction area and construction of the CDF (Appendices C and E). Additionally, the conceptual design for the CDF would safely fulfill storage and ponding requirements, and the CDF would be protected by the Greater New Orleans Hurricane and Storm Damage Risk Reduction System (HSDRRS).

1.1.5. Threatened and Endangered Species

No Federally threatened or endangered species, nor any designated critical habitat, would be affected by the recommended plan (Appendix B). Likewise, no species or habitat of local concern, as listed by the Louisiana Natural Heritage Program, would be affected.

1.1.6. Executive Order 11988, Floodplain Management

The recommended plan involves construction within the base (100-year) floodplain. All alternatives considered, including alternatives eliminated from detailed consideration in this SEIS, and the 1997 EIS, would be located within the base floodplain. No non-floodplain alternatives exist. The floodplain in the area of the recommended plan is completely developed for residential, commercial and industrial purposes. Levee systems and gated structures currently under construction in the area provide risk reduction from hurricane and Mississippi River flooding, and all protected areas are managed through forced drainage by pumping to remove excess rainwater.

The recommended plan would not encourage any additional development in the base floodplain, although waterfront industrial sites along connecting waterways could become more desirable due to the improvement in navigation traffic flows. The

recommended plan would not change the risk of flooding. All levees and floodwalls that would be realigned for project construction would be built to current design standards.

1.1.7. Executive Order 11990, Protection of Wetlands

No impacts on wetlands would occur from the construction of the new lock or demolition of the existing lock within the IHNC. However, impacts from these activities would occur within jurisdictional waters of the U.S. The construction of the off-site construction area and CDF would impact wetlands. The temporary and permanent impacts on wetlands would be fully mitigated by restoring wetlands between Bayou Bienvenue and Florida Avenue.

1.1.8. Executive Order 12898, Environmental Justice

Potential impacts on minority and economically disadvantaged people in the vicinity of all lock alternatives have been considered since the initial planning of the IHNC Lock replacement. When the Violet Site was eliminated and the IHNC Site selected in 1991, the potential for Environmental Justice issues at the IHNC Site were recognized, and U.S. Army Corps of Engineers, New Orleans District (CEMVN) looked at the IHNC Site as an opportunity to improve the overall condition of the IHNC corridor, including transportation infrastructure and the adjacent communities. Additionally, a community impact mitigation plan was developed with community representatives specifically to avoid or minimize, and where avoidance and minimization were not possible, compensate for adverse project impacts on the affected communities. Additionally, due to the devastating impacts on the adjacent neighborhoods from Hurricane Katrina (Appendix H), the IHNC Lock replacement project provides the opportunity to further develop businesses in the adjacent neighborhoods, including short-term economic benefits from local purchases during construction activities, and long-term economic benefits from redevelopment of maritime industry along the IHNC. This economic development would benefit all people regardless of race or income level.

1.1.9. Section 404(b)(1) Evaluation

A Section 404(b)(1) evaluation has been prepared for the recommended plan and is included in Appendix Q. The evaluation addresses the off-site construction area and the locations for dredged material disposal, including the CDF, mitigation site, backfill location at the new lock, and discharge into the Mississippi River. CEMVN has determined that, on the basis of the 404(b)(1) guidelines, the disposal of dredged material into the proposed disposal sites would comply with the requirements of the guidelines and would include the appropriate measures to minimize adverse effects on aquatic ecosystems.

1.1.10. State Water Quality Certification (Section 401)

An application for Water Quality Certification pursuant to Section 401 of the Clean Water Act was submitted to the Louisiana Department of Environmental Quality (LDEQ) on March 20, 2009. Resolution on solid waste regulation of dredged material disposal is anticipated as part of the processing of the Water Quality Certification.

1.1.11. Consistency with the Coastal Zone Management Program

A Coastal Zone Management Act consistency determination for the recommended plan has been prepared and is contained in Appendix I. CEMVN has determined that, on the basis of the State of Louisiana's Coastal Use Guidelines, the recommended plan would be consistent to the maximum extent possible, with the State's approved Coastal Resources Program. Louisiana Department of Natural Resources has concurred that the recommended plan is consistent with the Louisiana Coastal Resources Program (Appendix I).

1.2. AREAS OF UNRESOLVED CONTROVERSY

The selection of the North of Claiborne IHNC Site for the new lock construction has been strongly opposed by residents in adjacent communities and local elected officials representing these communities (Appendix P). However, other locations for a new lock that had been evaluated previously, such as the Violet Site, also generated a tremendous amount of local controversy, and had significant conflicts with National wetlands policy.

1.3. UNRESOLVED ISSUES

The containment and effluent discharge design for the 85-acre wetland restoration component that mitigates for impacts on wetlands from the CDF and off-site construction area construction is not fully resolved. Available dilution in the mitigation site and Bayou Bienvenue is insufficient to meet applicable water quality criteria for wetland restoration, and a waiver would be required for discharge to Bayou Bienvenue. If a waiver could not be obtained for wetland restoration, either effluent would be handled in a different manner than currently proposed or an alternative mitigation site would be chosen for wetland restoration to meet the project's mitigation requirements. The Water Quality and Sediment Evaluation Report (Appendix C) contains the disposal plan for the mitigation site and provides a range of 37 to 148 acres for the Float-in-place Plan and 115 to 319 acres for the Cast-in-place Plan. Containment would be required for dredged material to be placed in the mitigation site and used to raise the surface elevation high enough relative to sea level to support wetland vegetation. The material would either be placed uncontained or a containment berm would need to be built with off-site material. The source of that off-site borrow material is currently not known. The borrow site would be contractor-furnished and would meet U.S. Army Corps of Engineers (USACE) prioritization for borrow site selection, which includes avoiding sites containing wetlands. Furthermore, the material that would be placed in the mitigation site for wetland creation would be hydraulically dredged from the IHNC, and would contain large volumes of water. As dredged material in the mitigation site settles, excess water, or effluent, would need to be contained within the containment berm until suspended sediments have settled, and then properly discharged, either into Bayou Bienvenue or pumped to the GIWW/MRGO. The containment and discharge of effluent and associated water quality issues are not fully resolved.

1.4. ENVIRONMENTAL COMMITMENTS AND MITIGATION PLAN

Commitments that would minimize or eliminate adverse effects on the human and natural environments have been included in the recommended plan. These commitments are summarized in Table 1-1.

Table 1-1. Environmental Commitments

Significant Issue or Resource	Reason for Commitment	Commitment
Business and Industry	Businesses in the vicinity of the IHNC may experience a decline in sales and rents during bridge closures.	Provide direct monetary compensation to commercial establishments and landlords that experience an actual, documented decline in sales, rents or tuition.
	The project would adversely affect some local business activity during construction.	Seed money would be provided to establish a business assistance program to serve as a stimulus for local business development. A pilot job training program in construction skills was implemented in 2003.
Employment	WRDA of 1986 and Congressional guidance require minority and local involvement in project construction.	Contractors would be required to give preference to hiring fully-qualified residents within the community.
	Many potential workers in the project area are unskilled and would not be qualified for many construction jobs.	A pilot construction skills enhancement-job training program was implemented in 2003. Although there are fewer residents in the adjacent neighborhoods since Hurricane Katrina, the job training program will be critical for providing locally available qualified labor for construction work.
Property Values	Residential property values in much of the IHNC area are depressed and numerous residences were destroyed or severely damaged by Hurricane Katrina. The situation could be worsened during project construction.	A housing improvement program and vacant lot cleanup program have been implemented as mitigation. These are part of the larger community improvement activities that mitigate for impacts on property values.
Public and Community Facilities and Services	Existing police, fire and emergency medical services have been severely damaged by Hurricane Katrina and their ability to respond could be further hampered by project construction.	Police patrols and emergency medical services would be increased near the IHNC and in St. Bernard Parish during the construction period. Emergency communication with the bridge operators, as requested by the U.S. Coast Guard bridge permit, would be improved.
	Few recreational facilities remain in the project area since Hurricane Katrina. Opportunities to use these remaining neighborhood recreational facilities may be diminished during project construction.	Recreation needs for each neighborhood would be provided. Facilities would be operated by non-Federal interests.
Vehicular Transportation	Construction-related traffic would increase the overall traffic in the IHNC area. However, traffic congestion in the area has decreased since Hurricane Katrina and the impacts from construction-related traffic and temporary bridge closures would be minimal.	Specific routes would be designated for construction-related traffic.
		All roads damaged by construction activities would be repaired. Local streets that would serve construction-related traffic would be resurfaced prior to initiation of project construction.
		A temporary bridge would be constructed at St. Claude Avenue to provide uninterrupted traffic flow through this corridor while a new permanent bridge is constructed.

Table 1-1, continued

Significant Issue or Resource	Reason for Commitment	Commitment
Vehicular Transportation, continued		Appropriate detour signs and signals would be erected to maintain access to local streets. Intersections where detours would be required would be improved, such as at Florida Avenue and Alvar Street.
		Offsite parking areas for construction workers would be provided on the east and west sides of the IHNC. Shuttle vans would transport workers to and from construction areas.
		Traffic signals would be synchronized in the vicinity of the IHNC and no less than four computerized message boards would be provided to direct traffic flow.
		An incident management plan would provide for a police detail and two tow trucks to stand-by during rush hours (7 am to 9 am and 4 pm to 6 pm) for accident and vehicle breakdown response during bridge construction activities.
		A rail line would be included on the new St. Claude Bridge and approach ramps to be compatible with the Regional Transit Authority's (RTA) long-term plan to implement streetcar service along the Desire route.
		Provide for additional school crossing guards on each side of the IHNC during bridge construction activities.
		A program of street resurfacing and drainage improvements would be implemented on both sides of the IHNC.
		Detours would be provided during the St. Claude Avenue and Claiborne Avenue bridge construction. Detours connecting Patricia Street to Florida Avenue via Angela Street, and to Florida Avenue via Tupelo Street and Caffin Avenue would be provided.
Noise	Project construction would expose residents, employees of businesses and school children near construction sites to elevated noise levels from pile driving, construction traffic and local traffic increases during bridge closures.	Pile driving tests were performed with various types of equipment and noise levels measured to develop noise contours.
		Contract specifications would limit noise to certain levels at specified distances from the construction sites.
		Contract specifications would require monitoring of noise levels to verify adherence to contract specifications.
		Contract specifications would use pile driving equipment designed to minimize noise levels.
		Specific routes would be designated for construction-related traffic to avoid residential areas. Staging areas would be located away from heavily populated areas.

Table 1-1, continued

Significant Issue or Resource	Reason for Commitment	Commitment
Noise, continued		Occupied residential and commercial structures located within areas exposed to unacceptable noise levels would be modified to reduce noise levels inside of structures.
		Pile driving and heavy truck hauling would be restricted to daylight hours, not to exceed 10 hours per day.
		Pile driving for the new St. Claude Avenue Bridge would be done during summer to avoid impacts on school children.
		Residents located immediately adjacent to high noise activities, especially pile driving, would be compensated if they choose to temporarily relocate.
Air Quality	Construction equipment would emit air pollutants and increase dust levels.	Contracts would require monitoring and compliance with Federal and state air quality standards and preservation of air quality, especially airborne particulate matter (dust), within specified levels.
		Best management practices (BMPs) such as watering of disturbed soils in active construction sites, as described by the Storm Water Pollution Prevention Plan (SWPPP), would be implemented to reduce airborne particulate matter.
Wooded Lands	Temporary and permanent impacts on wooded lands at the off-site construction area and CDF locations.	Upon completion of the use of the off-site construction area and CDF fill cell, grades would be restored to pre-construction conditions.
Wetlands	Permanent and temporary impacts on wetlands from the construction and use of the off-site construction area and CDF.	Wetland impacts would be mitigated by using dredged material suitable for estuarine disposal to create 85 acres of wetlands between Bayou Bienvenue and Florida Avenue. However, this area is located within the HSDRRS and available dilution in the mitigation site and Bayou Bienvenue is insufficient to meet applicable water quality criteria, and a waiver would be required for discharge to Bayou Bienvenue. If a waiver could not be obtained, either effluent would be handled differently, or an alternative mitigation site would be chosen for wetland restoration.
Aesthetic Values	Floodwalls constructed on levees will reduce the recreational use of the levee and batture area.	Both sides of the new lock would be backfilled and landscaped to create green space and recreation areas for community use.
		Street lighting would be improved or added along designated detour routes, including both existing and new routes.
		A recreational path would be built in proximity to the floodwalls and levees. The path would connect to the bicycle path that extends along St. Claude Avenue to St. Bernard Parish.
	Bridge approaches, bridge piers and re-aligned levees and floodwalls would adversely affect the aesthetic appeal of historic neighborhoods.	Landscaping would be provided around levees, floodwalls and bridge approaches.
		Textured surfaces would be used on exteriors of floodwalls, bridge approaches and bridge piers to add visual appeal.

Table 1-1, continued

Significant Issue or Resource	Reason for Commitment	Commitment
Asethetic Values, continued		One or more observation decks, with interpretive displays and benches, would be constructed on the new floodwall to preserve the current recreation viewing opportunities.
		Lighting and green space would be provided in the vacant areas created by reconstruction of the St. Claude Avenue Bridge approaches.
		Public right-of-ways along existing streets would be landscaped.
	A grove of large live oak trees provide an aesthetically important feature. They would be removed for the bypass channel around the existing lock during its demolition.	Compensation for the loss of the oak trees would involve either transplanting some of the trees to nearby public lands, or if transplantation is not feasible, planting of mature nursery stock.
Cultural Resources	Two structures eligible for listing in the National Register of Historic Places would be removed. These are St. Claude Avenue Bridge and the existing IHNC Lock. The project is perceived by some residents to present a threat to the historic nature of their communities, which has been severely damaged by Hurricane Katrina.	A permanent historical record of eligible structures has been prepared in coordination with the State Historic Preservation Officer (SHPO), the Advisory Council for Historic Preservation and the New Orleans Historic Districts Landmarks Commission.
		One or more key historically-significant components of the old lock and the St. Claude Avenue Bridge would be salvaged and displayed.
		A brochure addressing various historical features of the existing lock and St. Claude Avenue Bridge, as well as significant historical attributes of the surrounding community, would be produced.
		Markers and displays which feature appropriate information concerning the existing lock, other historic structures, and the surrounding neighborhoods would be erected.
		Oral histories of remaining local residents would be taken to preserve the history of the neighborhoods adjacent to the IHNC.
		A large display concentrating on the maritime history of New Orleans and south Louisiana would be constructed.
	The construction of the CDF has the potentially to disturb unknown deeply buried cultural resources.	A cultural resources monitor would be in place during all ground disturbing activities during CDF construction.

SECTION 2.
TABLE OF CONTENTS

2. TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF TABLES, CONTINUED

LIST OF PHOTOGRAPHS

LIST OF APPENDICES

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SECTION 3.
NEED FOR AND OBJECTIVES OF ACTION

3. NEED FOR AND OBJECTIVES OF ACTION

3.1. STUDY AUTHORITY

The Inner Harbor Navigation Canal (IHNC) is located between the Mississippi River and the Mississippi River Gulf Outlet (MRGO), on the Gulf Intracoastal Waterway (GIWW). The IHNC Lock was open to navigation in 1923. The authority for the replacement of the IHNC was described in the 1997 Mississippi River – Gulf Outlet New Lock and Connecting Channels Environmental Impact Statement (EIS), hereafter referred to as the 1997 EIS. The 1997 EIS was prepared to comply with the requirements of the National Environmental Policy Act of 1969 (NEPA) and the implementing regulations of the President's Council on Environment Quality (Figure 3-1). The study authority is incorporated by reference from the 1997 EIS.

Photograph 3-1. Existing IHNC Lock

In summary, the original authorization for the replacement of the 75-foot wide, 640-foot long and 31.5-foot deep IHNC Lock (Photograph 3-1) was established by Public Law (PL) 84-455 of 1956. This was amended by Section 186 of the Water Resources Development Act (WRDA) of 1976 (PL 94-587) making the construction of bridges associated with the construction of the MRGO channel a Federal responsibility. A Site Selection Report prepared by the U.S. Army Corps of Engineers (USACE), New Orleans District (CEMVN) and the Port of New Orleans, and approved by the Office of Chief of Engineers in 1976 recommended the Lower Site downstream of Violet, Louisiana (see Figure 3-1) as the best location for a new lock. WRDA of 1986 (PL 99-662) modified the project to locate the new lock at either the existing lock site or at the Violet site. Furthermore, WRDA of 1986 modified the project's cost-sharing agreement. In 1991, the U.S. House of Representatives, Committee on Appropriations drafted the Energy and Water Development Appropriations Bill (Report Number 101-536), which directed the USACE in conjunction with the local sponsor to develop a community impact mitigation plan to ensure that the communities adjacent to the project remain as complete, livable neighborhoods during and after project construction. WRDA of 1996 (PL 104-303) amended WRDA of 1986 by requiring the implementation of a comprehensive community impact mitigation plan as described in the evaluation report of the CEMVN Engineer dated August 1995.

The cost sharing for this project was set forth in the WRDA of 1986 and was described in the 1997 EIS. However, the project cost share description in the 1997 EIS was determined to be in error, and the cost share description was revised in Evaluation Report Supplement Number 1, dated September 20, 2000 as approved by the Deputy Commander for Civil Works (Appendix A). When Congress authorized the Lock Replacement project in Section 844 of WRDA of 1986, it authorized a new deep-draft lock to replace the existing deep-draft lock and specified that the cost sharing for both the shallow and deep-draft increments shall be consistent with Sections 101 and 102 of WRDA of 1986. Therefore, the cost sharing has been modified to be consistent with WRDA of 1986, and the non-Federal interests must provide 25 percent of the incremental

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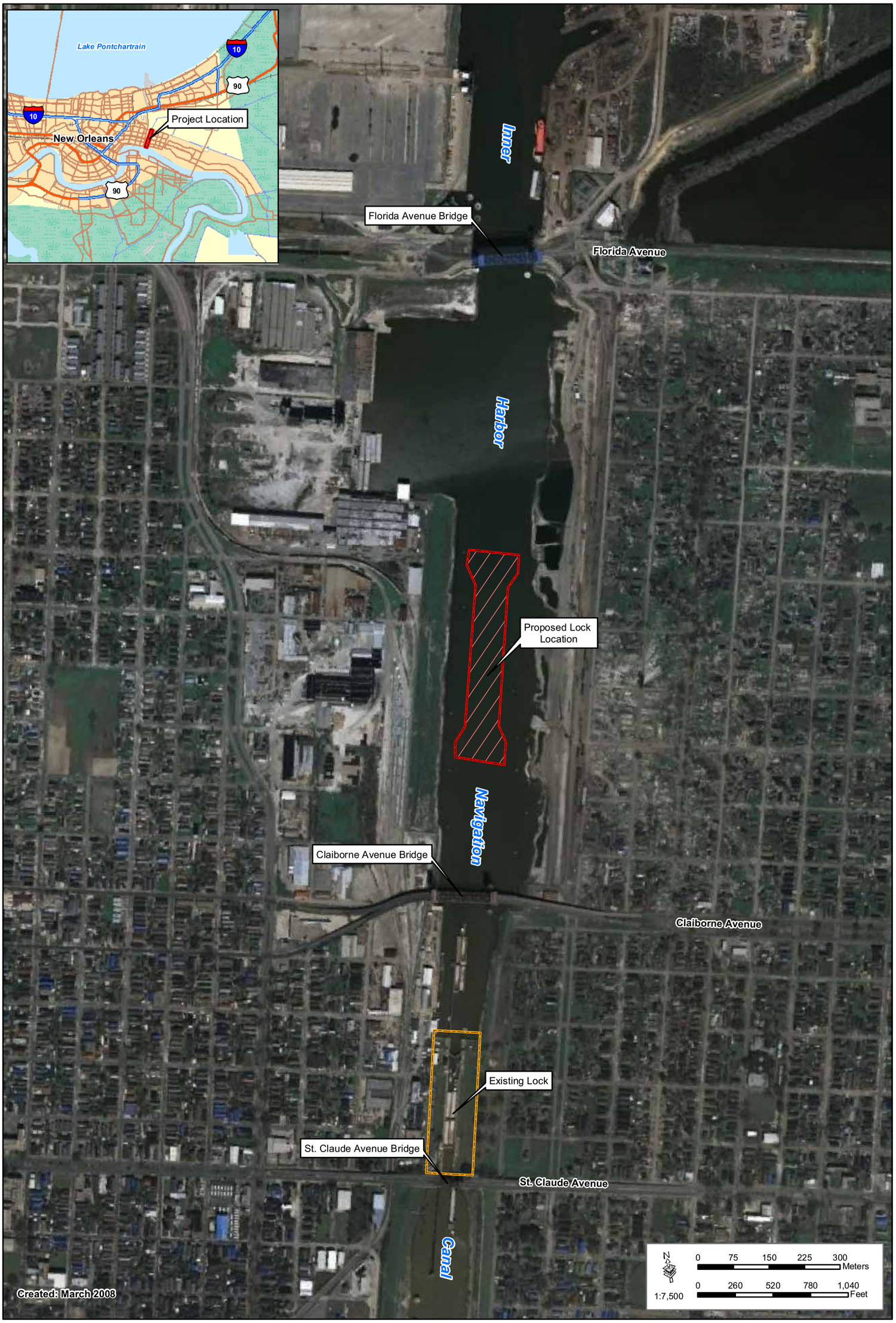

Figure 3-1: Location of IHNC Lock Replacement Project

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construction costs for the deep-draft portion of the project during construction and an additional 10 percent share in cash over a period not to exceed 30 years after completion of construction, at an interest rate determined pursuant to Section 106 of WRDA of 1986, and amendments thereto. In accordance with applicable inland and deep-draft navigation, USACE will be responsible for 100 percent of the operations, maintenance, repair, replacement, and rehabilitation costs for the replacement lock.

3.2. PLANNING CONCERNS

A long history of public concern associated with the IHNC Lock replacement was documented in the 1997 EIS, and is herein incorporated by reference. Historic and current public concerns focus around the potential neighborhood disruption associated with the long duration of the project. These include noise from pile driving activities, traffic delays and hurricane and storm damage risk reduction. Dredging activities, with particular emphasis on the disposal of contaminated dredged material, are also ongoing public concerns (Appendix P). In 2007, the Federal District Court, Eastern Louisiana District, enjoined the project and required the preparation of this Supplemental EIS (SEIS) to describe the changes in existing conditions after Hurricane Katrina and analyze impacts on the post-Hurricane Katrina human and natural environment.

3.3. PLANNING OBJECTIVES AND PROJECT PURPOSE AND NEED

The planning objectives and the project's purpose and need were described in the 1997 EIS and remain unchanged. These are:

- To develop plans that reduce or eliminate delays to navigation between the Mississippi River and tidewater facilities and waterways to the east of the Mississippi River;
- To develop plans that avoid and minimize relocations and other impacts on local residents and businesses to the maximum extent practicable;
- To develop plans that avoid and minimize environmental impacts on the maximum extent practicable; and
- To design and recommend appropriate mitigation features for unavoidable impacts on local residents, cultural resources, and environmental resources.

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SECTION 4.
ALTERNATIVES

4. ALTERNATIVES

4.1. PLANS ELIMINATED FROM FURTHER STUDY

Planning efforts for the IHNC Lock replacement started in 1960, and since that time numerous plans have been evaluated and eliminated. These include different sites for the lock replacement, as well as various alternative construction methods.

4.1.1. Lock Sites Eliminated

A total of eight sites have been evaluated during various planning efforts and described by a 1975 Site Selection Report. These eight sites, which were described in the 1997 EIS, are shown in Figure 4-1, and are incorporated herein by reference. A ninth site, the Meraux Site, was described by the original authorizing legislation, but was determined early on to be unsatisfactory due to the combination of proximity of industrial development and adverse river conditions. The Scarsdale, Caernarvon, and Bohemia sites were eliminated because the routes were too circuitous and would cause massive, permanent damage to productive coastal marshes. The Saxonholm Site would have caused more severe disruption to residents of St. Bernard Parish than the two sites (Upper and Lower) evaluated in the vicinity of Violet. Finally, the Upper Site in Violet was also eliminated due to the potential disruption of residents in Violet.

Based on the 1975 Site Selection Report, the remaining sites that were carried forward for further evaluation were the IHNC Site and the Lower Violet Site. In 1977, President Carter directed USACE to conduct further studies of the lock replacement while focusing on minimizing displacement and impacts on residents. WRDA of 1986 directed USACE to evaluate only the existing IHNC Lock Site and the Lower Violet Site for the lock replacement. Further studies at the Lower Violet Site revealed that a lock and connecting channels would have major adverse impacts on the environment, specifically on extensive coastal wetlands located between the Mississippi River and the MRGO. The combination of these adverse environmental impacts and the strong opposition from residents of St. Bernard Parish led CEMVN to request higher authority from the USACE to halt any further consideration of the Lower Violet Site. The USACE, Mississippi River Valley Division, Headquarters and the Assistant Secretary of the Army for Civil Works agreed, and the Plan Formulation Section of the Main Report included as part of the 1997 EIS documents the details of this decision. Following the decision to eliminate further consideration of the Lower Violet Site, the IHNC Lock Site became the only viable alternative, and a number of alternative lock alignments at this site were evaluated.

4.1.2. Lock Alignments at the IHNC Eliminated

Various alignments, locations, configurations and construction methods have been evaluated for the lock replacement at the IHNC Lock Site (Photograph 4-1). These alternatives were described in the 1997 EIS and are incorporated herein by reference. In summary, as part of the alternative evaluation, CEMVN gave maximum consideration to alternatives that minimized the disruption and displacement of nearby residents, as directed by the 1991 Appropriations Bill and WRDA of 1996.

Photograph 4-1. IHNC Lock Site

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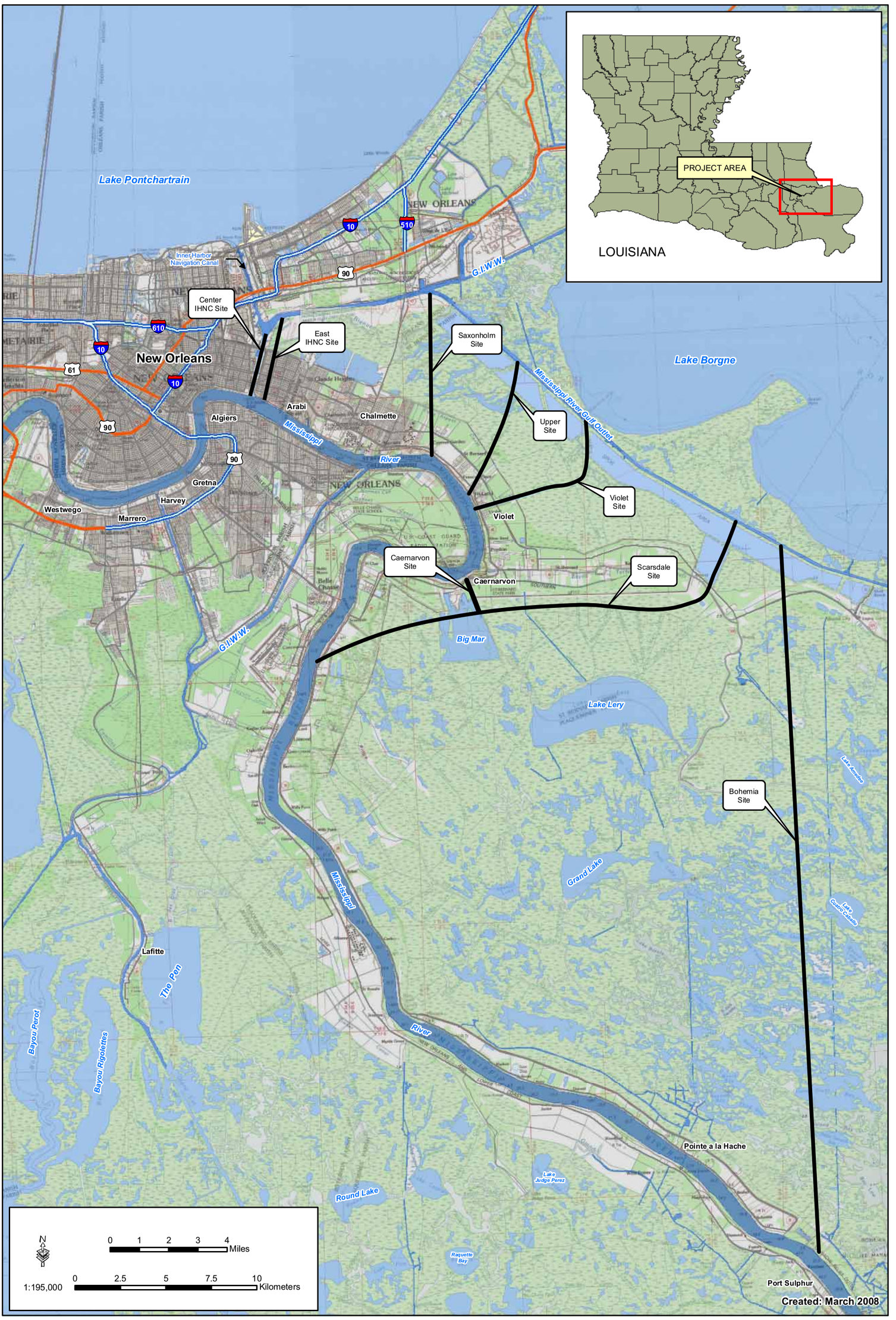

Figure 4-1: Eight Sites Originally Evaluated (as shown in the 1997 EIS)

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In 1991, five alternative alignment plans were evaluated:

- New lock located 200 feet east of the existing lock, conventional construction, new mid-level bridges at St. Claude and Claiborne avenues;
- New lock located 200 feet east of the existing lock, steel shell, float-in construction, new mid-level bridges at St. Claude and Claiborne avenues;
- New lock located 200 feet west of the existing lock, conventional construction, new mid-level bridges at St. Claude and Claiborne avenues;
- *In situ* lock replacement, concrete or steel shell, float-in construction, new mid-level bridge at St. Claude Avenue; and
- *In situ* lock replacement, float-in gate-bays, new mid-level bridge at St. Claude Avenue.

The socioeconomic impact analysis of these five alternatives determined that all of them would cause substantial adverse, significant impacts on the local community, and that any of these alternatives would potentially undermine the viability of the adjacent neighborhoods without the initiation of an overall, community-based improvement program as mitigation for impacts. Furthermore, the socioeconomic impact analysis recommended that a site located north of Claiborne Avenue within the IHNC be evaluated further for a new lock. From a socioeconomic perspective, the North of Claiborne Avenue Site provided substantial advantages over the other sites previously evaluated.

Although the North of Claiborne Avenue Site had been previously evaluated in the 1975 Site Selection Study and determined to be infeasible because of the length of time required for the demolition of the existing lock, innovative engineering designs allowing for a new approach to sequencing construction and demolition activities allowed the site to be determined a technically feasible alternative in 1992. Subsequently, CEMVN prepared a second report documenting the range of feasible alternatives that included four sites. The eight plans investigated at these four sites included four previously evaluated in 1991 and four North of Claiborne Avenue plans:

- New lock located 200 feet east of the existing lock, conventional construction, new mid-level bridges at St. Claude and Claiborne avenues;
- New lock located 200 feet east of the existing lock, steel-shell prefabricated off-site and floated into place in sections; new mid-level bridges at St. Claude and Claiborne avenues;
- New lock located 200 feet west of the existing lock, conventional construction, new mid-level bridges at St. Claude and Claiborne avenues;
- *In situ* lock replacement, conventional construction, new mid-level bridge at St. Claude Avenue, the existing Claiborne Avenue Bridge would be compatible with this lock alignment and would not need replacement;
- New lock located within the IHNC north of Claiborne Avenue, shell prefabricated off-site and floated into place in sections, new mid-level bridge at St. Claude Avenue, Claiborne Avenue Bridge would not be replaced;
- New lock located within the IHNC north of Claiborne Avenue, shell prefabricated off-site and floated into place in sections, new low-level bridge at St. Claude Avenue, Claiborne Avenue Bridge wound not be replaced;
- New lock located within the IHNC north of Claiborne Avenue, shell prefabricated off-site and floated into place in sections, new low-level bridge at St. Claude Avenue, new mid-level bridge at Claiborne Avenue; and

- New lock located within the IHNC north of Claiborne Avenue, conventional construction, new low-level bridge at St. Claude Avenue, new mid-level bridge at Claiborne Avenue.

Based upon significant adverse unmitigable impacts for the 200-foot east and west locations in combination with the public opposition for all of the plans except the North of the Claiborne Avenue Site, CEMVN concluded that the only suitable site for a new lock to be constructed was within the IHNC north of Claiborne Avenue. All other alternative locations were determined to not be reasonable, and additional details concerning the rationale for this conclusion are available in the Plan Formulation Section of the Main Report in the 1997 EIS, and are incorporated herein by reference.

4.1.3. Phased Construction Plan

A phased construction plan was considered in the 1997 EIS and is incorporated herein by reference. The phased construction plan was considered in order to reduce the vessel traffic congestion at the existing lock as soon as possible. This plan would have required the construction of a mid-level bridge at St. Claude Avenue to accommodate both vessels using the existing lock and vessels using a bypass channel. The combination of the socioeconomic impacts associated with the height of a mid-level St. Claude Avenue Bridge and the determination that it was an economically inferior plan, caused CEMVN to determine that it was not a viable alternative, and it was eliminated from further consideration.

4.1.4. Steel-shell Lock Design

A steel-shell lock design that would be constructed in modules off-site and soil-founded, thus requiring only a small number of leveling pilings, was considered in the 1997 EIS and is incorporated herein by reference. Although the steel-shell lock design would greatly reduce noise impacts on local residents due to decreased pile driving, the steel-shell lock design was deemed infeasible due to the maintenance and repair closures required as a result of corrosion and damage from vessels.

4.1.5. Tunnel Alternatives for the St. Claude Avenue and Claiborne Avenue bridges

Several alternative plans that would construct traffic tunnels beneath the IHNC to replace the St. Claude Avenue Bridge and the North Claiborne Avenue Bridge were evaluated by CEMVN in 2001 (CEMVN 2001). Tunnel alternatives for the replacement of both bridges were determined to be technically feasible. However, due to the high cost of construction, difficulties associated with construction in the dry, which would minimize disruption of IHNC waterborne traffic, and the adverse socioeconomic and traffic impacts, including the required displacement of residential and commercial structures and alterations to pedestrian and bicycle travel, the construction of tunnels to replace these two bridges was dismissed from further evaluation.

4.1.6. Alternative Claiborne Avenue Bridge Designs

CEMVN evaluated seven alternative bridge designs in 2004 (CEMVN 2004). Although the bridge designs located parallel to and south of the existing Claiborne Avenue Bridge provide the least amount of vehicular and marine outage time, and provide for the greatest percentage of waterborne traffic passage without bridge opening, these designs also had the highest cost, would require additional right-of-way and substantial residential and commercial structure displacement. Because of these adverse socioeconomic impacts, the alternative bridge designs that would construct a new bridge parallel to and south of the existing Claiborne Avenue Bridge were dismissed from further evaluation.

4.2. NO ACTION/WITHOUT PROJECT CONDITIONS

The No Action Alternative as evaluated in the 1997 EIS would preclude any Federal action to replace the existing IHNC Lock and modify or replace the St. Claude Avenue and Claiborne Avenue bridges and is herein incorporated by reference. Additionally, the No Action Alternative would require the continued expenditure of funds for maintenance of the existing IHNC Lock. It is estimated that, for the existing lock to operate over the life of the project (50 years), it would be necessary to make maintenance expenditures estimated at $16.1 million. Periodic canal closures would be likely, as some maintenance activities cannot occur while the lock is fully operational. Since the North of Claiborne IHNC Lock Replacement Site was selected in the 1997 EIS, is the authorized plan, and components of that design have been implemented, the No Action Alternative as described in the 1997 EIS is eliminated from further evaluation. Instead, a No-build/Deauthorization Plan, which better represents the future with the lack of any lock improvements, was fully evaluated (see Section 4.3.2).

4.3. PLANS CONSIDERED IN DETAIL

4.3.1. General

The plans considered in detail in this SEIS are the No-build/Deauthorization Plan; the 1997 EIS Plan, which is the authorized project and now considered to be the No Action Alternative; and the two revised lock replacement plans, which are the Cast-in-place and Revised Float-in-place Plans. Currently, a low-level, vertical lift railroad and vehicle bridge crosses the IHNC at Florida Avenue. The current bridge, constructed in 2005, has one railroad track, two vehicle lanes and two sidewalks, and is owned and operated by the Port of New Orleans (Photograph 4-2). The Louisiana Department of Transportation and Development (DOTD) is planning a new four-lane high-level vehicular bridge across the IHNC at Florida Avenue (Figure 4-2). However, due to funding issues, the start date for the construction of the new high-level Florida Avenue Bridge is not known at this time and the project is on-hold indefinitely. The Florida Avenue Bridge project also includes a two-lane elevated bridge section between Tupelo Street and Paris Road, new approaches on either side of the IHNC Florida Avenue Bridge, an interchange with Poland Avenue and Alvar Street, and a four-lane roadway between Caffin Avenue and Tupelo Street (DOTD 2007).

Photograph 4-2. Florida Avenue Bridge as viewed from the Lower Ninth Ward

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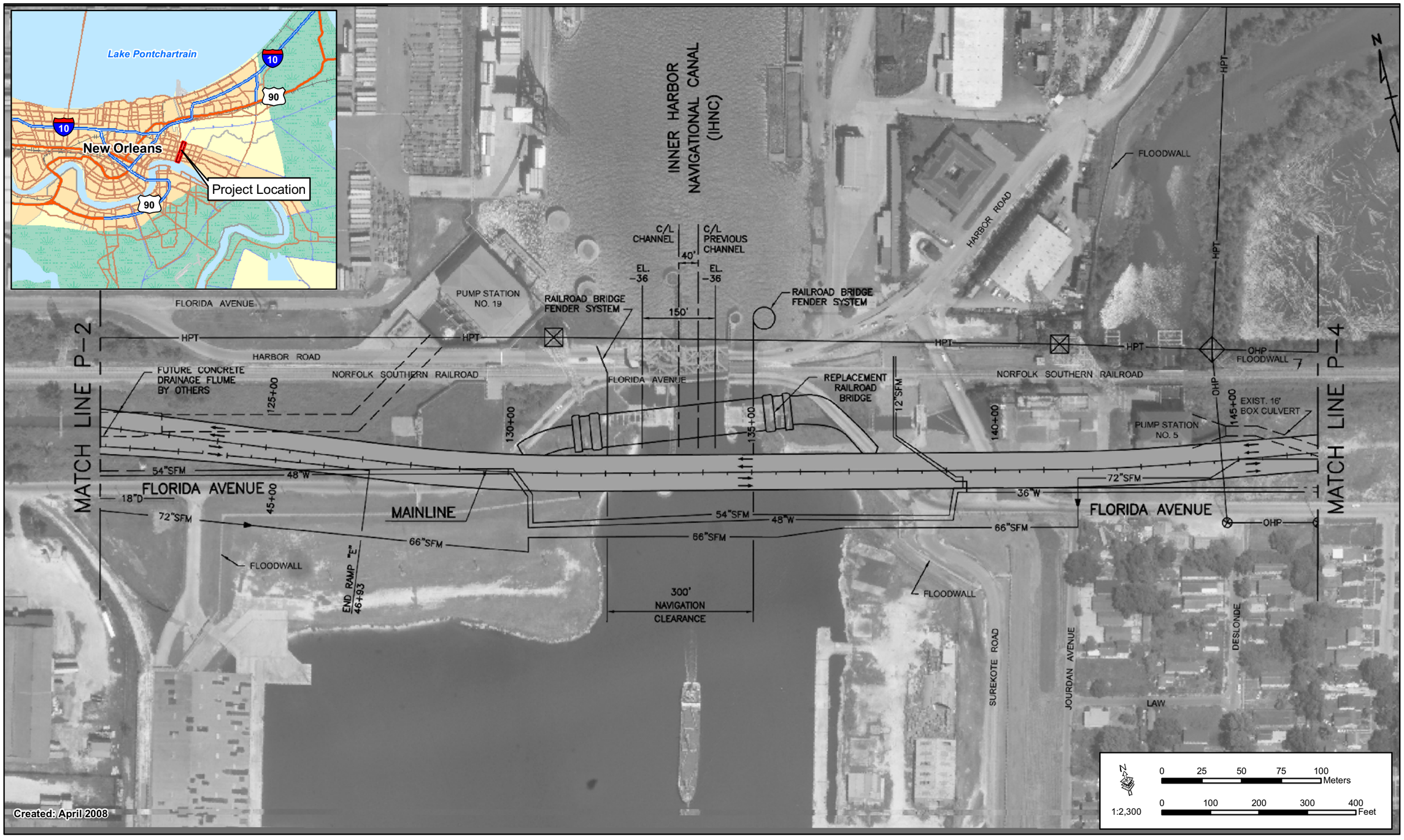

Figure 4-2: Conceptual Alignment of Proposed Florida Avenue Bridge and Highway Construction Project
Proposed by the DOTD (as shown in the EA/Addendum by DOTD)

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4.3.2. Plan 1 (No-build/Deauthorization)

Under the No-build/Deauthorization Alternative, the IHNC Lock Replacement project would be deauthorized by Congress and would preclude the construction of a new lock. The Federal government would continue to operate and maintain the existing lock. This alternative assumes that the existing lock would neither be replaced nor closed. Delay times would be similar to existing conditions, as lock repairs and maintenance would be a continuous concern.

4.3.3. Plan 2 (1997 EIS Plan)

The New Lock – North of Claiborne Avenue Plan was described in detail in the 1997 EIS and that description is incorporated herein by reference. Also, because this is the authorized project and portions of the project have been implemented, Plan 2 is the No Action Alternative for this SEIS. In summary, that plan included the replacement of the existing lock with a new lock to be constructed in the IHNC, north of Claiborne Avenue. Various dimensions for the new lock were described; however, the recommended plan (Plan 3f in the 1997 EIS), would construct a new lock with dimensions of 110 feet wide by 1,200 feet long by 36 feet deep (Figure 4-3). This was also the locally preferred plan. When Congress authorized the project in Section 844 of WRDA of 1986, it authorized a new lock to replace the existing deep-draft lock. The cost sharing requires the Port of New Orleans to provide 25 percent of the incremental construction costs for the deep-draft portion of the project during construction and an additional 10 percent share in cash over a period not to exceed 30 years after construction.

The construction of the new lock north of Claiborne Avenue would require a complex sequence of tasks, and these were also described in the 1997 EIS. It is anticipated that the entire construction process would take 11 years to complete. The following is a summary of those tasks (and are shown on Figure 1-2 and sequentially summarized on Figure 4-4). Additionally, these tasks assumed that the new high-level Florida Avenue Bridge would be completed before the start of lock construction activities.

- The Galvez Street Wharf and U.S. Coast Guard facility on the west bank of the IHNC, and the remaining businesses on the east bank of the IHNC between the Mississippi River and Florida Avenue, would be demolished and removed.
- A temporary bypass channel would be excavated on the east side of the IHNC where the new lock is proposed (Photograph 4-3).
- The site for the new lock north of Claiborne Avenue would be prepared by hydraulically dredging the canal bottom, placing bedding material and driving pilings.

Photograph 4-3. Location of temporary bypass channel on the east side of the IHNC.

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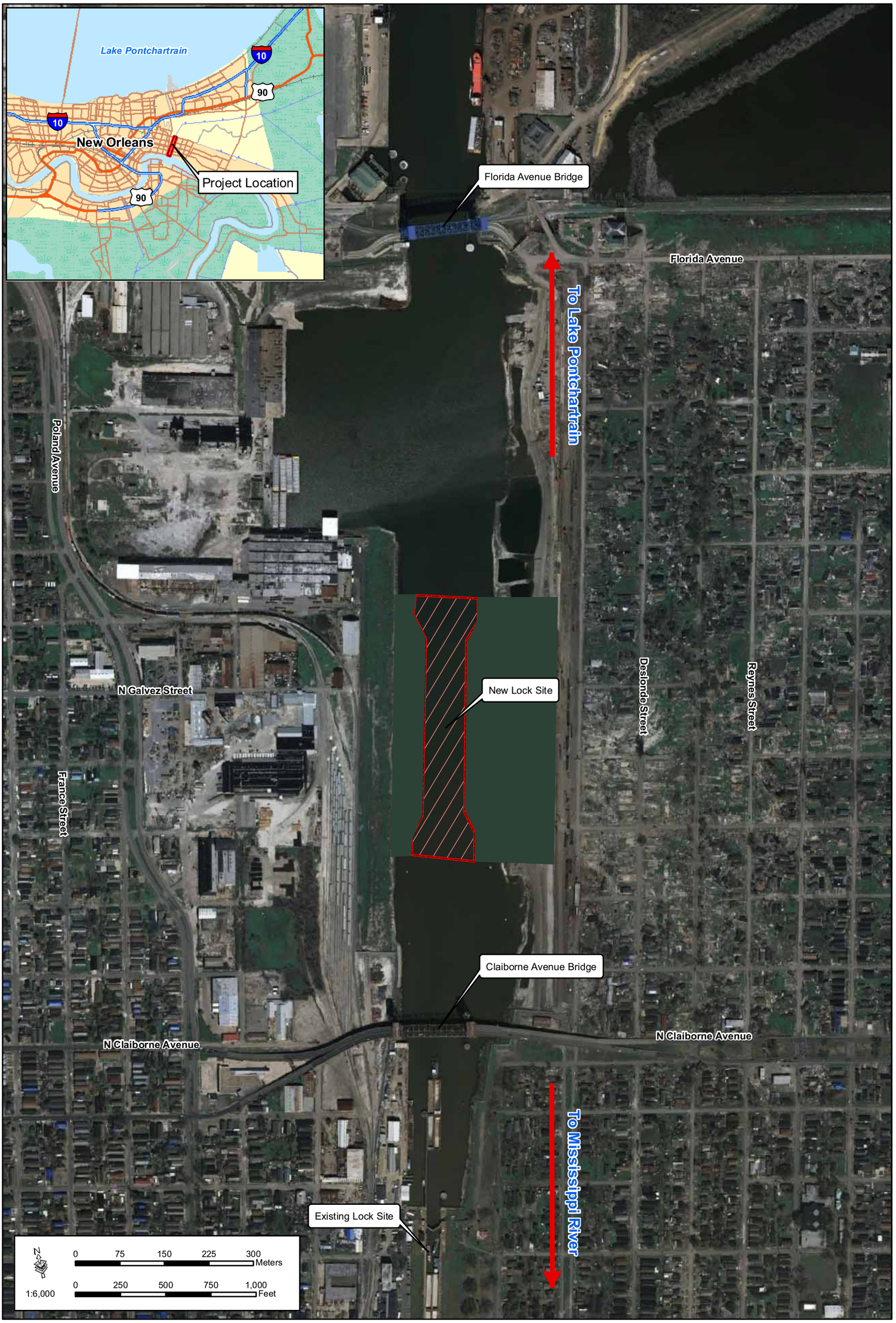

Figure 4-3: Footprint of Proposed Lock (110 feet wide; 1,200 feet long; and 36 feet deep at its location as shown in the FIP vs CIP Letter Report exhibits)

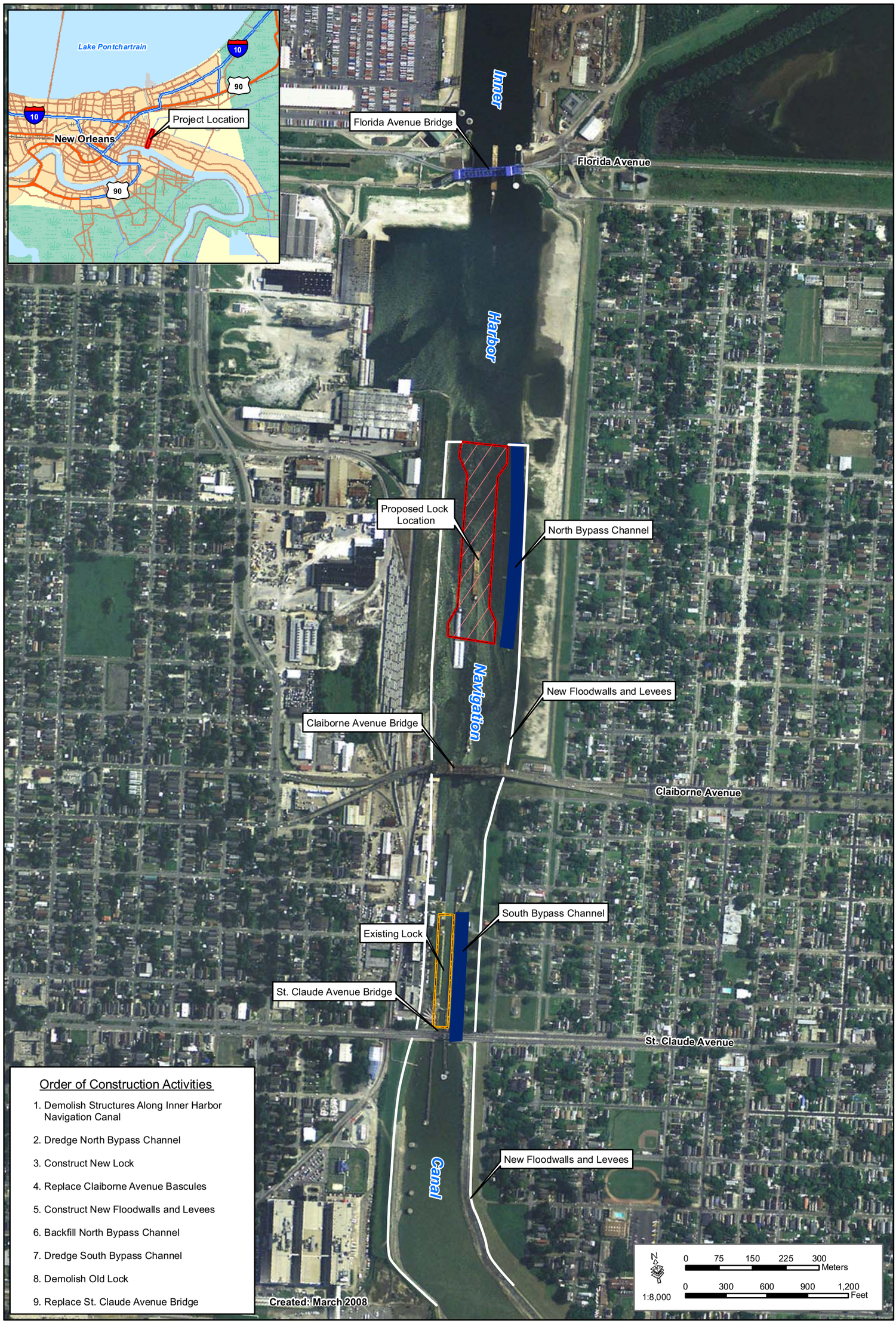

Figure 4-4: Components of IHNC Lock Replacement Project

- All dredged material would be disposed of in three locations: 1) the Mississippi River; 2) along the south bank of the GIWW/MRGO in a 240-acre CDF previously used for dredged material disposal; and 3) placed west of the City of New Orleans Wastewater Treatment Plant in a shallow open water triangular-shaped area between Bayou Bienvenue and Florida Avenue to develop marsh as mitigation for impacts from an offsite construction area located north of the GIWW/MRGO and west of the Paris Road Bridge (Photograph 4-4).

Photograph 4-4. 1997 EIS Plan off-site construction area located on the north bank of the GIWW/MRGO

- Reinforced concrete lock modules would be partially constructed at the off-site construction area, also known as the Aurora Property. The four partially completed lock modules would be individually floated from the off-site construction area to the former Galvez Street Wharf area, where lock walls and accessories would be added.
- The completed modules would then be floated from the former Galvez Street Wharf area to the prepared foundation site and ballasted into position.
- A detour road would be constructed through an undeveloped area in St. Bernard Parish (Meraux Tract) to link St. Bernard Highway, Judge Perez Boulevard and Florida Avenue. This would provide commuters with improved access to the new Florida Avenue Bridge bypassing the St. Claude Avenue and North Claiborne Avenue bridges during construction.
- Temporary single-bascule bridges would be constructed adjacent to the St. Claude Avenue Bridge (Photograph 4-5) to provide a comparable level of traffic flow while the St. Claude Avenue Bridge is replaced with a low-level double bascule bridge.

Photograph 4-5. Existing St. Claude Avenue Bridge; view of the bridge is from the south near the IHNC – Mississippi River confluence

- The towers and lift span of the North Claiborne Avenue Bridge would be replaced (Photograph 4-6). The new towers and lift span would be prefabricated off-site and floated into position on barges. The North Claiborne Avenue Bridge closure time is not expected to exceed 4 weeks.
- Levees and floodwalls would be relocated and upgraded to provide Mississippi River flood control. This includes extending the Mississippi River flood control levees north of North Claiborne Avenue to the location of the new IHNC Lock and realigning the existing levees south of St. Claude Avenue to the confluence of the IHNC and Mississippi River. A floodwall cap would be placed on top of the realigned levees.

Photograph 4-6. Existing Claiborne Avenue Bridge; view is from the south near the existing IHNC Lock

- Once the new IHNC Lock becomes operational, the north bypass channel would be back-filled mainly with material dredged from the south bypass channel (*i.e.*, demolition bypass channel) to be excavated around the east side of the old lock.
- The existing lock would be demolished and hauled away. Additional dredging would occur in the vicinity of the old lock site following demolition and in the old and new lock fore bays. Some of this dredged material would be used around the new lock site, and any excess, uncontaminated material would be pumped into the Mississippi River.
- New lock guide walls and permanent mooring facilities would be constructed.

A broad-based community impact mitigation plan is also a component of this alternative. The plan to be implemented includes numerous actions to minimize and compensate for adverse impacts on the local community that are expected from project construction, mainly in areas of community facilities and services, community cohesion, noise, police and fire protection, aesthetics and pedestrian access. The community impact mitigation plan was described in detail in the 1997 EIS and is incorporated herein by reference. As part of the community impact mitigation plan, a total of $43 million would be expended in Lower Ninth Ward, Holy Cross, St. Claude/Florida, and Bywater in order to mitigate impacts on these neighborhoods resulting from the IHNC Lock Replacement Project (Community Based Mitigation Committee [CBMC] 2008).

The off-site construction area was chosen from a list of potentially suitable sites provided to CEMVN by the Port of New Orleans. Those sites were described in Table 4 of the 1997 EIS, and the analysis of those sites is incorporated by reference. Dredged material removed during construction of the new lock, temporary bypass channels, and after demolition of the existing lock is completed would be disposed of in one of three ways. Dredged material determined to be contaminated would be disposed of along the south bank of the GIWW/MRGO in a CDF, and a conceptual design for this CDF was prepared (Appendix E). Dredged material deemed suitable for use in wetland restoration would be disposed of south of Bayou Bienvenue and west of the City of New Orleans' Wastewater Treatment Plant to create wetlands as mitigation for impacts on wetlands from other project components (*e.g.*, off-site construction area and CDF site construction). Finally, material determined to be suitable for disposal in freshwater aquatic environments, but

not needed for future use as fill material or determined to be unsuitable for wetland creation, would be discharged into the Mississippi River.

As part of the project, a Water Quality and Sediment Evaluation Report (Appendix C) for dredged materials in the IHNC was conducted. Based upon the results of the Water Quality and Sediment Evaluation, a CDF would be designed to the appropriate size to contain material unsuitable for open water disposal. Furthermore, a plan was developed for the disposal or reuse of all dredged materials, including those for wetland creation purposes and discharge into the Mississippi River.

4.3.4. Plan 3 (Revised Lock Replacement Plans)

Since the preparation of the 1997 EIS, portions of the originally proposed project have been completed and additional studies, design, and analyses have been conducted that require a revision to the original lock replacement plan. Most of these changes involve details associated with dredged material reuse and disposal. However, in addition to the original proposed float-in-place construction method evaluated in the 1997 EIS, a second plan that would allow for cast-in-place construction has been evaluated.

Between 2001 and 2005, over $1 million has been spent on community mitigation projects in the impact area. These mitigation projects included job training programs at Xavier University and Nunez Community College; an Integrated Communications System between IHNC bridge towers and police, fire, and emergency medical services (EMS) units; additional police patrols on the east side of the IHNC; playground improvements, and the Vacant Lot Maintenance Program (CBMC 2008).

Demolition and environmental remediation of the abandoned industrial sites along the east side of the IHNC have been completed. This work included the removal of above- and below-ground structures and canal-side obstructions. This work was completed in June 2005, and now this area, north of Claiborne Avenue is a grassy area with some open water areas where soils were removed below the tidal water level. The U.S. Coast Guard facilities, which were destroyed in Hurricane Katrina, were relocated to the new Integrated Support Command at National Aeronautics and Space Administration's (NASA) Michoud Assembly Facility in Eastern New Orleans. The Galvez Street Wharf has been demolished, with the work being completed in February 2003. Following the demolition of the wharf, nine mooring buoys were placed to protect the exposed bank and aid in navigation. Real estate needed for the lock construction was purchased from the Port of New Orleans for $16.8 million.

Since the current IHNC lock was constructed in 1923, barge and ship traffic, as well as industrial activities, sanitary sewer facilities, and stream flow through the IHNC from the Mississippi River and the MRGO, have deposited an assortment of chemicals and other contaminants in the sediment accumulated at the bottom of the canal. Because of this, any material dredged from the canal or the lock would require evaluation prior to disposal or beneficial use. Prior testing conducted in 1982 and 1993 was documented in the 1997 EIS and that information, including a list of contaminants of concern (CoC) is incorporated herein by reference. As a result of the testing in support of the 1997 EIS, it was concluded that the proposed dredged material would have moderate impacts on the environment. Those dredged materials that were considered suitable for estuarine open-water disposal were proposed to be used beneficially to create marsh and mitigate for the loss of wetlands at the off-site construction area.

Water Quality and Sediment Evaluation
Sampling and testing of sediments as described by the Water Quality and Sediment Evaluation Report (Appendix C) were conducted by Weston Solutions, Inc. during the period July 9, 2007 to September 10, 2007. Lock Replacement construction overlays three general sediment and soil types within the project area: (1) non-native sediment (NN) consisting of unconsolidated material that has been deposited naturally within the IHNC since it was constructed in the 1920s; (2) non-native fill (F) consisting of material that has been placed adjacent to the IHNC for industrial development since the IHNC was constructed; and (3) native (N) subsurface soil consisting of clays and alluvial formations at or below the depth of the original IHNC cut and underlying fill material along the banklines of the IHNC.

Project features also overlap areas impacted by industrial activities along the IHNC, including a former industrial area where contaminated soils have since been remediated. After a review of prior reports, studies, and contaminant sampling programs, suspected areas of contamination were defined within: (1) a segment of the IHNC north of the Florida Avenue Bridge and adjacent to a metal scrap yard; (2) a remediated industrial area, formerly known as the East Bank Industrial Area, located between the Florida and Claiborne Avenue bridges; and (3) an abandoned wharf along the west bank of the IHNC near Galvez Street. A summary of contaminant reports appears in Appendix C, and includes a list of suspected contaminants with analytical target detection limits developed for the IHNC Lock Replacement Project analytical program.

The project area comprises 11 major Dredge Material Management Units (DMMU), defined both laterally and vertically by sediment characteristics, dredging depths, and known or suspected areas of contamination (Figure 4-5). Based on the location and dimension of the project features and overlap with sediment types and suspected areas of contamination, these 11 major DMMUs were further divided into 11 NN DMMUs, four F DMMUs, and five N DMMUs (Table 4-1). Depending on the size of the DMMU, two to 16 sediment samples were collected, and subjected to chemical, physical, and biological tests. DMMU 11 was eliminated from sampling when bathymetric surveys indicated that no dredging would be required in that unit for the proposed lock project.

As mentioned previously, two open-water disposal areas have been proposed for dredged material excavated as part of the lock replacement project. An area of deep water in the Mississippi River adjacent to the IHNC would serve as a primary disposal site. A secondary disposal site for mitigation of impacts on wetlands is located within the HSDRRS in a triangular-shaped area of subsided marsh bounded by Bayou Bienvenue to the North and the Lower Ninth Ward back risk reduction levee along Florida Avenue to the South. Dredged material would be discharged unconfined into the Mississippi River disposal site and is expected to disperse. Material would be placed semi-confined into the secondary disposal site to create a sub-aerial platform at typical marsh elevations. Chemical and physical analyses were conducted on sediment and water samples representative of each disposal area to characterize the sites and for comparison to materials collected from the DMMUs. Samples were taken from within the disposal areas and from adjacent reference areas previously not directly impacted by dredged material placement located on the Mississippi River upstream of the IHNC and St. Bernard central wetlands.

Discharges of effluent and runoff from the CDF would likely be routed to the GIWW and Bayou Bienvenue, respectively, and design considerations for managing these discharges have been included in the Water Quality and Sediment Evaluation Report (Appendix C). Chemical analysis was conducted on water samples collected from the GIWW and Bayou Bienvenue to characterize potential receiving waters for effluent and runoff from the

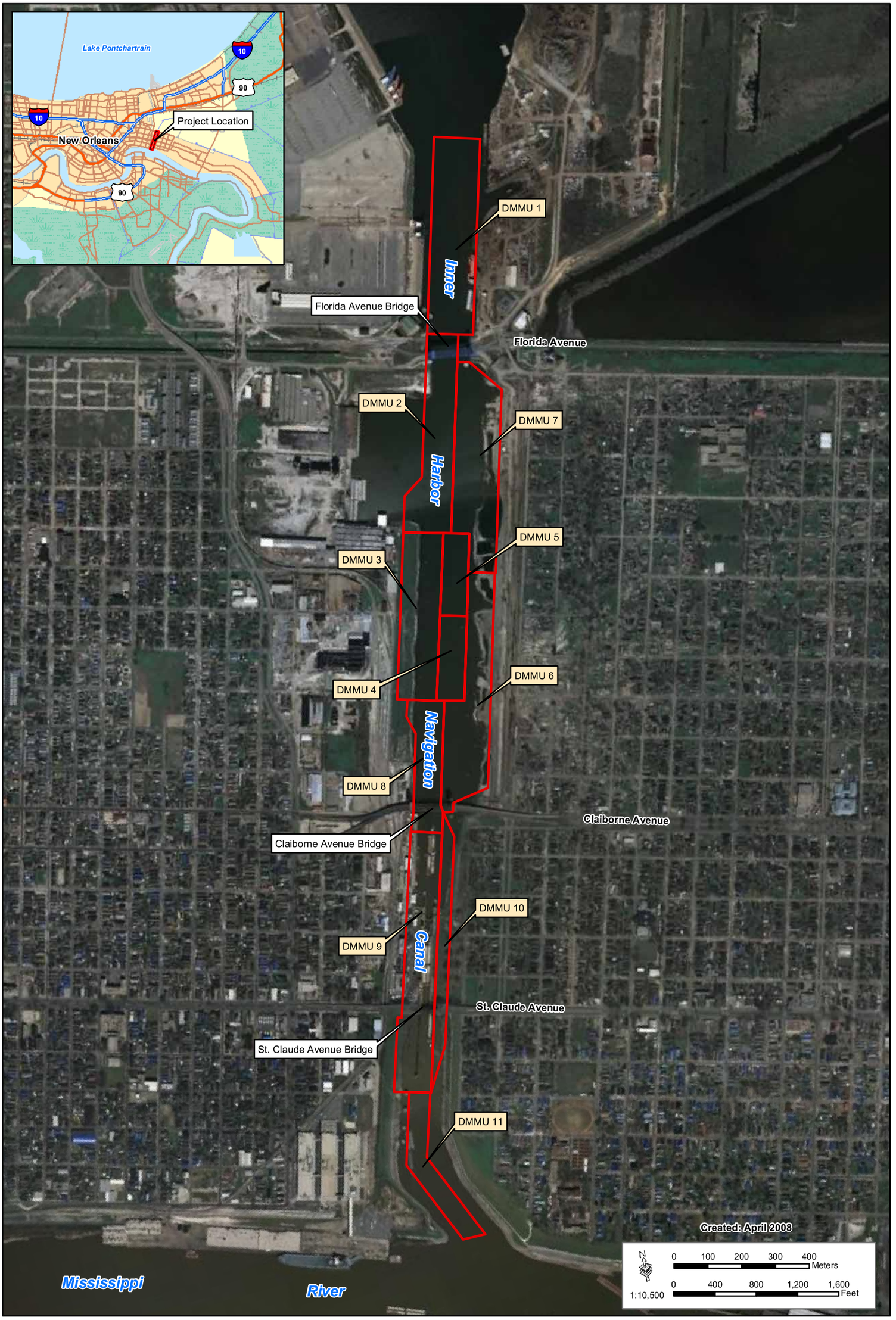

Figure 4-5: Location of Dredged Material Management Units

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CDF. Soil samples were also collected for analysis from a reference area near the project area that was previously not directly impacted by dredged material placement located at the Bayou LaLoutre Ridge near Hopedale (Figure 4-6).

Table 4-1. IHNC DMMUs and associated project features. Note that non-native sediments occur within the channel, non-native fill is located on the channel banks, and native subsurface soils underlay non-native sediments and soils

Sediment Type	DMMU	Associated Project Feature
Non-Native Sediments	1	IHNC Channel Enlargement
	2	IHNC Channel Enlargement
	3	New Lock Construction
	4	New Lock Construction
	5	New Lock Construction
	6	North Bypass Channel
	7	North Bypass Channel
	8	IHNC Channel Enlargement
	9	Lock Demolition and IHNC Channel Enlargement
	10	South Bypass Channel
	11	IHNC Channel Enlargement
Non-Native Fill	3	New Lock Construction
	6	North Bypass Channel
	7	North Bypass Channel
	10	South Bypass Channel
Native Subsurface Soils	3	New Lock Construction
	4/5*	New Lock Construction
	6	North Bypass Channel
	7	North Bypass Channel
	10	South Bypass Channel

*DMMU 4/5 N underlies both DMMUs 4 NN and 5 NN

Physical and chemical properties of DMMU sediment samples were measured to characterize potential toxicity and make general comparisons to disposal area sediments. Physical properties of project sediments were measured, including grain size distribution, moisture content, and organic content. Sediments were analyzed for the presence of over 170 CoC, including metals, organotins, polychlorinated biphenyls (PCB), semi-volatiles, total petroleum hydrocarbons, pesticides, herbicides, and volatiles. Physical characterization and chemical inventories were used in the interpretation of biological tests and to identify sediment properties that may have contributed to observed adverse impacts on water column and benthic test organisms.

Separate freshwater and estuarine biological evaluations of water column and benthic impacts were conducted. Sediments and soils were used for the preparation of elutriates (mixture of sediment and site water representative of dredged material slurry) used in freshwater and estuarine suspended phase toxicity tests and for conducting freshwater and estuarine solid phase toxicity and bioaccumulation tests.

Potential impacts on disposal areas' receiving waters during the placement of dredged material were assessed through exposure of sensitive water column organisms to elutriate composites prepared for the biological evaluation and comparison of measured CoC concentration in individual sample elutriates (Appendix C), and comparison of measured CoC concentration in elutriates to background levels in receiving waters and to water

Figure 4-6: Reference Site Sampling Locations

quality standards. Freshwater and estuarine juvenile fish were exposed to elutriates to predict any potential water column toxicity at the Mississippi River and mitigation site, respectively. In cases where elutriate exposures resulted in significant mortality, site-specific standards were developed for CoC that lack state or Federal water quality standards. Dilution requirements were then determined for each elutriate CoC to meet background levels, or site-specific and regulatory water quality standards. Maximum dilution required for each DMMU to meet the above criteria at each disposal area was identified, and mixing zone models were evaluated to determine if sufficient dilution occurred within regulatory mixing zones specified by the Louisiana Department of Environmental Quality (LDEQ).

Typically, elutriates exceeding required dilutions beyond the mixing zone are predicted to be potentially toxic to water column organisms. When predicted, toxicity can provide a basis for eliminating disposal alternatives for a DMMU. The results of the Elutriates test indicated no potential acute toxicity to water column organisms would occur at any proposed disposal site with adequate dilutions. Due to a limited volume of water and minimal tidal exchange, it is unlikely that elutriates would be adequately diluted after discharge into the mitigation site. In cases where toxicity was not observed in estuarine fish exposed to an elutriate treatment but state or Federal water quality standards were exceeded beyond the mixing zone, DMMUs were further evaluated as a potential source of material for the mitigation site.

Potential impacts on the benthos at disposal areas after placement of dredged material were assessed through direct exposure of sensitive benthic organisms to dredged material, and analysis of CoC bioaccumulated in tissues of organisms exposed to DMMU and disposal reference sediments. Freshwater and estuarine amphipods were exposed to DMMU and disposal area reference sediments to predict any potential benthic toxicity following dredged material placement at the Mississippi River and mitigation site. For any DMMU exposure resulting in statistically significant mortality exceeding a disposal area reference, the dredged material is predicted to be acutely toxic to benthic organisms at a given disposal site. Similar statistical analysis was performed on freshwater and marine clams to compare bioaccumulation of CoC in organisms exposed to DMMU and reference sediments. Where statistically significant bioaccumulation was observed, consideration was given to the concentration of the contaminant relative to U.S. Food and Drug Administration (USFDA) Action Levels, the toxicological importance of the contaminant, potential for the contaminant to biomagnify, the magnitude of exceedence above the reference, and the number of CoC exceeding the reference. The results of the analyses are presented in Appendix C and a summary of the Water Quality and Sediment Evaluation Report is provided in the Aquatic Habitats resource section (see Section 5.3.19).

Summary of 1997 EIS Plan

Portions of the original recommended plan, as described in the 1997 EIS, have been fully implemented (*e.g.*, demolition of Galvez Street Wharf, Water Quality and Sediment Evaluation, implemented community impact mitigation measures, demolition of industrial sites along the IHNC), and are no longer part of the proposed 1997 EIS Plan or the revised lock replacement plan alternatives. Additionally, the 1997 EIS assumed that the new high-level Florida Avenue Bridge would be in place and operational prior to lock construction. Due to DOTD funding activities, the new Florida Avenue Bridge will likely not be constructed prior to the initiation of lock construction. Therefore, under the 1997 EIS Plan and the Cast-in-place and Revised Float-in-place plans, it is assumed that the new Florida Avenue Bridge would not be available during lock construction activities and that the detour road through the Meraux Tract would not be built. The 1997 EIS Plan recommended that an I-wall cap be placed on the realigned levees located south of the St.

Claude Avenue Bridge. Since Hurricane Katrina, new design criteria have led to the recommendation of the use of T-walls in place of I-wall construction, and these recommendations have been incorporated into the designs.

4.3.4.1. Plan 3a (Cast-in-place Lock Construction)

Previous contract advertisement experience by CEMVN has resulted in the realization that some uncertainty exists as to the price associated with float-in-place construction. Therefore, an alternative plan for lock construction was developed that would construct seven lock monoliths founded on 24-inch square precast pre-stressed concrete piles within a cellular sheet pile cofferdam on site, instead of floating lock monoliths to the new lock site (Appendix D).

Hydraulic dredging methods would be used primarily because of the rate of production from hydraulic dredges compared to bucket dredges. Hydraulic dredges typically have a rate of production that is an order of magnitude greater than bucket dredges (thousands of cubic yards (cy) per hour for a hydraulic dredge vs. hundreds of cubic yards per hour for a bucket dredge [USACE 1983]). Given the large volumes of material proposed to be dredged over the life of the project, hydraulic dredging would be the likely choice of a construction contractor. Also, bucket dredging (*i.e.*, clamshell) generates higher turbidity than hydraulic dredging. During bucket dredging, sediment resuspension occurs when the bucket impacts the bottom and is pulled back through the water column, and then out of the water, as turbid water spills out of the bucket or through leaks in openings between the jaws (USACE 1983). The turbidity impacts from a bucket dredge can be reduced through the use of a watertight bucket, but this further reduces the rate of dredging production.

Similar to float-in-place construction, the first step would be to hydraulically dredge a bypass channel around the new lock construction site. The bypass channel would accommodate two-way traffic and would have protection cells constructed along the west side of the bypass channel to protect the cofferdam. It is estimated that 840,000 cy of material would be hydraulically dredged as a result of the construction of the bypass channel. Following completion of the bypass channel, traffic would be rerouted and tug assistance vessels would be required 24 hours daily to assist with navigation of the bypass channel.

Lock excavation would immediately follow the completion of the bypass channel construction. The material would be hydraulically dredged and be transported off-site to a CDF. The perimeter of the lock footprint would be excavated to -60 feet for the cofferdam construction. The total material dredged for the lock excavation would be approximately 2.15 million cy. Prior to the installation of the cofferdam, foundational support would be necessary; therefore, jet grouting of the canal bottom sediments from a barge for soil improvement would occur. After soil improvements, sheet piles for the cofferdam cells would be driven to a depth of approximately -90 feet using a barge-mounted vibratory hammer. Cofferdam cells would then be filled with sand from a barge-mounted crane with clamshell bucket between -60 feet to +3.5 feet. After the completion of the cofferdam cells, a rock berm on the land side of the cells would be constructed from a barge-mounted crane for stability of the cofferdam. Finally, soil improvement by jet grouting of the soils would occur along the west bank of the IHNC next to the cofferdam at the top of the excavated slope, and sheet piling would be driven at the top of the excavated slope parallel to the floodwall for seepage protection.

Dewatering would occur with a series of pumps, sumps and wells. This would include the construction and operation of pressure relief wells. Dewatering activities would occur until the excavation area is dry, and dewatering activities would continue

throughout construction activities to insure dry working conditions. All water would be pumped from excavated areas into the IHNC.

Foundation piling would then be driven to support the concrete pours of the lock module. Foundation piling would consist of 24-inch x 24-inch precast pre-stressed concrete piles spaced on approximately 10-foot centers with tighter spacing under lock module walls. A total of 2,607 vertical piles and 808 battered piles would be driven to a depth of -131 feet. Either a vibratory or impact hammer would be used for pile driving. Module concrete pours would begin at the gates and work inward to the chambers. Alternate sections of the module would be poured, and some concrete pours may need to occur at night with the use of lighting due to possible concrete placement temperature restrictions. Machinery, valves, electrical and mechanical connections would all be installed after completion of concrete placement. An on-site concrete batch plant would be necessary and nearby staging areas for aggregate and other materials would be required.

Following the completion of the lock modules, the cofferdams would be removed and the excavated area re-watered. Areas around the lock modules would be backfilled with excess sand from the cofferdams or stockpiled dredged material from the original excavation. The west side of the lock would be backfilled first, prior to opening the lock, so that administration buildings could be constructed in that area and to avoid working on the west side of the lock while traffic is passing through the lock. The lock would then be opened to traffic and the bypass channel backfilled. Floodwalls and levees would be raised and the demolition of the existing lock could then proceed as described in the original 1997 EIS. The new lock would then be fully functional.

The estimated cost for cast-in-place lock construction is $824.5 million, but does not include costs such as those required for real estate acquisition, lock demolition and prior expenditures. These additional costs beyond lock construction are estimated at $383.1 million. An updated economic analysis was conducted by CEMVN to determine the remaining annual benefits, annual costs, and remaining benefit-to-cost ratios. The remaining benefit-to-cost ratio is 0.92 at the project discount rate of 7.125 percent and 0.95 at the Office of Management and Budget discount rate of 7.0 percent. However, the remaining benefit-to-cost ratio is 1.63 at the current Federal discount rate of 4.875 percent (Appendix O).

Approximately 3.4 million cy of material would be hydraulically dredged during the life of the construction project. Dredged material could be permanently disposed of in one of three ways: 1) either entirely in a CDF; 2) in a combination of a CDF and Mississippi River; or 3) in a combination of a landfill and Mississippi River. Beneficial use placement of suitable materials in a proposed mitigation site is also being considered. The CDF would be located in an area along the GIWW/MRGO that was used for dredged material disposal in 1958 and 1959. A conceptual design was prepared for the CDF (Appendix E) for the purposes of establishing preliminary design assumptions, determining the area that might be impacted by the CDF, and evaluating anticipated environmental and water quality impacts associated with the disposal operation.

It is anticipated that containment dikes for the CDF would be constructed utilizing *in situ* material to the extent practicable. An approximate initial crest elevation of 17 feet and a final crest elevation of 15 feet (following settling) were assumed for the purposes of developing the conceptual design. This elevation matches the specified interim reconstructed height of the adjacent hurricane and storm damage risk reduction levee, and was used as a conservative estimate of height required to prevent overtopping in the event of severe flooding. It was assumed that refinements would be made to the design if flood protection was determined not to be necessary, or if a lower dike height would provide

adequate flood protection and a different dike height would result in a more efficient use of resources.

A Water Quality and Sediment Evaluation (Appendix C) was conducted concurrently with development of the conceptual design for the CDF. A comparison of exposure point concentrations to Risk Evaluation/Corrective Action Program (RECAP) soil standards for direct contact exposure and soil-to-groundwater migration pathways was conducted (Appendix R). Results of the human health risk evaluation indicate that even during catastrophic failure of the CDF during filling, which would be a worse-case scenario, human exposure through either direct contact (*e.g.*., ingestion, skin contact, and inhalation) or from recreation activities (*e.g*., boating and ingestion of fish/crabs caught in Bayou Bienvenue, IHNC, or GIWW) would not be expected to cause adverse human health effects.Conservative assumptions were employed for the health evaluation including the use of residential risk standards and assuming no dilution of the dredged material after release from the CDF during a catastrophic failure (Appendix R).

Results of the groundwater protection evaluation indicate that exposure point concentrations of any contaminants leached from the dredged material to shallow groundwater beneath the CDF (for all scenarios evaluated) would not exceed RECAP standards for non-drinking water sources. This standard also provides an evaluation of any discharge to the adjacent surface water body that might occur by leaching or seepage through the containment berms. Additionally, groundwater is not used for drinking water purposes in the New Orleans area and within a 1-mile radius of the CDF which further supports the lack of potential health risks from groundwater (Appendix R).

The proposed CDF would be comprised of two types of cells: a disposal cell that would permanently contain dredged material unsuitable for open water placement and a fill cell that would temporarily contain dredged material until it would be needed for backfill around the lock construction site (Appendix E). The CDF would be constructed with containment dikes engineered to provide adequate containment for dredged material, according to established USACE guidance and practice (USACE 1987, USACE 2003a). The primary purpose of a CDF is to provide for structural containment of the dredged material; however, necessary hurricane protection measures were considered in the CDF design.

The placement of the CDF behind the HSDRRS would provide it with the 100-year level of risk reduction. However, because flooding has occurred in this area previously as a result of levee failure, the conservative approach would be to model the potential for overtopping in the event of widespread flooding. Although this modeling effort has not been completed, a preliminary analysis suggests that the maximum depth of flooding in the area of the proposed CDF would be 10 feet, and the modeled height of 15 feet would be adequate to prevent overtopping of the CDF dike in the unlikely event of catastrophic flooding. The potential for material loss from the CDF as a result of scouring during a catastrophic flood was not quantified; however, the substantial dike profile and final condition of the contained materials (*i.e.*, relatively high percentage of solids) would limit the area of the CDF that could be potentially lost as a result of scour. Armoring the dikes to prevent scour was also considered, but deemed unnecessary due to the limited volume of material potentially lost to scour. The CDF would be setback an adequate distance from the existing HSDRRS levee to prevent compromising their integrity. Drainage ditches would be constructed in the space created between the CDF dikes and HSDRRS levee to prevent undesirable pooling of runoff. Once the dredged material in the disposal cell consolidates, a clean cover would be placed over the contaminated material and the cover would be stabilized with vegetation. Detailed design of the CDF, including the height and slope of the containment dikes, geotechnical analysis of stability of underlying

soils, adequacy of *in situ* material for dike construction, final containment dike elevation, and side slopes and construction methods, would be prepared with the resumption of the lock replacement project.

Once the dredged material in the disposal cell consolidates, a clean cover would be placed over the contaminated material and the cover would be stabilized with vegetation. Detailed design of the CDF, including the height and slope of the containment dikes, geotechnical analysis of stability of underlying soils, adequacy of *in situ* material for dike construction, final containment dike elevation, and side slopes and construction methods, would be prepared with the resumption of the lock replacement project.

The first handling option assumes that all of the material dredged during the life of the construction project would be placed in the CDF. Some of this material would be placed in a fill cell within the CDF, and would only be temporarily stored and managed before being reused at the construction site for backfill. The remaining material would be placed in a disposal cell for permanent storage within the CDF. Table 4-2 provides the volume of material to be placed in the fill and disposal cells for each DMMU if all material was placed in the CDF. To accommodate this volume of material, the CDF would be 505 acres in size, which includes the disposal cell, fill cell and containment dike (Figure 4-7). The location for the CDF on the south bank of the GIWW/MRGO was chosen because it is proximate to the IHNC Lock site, and a pipeline transporting hydraulically dredged material could reach this site without crossing navigable waterways or heavily traveled roads. Alternative locations for the CDF were evaluated, but all areas in proximity to the IHNC Lock site are developed urban areas, or are undeveloped but located across the GIWW/MRGO, a navigable waterway.

Table 4-2. Volume of Dredged Material for the Placement of All Material in the CDF for Cast-in-place Design

DMMU	*In situ* Volume (cy)	Year Dredged	Initial Storage Volume (cy)
DISPOSAL CELL			
1	48,100	6	101,640
2	155,200	6	316,213
3	389,600	2 and 3	1,193,866
4	257,800	2 and 3	774,400
5	83,500	2 and 3	242,000
7	152,500	1	445,280
8	162,000	7	440,440
9	192,200	7 and 11	524,333
Total	1,440,900		4,038,172
FILL CELL			
3	196,700	2 and 3	672,760
5	161,700	2 and 3	432,373
6	997,700	1	2,537,773
7	468,400	1	1,355,200
10	131,300	7	525,946
Total	1,955,800		5,524,052

Source: CDF Conceptual Design Report, Appendix E

Figure 4-7: Cast-in-Place Confined Disposal Facility Option #1

A second handling option would place some material unsuitable for freshwater disposal (DMMUs 1, 2, 5 and 7) in a CDF, while disposing of the remaining material suitable for freshwater disposal in the Mississippi River. Similar to the previous handling option, some of the material would be placed in the CDF fill cell and reused for backfill at the construction site, while the remaining portion would be permanently placed in the CDF disposal cell. Table 4-3 provides the volume of material estimated to be placed in the fill and disposal cells, and discharged to the Mississippi River, for each DMMU. The CDF for this second handling option would be 266 acres in size (which includes the disposal and fill cells and containment dike) to accommodate the remaining volume of dredged material not placed in the Mississippi River (Figure 4-8).

Table 4-3. Volume of Dredged Material in CDF for Cast-in-place Design with Freshwater Disposal of Suitable Material

DMMU	*In situ* Volume (cy)	Year Dredged	Initial Storage Volume (cy)
DISPOSAL CELL			
1	48,100	6	101,640
2	155,200	6	316,213
5	83,500	2 and 3	242,000
7	152,500	1	445,280
Total	439,300		1,105,133
FILL CELL			
6	651,022	1	1,745,627
Total	651,022		1,745,627

Source: CDF Conceptual Design Report, Appendix E

The third handling option would place material determined to be unsuitable for freshwater disposal in a permitted landfill, while disposing of all remaining material not needed for backfill at the lock site in the Mississippi River. Eight landfills were evaluated for the cast-in-place design, and this evaluation also included various facilities and methods for handling the liquid and solid wastes (Appendix F).

Due to the estimated larger size of the CDF (505 acres) and the increased engineering requirements, cost and impacts on wetland and bottomland hardwood forest habitats, the option that would place all dredged material in the CDF (first handling alternative) was eliminated from further consideration.

Use of a CDF for disposal of dredged material meets USACE engineering requirements and is standard practice for dredged material disposal. The construction of a CDF would not compromise the environment because all material would be managed to insure safety of aquatic habitats and human health. Therefore, the CDF is a reasonable and safe disposal method for dredged material and is considered a viable disposal method, and is the preferred option.

The disposal of dredged material at a landfill (third handling option) has a number of limitations, which include:

- The estimated costs for disposal at a landfill ranged from approximately $75 to $131 million (Appendix F), while the estimated cost for the CDF construction ranges from $23 to $45 million based upon design size and contingencies (Appendix E);

Figure 4-8: Cast-in-Place Confined Disposal Facility Option #2

- Although not required for landfill disposal, to minimize costs, the dredged material would likely be dewatered prior to disposal. The material would likely be placed in the CDF and worked over several years to reduce the quantity of water that would be taken to a landfill. This would still require the temporary construction and use of a CDF. Once the material was dried, it would be trucked from the CDF to the landfill;
- Disposal of material at a local landfill would potentially reduce the landfills' life span. Three Type landfills are located in the New Orleans area. According to LDEQ Solid Waste Disposer Annual Reports, the Coast Guard Road Sanitary Landfill has an estimated facility life of 98 months, the Jefferson Parish Sanitary Landfill Phase II A and B has an estimated facility life of 38 months and the River Birch, Inc. Landfill has an estimated facility life of 372 months; and,
- Landfills located in the New Orleans area receive the same level of hurricane and storm damage risk reduction as the proposed CDF and could also be subject to flooding during sever storm events;
- Although disposal of this material at a landfill would be costly, the landfill disposal option has been carried forward as an alternative to permanent placement of material in a CDF.

Hydraulically dredged material pumped into the CDF would contain a large volume of water, called effluent. Both effluent and water collecting from precipitation would be managed at the CDF. Effluent would be pumped from the CDF over the hurricane and storm damage risk reduction levee and into the GIWW and treatment of effluent water prior to discharge (Appendix C). Main discharge weirs would be located at the northeast corner of each of the CDF cells and would be connected to the pumps and pipes that discharge effluent to the GIWW. Active dewatering of the CDF would occur to encourage rapid consolidation and desiccation of dredged material. Active dewatering would include regular surface trenching and weir management. Vegetation management on the CDF during dewatering activities would occur through both active tilling and the application of herbicides approved for aquatic environments. After disposal and dewatering is complete, runoff from precipitation would either be routed to the GIWW or released slowly into Bayou Bienvenue.

The CDF would be accessed by constructing an earthen ramp across the risk reduction levee allowing access for trucks for CDF maintenance and to recover materials from the fill cell for use as backfill at the lock construction site. Earthen ramps would also be constructed for ingress and egress to the CDF cells and for adequate turn-around and staging space for vehicles. Electricity would be brought to the CDF from the Florida Avenue Bridge area to provide power for the pumps used to dewater the CDF.

Backfill material would be delivered by trucks from the CDF fill cell to the lock construction site. Trucks would cross the ramp over the GIWW/MRGO risk reduction levee and traverse the north side of the levee to the Harbor Drive/Florida Avenue intersection, then access the lock construction site from Surekote Road or Jourdan Avenue on the east side of the IHNC, or the former Galvez Street Wharf or Japonica Street from the west side of the IHNC.

Table 4-4 provides a proposed schedule for construction activities for the IHNC Lock Replacement project as described by the cast-in-place design.

Table 4-4. Estimated Schedule for Construction Activities for Cast-in-place Design

Task	Start Date	End Date
New lock demolition, clearance, preparation	15 March 2009	19 December 2009
Dredge and install bypass channel	1 October 2009	30 July 2010
Cofferdam installation	11 February 2011	31 May 2012
Construct detour route for Claiborne Avenue Bridge closure	17 August 2012	12 June 2013
Installation of new lock monoliths at new site	9 July 2013	4 March 2018
Detour routes enacted	16 November 2014	15 December 2014
Claiborne Avenue Bridge closure & replacement	16 November 2014	15 December 2014
Re-open Claiborne Avenue Bridge	16 December 2014	16 December 2014
Construct bypass channel around old lock	3 January 2018	15 December 2019
Cofferdam removal	14 August 2018	27 September 2019
Construct temporary St. Claude Avenue Bridge	3 January 2019	15 April 2019
Install new floodwall	18 February 2019	22 February 2021
Demolition of St. Claude Avenue Bridge and old lock	20 April 2019	15 September 2019
Backfill and finish new lock site and building construction	6 May 2019	15 December 2020
Install new St. Claude Avenue Bridge	3 October 2019	15 March 2020
Re-open St. Claude Avenue Bridge	16 March 2020	16 March 2020
Install guide walls for south entrance to new lock	20 April 2020	20 October 2021

Source: Cast-in-place vs Float-in-place Report Letter, Appendix D

4.3.4.2. Plan 3b (Float-in-place Lock Construction; Recommended Plan)

Due to improved constructability, substantially less material dredged during construction, reduced noise impacts from less pile driving, and better vessel navigability during lock construction activities, the float-in-place lock construction method has been determined to be the recommended plan for the lock construction replacement. Fundamentally, the float-in-place lock construction is very similar to the 1997 EIS Plan. Two separate construction locations would be needed for the Float-in-place Plan, the off-site area which allows for lock module construction in the dry, and the lock site (Appendix D). The location of the off-site construction area has been moved from the north side of the GIWW/MRGO to the south side and from just west of Paris Road to just east of Paris Road. Construction activities at these two sites would occur concurrently.

Off-site Construction Area

To prepare the off-site area for lock module construction, all of the vegetation on the site would be removed, the risk reduction levee relocated, and a small drainage canal rerouted. The site would then be excavated to a depth of -31 feet with 1:5 (vertical:horizontal) side slopes and some excavated material used to reinforce the risk reduction levee along the GIWW. It is estimated that a total of 664,000 cy of material would be excavated. Of that total, 112,000 cy of material would be used to reinforce the berm and relocated levee and the remaining 552,000 cy stockpiled east of the off-site construction area within a temporary containment facility. However, if it is determined the material excavated is not suitable for levee construction, then suitable borrow material would be used for the relocated levee and the all of the excess material would be stockpiled east of the off-site construction area. The western end of the excavated area would be no closer than 110 feet from the base of the Paris Road Bridge piers. The off-site construction area would be dewatered and maintained for 4 to 5 years in a dewatered condition during the construction of the lock modules. Electricity would be brought to the site along the Paris Road right-of-way for module construction activities and pumping. Pumps for dewatering activities would discharge into the GIWW. A 30-foot

wide separating berm, which would provide separation for lock module construction efforts, would be constructed and then removed, and reconstructed four additional times, between each of the lock modules as they are completed and floated out of the GIWW. Following the construction of the lock modules, the stockpiled excavated material and any material imported for the realigned levee construction would be used to fill the off-site construction area and return the off-site construction area to the preconstruction elevation. The risk reduction levee would be reconstructed to its current alignment and authorized elevation. If it is determined that the volume of material in the stockpile area is not adequate to restore the off-site construction area to the preconstruction elevation, borrow material would be imported to reach this elevation. The off-site construction area and stockpile area are approximately 34 acres in size.

Lock Site

A bypass channel would be constructed east of the new lock site north of Claiborne Avenue. The bypass channel would be constructed by hydraulically dredging approximately 876,000 cy of material to provide for two-way barge traffic and one-way ship traffic during lock construction. Because of the large volumes of material that would be dredged for lock construction, hydraulic dredging, which allows for the pumping of material to a temporary or permanent disposal site, would be necessary to meet the project schedule. As described previously, bucket dredging is a substantially slower method and dredged material must be handled twice in order to temporarily or permanently dispose of the material. Three protection cells would be constructed at the south end of the bypass channel concurrent with channel dredging, and a timber guide wall installed before opening the channel. Tug assistance vessels would be stationed at each end of the bypass channel and be available 24 hours daily to assist tows through the channel.

Following the completion of the bypass channel, the footprint of the lock would be hydraulically dredged to a depth of -54 feet for the gatebay modules and -52 feet for the chamber modules. A total of approximately 1.1 million cy of material would be hydraulically dredged within the lock footprint. Sheetpile would then be driven along the perimeter of the lock footprint to create a containment wall. A 3-foot thick stone base would be placed at the bottom of the lock footprint. A hopper box lowered to the bottom would be used to place the stone base. Eight protection cells, 78 feet in diameter, would be constructed at both ends of the excavated area. Steel lock pipe piles, 120 feet long and 48 inches in diameter, would be driven within the footprint of the lock. A vibratory hammer would be used to drive piles above the water surface and a hydro-hammer used below the water surface.

As each lock module is floated to the lock site from the off-site construction area, two of the protection cells located on the north end of the lock site would be removed to allow for the lock module passage. Following the placement of a lock module, the two protection cells would be rebuilt. This removal and replacement of protection cells would occur for each lock module. A batch plant for concrete production would be constructed on top of a platform placed on three of the protection cells.

The south lock module would need to be constructed and transported to the lock site first. Prior to the transport of each module, the off-site construction area around that module would be flooded by removing the independent closure system. The closure materials would be stockpiled while the module floated out. The site would be dewatered again and the closure rebuilt to allow construction of the next module. Tug boats would pull the lock module from the off-site construction area to the lock site. It is anticipated that transport of a module would take 1 day, and the GIWW/MRGO would be closed to marine traffic during the towing. The module would then be attached to temporary

mooring dolphins and then moved into place and attached directly to another already installed lock module.

Using sand ballast, the lock module would be positioned horizontally and vertically in its correct position. Grouting of lock module sections, placement of mechanical components, and underbase infilling would then be completed. The lock module's structural load would then be transferred from jacks, which were holding the lock module in place while the concrete was setting, to the piles. Flooding and then dewatering of the newly placed lock module and adjacent lock modules would be done to test mechanical equipment and grouted seals.

These same steps would be completed for each of the lock modules until the new lock is completed. Mechanical and electrical components would be installed after all of the lock modules are in place. The lock would be tested, the channel protection cells removed from both ends of the lock, protection riprap placed at both ends of the lock, and the lock opened to traffic. Once the new lock is fully operational, the bypass channel would be closed and new guidewalls put into place. At this time, the water depth in the new lock would still be controlled by the old lock. The bypass channel would be filled with a combination of sand and stockpiled dredged material to an elevation of +5 feet.

Levees and floodwalls would be raised and tied into the Mississippi River flood control system as described in the 1997 EIS. A channel would be constructed around the old lock and the old lock demolished as described in the 1997 EIS. The new lock would then be fully functional.

The estimated cost for float-in-place lock construction is $879.8 million, but does not include costs such as those required for real estate acquisition, lock demolition and prior expenditures. These additional costs beyond lock construction are estimated at $383.1 million. As described previously, an updated economic analysis was conducted to determine the remaining annual benefits, annual costs, and remaining benefit-to-cost ratios. The remaining benefit-to-cost ratio is 0.90 at the project discount rate of 7.125 percent and 0.92 at the Office of Management and Budget discount rate of 7.0 percent. However, the remaining benefit-to-cost ratio is 1.57 at the current Federal discount rate of 4.875 percent (Appendix O).

Nearly 2.2 million cy of material would be hydraulically dredged from the 10 DMMUs in the IHNC during the life of the construction project. DMMU 11, as mentioned previously, is currently at sufficient depths. As described in the Cast-in-place Plan alternative, dredged material would be disposed of using one of three handling options: 1) disposed of entirely in a CDF; 2) in a combination of a CDF and in the Mississippi River; or, 3) in a combination of a landfill and in the Mississippi River. The CDF location and construction would be the same as described previously for the Cast-in-place Plan; however, the size of the CDF would be smaller given the smaller volume of material dredged under the float-in-place design (Appendix E). Also, the CDF would be comprised of a disposal cell and a fill cell. Table 4-5 provides the volume of material to be placed in the fill and disposal cells for each DMMU if all material was placed in the CDF. The CDF, including disposal and fill cells and containment dike, would be approximately 372 acres in size (as compared to 505 acres for the Cast-in-place Plan) to accommodate this volume of dredged material (Figure 4-9). Table 4-6 provides the volume of material for each DMMU estimated to be placed in the fill and disposal cells if approximately 1.4 million cy of dredged material which has been determined suitable for freshwater disposal was discharged to the Mississippi River. To accommodate the

Figure 4-9: Float-in-Place Confined Disposal Facility Option #1

smaller volume of material, the CDF would be approximately 209 acres in size (as compared to 266 acres for the Cast-in-place Plan), including disposal and fill cells and containment dike (Figure 4-10).

Table 4-5. Volume of Dredged Material for the Placement of All Material in the CDF for Float-in-place Design

DMMU	In-situ Volume (cy)	Year Dredged	Initial Storage Volume (cy)
DISPOSAL CELL			
1	48,100	7	101,640
2	88,700	7	191,987
3	349,900	2 and 3	1,090,613
4	152,800	2 and 3	511,427
5	78,500	2 and 3	229,093
7	101,500	1	314,600
8	132,000	7	369,453
9	192,200	7 and 11	521,107
Total	1,143,700		3,329,920
FILL CELL			
3	62,850	2 and 3	161,333
4 and 5	64,900	2 and 3	193,600
6	463,100	1	1,295,507
7	311,500	1	966,387
10	131,400	7	525,946
Total	1,033,750		3,142,773

Source: CDF Conceptual Design Report, Appendix E

Table 4-6. Volume of Dredged Material in CDF for Float-in-place Design with Freshwater Disposal of Suitable Material

DMMU	In-situ Volume (cy)	Year Dredged	Initial Disposal Volume (cy)
DISPOSAL CELL			
1	48,100	7	101,640
2	88,700	7	191,987
5	78,500	2 and 3	229,093
7	101,500	1	314,600
Total	316,800		837,320
FILL CELL			
6	404,000	1	1,295,507
Total	404,000		1,295,507

Source: CDF Conceptual Design Report, Appendix E

CDF management would occur as described under the cast-in-place alternative. This includes effluent dewatering through a series of pumps that deliver water to the GIWW, precipitation management, surface trenching, weir management, vegetation control, placement of a clean cover over the disposal cell, and truck access ramps over the hurricane and storm damage risk reduction levee and CDF containment dike.

Figure 4-10: Float-in-Place Confined Disposal Facility Option #2

The third handling option would place material determined to be unsuitable for freshwater disposal in a permitted landfill, while disposing of all remaining material in the Mississippi River. Eight landfill disposal alternatives were also evaluated for the float-in-place design similar to those described in the cast-in-place design (Appendix F).

As described in the Cast-in-place Plan, disposal of all dredged material in a larger CDF was eliminated from further consideration. Additionally, disposal of dredged material in a landfill was determined to be a more costly option, but was carried forward for further analysis.

Table 4-7 provides a proposed schedule for construction activities for the IHNC Lock Replacement project as described by the Float-in-place Plan.

Table 4-7. Estimated Schedule for Construction Activities for the Float-in-place Plan

Task	Start Date	End Date
New lock site demolition, clearance, preparation	15 March 2009	14 October 2009
Dredge and install bypass channel	1 October 2009	8 January 2011
Construction of off-site construction area and new lock	30 October 2009	26 June 2018
Cofferdam installation	15 March 2010	2 August 2010
Construct detour route for Claiborne Avenue Bridge closure	17 August 2012	12 June 2013
Installation of new lock modules at new site	1 October 2012	10 November 2017
Detour routes enacted	19 July 2014	15 December 2014
Claiborne Avenue Bridge closure and replacement	20 July 2014	15 December 2014
Re-open Claiborne Bridge	16 December 2014	16 December 2014
Construct bypass channel around old lock	3 January 2018	15 December 2019
Backfill and finish new lock site & buildings	3 February 2018	26 April 2021
Construct temporary St. Claude Avenue Bridge	3 January 2019	15 April 2019
Install new floodwall	18 February 2019	22 February 2021
Cofferdam removal	1 April 2019	16 April 2019
Demolition of St. Claude Avenue Bridge and old lock	20 April 2019	15 September 2019
Install new St. Claude Avenue Bridge	3 October 2019	15 March 2020
Re-open St. Claude Avenue Bridge	16 March 2020	16 March 2020
Install guide walls for south entrance to new lock	20 April 2020	20 October 2020

Source: Cast-in-place vs Float-in-place Report Letter, Appendix D

4.4. COMPARISON OF ALTERNATIVES

A summary of impacts on significant resources for each alternative analyzed in detail is presented in Table 4-8. The context of impacts for all resources, as described in Table 4-8 and discussed in greater detail in Chapter 5, includes implementation of mitigation plans for impacts on communities, fish and wildlife resources, and traffic.

Table 4-8. Summary of Impacts on Significant Resources by Alternative

Resource	No-build/Deauthorization	1997 EIS Plan	Cast-in-place Plan	Float-in-place Plan
Waterborne Transportation	Future delays would be similar to current delays, which average approximately 8 hours. It is anticipated that 67 percent of all traffic would experience a delay at the IHNC Lock.	Future delays would be considerably reduced because a larger lock would speed lockages and allow more than one vessel to be locked at a time. A substantial reduction in maintenance delays is also anticipated.	During lock construction, navigability would be more difficult than the float-in-place design for the 1997 EIS and float-in-place plans. Following completion of construction, lockage delay reductions would be similar to the 1997 EIS Plan.	The impacts on waterborne transportation would be the same as the 1997 EIS Plan.
Hurricane and Storm Damage Risk Reduction System and Mississippi River Flood Control	The existing lock would continue to provide Mississippi River flood control.	The Mississippi River levees and floodwalls would be extended to the new lock location north of Claiborne Avenue to provide risk reduction from Mississippi River flooding. The new IHNC Lock would be integrated into the 100-year level of risk reduction projects for the HSDRRS.	Impacts would be the same as the 1997 EIS Plan.	Impacts would be the same as the 1997 EIS Plan.
Business and Industrial Activity	Commercial and retail businesses damaged or destroyed by Hurricane Katrina would likely continue to rebuild in nearby neighborhoods and throughout the region. Limitations to navigation from use of the existing lock would limit future development of marine-related industries on the IHNC.	A new lock would have beneficial long-term impacts on marine-related business development along the IHNC. Temporary reduction in local business activity would occur in nearby neighborhoods during construction. Spending on local labor and materials during construction would be a short-term benefit.	Short-term impacts on business activity would likely be greater than the 1997 EIS Plan due to increased construction activity. Long-term impacts would be similar to the 1997 EIS Plan.	Short and long-term impacts on business and industrial activity would be similar to the 1997 EIS Plan.
Employment	Recovery from Hurricane Katrina is expected to generate increased employment opportunities in the region. However, limited job growth is expected in the study area.	Claiborne Avenue Bridge closure could adversely impact businesses on both sides of the IHNC temporarily impacting employment opportunities. Increased industrial development along the IHNC would improve local employment opportunities in the long-term.	Impacts on employment would be similar to the 1997 EIS Plan.	Impacts on employment would be similar to the 1997 EIS Plan.

Table 4-8, continued

Resource	No-build/Deauthorization	1997 EIS Plan	Cast-in-place Plan	Float-in-place Plan
Land Use	No changes in land use as a result of lock improvements would occur. Future redevelopment of nearby neighborhoods would likely follow recommendations described by the Unified New Orleans Plan.	The off-site construction area on the north side of the GIWW/MRGO would be acquired by the Port of New Orleans. Wooded lands located along the south bank of the GIWW/MRGO would be used for dredged material storage; however, this area was previously used for dredged material placement during the construction of the GIWW/MRGO. All lock construction would take place within the IHNC and would not change permanent land uses in the area.	The use of a CDF for dredged material storage would have similar land use impacts as the 1997 EIS Plan. If the landfill option was chosen for permanent disposal, the land use impacts from a CDF would be temporary. No off-site construction area would be required for this alternative. Impacts on land use from the lock construction would be similar to the 1997 EIS Plan.	Impacts on land use would be similar to the Cast-in-place Plan, except an off-site construction area located on the south bank of the GIWW/MRGO near the Paris Road Bridge would be temporarily used for lock module construction. The off-site construction area would be restored after use and there would be no long-term impacts on land use.
Property Values	The devastation from Hurricane Katrina and outmigration of the population has greatly influenced property values in nearby neighborhoods. There has been a substantial increase in property values in the study area over the last 8 years; however, since Hurricane Katrina there are substantially fewer housing units available.	Property values would be adversely impacted in the short-term from construction noise and increased traffic. The community Impact Mitigation Plan implementation would greatly reduce these impacts. No long-term adverse impacts on property values are anticipated.	Impacts on property values would be similar to the 1997 EIS Plan.	Impacts on property values would be similar to the 1997 EIS Plan.
Public/Community Facilities and Services	It is anticipated that as residents return to the area, community facilities and services would be improved.	Short-term disruptions of pedestrian and vehicle traffic due to the Claiborne Avenue Bridge closure and the temporary bridges at St. Claude Avenue would limit access to existing public and community facilities. A permanent reduction in access to facilities may occur as increased marine traffic would increase the length of time that bridges would remain open.	Impacts on public and community services would be similar to the 1997 EIS Plan.	Impacts on public and community services would be similar to the 1997 EIS Plan.

Table 4-8, continued

Resource	No-build/Deauthorization	1997 EIS Plan	Cast-in-place Plan	Float-in-place Plan
Tax Revenues	It is anticipated that housing values and business growth in the area would increase slowly in the future, providing only slight increases in tax revenues.	A short-term impact on property values and, therefore, property taxes would occur as a result of construction noise and bridge closures. However, increased economic activity from lock construction would offset some of the short-term reduction in tax revenues.	Impacts on tax revenues would be similar to the 1997 EIS Plan.	Impacts on tax revenues would be similar to the 1997 EIS Plan.
Population	Population levels in the study area would be expected to continue to recover from outmigration due to Hurricane Katrina.	The 1997 EIS Plan is not anticipated to have any short or long-term impacts on the population of the study area. Inconveniences caused by construction noise and traffic congestion could temporarily discourage residents from relocating to the area.	Impacts on population would be similar to the 1997 EIS Plan.	Impacts on population would be similar to the 1997 EIS Plan.
Community and Regional Growth	Community and regional growth is anticipated to be dependent on the ability for adjacent neighborhoods that were devastated by Hurricane Katrina to redevelop. Costs associated with flood risk, and availability of adequate housing, jobs and public services would be important for community reinvestment.	Redevelopment in nearby neighborhoods would be diminished during construction. Construction of a new lock would not have any impacts on long-term community growth.	Impacts on community and regional growth would be similar to the 1997 EIS Plan.	Impacts on community and regional growth would be similar to the 1997 EIS Plan.
Vehicular Transportation	The current transportation system is anticipated to remain relatively unchanged for the next 10 to 12 years, and traffic volume at the bridge crossing of the IHNC has been estimated to remain flat to a slight increase with no substantial delays predicted.	Due to socioeconomic changes from Hurricane Katrina, adequate future capacity would remain even with bridge closures. Operational analysis indicates some minor delays due to temporary bridge closures, but adequate detour routes are available to mitigate these delays. No long-term traffic impacts are anticipated.	Impacts on vehicular transportation would be similar to the 1997 EIS Plan.	Impacts on vehicular transportation would be similar to the 1997 EIS Plan.

Table 4-8, continued

Resource	No-build/Deauthorization	1997 EIS Plan	Cast-in-place Plan	Float-in-place Plan
Housing	The availability and volume of housing in nearby neighborhoods devastated by Hurricane Katrina reflect broad trends in parameters such as migration, employment, income and confidence in the hurricane and storm damage risk reduction system.	No acquisition of property containing housing would occur as a result of this plan. Due to noise and traffic congestion, short-term impacts on housing development in nearby neighborhoods may occur during lock construction.	Impacts on housing would be similar to the 1997 EIS Plan.	Impacts on housing would be similar to the 1997 EIS Plan.
Community Cohesion	No change in community cohesion would occur with the deauthorization of the existing lock. It is anticipated that community members would slowly return to redevelop nearby neighborhoods as community services become available.	Recovery efforts in nearby neighborhoods have been slow, and increased traffic and noise from construction activities would have short-term impacts on redevelopment; temporary closure of the Claiborne Avenue Bridge and a temporary bridge at St. Claude Avenue would make pedestrian and bicycle access between neighborhoods more difficult. No long-term impacts on community cohesion are anticipated.	Impacts on community cohesion would be similar to the 1997 EIS Plan.	Impacts on community cohesion would be similar to the 1997 EIS Plan.
Noise	No noise impacts would occur under the no-build alternative.	Lock construction and increased traffic would have adverse noise impacts on nearby neighborhoods. Pile driving and truck traffic would generate the highest noise emissions.	Noise impacts from construction activities would be greater under the Cast-in-place Plan than the 1997 EIS Plan. More pile driving would be required, and all lock fabrication would take place at the lock construction site instead of at an off-site construction area along the GIWW/MRGO.	Noise impacts would be similar to the 1997 EIS Plan.

Table 4-8, continued

Resource	No-build/Deauthorization	1997 EIS Plan	Cast-in-place Plan	Float-in-place Plan
Air Quality	The project area would continue to be in attainment for all ambient air quality standards.	There would be increased emissions from construction activities and traffic congestion under the 1997 EIS Plan. However, there are no violations of air quality standards and no conflicts with the state implementation plan.	Air quality impacts would be similar to the 1997 EIS Plan.	Air quality impacts would be similar to the 1997 EIS Plan.
Wooded Lands	No impacts on wooded lands would occur from the no-build alternative.	Approximately 240 acres of wooded lands would be temporarily impacted by the construction of a CDF. After construction of the CDF, the area would be allowed to naturally revegetate. Approximately 25 acres of wooded lands would be permanently impacted by the construction of an off-site construction area.	Approximately 266 acres of wooded lands would be temporarily impacted by the construction of a CDF. Following disposal of dredged material, these areas would revegetate. If the option to dispose of dredged material in a landfill was chosen, 170 acres of wooded lands would be temporarily impacted.	Approximately 209 acres of wooded lands at the CDF and 38 acres of wooded lands at the off-site construction area would be temporarily impacted. Revegetation would occur following disposal of dredged material. If the option to dispose of dredged material in a landfill was chosen, 138 acres of wooded lands would be temporarily impacted.
Coastal Wetlands	No impacts on coastal wetlands would occur from the no-build alternative.	A Wetland Value Assessment (WVA) determined that 36.97 average annual habitat units would be lost as a result of the construction of the CDF and off-site construction area.	A WVA determined that 37.0 average annual habitat units would be lost as a result of the construction of a CDF.	A WVA determined that 34.5 average annual habitat units would be lost as a result of the construction of a CDF and off-site construction area.

Table 4-8, continued

Resource	No-build/Deauthorization	1997 EIS Plan	Cast-in-place Plan	Float-in-place Plan
Aquatic Habitats	There would be no change in water quality or use of the IHNC by aquatic organisms.	Impacts on the aquatic environment would occur from dredging operations, filling activities and discharge of effluent from the CDF. Disposal of material in the Mississippi River would increase the river's average sediment load by approximately 0.33 percent at the point of discharge. All contaminated dredged materials would be contained permanently within an upland CDF. Hydraulic dredging would primarily be used to reduce the size of sediment plumes in the IHNC.	Impacts would be similar to those described by the 1997 EIS Plan. No off-site construction area would be constructed; therefore, there would be no impacts from discharges associated with dewatering activities at the off-site construction area. Silt curtains would be placed in the IHNC during dredging as necessary to protect nearby waterbodies from increased turbidity.	Impacts on aquatic habitats would be similar to those described in the 1997 EIS Plan.
Essential Fish Habitat	No impacts on Essential Fish Habitat would occur under the no-build alternative.	No impacts on Essential Fish Habitat would occur under the 1997 EIS Plan.	No impacts on Essential Fish Habitat would occur under the Cast-in-place Plan.	No impacts on Essential Fish Habitat would occur under the Float-in-place Plan.
Threatened and Endangered Species	The no-build alternative would have little, if any, effect on threatened and endangered species.	CEMVN has determined that the 1997 EIS Plan would not likely adversely affect any threatened and endangered species.	CEMVN has determined that the Cast-in-place Plan would not likely adversely affect any threatened and endangered species.	CEMVN has determined that the Float-in-place Plan would not likely adversely affect any threatened and endangered species.

Table 4-8, continued

Resource	No-build/Deauthorization	1997 EIS Plan	Cast-in-place Plan	Float-in-place Plan
Aesthetic Values	No changes in aesthetic values are anticipated under the no-build alternative.	During construction activities, aesthetic values would be diminished because of views of construction equipment and activities. New levees and floodwalls to proved Mississippi River flood control would have long-term adverse impacts on aesthetics. The 15-foot high containment berm for the CDF would be visible from parts of the Lower Ninth Ward and along bridge crossings.	Impacts on aesthetics would be similar to the 1997 EIS Plan. Permanent disposal of dredged material in a landfill instead of a CDF would reduce the permanent visual impacts associated with a 15-foot high containment berm.	Impacts on aesthetics would be similar to the Cast-in-place Plan.
Recreational Opportunities	Many of the existing recreational resources in the nearby neighborhoods were severely damaged by Hurricane Katrina, and recovery of these facilities would occur slowly as local community organizations and volunteers provided support to their recovery.	The loss of accessibility to the levee would occur during construction activities. Pedestrians and bicyclists utilizing the St. Claude Avenue Bridge would be adversely impacted during its replacement.	Impacts on recreational opportunities would be similar to the 1997 EIS Plan.	Impacts on recreational opportunities would be similar to the 1997 EIS Plan.
Cultural Resources	The St. Claude Avenue Bridge would eventually need extensive rehabilitation or replacement which could be a potentially adverse effect on the National Register of Historic Places-eligible bridge. Besides ongoing maintenance, no changes to the existing IHNC Lock would occur.	The existing IHNC Lock and St. Claude Avenue Bridge would be demolished. The demolition would be an adverse effect, and would be mitigated through appropriate recordation. There is the potential for deeply buried cultural resources at the CDF, and an archaeological monitor would be present during all ground-disturbing activities.	Impacts on cultural resources would be similar to the 1997 EIS Plan. There would be no off-site construction area; therefore, there would be no potential for impacts on unknown buried cultural resources during off-site construction area excavation.	Impacts on cultural resources would be similar to the 1997 EIS Plan. Recent surveys of the proposed off-site construction area have determined that no eligible sites are present at that location; concurrence from Louisiana State Historic Preservation Office (SHPO) has been received. Therefore, the construction of the proposed off-site construction area would have no effect on historical properties.

Table 4-8, continued

Resource	No-build/Deauthorization	1997 EIS Plan	Cast-in-place Plan	Float-in-place Plan
Human Health and Safety	There would be no change to human health and safety as a result of the no-build alternative.	Public access to lock construction and demolition activities would be restricted. During levee and floodwall reconstruction, fencing and signage would be placed along the perimeter of the construction areas. Site workers and trespassers may have infrequent contact with the benzo(a)pyrene in the dredged material placed in the CDF. Based on these short-term exposures, no health effects are expected. Dust suppression measures and engineering controls would be used to minimize human exposure. Site restrictions would be put in place at the CDF to stop trespassers from entering the CDF.	Impacts on human health and safety would be similar to the 1997 EIS Plan.	Impacts on human health and safety would be similar to the 1997 EIS Plan.

SECTION 5.
AFFECTED ENVIRONMENT/ENVIRONMENTAL EFFECTS

5. AFFECTED ENVIRONMENT/ENVIRONMENTAL EFFECTS

5.1. ENVIRONMENTAL CONDITIONS

The project is located between Lake Pontchartrain and the Mississippi River in a highly urbanized area of New Orleans in Orleans Parish just west of the Orleans/St. Bernard Parish line. The project area is primarily comprised of man-made navigation channels; however, portions of the project where dredged material disposal is proposed are comprised of wooded lands, wetlands and open water. Neighborhoods located adjacent to the project area (Holy Cross, Lower Ninth Ward, Bywater, Florida and St. Claude), as well as those that are located near the project area, such as New Orleans East and Arabi/Chalmette in St. Bernard Parish, were heavily impacted by Hurricane Katrina, and recovery in some of these neighborhoods has been slow. Therefore, these neighborhoods are a mix of vacant lots, damaged and gutted houses, recently renovated homes and homes in the process of being constructed or renovated. The neighborhoods in the project area are very active in their rebuilding efforts, and many of the residents of these neighborhoods have been displaced out of the neighborhoods and temporarily reside in other neighborhoods in the region or out of the area entirely.

The devastation of Hurricane Katrina, which made landfall in August 2005 south and east of New Orleans, has greatly altered the natural and human environment of the project area. Tropical storms are relatively common occurrences in the Gulf of Mexico. Tropical storms typically produce the highest wind speeds and greatest rainfall events along the Gulf Coast. Category 5 hurricanes, such as Hurricane Camille which made landfall just east of New Orleans on August 17, 1969, generate the highest sustained wind speeds in the region (greater than 155 miles per hour). High winds are typically accompanied by massive storm surge, and in the case of Category 5 storms, storm surge exceeds 18 feet in height (National Hurricane Center 2007). Between 1926 and 2005 a total of 10 hurricanes have struck Orleans Parish (National Hurricane Center 2007). The frequency of hurricanes is greatest between August and October; however, hurricane season extends from June through November (National Hurricane Center 2007). Prior to Hurricane Katrina in 2005, Hurricane Betsy, on September 9, 1965, was the most damaging tropical storm in Metropolitan New Orleans. Hurricane Betsy caused a storm surge of 10 feet, flooding large parts of the city, claiming 81 lives and causing $1 billion (1965 dollars) in damage (NOAA 2007a).

The devastation from Hurricane Katrina is one of the largest natural disasters in modern U.S. history. The study area and St. Bernard Parish as a whole were especially devastated by the storm. On September 24, 2005, less than a month after Hurricane Katrina made landfall southeast of New Orleans, Hurricane Rita, a Category 5 storm, passed to the south of the New Orleans area making landfall along the Louisiana – Texas border. While wind damage was minor, temporary levees along the IHNC were overtopped by the storm surge in New Orleans.

The inundation of much of Metropolitan New Orleans from these storms forced the displacement and relocation of hundreds of thousands of area residents. Hurricanes Katrina and Rita have proven to be the costliest and the most devastating natural disasters in U.S. history. Due to the extensive damage to residences and infrastructure, many of these displaced residents have resettled elsewhere within the region or out of the New Orleans urbanized area entirely (Photograph 5-1). It is anticipated that many will never return, or may repopulate their former neighborhoods over a long period of time.

The near-surface geology of the area surrounding the IHNC/GIWW/MRGO is the most important physical component of the region, and can best be explained as the result of a

subsiding Mississippi River delta lobe that has been drained, diked and filled with various types and vintages of dredged material derived from Lake Pontchartrain and adjacent drainage canals. The deepest formations investigated in the area are Pleistocene deposits, consisting of somewhat hardened fluvial sands, silts and muds at a depth of -40 to -60 feet to depths around -180 feet. These sediments were exposed and weathered during low sea level stands as a result of Pleistocene glaciation, resulting in relatively higher cohesive strengths than would normally be expected. Above the Pleistocene, Holocene deposits are the result of gradual deposition of organic peat mixed with fluvial silt and mud deposited as overbank deposits and interdistributary bay deposits of the Mississippi River in cypress swamps around Lake Pontchartrain (Kolb *et al*. 1975).

Photograph 5-1. Example of damaged residences located in the study area.

Much of the project area was formerly wetlands (*e.g.*, cypress swamps and marshes). As Metropolitan New Orleans grew and the hurricane and storm damage risk reduction levees were built ever higher, water was drained from swamps and marshes by canals and pumping, and dredged material, including peat and mud, was used to elevate the area for habitation. Resulting surface soils are classified as dredged material or muck (Natural Resources Conservation Service [NRCS] 2007). Land inside the levees is continually subsiding due to dewatering of peat deposits, resulting in surface elevations below sea level. Water content in soils is generally high, and increases with depth. The near-surface groundwater table is connected to the water levels in Lake Pontchartrain and the Mississippi River, hence the need for numerous drainage canals and pumps to remove constant inflow and water from rainfall events.

5.2. SIGNIFICANT RESOURCES NOT AFFECTED BY ALTERNATIVES

This section was fully described in the 1997 EIS and is incorporated herein by reference. In summary, due to the highly developed nature of the project area, no agricultural lands and farms are present. Furthermore, coordination with the U.S. Department of Agriculture, NRCS, confirmed that no prime or unique farmland soils subject to the provisions of the Farmland Protection Policy Act are located in the project area.

No Federally listed streams or streams listed as part of the Louisiana Scenic Rivers System occur in the project area, and those that occur in St. Bernard Parish are far removed from the alternatives under consideration. The Bayou Sauvage National Wildlife Refuge (NWR) is located in New Orleans East, but is well outside the influence of the proposed alternatives and would not be affected.

5.3. SIGNIFCANT RESOURCES AND EFFECTS OF ALTERNATIVES

5.3.1. Introduction

This section contains a list of the significant resources located in the vicinity of the proposed IHNC Lock project area (*i.e.*, the study area), and describes in detail those resources that would be impacted, directly or indirectly, by the alternatives. Direct

impacts are those that are caused by the action taken and occur at the same time and place (40 Code of Federal Regulations [CFR] §1508.8(a)). Indirect impacts are those that are caused by the action and are later in time or further removed in distance, but are still reasonably foreseeable (40 CFR §1508.8(b)). Cumulative impacts are discussed in Section 6. The resources described in this section are those recognized as significant by laws, executive orders, regulations, and other standards of National, state, or regional agencies and organizations; technical or scientific agencies, groups, or individuals; and the general public.

The amount and quality of socioeconomic data (*i.e.*, employment, population, and housing) available are very limited because of the devastation and out-migration caused by Hurricane Katrina in 2005. Numerous possible data sources were analyzed and, for the purpose of this study, it was determined that the most accurate and up-to-date socioeconomic information available for 2008 was for ZIP Codes and was based on mail deliveries as reported by the U.S. Postal Service (USPS). Data from numerous "cutting edge" research firms were analyzed, and it was determined that the ESRI's *Business Analyst Online* (ESRI 2008) provides the most easily accessible and seemingly accurate information. These data are aggregated by ZIP Code and compared to the monthly "mail deliveries by ZIP Code" from the USPS. Even though the ESRI population estimates were somewhat lower than the estimates based on mail deliveries, they were deemed to be within reasonable bounds and were used in this analysis. Population composition, housing characteristics, employment, and income were also taken from the ESRI reports. Socioeconomic estimates for the study area used in the 1997 EIS were defined as comprising Zip Code 70117-New Orleans (Figure 5-1). This Zip Code includes the neighborhoods of Florida, St. Claude, Bywater, Holy Cross, and Lower Ninth Ward.

5.3.2. Waterborne Transportation

This is a socioeconomic resource that includes navigation needs as regulated by the Rivers and Harbors Act of 1899 and River and Harbor Flood Control Act of 1970. The lower Mississippi River is one of the world's busiest port complexes, and includes the Port of New Orleans, which has numerous facilities serviced by the IHNC.

Affected Environment

This resource was described in the 1997 EIS and is incorporated herein by reference. Louisiana is the top state in waterborne transportation by tonnage in the Nation. Four of the 15 largest ports by tonnage in the U.S. are located on the Mississippi River and account for over 410 million tons of cargo annually, with the Port of New Orleans handling nearly 77 million tons annually (American Association of Port Authorities 2006). In Louisiana, 236 miles of the Mississippi River provide deep-draft navigation to Baton Rouge; 310 miles of shallow-draft navigation on the GIWW (270 miles to the west and 40 miles to the east of the Mississippi River); and numerous connecting navigating channels such as the IHNC. The IHNC and existing lock connects the Mississippi River and Lake Pontchartrain, and provides a connection with the GIWW and MRGO (Figure 5-2).

The lock primarily serves shallow-draft barge traffic; however, a limited number of deep-draft vessels (to a depth of 31.5 feet) are accommodated. Although annual vessel traffic at the IHNC Lock is variable, since Hurricane Katrina, there has been a reduction in barge traffic, total lockages and total vessels utilizing the IHNC Lock for both up and down waterway passage (Table 5-1). However, there has been an increase in the average delay at the IHNC Lock even though the lock traffic has decreased (USACE 2008).

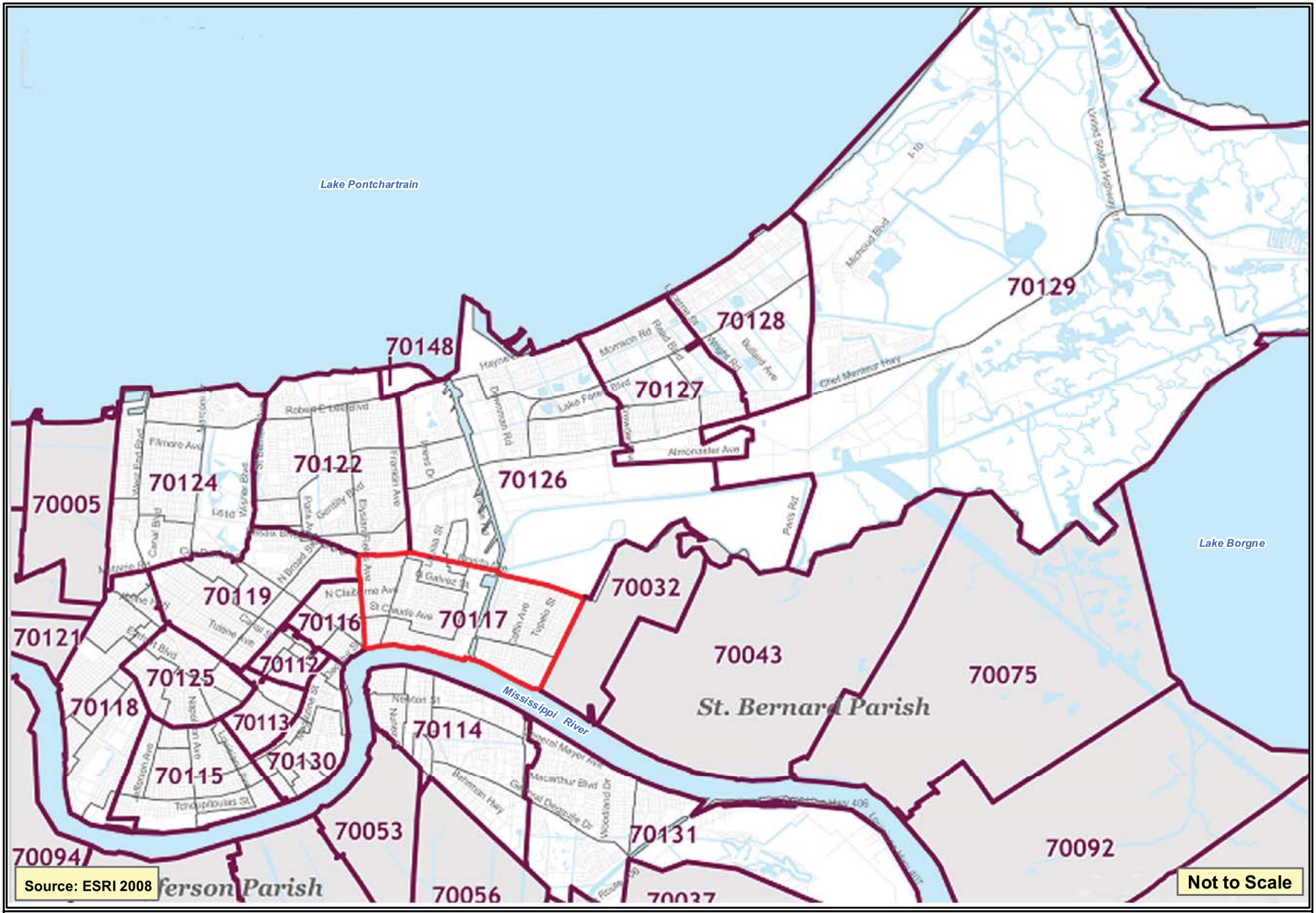

Figure 5-1: Socioeconomic Study Area - Zip Code 70117

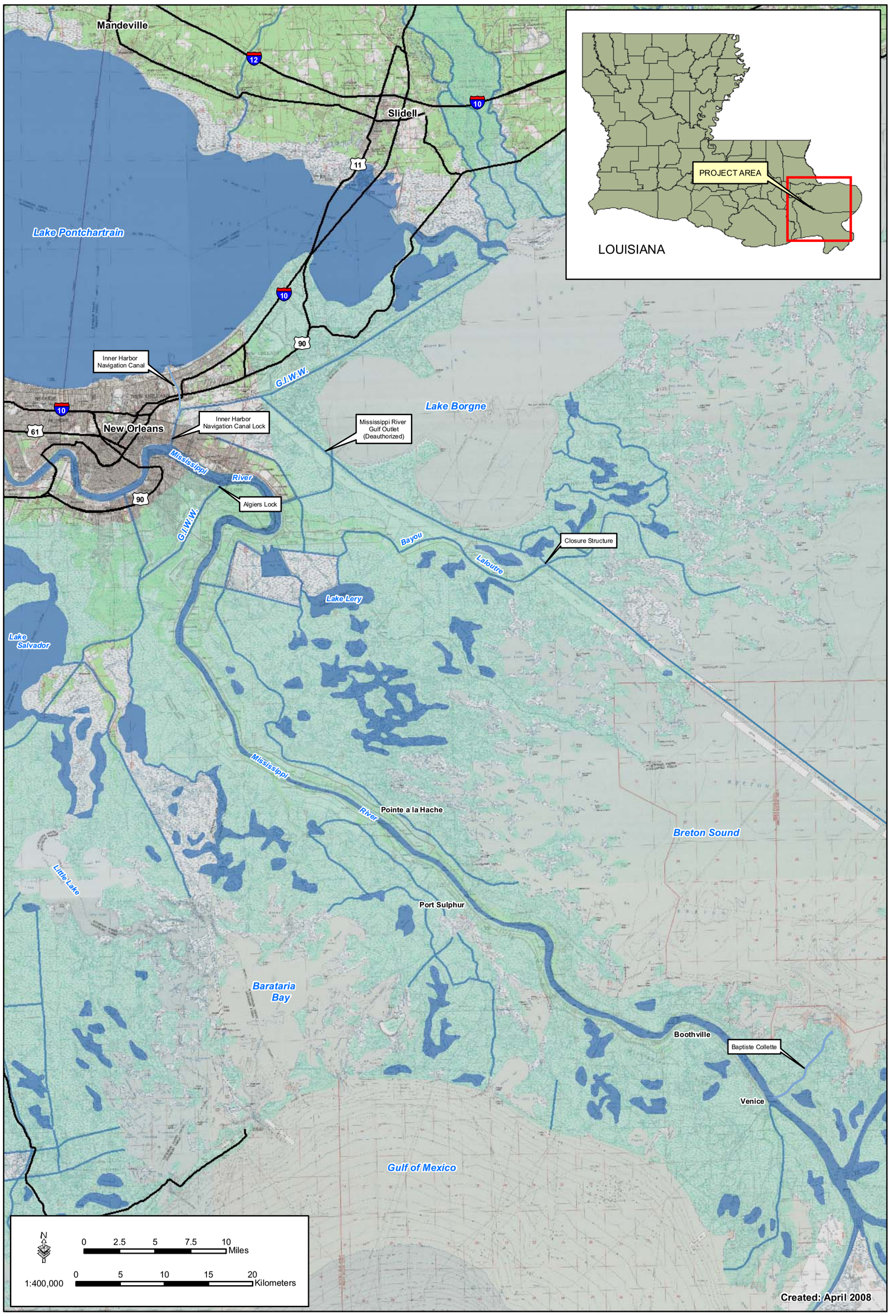

Figure 5-2: Waterborne Transportation

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Table 5-1. Vessel Traffic and Delay Time at the IHNC Lock

Calendar Year	Total Barges	Total Vessels	Total Lockages	Average Delay (hours)	Percent of Vessels Delayed
2007	16,818	13,059	19,906	8.25	73
2006	16,141	8,095	16,389	8.16	91
2005	15,760	13,252	17,577	8.00	66
2004	18,933	15,934	20,524	8.23	67
2003	17,959	16,280	21,048	4.47	66
2002	19,040	16,039	20,864	5.18	67
2001	18,203	14,964	19,521	4.13	67

Source: USACE 2008

In addition to barge and deep-draft vessel traffic, the IHNC Lock also serves recreational and other commercial vessels (such as fishing vessels), U.S. Government vessels, and local law enforcement vessels.

The IHNC Lock has traditionally provided one of two connections between the western and eastern legs of the GIWW at its crossing of the Mississippi River (see Figure 5-2). Because the water levels of the Mississippi River are higher than sea level in the New Orleans area except during very rare combinations of river stage and tidal stage, any vessels navigating the GIWW and crossing the Mississippi River must use locks on the west and east bank of the river for the crossing. The IHNC Lock is the only lock that provides access to the eastern segment of the GIWW. Prior to Hurricane Katrina, vessels could utilize an alternate but substantially longer route that avoided the IHNC Lock to move from the Mississippi River to the eastern leg of the GIWW. This route required navigating the Mississippi River to near Venice, entering Baptiste Collette Bayou which provides navigable passage into Breton Sound, and then crossing Breton Sound into the MRGO (see Figure 5-2). Vessels could then navigate the MRGO north to the GIWW without negotiating any locks. As well as being a substantially longer route, it required vessels to enter the less protected waters of Breton Sound, which at times, for some vessels, is impassable due to poor weather conditions.

Following Hurricane Katrina, CEMVN no longer dredges the MRGO south of its confluence with the GIWW in response to Congress's deauthorization of the deep-draft channel. Furthermore, CEMVN is closing the MRGO with a rock weir structure placed at the Bayou LaLoutre ridge and construction has started on the closure. Once closure of the MRGO is completed, the IHNC Lock would provide the only method of navigation between the Mississippi River and the eastern leg of the GIWW.

Plan 1. No-build/Deauthorization

Under the no-build alternative, it is anticipated that delays would be similar to those experienced in 2004 through 2007, which average approximately 8 hours, and that over 67 percent of all waterborne traffic would experience a delay at the IHNC Lock. Additionally, with the closure of the MRGO, there would be no alternative for ship access between the Mississippi River and the eastern leg of the GIWW during extended lock closures. The existing lock would continue to provide the same level of service to the navigation industry as is currently provided, which would limit expansion of waterborne-related industries along the IHNC and GIWW.

Plan 2. 1997 EIS Plan

The long-term impacts on waterborne transportation were described in the 1997 EIS and are incorporated herein by reference. It is anticipated that the future expected transit

delays for shallow-draft vessels would be considerably reduced because a larger lock would speed lockages and allow more than one vessel to be locked at one time. Additionally, a reduction in maintenance closures as a result of a new lock would also reduce lockage delays. However, it is anticipated that an increase in use of the IHNC Lock by deep-draft traffic would occur with the closure of the MRGO.

Plan 3a. Cast-in-place Plan

In the short-term during construction, it is anticipated that delays at the existing IHNC Lock would be similar to existing conditions and that navigation through the north bypass and south bypass channels during construction and demolition activities would further contribute to navigation delays. A simulation study of navigability during construction of the cast-in-place and float-in-place designs (Plans 2 and 3b) determined that the cast-in-place design was more difficult to navigate relative to the float-in-place design because of the wider navigation channel around the construction site provided by the float-in-place design (Appendix G). This difference in navigability would be further exacerbated by poor weather conditions.

Following completion of the new IHNC Lock, shallow-draft and deep-draft traffic would experience considerably reduced transit delays, both due to the reduction in lock maintenance needs and from the larger lock, which would better accommodate large tows and deep-draft vessels. However, lock delays due to non-lock related events, such as river conditions and weather, would still occur similar to existing conditions.

Landfill Disposal Option

The choice of dredged material disposal options (*i.e.*, CDF vs. landfill disposal) would have no impact on waterborne transportation.

Plan 3b. Float-in-place Plan (Recommended Plan)

The impacts on waterborne transportation for the Float-in-place Plan are similar to those described for the Cast-in-place Plan. However, during construction of the IHNC Lock, the float-in-place design offers improved navigability for both ship pilots (deep-draft) and tow pilots (shallow-draft) (Appendix G).

Landfill Disposal Option

The choice of dredged material disposal options (*i.e.*, CDF vs. landfill disposal) would have no impact on waterborne transportation.

5.3.3. Hurricane and Storm Damage Risk Reduction System and Mississippi River Flood Control

This is a socioeconomic resource responsible for providing Metropolitan New Orleans with risk reduction from both Mississippi River flooding and hurricane and storm damage. The responsibility for constructing risk reduction systems falls on both CEMVN and local agencies, while long-term maintenance of risk reduction systems is the responsibility of local agencies.

Affected Environment

Hurricane and storm damage risk reduction and Mississippi River flood control for the area surrounding the IHNC Lock was described in the 1997 EIS and is incorporated herein by reference. In summary, the Mississippi River flood control and hurricane and storm damage risk reduction systems are designed to provide the developed areas surrounding the IHNC Lock protection from flooding from the Mississippi River, Lake Pontchartrain (tidal flooding), normal rain events and tropical storm events. This complex series of levees, floodwalls, floodgates, drainage canals, pipes and pump

stations is divided into separate polders by the IHNC and the GIWW/MRGO. Each of these polders has its own system of risk reduction and drainage structures.

The Mississippi River levees in the vicinity of the IHNC provide flood control to an elevation of 20 feet North American Vertical Datum 88, and are part of the larger Mississippi River and Tributaries Project. The IHNC Lock is a component of the flood control for the Mississippi River. The floodwalls on either side of the IHNC currently provide hurricane and storm damage risk reduction to an elevation of between 12.5 and 15.5 feet, and were repaired and substantially improved after being damaged by Hurricane Katrina.

Substantial flooding in the project area has occurred twice due to tropical storms; Hurricane Betsy in 1965 and Hurricane Katrina in 2005. Hurricane Betsy caused substantial flooding and damage to the neighborhoods located east of the IHNC, including the Lower Ninth Ward, Holy Cross, New Orleans East and much of St. Bernard Parish. Hurricane Katrina devastated much of metropolitan New Orleans. Areas west of the IHNC flooded during Hurricane Katrina due to structural failure of floodwalls along the IHNC and the 17th Street and London Avenue canals, while areas east of the IHNC flooded from both damaged floodwalls and overtopping and subsequent structural failure of levees.

In response to Hurricane Katrina, CEMVN is planning numerous projects for the Greater New Orleans HSDRRS to meet the 100-year level of risk reduction. In the project area, this includes improving and replacing levees, floodwalls and floodgates that were originally constructed as part of the Lake Pontchartrain and Vicinity (LPV) project. This primarily includes increasing the elevation of existing levees, the replacement of I-walls with T-walls to meet new design criteria, replacement of floodgates, modifications to the 17th Street, London Avenue and Orleans Avenue canals and the construction of barrier structures.

For the IHNC, the 100-year level of hurricane and storm damage risk reduction would be provided by constructing gated structures, one set of structures and floodwalls to provide protection from Lake Borgne storm surges and the other structure to provide protection from Lake Pontchartrain storm surges. The Lake Borgne storm surge protection structures would be located along the GIWW/MRGO east of the Paris Road Bridge, and the Lake Pontchartrain storm surge protection structure would be located on the IHNC between the Senator Ted Hickey Bridge and Lake Pontchartrain. The storm surge protection structures which are wider construction would include static barriers across non-navigable portions of the channel locations and gated (or otherwise navigable) structures across the navigable portions of the channels. This project is a design-build project and would include both temporary measures necessary to provide some level of immediate protection and the permanent structures to be completed by June 2011.
In St. Bernard Parish, 22 miles of levee along the south bank of the MRGO would be raised to meet the 100-year level of hurricane and storm damage risk reduction. In addition to levee improvements, a ramp and the construction of floodwalls would occur at Louisiana Highway 46 (LA 46). The project would include the replacement of navigable gates and associated floodwalls at the confluence of Bayou Bienvenue and Bayou Dupre and the MRGO.

Plan 1. No-build/Deauthorization
Under the no-build alternative, CEMVN would continue to implement 100-year level of risk reduction projects that are part of the HSDRRS within the project area, with the goal of providing this level of risk reduction by June 2011. The existing lock would continue

to provide control from the Mississippi River flooding, and ongoing maintenance by CEMVN would insure that the lock would provide this level of flood control.

Plan 2. 1997 EIS Plan
The Mississippi River levees would be extended from the location of the existing lock to the new lock location north of Claiborne Avenue along the IHNC. The combination of the new lock and extended Mississippi River levees and floodwalls would provide flood control from the Mississippi River north of Claiborne Avenue.

All components of the 100-year level of risk reduction for the HSDRRS, including those structures proposed for portions of the LPV project which provides risk reduction for the project area, would be implemented as described in the no-build alternative. The CDF would be constructed to provide containment for dredged material and would be designed to safely meet storage and ponding requirements (Appendix E). However, the CDF has the same level of risk reduction as structures (*i.e.*, residences and businesses) in the nearby neighborhoods. Furthermore, the completion of the HSDRRS would insure that all components of the project would have 100-year level of risk reduction, including the CDF, and new design criteria for levees and floodwalls would ensure that overtopping of levees and floodwalls would not cause catastrophic failure. The CDF would be protected from storm surge and wave run-up by these structures.

The H-piles which provide support for the T-wall on the east side of the IHNC adjacent to the proposed bypass channel do not extend into the bypass channel's proposed excavation limits. The bypass channel excavation limits do not encroach on the T-wall and pile supports. Furthermore, a stability analysis was performed which modeled the effects of the bypass channel excavation on the T-wall. The stability analysis showed that the T-wall meets the Factor of Safety criteria for the proposed bypass channel excavation limits. Because the soil parameters used in the stability analysis were considered conservative, the final design would confirm that the T-wall will remain stable after construction of the bypass channel.

Plan 3a. Cast-in-place Plan
The Cast-in-place Plan would provide the same level of risk reduction as described in Plan 2.

Landfill Disposal Option
The choice of dredged material disposal options (*i.e.*, CDF vs. landfill disposal) would have no impact on Mississippi River flood control and hurricane and storm damage risk reduction systems.

Plan 3b. Float-in-place Plan (Recommended Plan)
The Float-in-place plan would provide the same level of risk reduction as described in Plan 2 regardless of the choice of dredged material disposal options.

5.3.4. Business and Industrial Activity
Business and industrial activity is an important component of socioeconomic resources. The support of existing businesses and industry and their future expansion provides an economic base for communities and is part of the community's long-term economic stability.

Affected Environment
Business and industrial activity were described in the 1997 EIS; however, that description provides the conditions in the neighborhoods surrounding the IHNC Lock prior to the

affects of Hurricane Katrina. Conditions in the surrounding neighborhoods have changed dramatically since 1997 as a result of the damage from Hurricane Katrina.

New Orleans is one of the older urban centers in the U.S., developing from its natural waterways, port facilities and services, commercial fisheries, ship building, oil and gas production, NASA space programs, and its tourism, entertainment, and convention facilities. The study area still contains a number of small businesses comprised of corner grocery stores, neighborhood bars and restaurants, gas stations and auto services, with most of these businesses being located west of the IHNC, primarily in the Bywater and St. Claude neighborhoods. Fewer small businesses have reopened east of the IHNC in the Lower Ninth Ward and Holy Cross; these areas lack any real business redevelopment. No large grocery stores, bank branches or drugstores have opened in the project area since the storm. Prior to Hurricane Katrina there were estimated to be 146 businesses within the study area, and under the current conditions there are estimated to be less than 40 businesses that have reopened, almost all of which are located west of the IHNC (CBMC 2008).

Current industrial activity along the IHNC includes metal and scrap recycling yards, marine-related businesses, and light industries. The Port of New Orleans maintains waterfront properties along the IHNC and Mississippi River in the project area, including four container terminals north of the Florida Avenue Bridge. The Port of New Orleans leases much of its waterfront properties along the IHNC to private marine-related industries, some of which maintain active operations along the IHNC.

Plan 1. No-build/Deauthorization

With the continued use of the existing IHNC Lock and its limitations to navigation, including substantial periodic delays, industrial and commercial redevelopment along the IHNC would be limited. It is anticipated that most marine-related businesses would evaluate and choose other locations to conduct business, either in the Metropolitan New Orleans area, or elsewhere, such as Houston, Texas or Mobile, Alabama, where there would be substantially less hindrance to ship traffic.

Under the no-build alternative, commercial and retail businesses would likely continue to rebuild in the nearby neighborhoods devastated by Hurricane Katrina. Residential redevelopment is key to attracting commercial and retail businesses, and it is anticipated that most of the redevelopment of both residential and commercial and retail businesses would occur in the Bywater and Holy Cross neighborhoods in the near future (1 to 5 years) due in part to their strong neighborhood associations and higher elevation along the river, followed by Florida/St. Roch and Lower Ninth Ward neighborhoods in the next 5 to 10 years.

Plan 2. 1997 EIS Plan

A new lock constructed in the IHNC north of Claiborne Avenue would have long-term beneficial impacts on marine-related business development along the IHNC. The larger lock size, which would accommodate modern ship traffic, and the lack of long delays would encourage the redevelopment of industry along the IHNC.

Disruptions of neighborhoods near the IHNC from lock construction, as well as increased traffic delays associated with the replacement of the St. Claude Avenue and North Claiborne Avenue bridges, would negatively impact residential redevelopment in these areas. This short-term impact on residential redevelopment would also negatively impact nearby neighborhood commercial and retail redevelopment, as fewer local residents would equate to less business activity. Existing businesses located along St. Claude Avenue and North Claiborne Avenue would suffer short-term business losses during

detours, as businesses would be less accessible and have reduced exposure. However, after construction of the new lock is completed, it is anticipated that marine-related businesses relocating to the IHNC would bring jobs for local residents. The increase in local job availability, many of them within walking distance of the Holy Cross, Bywater, Lower Ninth and Florida/St. Roch neighborhoods, would cause the redevelopment of residential areas and associated commercial and retail business activity.

A temporary increase in regional business activity would occur during construction activities. The new lock construction, existing lock demolition, hurricane and storm damage risk reduction improvements, St. Claude Avenue Bridge and North Claiborne Avenue Bridge improvements, dredged material disposal and off-site construction area and mitigation site construction would cost between $800 million and $1 billion, much of which would be spent for local labor and materials. This would generate a substantial increase in construction-related business activity in the region.

Mitigation measures were described in the 1997 EIS and are incorporated herein by reference. These include providing monetary compensation to commercial establishments and landlords that experience a demonstrable reduction in sales and rents during bridge construction activities. Incentives would be provided to lessees on the IHNC displaced by the IHNC Lock replacement, with an encouragement to relocate in Orleans Parish. Additionally, a business assistance program would be established in the area to stimulate local business development.

Plan 3a. Cast-in-place Plan

The cast-in-place construction for the IHNC Lock would have similar impacts on business activity in the project area; however, short-term impacts on commercial and retail businesses would likely be further hampered due to increased noise and localized activity associated with this type of lock construction. The cost of the lock construction using a cast-in-place method is less than the float-in-place method; therefore, benefits from the increase in temporary local construction-related business activity would be less than either Plan 2 or Plan 3b. Mitigation measures would be the same as described for Plan 2.

Landfill Disposal Option

Disposing of dredged material in a landfill instead of a CDF would temporarily increase landfill activity and increase business activity associated with the transport of dredged material from the lock construction site to local landfills. In the long-term, there would be a reduced capacity in local landfills as a result of the large volume of material under the landfill disposal option. Reduced local landfill capacity could increase future disposal prices and have a minor impact on business activities that require low cost landfill disposal.

Plan 3b. Float-in-place Plan (Recommended Plan)

The float-in-place construction for the IHNC Lock would have the same impacts on business activity in the project area as Plan 2 . Mitigation measures would be the same as described for Plan 2.

5.3.5. Employment

Employment is an important socioeconomic resource that affects community structure. Housing occupancy, business development and tax revenues are based on adequate employment in a community.

Affected Environment

Impacts of Hurricane Katrina included loss of life, destruction of homes and businesses, damage and disruption of public facilities and services, high unemployment, loss of income, disruption and closure of local institutions, and in many cases, the loss of neighborhood unity. The destruction of so many thousands of housing units has led to no immediate return to the metropolitan area for many residents, whether or not employment has been available.

The total number of employers in Orleans and St. Bernard Parishes was greatly reduced following Hurricane Katrina (Table 5-2). A net loss of over 2,500 employers has occurred in these two parishes. Employment losses in these two parishes mirror the changes seen in total number of employers with a substantial reduction in employment since Hurricane Katrina (Table 5-3).

Table 5-2. Net Change in Total Employers for Orleans and St. Bernard Parishes*

Parish	Year (2nd Quarter)	Total Employers	Cumulate Net Change Since Katrina
Orleans	2005	9,592	
	2006	7,039	-2,553
	2007**	7,482	-2,110
St. Bernard	2005	1,051	
	2006	488	-563
	2007**	540	-511

Source: Greater New Orleans (GNO) Community Data Center 2008; *Quarterly Census of Employment and Wages is not available for 2000; **preliminary data

Table 5-3. Net Change in Total Employment for Orleans and St. Bernard Parishes

Parish	Year	Civilian Labor Force	Employment	Unemployment	Unemployment Rate (%)
Orleans	2000	210,684	199,940	10,744	5.1
	2005	181,098	169,767	11,331	6.3
	2006	95,701	90,483	5,218	5.5
	2007	99,718	95,199	4,519	4.5
St. Bernard	2000	32,177	30,535	1,642	5.1
	2005	28,318	26,878	1,440	5.1
	2006	7,237	6,923	314	4.3
	2007	7,599	7,284	315	4.1

Source: Louisiana Workforce Commission, Labor Market Statistics, Local Area Unemployment Statistics Program 2008

In 2000, the labor force of the study area was 18,814. The labor force participation rate was 50.5 percent in 2000. The unemployment rate for the study area for 2000 was 6.8 percent. In 2000, there were 15,679 workers and in 2008 there were only 7,777 workers in the study area (ESRI 2008).

Plan 1. No-build/Deauthorization

As the study area recovers from the aftermath of Hurricane Katrina, the number of workers in the labor force and the number employed are expected to increase. However, within the study area, it is anticipated that there would be limited job growth and the

labor force would be required to commute to other locations within the Parish or outside of Orleans Parish for employment.

Plan 2. 1997 EIS Plan
No adverse long term impact on the levels of employment is expected by this alternative. Bridge closures could have short term impacts on some of the businesses on both sides of the canal. However, these impacts would likely be minor. The construction of the new IHNC Lock would improve access for deep-draft and shallow-draft vessels through the IHNC, and would provide the Port of New Orleans and others the opportunity to improve and construct facilities within the study area to service the maritime industry. This has the potential to increase the number of jobs available within the study area, potentially reducing unemployment and providing employment locally without the need to commute to other areas within or outside the parish.

Mitigation measures proposed in the 1997 EIS are incorporated herein by reference. These mitigation measures would require that contractors give preference to fully-qualified residents to achieve minority and local resident participation goals, and expansion of the skilled labor workforce in the community through vocational training and hiring preferences.

Plan 3a. Cast-in-place Plan
Impacts on employment would be the same as described for Plan 2. Mitigation measures would be the same as described for Plan 2.

Landfill Disposal Option
The choice of dredged material disposal options (*i.e.*, CDF vs. landfill disposal) would have no impact on local or regional employment.

Plan 3b. Float-in-place Plan (Recommended Plan)
Impacts on employment would be the same as described for Plan 2. Mitigation measures would be the same as described for Plan 2.

5.3.6. Land Use
Land use is an important socioeconomic resource that is regulated by state and local laws and ordinances. Land use laws and ordinances guide development, preserve existing uses and provide for social development and welfare in urbanized areas.

Affected Environment
Land use for each of the neighborhoods (Figure 5-3) in the study area was described in the 1997 EIS and is incorporated herein by reference. Although Hurricane Katrina had tremendous impacts on the population of these neighborhoods, and has either damaged or destroyed most of the businesses and residences, the designated land uses have not changed substantially. It should be noted that, although the designated land uses remain, damage to the Lower Ninth Ward neighborhood from Hurricane Katrina was so extensive, that the majority of the residences in this primarily residential neighborhood were destroyed, demolished and now consist of vacant lots.

The St. Claude neighborhood is primarily residential with a large industrial area along the west side of the IHNC from Claiborne Avenue to Florida Avenue. The Bywater neighborhood is also primarily residential with industrial development and government use (Naval Support Facility) along the Mississippi Riverfront and along Press Street near the intersection of the river and the IHNC. Some warehouse development is located along the western edge of the Bywater neighborhood adjacent to the Faubourg Marigny. The Lower Ninth Ward neighborhood is primarily residential with an industrial area

Figure 5-3: Location of Neighborhoods in Project Area

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located along the IHNC, and Jackson Barracks, a U.S. Army National Guard facility, located along the eastern boundary of the neighborhood. The Holy Cross neighborhood is primarily residential with a riverfront industrial area, recreational use along the IHNC and government use along the eastern boundary of the neighborhood (Jackson Barracks). The primary commercial corridors for all four neighborhoods are St. Claude and Claiborne avenues.

Plan 1. No-build/Deauthorization

With the continued operation of the existing IHNC Lock by CEMVN, no substantial changes in land use are anticipated. No development of the CDF or off-site construction area locations would occur. Future redevelopment in nearby neighborhoods would follow the Unified New Orleans Plan, as described for Planning Districts 7 and 8 (Unified New Orleans Plan 2007) as described below. The District 7 Plan includes the Bywater, Florida and St. Roch neighborhoods; the District 8 Plan includes the Holy Cross and Lower Ninth Ward neighborhoods.

District 7 Plan - Bywater

For the housing redevelopment, the Bywater Community proposes to establish a commercial overlay for mixed uses, allowing neighborhood service retail mixed with residential in the community. The Bywater Community also proposes construction of neighborhood information/housing resource centers at Mt. Carmel Church, Desire Street Ministries, St. Roch Fire House, Capital One Bank, Mandeville Center, and Stallings Recreation Center. The Bywater Community would protect historically significant structures located in the area north of St. Claude Avenue as part of their historic preservation redevelopment. Proposed economic development and business activity include the redevelopment of St. Claude Avenue as a "main street" to aid commercial and retail establishments. Also, the rehabilitation and reopening of St. Roch Market for public uses has been proposed.

The District 7 Plans support the development of a streetcar or other transit vehicle that travels from Canal Street to St. Claude Avenue, then to the Industrial Canal and perhaps turning south to the riverfront returning to downtown. Also, the development of bike lanes along Chartres Street, St. Claude Avenue and along the riverfront has been proposed.

For education and healthcare services redevelopment, residents are planning for neighborhood schools to be rebuilt and rehabilitated. The establishment and improvement of community and recreation centers, including Stallings Recreation Center, Mandeville Center, and activity nodes at Colton Middle and Douglas High schools, has been proposed for community/cultural facilities redevelopment. Public roads, parks, and open space redevelopment includes an increase in street trees throughout the Bywater community. Residents also wish to enhance and create parks, including a new linear park along Press Street, a new park honoring Homer Plessy, and renovation and enhancement of Markey Park, the Chartes Street linear park, and McCarty Square. For riverfront access, pedestrian crossings and entrances through the floodwalls have been proposed. Also, some of the riverfront wharves would be retained as park facilities.

District 7 Plan - Florida

The Florida Community has proposed to redevelop public housing sites, vacant land, and underutilized land into a model mixed-income community. They have also proposed construction of neighborhood information/housing resource centers at Mt. Carmel Church, Desire Street Ministries, St. Roch Fire House, Capital One Bank, Mandeville Center, Stallings Recreation Center, and at the Desire-Florida Area Community Council.

The community proposes to revitalize Louisa Street as a mixed-use corridor supporting retail, additional housing, enhanced transit service, and community services. Redevelopment to allow commercial development of the western portion of the Agriculture Street Landfill site has been proposed.

Residents of Florida Community propose to develop new truck routes to divert heavy trucks from residential streets. Also, the community supports the installation of overpasses for the Norfolk Southern Railroad tracks at appropriate locations. Establishment of streetcar service to the Florida Community has been proposed. The streetcar route through the Florida Community may run toward the river along Desire Street and return toward Lake Pontchartrain along one of the streets that runs parallel to Desire Street. Infrastructure/public works redevelopment includes the proposition of covering the Florida Avenue Canal to eliminate the barrier between neighborhoods. To enhance police and fire protection, residents wish to reopen, rebuild, and add appropriately staffed stations.

For education and healthcare services redevelopment, residents have proposed that neighborhood schools be rebuilt and rehabilitated, especially Carver Middle, Carver High, and Moton Elementary schools. The restoration of healthcare services, including the multipurpose health/community services center at Louisa and Industry, the Desire Mental Health Clinic, and the clinics at Higgins and Louisa, have been recommend. Also the reopening of the Sidney Collier Technical School has been proposed. As for community/cultural facilities redevelopment, the reopening of Edwards Elementary School as a community resource center is proposed. Residents of Florida Community also plan to restore parks, including McGruder, Sampson, Odell, and Jackson Memorial parks. Residents have proposed the creation of landscape buffers along streets such as Alvarm, Almonaster, and Press.

District 7 Plan - St. Roch

The St. Roch community, which is located west of the St. Claude neighborhood, proposes to expand Musician's Village to provide additional housing for musicians and artists. Live-work space for artists has also been proposed, with Music and Urquhart streets as suggested locations. The construction of neighborhood information/housing resource centers at Mt. Carmel Church, Desire Street Ministries, St. Roch Fire House, Capital One Bank, Mandeville Center, Stallings Recreation Center, and vacant structures on St. Claude near the railroad tracks has been recommended. Proposed economic development and business activity include the redevelopment of St. Claude Avenue as a "main street" to help commercial and retail establishments to benefit. The rehabilitation and reopening of St. Roch Market for public uses has also been proposed.

For transportation/transit redevelopment, the St. Roch Community supports the establishment of a streetcar service from Canal Street along North Rampart Street to St. Claude Avenue and then to the IHNC. Restoration of bus service along Desire and Galvez streets has also been suggested. Extension of Treasure Street between Florida Avenue and Desire Street is proposed to provide additional access between the two streets. Residents also propose to develop a pedestrian/bike path along St. Roch Avenue to connect to the Florida Avenue Greenway.

A family health center has been proposed for healthcare services redevelopment. Residents would like to have all the schools reopened. Converting vacant fire stations on St. Roch Avenue and the corner of North Johnson and Independence streets and the Navy recreation center into community centers has also been proposed. As for the public roads, parks, and open space redevelopment, the creation of monuments or other elements to honor neighborhood heroes has been suggested. Also, residents have

proposed the reopening of existing parks and creation of new parks throughout the community including parks at Derbigny Street, Bartholomew Street, Florida Avenue, and Florida Avenue Canal.

District 8 Plan - Holy Cross/Lower Ninth Ward
Residents of Holy Cross/Lower Ninth Ward communities propose to repair and improve St. Claude and Claiborne avenues as mixed use corridors and traditional avenues. For economic development and business activity redevelopment, the community proposes to attract clean, green industry to the flood-side of the flood wall along the IHNC.

For transportation/transit redevelopment, the creation of a new light rail and streetcar system with multi-modal nodes has been proposed. The community has also suggested the removal of the railroad spur from St. Claude Avenue, Alabo Street, and the riverfront. In regards to public safety, relocation of police headquarters to the town center has been proposed.

The Holy Cross/Lower Ninth Ward communities would like to have all schools and community facilities reopened and improved. Street closures separating schools and parks/playgrounds for one block to develop a campus environment have been proposed. Residents would like to renovate, expand, and operate Holy Cross School as a community college and education center. For community/cultural facilities redevelopment, renovation and expansion of the Sanchez Community Center has been proposed. Several redevelopments for public roads, parks, and open space have been proposed including improvements to all parks and the riverfront. A new linear park adjacent to the levee/flood wall of the IHNC has been suggested. Also, residents would like for the Florida Avenue back levee to be developed into major greenways. Relocation of the riverfront park and playground on Alahambra Street to the parcel bound by Royal, Alabo, Chartres, and Charbonette streets has also been proposed.

Plan 2. 1997 EIS Plan
The impacts on land use as a result of Plan 2 were described in the 1997 EIS and are incorporated herein by reference. Redevelopment of neighborhoods near the IHNC Lock would continue as described in Plan 1. The proposed off-site construction area on the north bank of the GIWW would be utilized for a construction facility during the life of the project. Upon completion, this site would convert to the land use that the Port of New Orleans deemed appropriate, which could include maritime and industrial uses. Some acquisition of private and public lands for the construction of the CDF would be required and all landowners would be compensated at fair market value as described in the 1997 EIS. No long-term impacts on land use would occur from lock-related activities.

Plan 3a. Cast-in-place Plan
In the short-term during lock construction activities, it is anticipated that some residential and commercial redevelopment activities near the IHNC (within approximately 500 feet of the IHNC) would be suppressed due to construction noise and traffic that would be disrupting to nearby areas. Parks proposed along the IHNC and riverfront south of the St. Claude Avenue Bridge would not be implemented until lock construction is completed. Any proposed transit developments across the St. Claude Avenue or North Claiborne Avenue bridges (such as the Desire Streetcar Line) could be temporarily delayed until completion of bridge modifications. However, redevelopment in nearby neighborhoods beyond the influence of noise and construction traffic would occur as described by Plan 1. In the long-term, improved infrastructure along the IHNC, including a new lock and bridges, would contribute to commercial and industrial development in the immediate vicinity of the IHNC, and would bring jobs to the region, contributing to the implementation of the proposed redevelopment as described by the Unified New Orleans

Plan. No additional property acquisition would be required for the lock construction; however, property acquisition would be necessary for the proposed CDF.

The CDF would be converted from undeveloped open space to a dredged material disposal area in the short-term. However, after construction activities are completed, the CDF would be allowed to revegetate and would convert back to undeveloped open space. The off-site construction area would not be needed with the cast-in-place design; therefore, there would be no changes in land use at that site.

Landfill Disposal Option
With the landfill disposal option, land use at the fill cell of the CDF would not change and dredged material would be hauled to a suitable landfill that is currently permitted to accept solid waste. No land use changes would occur at the landfill site(s).

Plan 3b. Float-in-place Plan (Recommended Plan)
Impacts on nearby neighborhoods from noise and traffic would be reduced relative to the Cast-in-place Plan; therefore, short-term impacts on redevelopment of Hurricane Katrina-damaged areas would also be reduced. However, construction activities would still generate noise and construction traffic which would influence redevelopment activities within the first two to three blocks east and west of the IHNC during the approximately 11-year long construction period. Long term impacts on redevelopment of nearby neighborhoods would be the same as the cast-in-place design. Land use impacts in the CDF would also be the same as the cast-in-place design, except additional land acquisition for the proposed off-site construction area would be required.

The off-site construction area on the south bank of the GIWW would be utilized for a construction facility during the life of the project, but would be backfilled after the completion of the IHNC Lock and be returned to pre-construction conditions.

5.3.7. Property Values
Property values are an important socioeconomic resource that insures community stability and fosters community cohesion and regional growth.

Affected Environment
Property values in the study area are affected by a variety of factors, such as trends in employment and income growth experienced by the study area and the metropolitan area as a whole. Additionally, the devastation of Hurricane Katrina and the resulting out-migration have greatly influenced property values. The values of owner-occupied housing have increased between 2000 and 2008; however, if the vacant housing that had significant damage from Hurricane Katrina is included, there would likely be a significant decrease in the median and average housing values between 2000 and 2008.

The average value of owner-occupied housing units in the study area increased from $68,491 in 2000 to $82,664 in 2008, an increase of 20.7 percent. However, during that same time, the consumer price index for housing for the U.S. increased 27.9 percent. The median value of owner-occupied housing units in the study area increased from $56,918 in 2000 to $65,149, an increase of only 14.5 percent, compared to the 27.9 percent increase in consumer price index (ESRI 2008).

Plan 1. No-build/Deauthorization
The 2013 average and median values for owner occupied housing units in the study area are projected to be $87,266 and $65,692, respectively (ESRI 2008). However, housing values would likely not increase as rapidly as in other areas of the city that were less

damaged by Hurricane Katrina and are in proximity to active commercial and retail businesses and jobs.

Plan 2. 1997 EIS Plan
Property values in the immediate vicinity of construction activities could be adversely impacted in the short-term by this alternative because of noise impacts and the traffic congestion caused by the Caliborne Avenue Bridge closure. Following the completion of the project, property values would continue to be adversely impacted due to raised towers on the North Claiborne Avenue Bridge, the double-bascule St. Claude Avenue Bridge, the increased heights of floodwalls and levees to provide flood control from the Mississippi River and the loss of some mature vegetation near the existing lock. These changes may reduce aesthetics of the area, affecting property values.

A neighborhood housing revitalization program was proposed as mitigation for impacts on property values in the 1997 EIS, and that mitigation measure is incorporated herein by reference. This mitigation measure would serve as a source of seed money for a program of progressive housing rehabilitation, and would be developed in cooperation with the Port of New Orleans and local groups and agencies. This mitigation measure would reduce the short-term and long-term impacts on property values in the adjacent neighborhoods.

Plan 3a. Cast-in-place Plan
Impacts on property values and mitigation measures to be implemented to reduce these impacts would be similar to those described by Plan 2.

Landfill Disposal Option
The choice of dredged material disposal options (*i.e.*, CDF vs. landfill disposal) would have no impact on property values.

Plan 3b. Float-in-place Plan (Recommended Plan)
Impacts on property values and mitigation measures to be implemented to reduce these impacts would be similar to those described by Plan 2.

5.3.8. Public/Community Facilities and Services
This socioeconomic resource provides needed services for health and safety of the general public.

Affected Environment
The public/community facilities and services in the project area as described by the 1997 EIS are not applicable to the existing conditions because of the tremendous impact from Hurricane Katrina. The following provides an updated summary of these services in the project area and a more detailed description along with future project area needs is available in Appendix H. It should be noted that public/community facilities and services are being constantly redeveloped and the following description provides the most recent available data for the area.

Police Protection
The project area is in the New Orleans Police Department (NOPD) Fifth District. The Fifth District Station and Substation received major damage from Hurricane Katrina. The NOPD Fifth District Substation, formerly located in the Lower Ninth Ward, is temporarily housed in the old Universal Furniture store at 2372 St. Claude Avenue in the St. Claude neighborhood. The old station house at 3900 North Claiborne Avenue suffered substantial damage from Hurricane Katrina and is being renovated. There are 86 officers on duty, working 8-hour shifts. Since Hurricane Katrina, this force has been

supplemented by elements from the Louisiana State Police and a steadily-decreasing number of National Guard troops.

Fire Protection

Four fire stations, each equipped with a single engine, serve the project area, one in each of the four neighborhoods. All four stations received substantial damage from Hurricane Katrina. The Bywater Station at 1040 Poland Avenue is currently housed in its original building. Engine No. 24 and Ladder No. 4 operate out of this station. The St. Claude/Florida Avenue Station is housed at its pre-Katrina location, but within a trailer. Engine No. 8 and a water truck operate out of this location. The Lower Ninth Ward Station has Engine No. 22 and is located at 2041 Egania Street. The Holy Cross Station, consisting of Engine No. 39 and a water carrier, moved from their damaged headquarters on 6030 St. Claude Avenue to the corner of North Claiborne Avenue and Caffin Avenue, across from the newly-opened Martin Luther King Elementary School. The total number of personnel in the area fire stations is 22, which includes four people per engine; four people for Ladder No. 4; and one person each to operate the two water carriers.

Schools

Prior to Hurricane Katrina there were 23 schools located in the study area. Today, there are only 11 schools in operation. Of these, seven are public schools and four are private. Almost all of the facilities suffered heavy damage from the Hurricane Katrina and subsequent flooding of the immediate area (Photograph 5-2). The Carver schools, consisting of an elementary, a middle and a high school pre-Katrina, now consist of only an elementary (pre-kindergarten [PK] through eighth grade) and a high school (ninth through twelfth grades). Dr. Charles Richard Drew Elementary School (PK through eighth grade), Fredrick A. Douglas High School (ninth through twelfth grades), and Dr. Martin Luther King Charter School for Science and Technology (PK through eighth grades) have also opened to serve children in the area.

Photograph 5-2. Johnson Lockett Public School which has not reopened since Hurricane Katrina

Health Care

Some medical clinics and hospitals in Orleans Parish damaged by Hurricane Katrina have now reopened. However, numerous medical centers devastated by floodwaters remain closed, with the number of pre-Katrina beds available to the sick cut in half. Each facility has been assessed by the Department of Health and Human Services as able to support public health needs. Local clinics can handle most emergencies and can quickly determine if a patient needs to go to a hospital and, if so, arrange the transfer. Charity Hospital, which for generations provided care to the poor and uninsured in Orleans Parish, flooded during Hurricane Katrina and has been closed since the August 2005 storm. Although no determination has been made regarding the disposition of the Charity Hospital building, the Louisiana State University (LSU) Medical System has determined that it is not suitable to return to use as a hospital. LSU is planning a new medical complex in association with a new Veterans Administration hospital just north of the Central Business District. No medical centers have opened in St. Bernard Parish or elsewhere east of the IHNC Lock.

Mobile Disaster Medical Assistance Teams continue operating in some areas. In May 2008, the Lower Ninth Ward Health Clinic, at the corner of St. Claude Avenue and Egania Street, opened for business, dispensing free health care to anyone in need. Besides the Lower Ninth Ward Health Clinic, the Daughters of Charity Health Center – Saint Cecilia at 4201 North Rampart Street is the only other medical facility in the neighborhoods adjacent to the project area.

Recreational Facilities
Numerous parks and playgrounds, as well as a recreation center, were maintained by the City of New Orleans Recreation Department prior to Hurricane Katrina. All of these recreation facilities received varying damages from Hurricane Katrina and many of the playgrounds are still not open to the public. Several parks and recreational facilities are now being used for residential and commercial trailers, and all of these facilities are in need of substantial maintenance. Both the Sanchez and Stallings Community Centers remain closed and Hurricane Katrina damage remains. A 3-mile long, white-striped bicycle path has recently opened along St. Claude Avenue, extending through the Lower Ninth Ward and ending at the Orleans/St. Bernard Parish line.

Other Facilities
The USPS's Bywater Station on Poland Avenue was damaged by Hurricane Katrina, but reopened for service in 2006.

Plan 1. No-build/Deauthorization
Under the no-build alternative, it is anticipated that community facilities and services would continue to be improved and renovated. As residents return to these storm damaged areas, schools, health care and recreational facilities would be rebuilt. City services would improve through time, and fire and police facilities would be renovated and these services would move from temporary to permanent facilities. Much of the renovation and improvement to community services have been completed by volunteer organizations, and it is likely that volunteers would continue to be an important part of future redevelopment.

Plan 2. 1997 EIS Plan
The impacts on community services from Plan 2 were described in the 1997 EIS and are incorporated herein by reference. The temporary closure of the North Claiborne Avenue Bridge and the use of a temporary bridge at St. Claude Avenue would cause short-term disruptions to pedestrian and vehicle traffic, impacting resident's access to the remaining public and community facilities. The temporary disruption in vehicle traffic across the IHNC would also increase response times for emergency vehicles traveling across the canal. This is especially critical for residents of St. Bernard Parish, the Lower Ninth Ward and Holy Cross, who rely upon the IHNC bridges for emergency transportation to emergency medical centers located in New Orleans, west of the IHNC.

In the long-term, the period of time in which the North Claiborne Avenue and St. Claude Avenue bridges would remain open would be greater than that of the no-build plan because of increased marine traffic. This would cause a permanent reduction in accessibility to community services and facilities and response time for emergency vehicles. Community mitigation measures to reduce these impacts were also provided, and include additional community facilities such as playgrounds, gardens, tot-lots and linear parks; and additional police, emergency medical and fire protection provided during the period of construction. Additionally, consideration would be given to converting the proposed off-site construction area to a recreational area once construction of the lock modules is completed.

Plan 3a. Cast-in-place Plan
The improvements to the St. Claude Avenue and North Claiborne Avenue bridges are the same as Plan 2; therefore, the impacts on community services and mitigation measures would be the same as described for Plan 2.

Landfill Disposal Option
The choice of dredged material disposal options (*i.e.*, CDF vs. landfill disposal) would have no impact on community facilities and services.

Plan 3b. Float-in-place Plan (Recommended Plan)
The improvements to the St. Claude Avenue and North Claiborne Avenue bridges are the same as Plan 2; therefore, the impacts on community services and mitigation measures would be the same as described for Plan 2.

5.3.9. Tax Revenues
The collection of business, sales and property taxes in support of community services and infrastructure is an important socioeconomic resource.

Affected Environment
The average value of owner-occupied housing units was $82,664 in the study area in 2008 (ESRI 2008). These relatively low housing values, in combination with the statewide homestead exemption of $75,000, and the fact that the number of occupied houses decreased by 57 percent from 2000 to 2008, creates a very limited tax base for the study area.

The number of retail businesses in the study area has been declining over the past several decades. The devastation caused by Hurricane Katrina has further damaged the businesses in the area, reducing the retail business tax base. Sales tax collections in the City of New Orleans fell dramatically immediately following Hurricane Katrina, but have somewhat recovered to approximately 85 percent of the pre-Katrina tax collection level. Of the total sales tax collections, general sales tax collections have declined the most since Hurricane Katrina, while hotel/motel and motor vehicle sales taxes have recently been equivalent to or in some months greater than pre-Katrina levels (GNO Community Data Center 2008).

Plan 1. No-build/Deauthorization
Under this plan, the housing values and business of the study area would change very little in the future. As a result, the tax revenues generated in the study area would remain stagnant. Without the IHNC Lock construction, there would be no increase in local sales tax collections associated with the expenditures on materials and supplies.

Plan 2. 1997 EIS Plan
Under this plan, property values and thus, property taxes, could experience a small adverse impact because of the bridge closures and construction noise. In the short-term, sales taxes could be adversely affected by the bridge closures as residents are discouraged from shopping in nearby retail businesses due to these inconveniences. However, increased economic activity from construction activities (such as local purchases by construction personnel, purchasing of supplies and equipment for construction, and housing needs) at the lock site could offset some, if not all, of the loss in business because of the bridge closures. The impact on tax revenue from a reduction in property values would be short-term and would likely return, if not increase, to preconstruction conditions following completion of lock construction.

Plan 3a. Cast-in-place Plan
The impacts on tax revenues from the implementation of this plan would be the same as described for Plan 2.

Landfill Disposal Option
The placement of dredged material in a CDF would have no impacts on tax revenues. However, if the option to place dredged material in a landfill is chosen, there would be a short-term increase in local tax revenues in the municipality where the landfill is located.

Plan 3b. Float-in-place Plan (Recommended Plan)
The impacts on tax revenues from the implementation of this plan would be the same as described for Plan 2.

5.3.10. Population

Affected Environment
Hurricane Katrina devastated the population in Orleans and St. Bernard parishes, with a tremendous loss of population between July 2005 and July 2006 (Louisiana Public Health Institute 2007; U.S. Census Bureau 2008). Table 5-4, which is based on USPS data, shows the population change for Orleans and St. Bernard parishes and the Metropolitan Statistical Area (MSA) since Hurricane Katrina, and indicates the extreme depopulation of the project area following Hurricane Katrina, and the slow recovery of that population. Although the recovery of the area has been slow, based upon USPS data, nearly 72 percent of Orleans Parish pre-Katrina households are actively receiving mail (GNO Community Data Center 2008).

Table 5-4. Population Change for Orleans and St. Bernard Parishes, and the MSA

Year	Orleans	St. Bernard	MSA
2000	484,674	67,229	1,316,510
2005 (July)	453,726	64,683	1,309,954
2006 (July)	210,198	13,875	990,478
2007 (July)	239,124	19,826	1,030,363

Source: GNO Community Data Center 2008; note that Orleans and St. Bernard parishes have challenged the July 2007 population estimates.

Based on data in the ESRI (2008) data base, the population of the study area declined from 51,528 in 2000 to 21,402 in January 2008. During this same period of time, the population of Orleans Parish declined from 484,674 to 321,466, while the population of Louisiana increased slightly from 4,468,976 to 4,500,627. The majority of the overall population of the study area continues to be made up of older persons with only 30 percent being under the age of 19 in 2008. This compares to 34 percent under 19 in 2000. In 2008, nearly 22 percent of the population was 55 years of age or older compared to 20 percent in 2000 (ESRI 2008).

In 2008 the African-American population represented almost 83.3 percent of the population in the study area, while the white population represented 14.2 percent. Other races represented 2.5 percent. This compares to 88.8 percent African-American, 9.4 percent white, and 1.8 percent other races in 2000 (ESRI 2008).

Plan 1. No-build/Deauthorization
ESRI (2008) projects the population to be 27,083 in 2013. Although the population of the study area is slowly recovering from the aftermath of Hurricane Katrina, the population age 55 and over is expected to continue to increase, reaching almost 24.5

percent of the total population by 2013. African-American population is projected to increase to 85.9 percent by 2013 while the white population decreases to 12.0 percent (ESRI 2008). The biggest factors impacting population in the study area would be recovering from the aftermaths of Hurricane Katrina and the ability of local, state, and Federal governments to reestablish the public's confidence in the hurricane and storm damage risk reduction system providing adequate storm protection.

Plan 2. 1997 EIS Plan
This plan is not expected to have any significant impacts, short or long term, on the population of the area. However, it is possible that inconveniences caused by traffic congestion or increased noise levels could cause some of the residents who do not own their homes to consider relocation and discourage returning residents from rebuilding near IHNC Lock construction activities.

Plan 3a. Cast-in-place Plan
The impacts on population from this plan would be the same as Plan 2.

Landfill Disposal Option
The choice of dredged material disposal options (*i.e.*, CDF vs. landfill disposal) would have no impact on population.

Plan 3b. Float-in-place Plan (Recommended Plan)
The impacts on population from this plan would be the same as Plan 2.

5.3.11. Community and Regional Growth
Generally desirable community and regional growth is considered to be growth supported by local and regional institutions through economic developments, social programs, and the human environment supported by neighborhoods and metropolitan areas as reflected by employment, income, and population trends.

Affected Environment
While total employment and population within the immediate area of the community adjacent to the project site have tended to decline in recent decades, the size of the larger New Orleans MSA has increased as adjacent suburban areas have expanded. As previously mentioned, however, the effects of Hurricane Katrina have included severe damage to communities immediately adjacent to the project area, the New Orleans MSA, and a larger region, extending for about 200 miles along the Gulf coast. The Louisiana Recovery Authority estimates that Hurricanes Katrina and Rita caused the destruction of 200,000 housing units and 18,000 businesses, many of which have not been restored, influencing community and regional growth. The GNO Community Data Center (2008) and other reports have pointed out that some of the deepest flooding in New Orleans was adjacent to Lake Pontchartrain, and these areas are experiencing tremendous difficulty in recovery.

Plan 1. No-build/Deauthorization
Future community and regional growth is anticipated to be dependent upon the ability to redevelop adjacent neighborhoods that were devastated by Hurricane Katrina. This includes the ability to improve housing conditions, provide local and regional health care, and make available adequate public schools and child care centers. The future growth of the study area and the New Orleans MSA is correlated to the perceived risk of damage from future storm events and its relationship to investment for future redevelopment. Additionally, costs associated with flood risk, such as insurance coverage and commuting distance to adequate jobs, also play a role in redevelopment of the study area.

Plan 2. 1997 EIS
Redevelopment of neighborhoods in the study area could be diminished during the construction period due to the disruption from construction activities and increased traffic. However, it is anticipated that the construction of a new lock would not have any long-term impacts on community and regional growth. The expenditure of $800 million to $1 billion on lock construction, including the labor and the purchase of supplies and materials, would have a short-term beneficial impact on community and regional growth.

Plan 3a. Cast-in-place Plan
Impacts on community and regional growth would be the same as described for Plan 2.

Landfill Disposal Option
The choice of dredged material disposal options (*i.e.*, CDF vs. landfill disposal) would have no impact on community and regional growth.

Plan 3b. Float-in-place Plan
Impacts on community and regional growth would be the same as described for Plan 2.

5.3.12. Vehicular Transportation
This resource is important for a variety of reasons, among them a transportation network that links waterways, major rail lines, trucking companies and airports to limited access highways and streets and bridges supporting the urban center. This resource is a major component of the evacuation routes needed in response to hurricanes that pass through the region. This resource is important to the public because of increase in traffic in relation to existing traffic load and capacity, reduction in alternative transportation options or inadequate parking capacity.

Affected Environment
The study area is comprised of a street grid that contains several arterial streets and a dense pattern of neighborhood and local streets. The east-west travel corridors of this street grid are bisected by the IHNC. The major east-west arterial routes in the study area include Florida Avenue, North Claiborne Avenue (LA 39), North Robertson Street, and St. Claude Avenue (LA 46; Figure 5-4). North Robertson Street and North Claiborne Avenue are one-way streets on the west side of the IHNC that merge to cross the IHNC at the four-lane wide, mid-level North Claiborne Avenue Bridge. North Claiborne Avenue continues as a four-lane divided road east of the IHNC. The Florida Avenue Bridge is a two-lane low-level bridge that also includes a railroad crossing. The St. Claude Avenue Bridge is a four-lane, mid-level bridge. These three bridges experience frequent openings as a result of passing marine traffic on the IHNC. Rush-hour curfews are in effect for these three bridges during weekdays to accommodate vehicle traffic.

Traffic counts were conducted in 2008 by the Regional Planning Commission as part of its ongoing Congestion Management System database (Appendix J). Table 5-5 provides the 2008 traffic counts for Florida Avenue, North Claiborne Avenue and St. Claude Avenue at the three bridges, along with previous traffic counts conducted in 1993 and 2004/2005. Traffic volumes were decreasing on these three east-west arterial routes prior to Hurricane Katrina, and are now greatly reduced due to the significant changes in socioeconomic conditions of the study area and region.

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Figure 5-4: Major Vehicular Transportation Routes

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Table 5-5. Comparison of Actual Traffic Counts, 1993 to 2008

Roadway	1993 (vehicle trips/day)	2004/2005 (vehicle trips/day)	2008 (vehicle trips/day)	Change 1993 – 2008 (percent)
Florida Avenue	14,000	8,906	976	-93
N. Claiborne Avenue	40,106	37,103	19,558	-51
St. Claude Avenue	30,190	28,653	11,474	-62
Total	84,350	74,662	32,008	-62

Source: Regional Planning Commission Traffic Analysis, Appendix J

Regional Planning Commission conducted travel time runs during am and pm peak traffic hours for the Florida Avenue, North Claiborne Avenue and St. Claude Avenue corridors to determine the true extent of travel time and delay along this corridor. Delay was ascertained using observed speeds and the posted speed limits. Table 5-6 shows the total trips and net delay for vehicles crossing the IHNC between Florida Avenue, North Claiborne Avenue, and St. Claude Avenue for the 2008 study. Although capacity along the roadways is well within acceptable operating parameters, delays are common because of bridge openings and railroad crossings, especially for St. Claude Avenue.

Table 5-6. Daily Traffic Metrics at IHNC Crossing, Observed Data for 2008

Roadway	Volume to Capacity	Travel Time (hours/facility)	Delay (hours/day)	Peak Hour Speeds (miles/hour)	Level of Service
Florida Avenue	0.0520	29.6	4.9	25.0	A
N. Claiborne Avenue	0.2785	976.5	220.4	25.8	B
St. Claude Avenue	0.1435	609.8	244.4	16.2	D
Total	-	1,615.9	469.7	-	-

Source: Regional Planning Commission Traffic Analysis, Appendix J

The major north-south arterial routes include Franklin and Almonaster avenues, Louisa Street, Piety Street and Poland Avenue on the west side of the IHNC; and Jourdon Avenue, Forstall Avenue, Caffin Street and Tupelo Street on the east side of the IHNC. Although most of these streets are two-lane two-way or one-way streets, they primarily serve as feeders to the major east-west arterial streets and have more capacity than the present demand, especially following the reduction in local population since Hurricane Katrina.

The Regional Transit Authority (RTA) operates the public transit system in Orleans Parish. Hurricane Katrina destroyed its fleet of buses and all of the streetcars used on the Canal Street line. The RTA currently has 150 buses and anticipates receiving 39 additional buses in 2008 and is repairing the Canal Street line streetcars. Additionally, the displacement of a large portion of the low-income customer base has altered ridership dramatically. Prior to Hurricane Katrina, the transit system was heavily used, with annual ridership estimated at 33 million. However, since Hurricane Katrina, annual ridership has decreased dramatically and is now estimated to be approximately 9 million (New Orleans Times Picayune 2008a).

The St. Claude Avenue and Florida Avenue bridges across the IHNC also provide access for pedestrian and bicycle traffic between neighborhoods. The North Claiborne Avenue Bridge is not designed to provide pedestrian access.

Plan 1. No-build/Deauthorization

Regional Planning Commission modeled the traffic growth for the no-build condition for a target year of 2014 (Appendix J). The current transportation system is anticipated to remain relatively unchanged for the next 10 to 12 years. Regional Planning Commission anticipates that the overall change in traffic volumes at the IHNC bridges to be roughly equivalent to overall population and employment growth in the area. Regional Planning Commission forecasts that the majority of that growth to occur along the North Claiborne Avenue corridor, as described by Unified New Orleans Plan planning efforts in St. Bernard and Orleans parishes. Based upon modeling results, traffic volumes at the IHNC bridges are anticipated to remain relatively flat to slightly increasing and no substantial delays would occur at the bridges under the no-build alternative. Table 5-7 shows an analysis of total trips, vehicle hours traveled, and net delay for the 2014 no-build scenario, with the worst case volumes. The expected net daily delay and level of service are not substantially different than existing conditions.

Table 5-7. Volume to Capacity at IHNC Crossing, 2014 No-build Scenario

Roadway	Volume to Capacity	Travel Time (hours/facility)	Delay (hours/day)	Peak Hour Speeds (miles/hour)	Level of Service
Florida Avenue	0.061	38.0	6.3	25.0	A
N. Claiborne Avenue	0.313	1,308.4	514.0	24.8	B
St. Claude Avenue	0.206	698.8	339.6	15.6	D
Total	-	2,045.2	859.9	-	-

Source: Regional Planning Commission Traffic Analysis, Appendix J

Additionally, Regional Planning Commission modeling indicates that most of the single trip interchanges are between St. Bernard and Orleans parishes and St. Bernard Parish is involved in more trip interchanges than any other defined areas.

Plan 2. 1997 EIS

The 1997 EIS Plan required the removal of the old Florida Avenue Bridge in order to float in the components of the new lock; however, the construction of the new Florida Avenue Bridge which was completed in 2005 is included in this transportation analysis. The new low-level Florida Avenue Bridge provides adequate clearance for lock components.

Regional Planning Commission modeled the closure of the North Claiborne Avenue and St. Claude Avenue bridges using a model calibrated to 2008 socioeconomic data and traffic counts. The North Claiborne Avenue Bridge would be out of service for a period of approximately 28 days as the bridge towers are raised to provide additional clearance for marine traffic. The closure of the North Claiborne Avenue Bridge is estimated to divert approximately 12 percent of total trips in the study area to Paris Road. Of the remaining trips, nearly 80 percent are forecast to use St. Claude Avenue, while the remaining 20 percent are forecast to use Florida Avenue (Table 5-8). This represents a tremendous increase in vehicular traffic for the Florida Avenue Bridge.

Table 5-8. Modeled Highway Link Comparison with North Claiborne Avenue Bridge Closure for Year 2014

Roadway	No Build Scenario (vehicle trips/day)	North Claiborne Bridge Closure (vehicle trips/day)
North Claiborne Avenue	26,090	0
St. Claude Avenue	14,100	28,430
Florida Avenue	910	7,740
Total	41,100	36,170

Source: Regional Planning Commission Traffic Analysis, Appendix J

During project construction, the closure of the St. Claude Avenue Bridge has traffic impacts on North Claiborne Avenue. The modeling results also show the diversion of just under 5,000 trips (or approximately 9 percent) that previously crossed the IHNC to a route using Paris Road (Table 5-9). However, this is a worst-case scenario estimate of bridge closure conditions. The model did not account for temporary bridges to be in place during the St. Claude Bridge replacement. With temporary bridges in place, the diverted traffic would be substantially less than shown in Table 5-9. At the time of the 1997 EIS, the anticipated closure time for the North Claiborne Avenue Bridge was expected to last 2 weeks. Upon further analysis, it was found that the closure time would require 28 days (CEMVN 2004).

Table 5-9. Modeled Highway Link Comparison with St. Claude Avenue Bridge Closure for Year 2014

Roadway	No Build Scenario (vehicle trips/day)	St. Claude Bridge Closure (vehicle trips/day)
North Claiborne Avenue	26,090	36,160
St. Claude Avenue	14,100	0
Florida Avenue	910	1,240
Total	41,100	37,400

Source: Regional Planning Commission Traffic Analysis, Appendix J

Delay estimates can be determined by observing all trip interchanges that involve canal crossings, including those diverted to Paris Road, and calculating the gross travel time for those trips. Model forecasts predict only very modest delays for both bridge closure scenarios (Table 5-10), which were based on a complete closure of the St. Claude Avenue Bridge. Again, temporary bridges would be constructed to alleviate these delays.

Table 5-10. Modeled Highway Delays with St. Claude Avenue Bridge Closure for Year 2014

Bridge Closure Scenario	Total Vehicle Trips/Day	Travel Time (hours)	Net Delay (hours)
No Build	41,100	962.8	0.996
St. Claude Bridge	37,400	820.4	1.262
North Claiborne Bridge	36,160	618.7	4.506

Source: Regional Planning Commission Traffic Analysis, Appendix J

The congestion and associated delays predicted by the model during the various bridge closures is considerably less than the reputation of the corridor would suggest. The demand analysis suggests some of the factors that contributed to this result.

The corridor is presently operating within its design capacity and there are no future capacity issues even during bridge closures. Peak hour speeds and delays are consistent with other parts of the region and fall within acceptable standards for urban arterial operations. The modest growth rate anticipated in the region should not produce much of a change in this condition, prior to the planned construction year. The transportation corridor's poor reputation is due to traffic delays and motorist frustration associated with the opening of the various bridges for vessels using the IHNC.

The past improvements made in the Paris Road corridor assist in mitigating the congestion during the proposed bridge construction by allowing traffic to divert around the project without substantial increase in travel delay. Despite these factors, the demand and operational analyses lead to the conclusion that there would be hot spots of severe congestion during bridge closures.

Minor to moderate delays on North Claiborne Avenue, particularly during peak hours, and moderate congestion in neighborhoods adjacent to Florida Avenue should be expected while the St. Claude Bridge is under construction. Of particular concern is the potential for traffic crossing the Claiborne Avenue Bridge to queue up sufficiently to block access to the detour routes, creating severe conflicts at the intersections of the east/west arterials and the north/south connecting streets. No long-term impacts on traffic in the study area are anticipated.

To mitigate traffic problems during construction activities, mitigation measures as described in the 1997 EIS would be implemented and are incorporated herein by reference. These include increased enforcement patrols; signal and signage reprogramming and improvements; the installation of message boards on both sides of the IHNC; implementation of an incident management plan; providing shuttle van service to accommodate pedestrian traffic across the IHNC; a plan for hurricane and emergency evacuation during periods of bridge closure; additional school crossing guards on each side of the IHNC; resurfacing of 5 miles of local streets prior to project construction to serve construction-related traffic; resurface 2 miles of streets that would have increased usage; provide four additional traffic control officers; and reimbursement to RTA for lost revenues.

Additionally, detouring St. Bernard Parish traffic onto Florida Avenue during the bridge construction at Claiborne Avenue and St. Claude Avenue would be accomplished by linking Angela Street to Florida Avenue through an existing lot owned by St. Bernard Parish. East-west traffic would then be routed along Patricia Street to Angela Street and then onto Florida Avenue, minimizing detours of St. Bernard Parish traffic through the Lower Ninth Ward. Residents of the Lower Ninth Ward and Holy Cross would be provided detours to Claiborne and Florida Avenue via Tupelo Street and Caffin Avenue. On the west side of the IHNC, intersection improvements at Florida Avenue and Alvar and France streets would be necessary to provide detour traffic with better access to Poland Avenue. Additionally, North Galvez Street would be utilized as an additional east-west detour route on the west side of the IHNC, but improved signage would be required at the intersection of North Galvez Street and Almonaster Boulevard to properly route west-bound traffic onto North Miro Street.

Plan 3a. Cast-in-place Plan
The impacts on traffic and mitigation measures to be implemented would be the same as Plan 2.

Landfill Disposal Option
If disposal of dredged material in a landfill is chosen, there would be a short-term impact from increased truck traffic near the contracted landfill as dredged material was delivered to the landfill. The traffic impacts from the landfill option can not be quantified because several local Type I landfills meet the disposal criteria, and the choice of landfills would be made by a contractor based primarily on cost considerations.

Plan 3b. Float-in-place Plan (Recommended Plan)
The impacts on traffic and mitigation measures to be implemented would be the same as Plan 2.

5.3.13. Housing
Adequate and affordable housing is a component of socioeconomic resources that maintains community integrity and allows for stability of local and regional populations.

Affected Environment
The floodwaters from Hurricane Katrina damaged or destroyed between 60 and 80 percent of the housing in the study area (Photograph 5-3). In nearby St. Bernard Parish, 100 percent of all residences were either damaged or destroyed (GNO Community Data Center 2008). The total number of housing units in the study area is estimated to be 21,556 in 2008, down slightly from 22,470 in 2000. However, the vacancy rate in 2008 is estimated at 62.5 percent compared to 16.3 percent in 2000. During this same period of time, the vacancy rate in Orleans Parish increased from 12.5 percent to 42.6 percent and increased statewide from 10.3 percent to 16.0 percent (ESRI 2008).

Photograph 5-3. Damaged houses in the study area.

The number of occupied housing units in the study area decreased from 18,804 in 2000 to 8,076 in 2008, a decrease of over 57 percent. Most of this large decline can be attributed to the magnitude of damage caused by Hurricane Katrina. Of the 8,076 occupied housing units in 2008, 43.5 percent are owner-occupied and 56.5 percent are renter-occupied (ESRI 2008).

Plan 1. No-build/Deauthorization
The total number of houses in the study area is projected to decline to 11,756 by 2013, but the vacancy rate is projected to be 15 percent in 2013. Many of the housing characteristics, especially the high vacancy rate, are an effect of the tremendous damage caused by Katrina. The predicted decrease in the total number of housing units from 2008 to 2013 is because of the large number of significantly damaged homes that will be removed from the area. At the same time the total number of units is decreasing, the number of vacant units is also decreasing significantly because of more people returning. The future of the housing inventory is very volatile. While the number of occupied

housing is projected to increase by 23.9 percent to 10,006 in 2013, the percentage of owner-occupied and renter-occupied units would remain fairly constant (ESRI 2008). Uncertainty about the rate of recovery from the aftermath of Hurricane Katrina is one of the main factors affecting the future level of housing inventory and occupied housing. The level of housing reflects broad trends in parameters, such as migration, employment, income, and more specific perceptions such as confidence on the improved hurricane and storm damage risk reduction system.

Plan 2. 1997 EIS Plan
Implementation of this alternative is not expected to have any significant impact on the housing in the area, as it will require no acquisition of residential property, nor will it result in the damage to residential structures. However, as stated in the section on population, traffic congestion because of rerouting and increased noise levels, may have a slight negative effect on rental housing by inducing highly mobile residents to move elsewhere.

Plan 3a. Cast-in-place Plan
The impacts on housing would be the same as described in Plan 2.

Landfill Disposal Option
The choice of dredged material disposal options (*i.e.*, CDF vs. landfill disposal) would have no impact on housing.

Plan 3b. Float-in-place Plan (Recommended Plan)
The impacts on housing would be the same as described in Plan 2.

5.3.14. Community Cohesion

Community cohesion is essentially the unifying force of conditions that provide commonality within a group. These characteristics may include such things as race, education, income, ethnicity, religion, language, and mutual economic and social benefits.

Affected Environment
Community cohesion has been described as the force that bonds people together long enough to establish meaningful interactions, common institutions, and agreed ways of behavior. It is a dynamic process, changing as the physical and human environment changes. Conditions brought about by water resources development can impact community cohesion through changing a right-of-way that can divide a community, cause the dislocations of a significant number of residents, or require the relocation of an important local institution, such as a church or community center. The basic objectives of water resources development have been to provide additional security through hurricane and storm damage risk reduction, improved navigation, environmental restoration, and recreation through civil works, as needed by the local, region, and Nation.

The neighborhoods surrounding the IHNC were well-established with many active residents that participated in restoration of abandoned properties, community development associations and school and church groups. However, many residents and businesses adjacent to the project area were destroyed by Hurricane Katrina, reducing the potential for community cohesion. Furthermore, the Lower Ninth Ward neighborhood was almost entirely destroyed by Hurricane Katrina. Currently a number of Federal, state, and local organizations, businesses, school, religious and other non-profit organizations, and other institutions have participated in the recovery of New Orleans

following Hurricane Katrina, a reflection of social bond, community cohesion, and National support.

The IHNC has had a dividing effect on the adjacent communities, many of which were developed prior to the construction of the IHNC, not only because of its direct physical presence as a barrier between neighborhoods, but also due to the only crossings being movable bridges, which make bicycle and pedestrian movement more difficult and cause vehicle traffic delays, which back-up into residential neighborhoods.

Plan 1. No-build/Deauthorization
No change in community cohesion would be expected in the absence of Federal action. It is anticipated that the individuals that made up the fabric of the community prior to Hurricane Katrina would slowly return to redevelop the neighborhoods as flood risk is reduced and community services improve in the future.

Plan 2. 1997 EIS Plan
The impacts on community cohesion were described in the 1997 EIS and are incorporated herein by reference. Since Hurricane Katrina, the neighborhoods adjacent to the IHNC have been struggling to rebuild. Recovery efforts within the Bywater Community have been more successful because a smaller portion of the properties were flooded than adjacent neighborhoods. Recovery efforts in the Lower Ninth Ward and Holy Cross neighborhoods have been substantially slower because of the greater damage from flood waters. It is anticipated that implementation of 1997 EIS, with the short-term closure of the North Claiborne Avenue Bridge, the increased noise and construction traffic, and the long-term delays associated with more bridge openings to accommodate a greater level in marine traffic, would cause further deterioration of community cohesion (such as walking in the area, visiting with neighbors, and shopping activities) between the struggling neighborhoods located east of the IHNC and those recovering more quickly on the west side of the IHNC.

Plan 3a. Cast-in-place Plan
It is anticipated that impacts on community cohesion for Plan 3a would be similar to those described for Plan 2.

Landfill Disposal Option
The choice of dredged material disposal options (*i.e.*, CDF vs. landfill disposal) would have no impact on community cohesion.

Plan 3b. Float-in-place Plan (Recommended Plan)
It is anticipated that impacts on community cohesion for Plan 3b would be similar to those described for Plan 2.

5.3.15. Noise
This resource is institutionally significant because of the Noise Control Act of 1972. Compliance with surface carrier noise emissions is technically significant. Exposure of persons to or generation of, noise levels in excess of applicable standards is publicly significant due to health reasons and annoyance.

Affected Environment
Noise is generally described as unwanted sound, which can be based either on objective effects (*i.e.*, hearing loss, damage to structures, *etc*.) or subjective judgments (*e.g.*, community annoyance). Sound is usually represented on a logarithmic scale with a unit called the decibel (dB). Sound on the decibel scale is referred to as sound level. The threshold of human hearing is approximately 0 dB, and the threshold of discomfort or

pain is around 120 dB. Sound levels are typically expressed as A-weighted db (dBA), which describes the relative loudness of sounds as perceived by the human ear.

Noise levels occurring at night generally produce a greater annoyance than do the same levels occurring during the day. It is generally agreed that people perceive intrusive noise at night as being 10 dBA louder than the same level of noise during the day. This perception is largely because background environmental sound levels at night in most areas are also about 10 dBA lower than those during the day.

Acceptable noise levels have been established by the U.S. Department of Housing and Urban Development (HUD) for construction activities in residential areas (HUD 1984):

- Acceptable (not exceeding 65 dBA) – The noise exposure may be of some concern, but common building construction will make the indoor environment acceptable and the outdoor environment will be reasonably pleasant for recreation and play.
- Normally Unacceptable (above 65 dBA but not greater than 75 dBA) – The noise exposure is significantly more severe; barriers may be necessary between the site and prominent noise sources to make the outdoor environment acceptable; special building constructions may be necessary to ensure that people indoors are sufficiently protected from outdoor noise.
- Unacceptable (greater than 75 dBA) – The noise exposure at the site is so severe that the construction costs to make the indoor noise environment acceptable may be prohibitive and the outdoor environment would still be unacceptable.

Noise levels surrounding the project corridor are variable depending on the time of day and climatic conditions. Background readings were taken within the existing floodwall and outside the floodwall prior to Hurricane Katrina, in the adjacent neighborhood (CEMVN 2000). Average background readings before 12 pm varied from 50 to 67 dBA with peak readings varying from 70 to 90 dBA. After 12 pm, average background readings varied from 50 to 75 dBA with peak readings varying from 64 to 99 dBA. Train traffic and to a lesser extent, air traffic contribute to the background noise levels.

Two spot noise measurements were performed by Wyle Laboratories during a 13 March 2008 site visit to assess the existing noise levels. A Larson-Davis Model 831 Sound Level Meter/Analyzer was used for the measurements. The average A-weighted sound level was measured for the duration of 20 or 40 seconds at the locations when no traffic was present on the nearby streets. The general ambient noise levels at Sister Street and Dauphine Street in the Holy Cross neighborhood were 48.1 dBA and the ambient noise levels at the top of the IHNC levee near the St. Claude Avenue Bridge were 52.9 dBA (Appendix K).

The project area's exposure to aircraft noise was evaluated for civil and military airports within 15 miles of the site. These included Naval Air Station (NAS) Joint Reserve Base (JRB) New Orleans (located approximately 10 miles southeast in Belle Chasse), New Orleans Lakefront Airport (located 4 miles north), and Louis Armstrong New Orleans International Airport (located 14 miles west in Kenner). Two other small airfields, namely Southern Seaplane (located 7.5 miles south) and Braithwaite Park (located 10 miles south) conduct only infrequent small aircraft operations, are located far from the site, and provide no significant noise impact or noise level data; consequently these airfields were not considered in the study.

Noise contours for NAS JRB New Orleans were obtained from the New Orleans Air Reserve Station (2008) published on the web site, and it was concluded from these data that the aircraft operations at NAS JRB New Orleans provide no substantial noise impact for the project area. Noise contours for New Orleans Lakefront Airport were obtained for the airport conditions in 1993 and activity forecast for 2015 from the Master Plan Update EIS for the airport (New Orleans Air Reserve Station 2008). Based on these data, it was determined that the aircraft operations at Lakefront Airport also provide no substantial noise impact for the project area.

No noise contours were available for the Louis Armstrong New Orleans International Airport. However, due to the airport runway layout and based on reported aircraft operations, whenever possible, arrivals and departures occur to the west of the airport rather than to the east and over the city. Taking into account the distance from the airport and flight patterns, it is not expected that the day-night average sound level (DNL) 65 contours would extend to the project area.

Two railroad lines are located near the IHNC. The New Orleans Public Belt Railroad runs parallel to the west bank of the IHNC. The Norfolk-Southern Railroad runs perpendicular to the IHNC at the north opening along Florida Avenue. An existing rail yard is located on the west bank of the IHNC next to the proposed lock location. Existing railway traffic data were collected and are listed in Table 5-11.

Table 5-11. Daily Railway Traffic Data

Railroad	Public Belt	Public Belt	Norfolk Southern
Direction	West	East	West
Locomotives	1 to 3	1	1
Daytime Trips	14	2	2
Nighttime Trips	4	2	1
Freight cars/train	57	57	40
Track	Welded	Welded	Welded
Speed (mph)	10	10	10
Whistle Stop	At crossings, bridge, Florida Ave	At crossings	At crossings, bridge, Florida Avenue
Power	Diesel	Diesel	Diesel
Grade	None	None	None

Currently, roadway traffic is the most prominent noise source in the neighborhoods surrounding the IHNC, especially at the three roadways that cross the IHNC. Average daily traffic (ADT) volumes and vehicle distributions were obtained from the April 2008 traffic study commissioned by Regional Planning Commission (Appendix J). As shown in Figure 5-5, the 65 DNL contour due to traffic intersects the first city block on either side of Florida Avenue, North Claiborne Avenue, St. Claude Avenue, France Road, Poland Avenue, and Chartres Street. Vehicle traffic crossing the North Claiborne Avenue Bridge is a substantial noise contributor due to the traffic volume, particularly trucks, height of the bridge and open metal grid road deck. Figure 5-5 also includes noise emissions from daily railroad traffic on local railway tracks.

There are numerous sensitive receptors in neighborhoods on both sides of the IHNC. However, since Hurricane Katrina there are substantially fewer occupied homes, schools and churches. Therefore, there are fewer nearby sensitive receptors than prior to Hurricane Katrina.

Figure 5-5: Existing Conditions - No Action - DNL Noise Contours

Plan 1. No-build/Deauthorization

No substantial change in noise levels would occur under the no-build alternative. The background frequency was described to have the following range: average background readings before 12 pm varied from 50 to 67 dBA with peak readings varying from 70 to 90 dBA; after 12 pm, average background readings varied from 50 to 75 dBA with peak readings varying from 64 to 99 dBA (CEMVN 2000). It is anticipated that residents and business would continue to return to the project area and rebuild infrastructure. Construction noise in neighborhoods would increase during rebuilding activities. The number of sensitive receptors in the project area would increase as more homes become occupied and churches and schools reopened.

Plan 2. 1997 EIS Plan

The impacts on the noise environment were described in the 1997 EIS and are incorporated herein by reference. In summary, noise from pile driving and other construction activities were areas of concern in the 1997 EIS. The project corridor is located in an urban area. CEMVN recommended that a pile driving noise and vibration analysis be performed. Eustis Engineering Company, Inc prepared the *U.S. Army Corps of Engineers, Noise and Vibration Monitoring in the Adjacent Neighborhood of the Inner Harbor Navigation Canal Lock Replacement, Pile and Test and Installation Study, New Orleans, Louisiana, Contract No. DACW29-98-D-0003, Task Order No. 37, Dated 26 July 2000* for CEMVN (Volume 1 and Appendices A, B (2) and C), which is incorporated herein by reference.

The Eustis Noise Monitoring Report (CEMVN 2000) included pile load tests and noise and vibration monitoring in the vicinity of the project site and adjacent neighborhoods. Observations were made during different construction activities. The report indicated 65 dBA and 90 dBA noise contours for the following four categories: non-pile driving activities (general construction), pile driving activities with a vibratory hammer, pile driving activities with an air impact hammer and pile driving activities with a hydraulic hammer (underwater). In summary, the report indicated that neighborhoods immediately adjacent to the project corridor may experience pile driving noise emissions greater than 65 dBA (Normally Unacceptable) but would not be subjected to noise emissions greater than 90 dBA (Unacceptable).

Pile driving activities would not expose adjacent neighborhoods to harmful vibrations (CEMVN 2000). Vibration monitoring recorded low range vibrations with average frequencies varied between 15 and 30 Hertz (Hz). These frequencies are within a range of natural frequency associated with residential construction. With measurements taken at the construction easement and beyond, peak particle velocities experienced during all construction activities, including hydraulic hammer, air hammer, and vibratory hammer operations, were minimal. The average maximum peak particle readings were approximately 0.1 inches per second, with maximum readings of 0.15 inches per second.

Background peak particle velocities were of equal or greater magnitude as peak particle velocities experienced during all pile driving operations, Based on these results, the pile driving activities for the main lock structure should not adversely impact any structure outside the floodwall.

Home occupancy decreased dramatically in the project area after Hurricane Katrina. Population levels in the study area would be expected to continue to recover; however, recovery in some nearby neighborhoods has been slow. Therefore, these neighborhoods are a mix of vacant lots, damaged and gutted houses, recently renovated homes and homes in the process of being constructed or renovated. Consequently, there are fewer

sensitive receptors adjacent to the project corridor that would be impacted by noise emissions from construction activities.

Plan 3a. Cast-in-place Plan

This noise assessment addresses noise and vibration emissions from pile driving operations and other construction activities, as well as railway traffic and vehicular traffic, including traffic that will be detoured through adjacent neighborhoods. Several construction scenarios were modeled, including IHNC construction and detours, and future conditions upon completion of the project. Results, in terms of the DNL were compared with HUD criteria for land-use compatibility. Results from prior vibration measurements of general construction activities and pile driving operations were analyzed and compared to acceptable standards on human-response to vibration (Appendix K).

Construction

Construction equipment used during the lock replacement would include vibratory and impact hammer pile drivers, dredging pumps, dump trucks, cement mixers, and batch plant operations. A batch plant is a temporary or portable cement production facility, typically consisting of cement mixing equipment and several silos for the cement ingredients. The construction of the new lock and removal of the existing lock is expected to last over 10 years.

Pile Driving

Piles would be driven in several locations throughout the construction area. The piles would form part of the protective cells, guide wall, lock foundation, and coffer dam for the cast-in-place lock. According to the proposed construction timeline, pile driving operations would occur for most of the project duration. Pile driving is the loudest construction noise emission.

Vibratory and impact hammer pile drivers would be used in the construction of the replacement lock. It is typical for vibratory hammers to start the pile and drive it to a specified depth, and then an impact hammer drives the pile to the final depth. For this analysis it was assumed that the vibratory and impact hammers would be used in this manner. It was assumed that two such systems would be in operation simultaneously on the construction site.

Vibratory hammers were treated as a continuous noise source, while impact hammers are an impulsive noise source. The value is 101 dB at 50 feet and is equivalent for both pile driver types (CEMVN 2000). The strike of an impact hammer is impulsive in nature. Therefore it was modeled as a broadband noise source. It was assumed that the vibratory hammer would be in operation 20 percent for every hour during the working day. The impact hammer was assumed to operate at a rate of 900 blows or impulses per hour during the working day. This is a typical rate equivalent to one blow every 4 seconds (Bolt, Beranek and Newman 1977) and supported by CEMVN measurement results during pile driving tests at the proposed replacement lock site (CEMVN 2000).

Dredging Operations

It was assumed that dredging operations would consist of a diesel engine supplying power to the dredging pump located approximately 3 feet above water level on a barge. The diesel engine would be the dominant noise contributor. A barge would move the dredge pump throughout each of the DMMUs over the duration of the dredging process.

The choice of dredged material disposal options (*i.e*., CDF vs. landfill disposal) would have no impact on noise from dredging operations, since dredging would occur regardless of the method of disposal.

Cement Batch Plant
A cement batch plant would be constructed for concrete production at the lock replacement site. According to the USACE Noise and Vibrations Monitoring report (CEMVN 2000), cement truck traffic would travel along an access road on the east bank of the IHNC between Florida Avenue and the general construction site. Typical cement mixing operations have a sound power level of 110 dB at the 500 Hz octave band frequency.

Vehicular Traffic
While the North Claiborne Avenue Bridge would be closed to raise the lift towers, road traffic would be detoured primarily to Florida Avenue. This detour would substantially alter traffic patterns and volumes, because North Claiborne Avenue currently has the highest traffic capacity and Florida Avenue has the lowest for roadways crossing the IHNC. A temporary single-bascule bridge would be constructed adjacent to the existing St. Claude Avenue Bridge and traffic would be diverted to the temporary bridge while the existing bridge is demolished and replaced with a low-level double-bascule bridge. Traffic flow is not expected to be significantly altered due to the immediate proximity of the temporary bridge during the replacement of the St. Claude Avenue Bridge.

ADT volumes and vehicle distributions were obtained from the April 2008 traffic study commissioned by the Regional Planning Commission (Appendix J). This included the three roads which cross the IHNC and select north-south arterial roads, such as Caffin Avenue, Forstall Street, and France Road. No roadway traffic data were included in the traffic study for residential roads. It was assumed that traffic on these roads is minimal and not a significant noise contributor.

Minor Noise Sources
Minor noise sources were considered negligible and omitted from the analysis (Appendix K). Meteorological effects due to wind or extreme temperatures were not considered in this analysis. Demolition was assumed to be short in duration, such that it does not influence the DNL contours over the total duration of the project. Barge movements and tug boat operations were assumed to be negligible noise contributors.

Noise Emission Model
The SoundPLAN noise prediction software (Braunstien *et al.* 2004) was used to model construction and traffic noise impacts (Appendix K). All noise sources (*i.e.*, roadway traffic, railway traffic and construction activities) detailed above were incorporated in the SoundPLAN model for the entire IHNC Lock construction area. The construction area included all land for 3,000 feet on either side of the IHNC. This would be the area between Caffin Avenue (east of the IHNC) and Independence Street (west of the IHNC). SoundPLAN utilizes a ray-tracing algorithm to calculate the overall DNL from all noise sources at grid points over the entire project site. A grid noise map was generated for 82 feet grid spacing.

Noise Modeling Results
Construction and dredging noise sources in the IHNC Lock construction area were incorporated in the noise model. The DNL 65 dB contour is substantially increased due to construction activities (Figure 5-6). To the east of the IHNC, the DNL 65 dB contour extends as far as Forstall Street north of North Claiborne Avenue and Jourdan Avenue between North Claiborne Avenue and North Villere Street. To the west of the IHNC, the

Figure 5-6: DNL Noise Contours Due to IHNC Construction and Existing Traffic

residential areas are mostly shielded by industrial buildings and the resulting noise levels are no greater than the No-build Plan, except for the two city blocks of Poland Avenue north of North Claiborne Avenue. Residential areas between Tennessee Street, Jourdan Avenue, North Prieur Street and North Miro Street are within the DNL 75 dB contour (Appendix K). According to HUD, these levels are unacceptable and severe to both indoor and outdoor activities.

The North Claiborne Avenue Bridge is currently planned to be replaced in 2014, and during that time, vehicle traffic would detour from North Claiborne Avenue to Florida Avenue, increasing the vehicle traffic on Florida Avenue. The DNL noise contour map for the North Claiborne Avenue detour (2014 traffic) with continuing construction of the IHNC Lock is shown in Figure 5-7. The DNL 65 dB contour expands predominately along Florida Avenue encompassing nearly an entire city block to the south. As expected, noise levels decrease in the proximity of the North Claiborne Avenue Bridge and along North Claiborne Avenue east of the IHNC (Appendix K).

Table 5-12 contains an estimate of the number of sensitive noise receptors located within the DNL 65 dB and 75 dB noise contours from the combined noise of the traffic detour resulting from the closure of the North Claiborne Avenue Bridge and IHNC Lock construction (*i.e.*, pile driving, cement batch plant, miscellaneous construction equipment and dredging operations).

Table 5-12. Number of Sensitive Noise Receptors within the 65 and 75 DNL Noise Contours

Type of Noise Receptor	Greater than DNL 75 dB (number of receptors)	Greater than DNL 65 dB (number of receptors)
Single family homes	120	423
Multiple living units	1	6
Churches	2	7
Schools	1	3
Parks	1	2

Source: Wyle 2008 (see Appendix K)

The noise exposure count includes structures that are currently standing in 2008. Empty lots were not counted as sensitive noise receptors. Most of the residential homes exposed to noise emissions greater than 75 dB DNL occurred along St. Claude Avenue, where a portion of the vehicular traffic would travel during the closure of the North Claiborne Avenue Bridge. Other areas exposed to noise emissions greater than 75 dB DNL are located on the east side of the lock construction area. The pile driving activities are the source of the high emissions in the residential neighborhoods on the east side of the IHNC.

After the North Claiborne Avenue Bridge replacement, the detour would be removed and construction would begin on the temporary bridge along St. Claude Avenue. Piles would be driven for the temporary bridge. The DNL noise contour map for post North Claiborne Avenue Bridge replacement (traffic in year 2014) and pile driving for temporary bridge along St. Claude Avenue is shown in Figure 5-8. Upon completion of the North Claiborne Avenue Bridge construction, the DNL 65 dB contour recedes along Florida Avenue. The additional pile driving for the temporary bridge at St. Claude Avenue would cause the DNL 65 dB contour to expand to Jordan Avenue between North Claiborne Avenue and North Rampart Street (Appendix K).

Figure 5-7: DNL Noise Contours Due to IHNC Construction and North Claiborne Avenue Closure and Traffic Detour

Figure 5-8: DNL Noise Contours Due to IHNC Construction, Installation of Temporary Bridge at St. Claude Avenue, and 2014 Traffic Post North Claiborne Avenue Bridge Replacement

DNL levels would exceed HUD allowable levels (DNL 65 dB) in several residential areas due to construction of the IHNC lock and related traffic detours. In particular, residential areas to the east of the IHNC (Lower Ninth Ward) would be most impacted by construction noise during the lock replacement. Most of the residential homes exposed to noise emissions greater than DNL 65 db and 75 db occur along St. Claude Avenue where vehicular traffic would travel during the closure of the North Claiborne Avenue Bridge and construction of the St. Claude Avenue temporary and permanent bridge would occur. According to HUD, DNL above 65 dB is considered normally unacceptable and DNL above 75 dB is considered unacceptable for residential areas.

A number of noise mitigation controls would be implemented to reduce construction-related noise impacts. These include placing temporary noise barriers adjacent to construction activities, routing of construction-related traffic to avoid residential areas, using staging areas located away from heavily populated zones, monitoring of noise levels to verify adherence to contract specifications, limiting pile driving activities to daylight hours and compensating residents located within the 75 dB DNL contour if they chose to temporarily relocate during construction activities. Because traffic detours would be temporary (approximately 28 days), no noise mitigation measures for vehicular traffic impacts are proposed.

Vibration Impacts from Pile Driving
Vibration impacts from construction activities and pile driving operations were assessed in the vicinity of the construction site based on the vibration measurement data collected by CEMVN (CEMVN 2000, 2002). These limited vibration monitoring data were collected for the background conditions (no construction activities), general construction with no pile driving activities, and pile driving activities with an impact hammer (hydraulic or air hammer) or vibratory hammer. The vibration measurements were conducted at various distances from 100 to 1,000 feet from the center of job site (between flood walls of the canal).

It is estimated that the lower range of vibrations in the surrounding communities would be within the acceptable vibration value and would not be perceptible by people. However, the upper range of vibrations generated by the construction activities and pile driving are expected to exceed the acceptable level, would be perceptible to people and may generate adverse public reactions. The measured vibration levels were also compared to the threshold of structural damage to buildings. The proposed construction activities or pile driving would not adversely impact any structure or building in the vicinity of the construction site outside the floodwalls (Appendix K).

Plan 3b. Float-in-place Plan
The total duration of pile driving operations for Float-in-place Plan would be approximately 9 months shorter than for Cast-in-place Plan (USACE 2007); however, the noise contours would remain approximately the same for an average day during either cast-in-place or float-in-place construction (Appendix K). Therefore, impacts on the noise environment from construction activities and traffic detours would be similar as described for Plan 3a.

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

Affected Environment

Orleans Parish is classified as in attainment for all of the NAAQS (U.S. Environmental Protection Agency [EPA] 2008). NAAQS represent the maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect the public health and welfare. The NAAQS are included in Table 5-13. Areas that do not meet these standards are called non-attainment areas; areas that meet both primary and secondary standards are known as attainment areas.

Table 5-13. National Ambient Air Quality Standards

POLLUTANT	STANDARD VALUE	STANDARD TYPE
Carbon Monoxide (CO)		
8-hour average	9ppm (10mg/m^3)*	P
1-hour average	35ppm (40mg/m^3)*	P
Nitrogen Dioxide (NO_2)		
Annual arithmetic mean	0.053ppm (100µ/m^3)*	P and S
Ozone (O_3)		
8-hour average*	0.08ppm (157µg/m^3)*	P and S
1-hour average*	0.12ppm (235µg/m^3)*	P and S
Lead (Pb)		
Quarterly average	1.5µg/m^3	P and S
Particulate<10 micrometers (PM-10)		
Annual arithmetic mean	50µg/m^3	P and S
24-hour average	150µg/m^3	P and S
Particulate<2.5 micrometers (PM-2.5)		
Annual arithmetic mean	15µg/m^3	P and S
24-hour average	65µg/m^3	P and S
Sulfur Dioxide (SO_2)		
Annual average mean	0.03ppm (80µg/m^3)*	P
24-hour average	0.14ppm (365µg/m^3)*	P
3-hour average	0.50ppm (1300µg/m^3)*	S

P= Primary;
S= Secondary;
ppm = parts per million;
mg/m^3 = milligrams per cubic meter of air;
µg/m^3 = micrograms per cubic meter of air;
* Parenthetical value is an approximate equivalent concentration
Source: EPA 2008.

The Federal Conformity Final Rule (40 CFR Parts 51 and 93) specifies criteria or requirements for conformity determinations for Federal projects. The Federal Conformity Rule was first promulgated in 1993 by the EPA, following the passage of Amendments to the Clean Air Act in 1990. The rule mandates that a conformity analysis must be performed when a Federal action generates air pollutants in a region that has been designated a non-attainment or maintenance area for one or more NAAQS.

A conformity analysis is the process used to determine whether a Federal action meets the requirements of general conformity rule. It requires the responsible Federal agency to evaluate the nature of the proposed action and associated air pollutant emissions, calculate emissions as a result of the proposed action, and mitigate emissions if *de minimis* thresholds are exceeded.

The IHNC Lock project is located in Orleans Parish, which is in attainment for all NAAQS (EPA 2008). Therefore, the air emissions generated by the proposed project would not trigger a conformity determination even if they exceed *de minimis* levels (100 tons per year). However, due to the long time frame involved in the construction (10 to 12 years), the conformity status in Orleans Parish may change. Therefore, an air emissions analysis is presented for a worst case scenario and an average construction year.

Plan 1. No-build/Deauthorization

Under the no-build alternative, it is anticipated that the project area would continue to be in attainment for all ambient air quality standards. Traffic flow patterns are anticipated to remain similar to existing conditions, resulting in similar emissions from motor vehicles in the project area.

Plan 2. 1997 EIS Plan

Impacts on air quality from Plan 2 were described in the 1997 EIS and are incorporated herein by reference. There would be one year (2019) where air emissions from the project would exceed *de minimis* thresholds. The backfilling of the lock would require numerous transport vehicles to haul in fill materials. Backfilling the lock is scheduled to take place in 2019. However, calculations of air emissions from an average year demonstrate that in most years, air emissions from the project would be below *de minimis* thresholds. Secondly, the closure of the North Claiborne Avenue Bridge contributes to air emissions in year 2014. Air emissions are anticipated to increase as the result of traffic detours and delays during the 28-day closure of the North Claiborne Avenue Bridge.

Construction Activities

Temporary increases in air pollution would occur from the use of construction equipment (combustible emissions). Combustible emission calculations were made for standard construction equipment, such as bulldozers, tug boats, excavators, dredgers, pumps, front end loaders, backhoes, cranes, and dump trucks, using emission factors from EPA-approved emission model NONROAD6.2. Analyses were made for the type of equipment, duration of the total number of days each piece of equipment would be used, and the number of hours per day each type of equipment would be used, based on the 2007 IHNC report prepared by Project Time and Cost Inc. 2007, included in Appendix L.

Construction workers would temporarily increase the combustible emissions in the air shed during their commute to and from the project area. Delivery trucks transporting supplies to the project area would contribute to combustible emissions. MOBILE6.2 model was utilized to determine air emissions resulting from the personal motor vehicles commuting to work and delivery trucks transporting supplies to the jobsite (EPA 2005a and EPA 2005b).

Fugitive dust can arise from the mechanical disturbance of surface soils and the manufacture of cement. Particulate matter (PM-10 and PM-2.5) emissions were calculated using emission factors recommended in EPA's National Emission Inventory (EPA 2001) which were the result of field studies conducted by Midwest Research Institute (1996).

The construction of the lock would require over a 200,000 cy of cement and a cement batch plant would be required to supply the concrete, which produces fugitive dust emissions during operation. In order to estimate emissions from the batch plant, AP 42 (EPA 2001) emission factors were utilized to calculate annual emissions.

Construction Air Emission Analysis

The life of the construction project is predicted to last approximately 10 to 12 years. Some tasks, such as backfilling the channel around the new lock in year 2019, would require over 30 dump trucks per day to complete the task. Several front end loaders and bull dozers would be required to distribute, level and compact fill material. Air emissions during 2019 would be substantially greater than other years, and it is therefore considered as a "worst case scenario". The results of this analysis are presented in Table 5-14. Analyses were also conducted for an average construction year; these results are presented in Table 5-15.

Table 5-14. Worst Case Air Emissions (in tons per year) from Construction Activities in Year 2019 vs. *de minimis* Levels

Emission source	VOC	CO	NOx	PM-10	PM-2.5	SO_2
Construction Equipment Combustible Emissions	14.19	62.51	173.03	12.58	12.25	23.23
Construction Site-fugitive PM-10	NA	NA	NA	13.75	2.75	NA
Construction Workers Commuting & Trucking	0.76	6.98	1.63	0.03	0.03	NA
Cement Batch Plant	NA	NA	NA	5.94	NA	NA
Total emissions	***14.95***	***69.49***	***174.66***	***32.30***	***15.03***	***23.23***
De minimis threshold*	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

Source: Time and Cost, Inc. 2007 and several air emission factors models were utilized to determine results. Data and sources are presented in Appendix L.
*Not applicable because Orleans Parish is currently in attainment for all NAAQS.

Table 5-15. Average Year Air Emissions (in tons per year) from Construction Activities Average Year vs. *de minimis* Levels

Emission source	VOC	CO	NOx	PM-10	PM-2.5	SO_2
Construction Equipment Combustible Emissions	6.37	25.20	80.08	5.60	5.44	10.55
Construction Site-fugitive PM-10	NA	NA	NA	13.75	2.75	NA
Construction Workers Commuting and Trucking	0.73	6.83	1.07	0.02	0.02	NA
Cement Batch Plant	NA	NA	NA	5.94	NA	NA
Total emissions	***7.49***	***34.03***	***81.15***	***25.31***	***8.20***	***10.55***
De minimis threshold*	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

Source: Time and Cost, Inc. 2007 and several air emission factors models were utilized to determine results. Data and sources are presented in Appendix L.
*Not applicable because Orleans Parish is currently in attainment for all NAAQS.

Several sources contribute to the air emissions analysis of the construction project. The air emission quantities presented in Tables 5-14 and 5-15 include emissions from:

- Combustible engines of construction equipment
- Vehicle emissions from construction workers during commute to and from work
- Vehicle emissions form supply trucks delivering materials for construction
- Fugitive dust emissions from job site ground disturbances
- Emissions from the pumps transporting slurry to containment areas
- Emissions from tug boat and barge
- Emissions from cement batch factory

The annual air emissions for construction activities would exceed *de minimis* thresholds for NO_x in year 2019 (worst case scenario). The dump trucks contribute the greatest portion of air pollutants when backfilling the bypass channel. The assumptions, emission factors, and resulting calculations are presented in Appendix L.

Traffic Delays and Detours
The North Claiborne Avenue Bridge closure and traffic detour is the second greatest contributor to air emissions. This event occurs in 2014 and, when combined with construction activities that year, the total annual emissions would exceed *de minimis* thresholds for nitrogen oxides (NOx) and carbon monoxide (CO). MOBILE6.2 model was utilized to determine air emissions resulting from the closure of the North Claiborne Avenue Bridge.

As mentioned earlier, the MOBILE6.2 model is an emission factor model which predicts gram per mile/minute emissions of volatile organic carbon (VOC), CO, NOx, carbon dioxide (CO_2), particulate matter (PM-10 & PM-2.5), and other toxics from cars, trucks, buses and motorcycles under various conditions.

The Regional Planning Commission Traffic Impact Study (2008) provides traffic delay time and detour miles resulting from the closure of the North Claiborne Avenue Bridge (Appendix J). The MOBILE6.2 traffic delay emission factors simulate the stop and go conditions found at stoplights, bridges and traffic delays. Model variables used National averages for the factors that affect emission rates. Average summertime weather conditions were used for the weather model inputs. These estimates are suitable for use in obtaining first-order approximations of idling emissions from vehicles in situations such as stoplights, toll gates and bridges, and other locations where vehicles are idling for relatively short periods of time (EPA 2005b and EPA 2005c). The MOBILE6.2 model emission factors were also used to measure the air emissions created during extra miles traveled by motor vehicles avoiding the North Claiborne Avenue Bridge closure (EPA 2005a, b and c).

The EPA model MOVES2004 was utilized to determine the fuel source of various types of vehicles on U.S. highways (*i.e.*, passenger cars, trucks, buses, *etc.*). In summary, privately owned vehicles are largely fueled by gasoline and the commercially operated vehicles use diesel. The school and public transit buses are largely fueled by diesel.

The composition of vehicles traveling on the North Claiborne Avenue Bridge (*i.e.* cars, trucks, buses) was determined by *in situ* observations conducted by the Regional Planning Commission Traffic Impact Study (Appendix J). The Regional Planning Commission assessed the total number of privately and commercially owned vehicles currently utilizing the North Claiborne Bridge in 2008.

Traffic Delay and Detour Air Emission Analysis
The following analysis addresses air emissions for construction from the year 2014, which is considered an "average construction year" and the year that the North Claiborne Avenue Bridge is closed for modifications (Table 5-16).

Table 5-16. Air Emissions (tons/year) from North Claiborne Closure (2014) Traffic Delay and Detour and Average Year Construction Activities vs. *de minimis* Levels

Emission source	VOC	CO	NOx	PM-10	PM-2.5	SO_2
Construction Equipment Combustible Emissions	6.76	27.20	80.08	5.60	5.44	10.55
Construction Site Fugitive PM-10	NA	NA	NA	13.75	2.75	NA
Construction Workers Commuting & Trucking	0.73	6.83	1.07	0.02	0.02	NA
Cement Batch Plant	NA	NA	NA	5.94	NA	NA
Traffic Detour	3.42	30.84	9.08	0.19	0.17	NA
Traffic Delays	0.07	1.40	0.11	0.00	0.00	NA
Total emissions	***10.61***	***64.94***	***86.28***	***25.21***	***8.09***	***10.08***
De minimis threshold*	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

Source: Regional Planning Commission 2008 and several air emission factors models were utilized to determine results. Data and sources are presented in Appendix L.

*Not applicable because Orleans Parish is currently in attainment for all NAAQS.

Model calculations predict that annual emissions for construction activities from an average construction year and from North Claiborne Avenue Bridge closure traffic delays to be below *de minimis* thresholds. Impacts from air emissions would only occur during construction, and due to the spatially limited activities of the construction project and traffic detour, the impacts on ambient air quality are expected to be short-term and minor.

Contractors would be instructed to conduct proper and routine maintenance of all vehicles and other equipment. These actions would ensure that emissions are within the design standards of all construction equipment. Dust suppression methods would be implemented to minimize fugitive dust emissions. Additionally, all construction equipment and vehicles would be required to be kept in good operating condition to minimize exhaust emissions. No significant impacts on air quality are expected to occur as a result of implementing the 1997 Plan. Furthermore, there would be no violations of air quality standards and no conflicts with the state implementation plan.

Plan 3a. Cast-in-place Plan

Impacts on air quality from construction activities and traffic delays would be similar to those described for Plan 2.

Landfill Disposal Option

The choice of dredged material disposal options (*i.e.*, CDF vs. landfill disposal) would have no substantial impact on air emissions. It is anticipated that similar emissions would occur from heavy equipment use during the construction of the CDF and active dewatering of dredged material as from hauling dredged material to a landfill. The lanfill(s) chosen would likely be in the Metropolitan New Orleans area; therefore, air emissions would not differ substantially based on the disposal method choice.

Plan 3b. Float-in-place Plan

Impacts on air quality from construction activities and traffic delays would be similar to those described for Plan 2.

5.3.17. Wooded Lands

These resources are institutionally significant because of the Fish and Wildlife Coordination Act of 1958, as amended. These resources are technically significant because of the habitat provided for both open and forest-dwelling wildlife, and the provision or potential for provision of forest products and human food products, and maintenance of water quality. These resources are publicly significant because of their present aesthetic, recreational and economic value or potential for future economic value.

Affected Environment

Wooded lands on the original 25-acre off-site construction area located on the north bank of the GIWW/MRGO were described in the 1997 EIS and are incorporated herein by reference. The area around the lock construction site is highly urbanized and no wooded lands occur in this area. However, at the proposed off-site construction area on the south bank of the GIWW/MRGO and the CDF, wooded lands are present, and the dominant plant species are Chinese tallow (*Sapium sebiferum*), elderberry (*Sambucus canadensis*), red maple (*Acer rubrum*), box elder (*Acer negundo*), roughleaf dogwood (*Cornus drummondii*) and black willow (*Salix nigra*). Much of these wooded lands were heavily damaged by Hurricane Katrina and woody vegetation was blown down by the winds and high water from the storm. Very little mature vegetation remains in these areas and much of the recruitment is Chinese tallow (Photograph 5-4).

Photograph 5-4. Wooded lands dominated by Chinese tallow at the proposed off-site construction area.

Mid-story and understory vegetation present within the proposed off-site construction area and CDF include elderberry, poison ivy (*Toxicodendron radicans*), blackberry (*Rubus* sp.), rattlebox (*Sesbania* sp.), yaupon (*Ilex vomitoria*), wax myrtle (*Morella cerifera*), groundseltree (*Baccharis halimifolia*), smartweed (*Polygonum punctatum*) and dog fennel (*Eupatorium capillifolium*).

The majority of the wooded areas in the proposed CDF are periodically flooded, primarily from rainfall. These areas are at an elevation that is high enough to restrict tidal flows, but are often saturated from rain events and close proximity to ground water. A portion of the proposed off-site construction area is located on the flood side of the GIWW/MRGO levee and is subject to tidal influence. Most of the time, the CDF and a small portion of the off-site construction area are not connected to nearby water bodies (*i.e.*, GIWW and Bayou Bienvenue) and are located within the HSDRRS; however, during major rain events and high tides, the area is hydraulically connected to exterior surface waters through eroded retention dikes. Most of the time, fish access is restricted.

Although much of the Lake Pontchartrain Basin provides habitat for a variety of important wildlife species, species occurring along the GIWW/MRGO are those most adapted to an urban environment. These include mammals such as nutria (*Myocaster coypus*), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), nine-banded armadillo (*Dasypus novemcinctus*), and swamp rabbit (*Sylvilagus aquaticus*), as well as wild boar (*Sus scrofa*) and white-tailed deer (*Odoccoileus virginianus*) which are commonly hunted on lands in the project area.

Common resident and migratory bird species include house sparrow (*Passer domesticus*), American robin (*Turdus migratorius*), red-shouldered hawk (*Buteo lineatus*), eastern screech-owl (*Otus asio*), red-headed woodpecker (*Melanerpes erythrocephalus*), European starling (*Sturnus vulgaris*), rock dove (*Columba livia*), cattle egret (*Bulbulcus ibis*), common grackle (*Quiscalus quiscula*), and American crow (*Corvus brachyrhynchos*). Reptiles and amphibians likely present in the CDF and off-site construction area locations include eastern box turtle (*Terrapene carolina*), green anole (*Anolis carolinensis*), five-lined skink (*Eumeces fasciatus*), rat snake (*Elaphe obsolete*), common kingsnake (*Lampropeltis getulus*), common garter snake (*Thamnophis sirtalis*), cottonmouth (*Agkistrodon piscivorus*), green treefrog (*Hyla cincerea*), marbled salamander (*Ambystoma ocapum*), eastern newt (*Notophthalmus viridescens*), and eastern narrow-mouthed toad (*Gastrophryne carolinensis*).

Plan 1. No-build/Deauthorization

No project-related impacts on wooded lands would occur from the no-build alternative. It is anticipated that, due to their relative isolation, there would be no impacts in the future on the wooded lands along the MRGO/GIWW where the proposed CDF and off-site construction area are located. Hunting activities for white-tailed deer and wild boar would continue on these lands in the future.

Plan 2. 1997 EIS Plan

The impacts on wooded lands were described in the 1997 EIS and are incorporated herein by reference. Wooded lands within a 25-acre off-site construction area would be permanently lost. Approximately 240 acres of a previously-used disposal area that is now wooded lands along the south bank of the MRGO/GIWW would be impacted for use as a CDF. Some impacts on less mobile and juvenile wildlife species would occur during the construction of the off-site construction area and CDF. However, adults of most species would disperse during construction activities and mortality would primarily be limited to eggs and larvae and less mobile reptiles and amphibians. Although these wooded lands represent relatively low quality habitat for wildlife, and these areas would revert back to wooded lands after dredged material placement was completed, mitigation for impacts on wooded lands is proposed. Timing of initial clearing and grubbing activities to avoid migratory bird nesting season, or alternatively conducting pre-construction surveys for nesting migratory birds for construction activities implemented during migratory bird nesting season (February 1 – August 31), would be considered. The discussion of mitigation for impacts on wooded lands is described in the coastal wetlands section (Section 5.3.18). During the use of the CDF, hunting activities would be restricted.

Plan 3a. Cast-in-place Plan

The impacts on wooded lands would be similar to those described for Plan 2, except there would be no impact to wooded lands at an off-site construction area, because the cast-in-place design would not require the construction of an off-site construction area. The footprint of the proposed CDF would be approximately 266 acres and would temporarily impact wooded lands. Impacts on wildlife would be similar to Plan 2. However, after the completion of the IHNC Lock and removal of material in the fill cell for use as backfill around the new lock, the entire CDF would be allowed to revegetate, and the 266 acres of wooded lands would be restored. Additionally, mitigation for loss of habitat function is further described in Section 5.3.18.

Landfill Disposal Option

The placement of dredged material unsuitable for open water disposal in a landfill would further reduce impacts on wooded lands. If the landfill disposal option was chosen and material was transported to a landfill without dredging, there would be short-term

impacts on 170 acres of wooded lands from the creation of a temporary storage fill cell in the CDF. Mitigation requirements for impacts on habitat, as described in Section 5.3.18, would also be substantially reduced.

Plan 3b. Float-in-place Plan (Recommended Plan)
For this plan, the off-site construction area is different in location and size compared to Plan 2. The final outcome is planned to be different as well, since the off-site construction area for Plan 2 would be permanently lost. The off-site construction area for this plan is proposed to be restored. The impacts on wooded lands at the CDF would be similar to those described for Plan 2. However, Plan 3b would temporarily impact 209 acres of wooded lands at the CDF and 38 acres of wooded lands at the off-site construction area. Impacts on wildlife would be similar to Plan 2. At the completion of construction, the CDF would be allowed to revegetate, and the off-site construction area would be backfilled and ambient elevations restored, allowing for similar habitat to re-establish in these areas. Mitigation for loss of habitat function is further described in Section 5.3.18.

Landfill Disposal Option
The placement of dredged material unsuitable for open water disposal in a landfill would further reduce impacts on wooded lands. If the landfill disposal option was chosen and material was transported to a landfill, there would be short-term impacts on 138 acres of wooded lands from the creation of a temporary storage fill cell in the CDF. Mitigation requirements for impacts on habitat, as described in Section 5.3.18, would also be substantially reduced.

5.3.18. Coastal Wetlands
This resource is institutionally significant because of the Clean Water Act of 1977, as amended; Executive Order 11990 of 1977, Protection of Wetlands; Coastal Zone Management Act of 1972, as amended; and the Estuary Protection Act of 1968. Wetlands are technically significant because they serve as ground water recharge areas; they provide storage areas for storm and flood waters; they serve as natural water filtration areas; they provide protection from wave action, erosion, and storm damage; and they provide various consumptive and non-consumptive recreational opportunities. Wetlands are publicly significant because of the high value the public places on the functions and values that wetlands provide.

Affected Environment
Coastal wetlands were described in the 1997 EIS and that affected environment description is incorporated herein by reference. Metropolitan New Orleans is located in the Mississippi River deltaic plain, and is surrounded by estuarine and coastal wetland habitats (Figure 5-9). Most of the coastal wetlands in the project area are located outside of the hurricane risk reduction system; however, some coastal wetlands in St. Bernard Parish and New Orleans East are within the flood risk reduction levees and receive tidal exchange through tidal gates, water control structures and pumps.

Bayou Sauvage NWR is one of the last remaining tracts of contiguous marsh located adjacent to Lake Pontchartrain. The NWR encompasses approximately 23,000 acres, consisting of a wide variety of habitat, including bottomland hardwoods, fresh and brackish water marshes, lagoons, canals, borrow pits, cheniers, and natural bayous. Most of the refuge is located within hurricane risk reduction levees built to protect New Orleans East from storm surges and flooding. A network of pumps and flapgated structures regulate water levels seasonally to encourage summer growth of emergent plants that, in turn, provide waterfowl food supplies in winter.

Figure 5-9: Coastal Wetlands and Aquatic Habitats

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A large tidal wetland complex is located along Bayous Bienvenue and Dupre in St. Bernard and Orleans parishes. Historically, these wetlands consisted of cypress (*Taxodium distichum*) swamp and freshwater and brackish marshes that have subsided and more recently received greater saltwater influence. Currently these wetlands are located on the protected side of the hurricane and storm damage risk reduction levee along the MRGO, but two gated structures, one at Bayou Bienvenue and one at Bayou Dupre, allow for tidal exchange in this wetland complex. Much of this area is now comprised of highly degraded salt marsh and open water with some areas containing dead cypress trees.

Photograph 5-5. Triangular-shaped wetland area located east of the IHNC and south of Bayou Bienvenue

The largest tract of coastal habitat in the immediate project vicinity is an approximately 440-acre triangular-shaped degraded swamp located within the HSDRRS east of the IHNC, north of Florida Avenue and south of Bayou Bienvenue. This area consists of former cypress swamp that has subsided and received increased saltwater influence (Photograph 5-5).

At this time, most of the area is comprised of shallow open water with tidal influence from Bayou Bienvenue and urban storm water runoff from a storm water pumping station located north of Florida Avenue in the Lower Ninth Ward. Numerous standing dead bald cypress trees are present within the area, and smooth cordgrass (*Spartina alterniflora*) is now the dominant plant species growing along the fringes of the triangular-shaped area (Photograph 5-6).

Photograph 5-6. Smooth cordgrass (*Spartina alterniflora*) located within the 440-acre triangular wetland area

The proposed off-site construction area and CDF were described under wooded lands; however, both of these sites are primarily wetland habitats and were historically part of the intertidal marsh and swamp system (Photograph 5-7). The dredging of the MRGO/GIWW, which was conducted in the 1950s and 1960s, substantially altered these wetlands. The off-site construction area and CDF were utilized for dredged material disposal, which raised the elevation of both sites. With the construction of a flood risk reduction levee along the MRGO/GIWW,

Photograph 5-7. Forested wetlands located at the proposed CDF

the CDF and a small portion of the off-site construction area were isolated from tidal influence.

These wetland habitats imbedded within the urban areas of New Orleans support wildlife species more tolerant of disturbance, including those that provide state income in the form of hunting license fees, such as white-tailed deer, American alligator (*Alligator mississippiensis*), and wood duck (*Aix sponsa*).

Plan 1. No-build/Deauthorization
Under the no-build alternative, there would be no disturbance of coastal wetlands from Federal action.

Plan 2. 1997 EIS Plan
Impacts on wetlands from construction of the CDF and off-site construction area were analyzed using WVA methodology (Appendix M). The WVA methodology is a quantitative habitat-based assessment tool developed for use in determining wetland benefits of proposed projects submitted for funding under the Coastal Wetlands Planning, Protection, and Restoration Act; however, the methodology is widely used to evaluate the impacts of coastal projects on wetland values. The results of the WVA, measured in average annual habitat units, provide an estimate of the positive or negative environmental effects of a potential project. Typically, for a CEMVN civil works project, the WVA analysis is applied to the habitats that will be impacted by the project, and if net negative impacts are determined, the WVA is applied to potential mitigation plans to develop appropriate compensatory mitigation.

The WVA has been developed for application to several habitat types along the Louisiana coast, and community models have been developed for fresh marsh, intermediate marsh, brackish marsh, salt marsh, fresh swamp, barrier islands, and barrier headlands. A WVA Procedural Manual has also been prepared to provide guidance to project planners in the use of the various community models (Environmental Working Group 2006). Two other habitat assessment models for bottomland hardwoods and coastal chenier/ridge habitat were developed for use outside of Coastal Wetlands Planning, Protection, and Restoration Act projects.

Habitat quality is estimated through the use of community models developed specifically for each habitat type. Each model consists of 1) a list of variables that are considered important in characterizing fish and wildlife habitat, 2) a Suitability Index graph for each variable, which defines the assumed relationship between habitat quality and different variable values, and 3) a mathematical formula that combines the Suitability Index for each variable into a single value for habitat quality; that single value is referred to as the Habitat Suitability Index.

A Suitability Index graph is a graphical representation of how fish and wildlife habitat quality or "suitability" of a given habitat type is predicted to change as values of the given variable change, and allows the model user to numerically describe, through the Suitability Index, the habitat quality of a wetland area for any variable value. Each Suitability Index ranges from 0.1 to 1.0, with 1.0 representing the optimal condition for the variable in question. Suitability Index graphs are constructed for each variable (Environmental Working Group 2006).

The final step in model development (Environmental Working Group 2006) is to construct a mathematical formula that combines all Suitability Indices into a single Habitat Suitability Index value. Because the Suitability Indices range from 0.1 to 1.0, the Habitat Suitability Index also ranges from 0.1 to 1.0, and is a numerical representation of

the overall or "composite" habitat quality of the particular wetland area being evaluated. The Habitat Suitability Index formula defines the aggregation of Suitability Indices in a manner unique to each wetland type depending on how the formula is constructed (Environmental Working Group 2006).

The net impacts of a proposed project are estimated by predicting future habitat conditions under two scenarios: future without-project and future with-project. Specifically, predictions are made as to how the model variables would change through time under the scenarios. Through that process, Habitat Suitability Indices are established for baseline (pre-project) conditions and for future without- and future with-project scenarios for selected target years throughout the expected life of the project. Those indices are then multiplied by the project area acreage at each target year to arrive at Habitat Units. Habitat Units represent a numerical combination of quality (*i.e.*, Habitat Suitability Index) and quantity (acres) existing at any given point in time. The Habitat Units resulting from the future without- and future with-project scenarios are annualized, averaged over the project life, to determine average annual habitat units. The impact of a project can be quantified by comparing average annual habitat units between the future without- and future with-project scenarios. The difference in average annual habitat units between the two scenarios represents the net impact attributable to the project in terms of habitat quantity and quality (Environmental Working Group 2006). The same type of analysis is applied to proposed mitigation plans to develop appropriate compensatory mitigation for unavoidable project impacts.

WVA analysis for the 240-acre CDF determined that there would be a loss of 33.37 average annual habitat units as a result of its construction. This includes the temporary impacts from the fill cell and the permanent impacts from the disposal cell. Additionally, WVA analysis for the temporary impacts of the off-site construction area determined that there would be a loss of 3.6 average annual habitat units. Therefore, a total of 36.97 average annual habitat units would be the net impact of this plan's implementation.

The loss of average annual habitat units would be mitigated by creating wetlands in the triangular area located south of Bayou Bienvenue and north of Florida Avenue by using excess dredged material from the lock construction. Material dredged during the construction of the IHNC Lock, which is in excess to the project's needs (*i.e.*, backfilling) and determined suitable for wetland restoration, would be beneficially used as mitigation for wetland impacts at the CDF and off-site construction area. To create wetlands, suitable material would be discharged into a confined area within the triangular-shaped mitigation site located south of Bayou Bienvenue and north of Florida Avenue. The amount of material suitable for beneficial use in Bayou Bienvenue would be adequate for the creation of between 85 and 100 acres of marsh. Thus, the volume of suitable and available material would be adequate to provide between 37 and 43 average annual habitat units of mitigation.

The goal of the mitigation would be to create emergent marsh in an area which now contains shallow brackish water. A conceptual mitigation and monitoring plan for marsh restoration at the triangular area has been prepared and is located in Appendix M. CEMVN will finalize the mitigation and monitoring plan through continued coordination with NOAA fisheries and provide copies of the final plan and future monitoring reports to the USFWS, NOAA Fisheries and LDWF. The site would be built adjacent to the perimeter of the large triangular area, just south of Bayou Bienvenue, so that the existing land would act as a corridor for animals and plants to colonize the mitigation site. The dredged material would be placed so that after settling, consolidation and initial subsidence, the elevation would be suitable for the colonization of tidal marsh plant species. One of several methods to achieve marsh creation would be used. Low-level

dikes constructed to contain the dredged material during placement could be constructed. The dikes would be breached at several locations after effluent discharge so that tidal exchange between the mitigation site and Bayou Bienvenue would occur. However, due to the condition of the foundation soils throughout the mitigation site, construction of some type of temporary structure, such as hay bales, may be used instead to minimize flow of solids away from the intended placement area. Unrestricted open water disposal at the mitigation site is yet another possibility for placement of material in the mitigation site. For all of the possible construction methods, it is anticipated that diluted effluent would ultimately discharge from the triangular area to Bayou Bienvenue (Appendix C).

It has been determined that there is suitable material available to create approximately 85 to 100 acres of marsh at the mitigation site, but available dilution in the mitigation site and Bayou Bienvenue is insufficient to meet applicable water quality criteria in Bayou Bienvenue, and a waiver would be required for discharge to Bayou Bienvenue (Appendix C). If a waiver can not be obtained, CEMVN would either consider other methods for effluent discharge or mitigate elsewhere. Alternative mitigation sites could include contributing to those being planned to mitigate for the impacts from implementing the HSDRRS, which is combining compensatory mitigation planning efforts to create large mitigation sites with greater ecological and economic benefits. Whether the entire mitigation for wetland impacts occurs at the triangular-shaped mitigation area located south of Bayou Bienvenue or elsewhere, CEMVN would fully mitigate for the loss of 36.97 habitat units associated with the implementation of the 1997 EIS Plan. In the event that there are substantial changes to the proposed mitigation plan, CEMVN will develop a revised mitigation plan in consultation with State and Federal resource agencies. CEMVN would then issue a 30-day public notice providing the details and rationale for this revised mitigation plan. Construction activities would not commence until completion of the revised mitigation plan.

Plan 3a. Cast-in-place Plan

WVA analysis for the 266-acre CDF determined that there would be a loss of 37.0 average annual habitat units as a result of its construction. This includes the temporary impacts from the fill cell and the permanent impacts from the disposal cell. As described for Plan 2, the loss of 37.0 average annual habitat units would be mitigated by creating wetlands in the triangular area located south of Bayou Bienvenue and north of Florida Avenue by using excess dredged material from the lock construction. As described in Plan 2, if the entire mitigation cannot occur at the triangular-shaped mitigation area located south of Bayou Bienvenue due to water quality criteria (Appendix C), CEMVN would fully mitigate for the loss of 37.0 average annual habitat units associated with the implementation of the Cast-in-place Plan.

Landfill Disposal Option

The placement of dredged material unsuitable for open water disposal in a landfill would reduce permanent impacts on wetlands. If the landfill disposal option was chosen, the construction of a permanent fill cell in the CDF would not be required and the impacts on wetlands would be 170 acres. WVA analysis determined that there would be a loss of 23.64 average annual habitat units as a result of the construction of the disposal cell at the CDF. Impacts on wetlands from construction of the disposal cell would be fully mitigated by the creation of 85 acres of wetlands in the mitigation area, which would provide 36.56 average annual habitat units (Appendix M).

Plan 3b Float-in-place Plan (Recommended Plan)

WVA analysis for the 209-acre CDF determined that there would be a loss of 29.06 average annual habitat units as a result of its construction. This includes the temporary impacts from the fill cell and the permanent impacts from the disposal cell. Additionally,

WVA analysis for the temporary impacts of the off-site construction area determined that there would be a loss of 7.22 average annual habitat units. Therefore, a total loss of 36.28 habitat units would be the net impact of the Float-in-place Plan implementation. As described in Plan 2, the loss of 36.28 average annual habitat units would be mitigated by creating wetlands in the triangular area south of Bayou Bienvenue. As described in Plan 2, if the entire mitigation cannot occur at the triangular-shaped mitigation area located south of Bayou Bienvenue due to water quality criteria, CEMVN would fully mitigate for the loss of 36.28 average annual habitat units associated with the implementation of the Float-in-place Plan.

Landfill Disposal Option
As described for Plan 3a, the placement of dredged material unsuitable for open water disposal in a landfill would reduce permanent impacts on wetlands. If the landfill disposal option was chosen, the impacts on wetlands from the CDF construction would be 138 acres. WVA analysis determined that there would be a loss of 19.19 average annual habitat units as a result of the construction of the disposal cell at the CDF. An additional 7.22 average annual habitat units would be lost from the temporary impacts at the off-site construction area. Impacts on wetlands form the construction of the disposal cell would be fully mitigated by the creation of 85 acres of wetlands in the mitigation area, which would provide 36.56 average annual habitat units (Appendix M).

5.3.19. Aquatic Habitats
This resource is institutionally significant because of the Clean Water Act of 1977, as amended. Aquatic habitats are technically significant because they provide habitat for various species of wildlife, finfish, and shellfish. Aquatic habitats are significant because of the public desire for recreational use for fishing, boating, and bird watching. This resource is institutionally significant because of the Fish and Wildlife Coordination Act of 1958, as amended. Fisheries resources are technically significant because: they are a critical element of many valuable freshwater and marine habitats; they are an indicator of the health of various freshwater and marine habitats; and many species are important commercial resources. Fisheries resources are publicly significant because of the high priority that the public places on their aesthetic, recreational, and commercial value.

Affected Environment
Major water bodies in the study area consist of the IHNC, MRGO, GIWW and Lake Pontchartrain. Smaller hydrologic features include a number of drainage canals and marshes. The most prominent water body is the Mississippi River, which is North America's longest and largest river and the fifth largest river worldwide. The Mississippi River flows 2,333 miles from Lake Itasca in northern Minnesota to its delta in southeast Louisiana. The Mississippi River drainage basin is the world's second largest, draining 1.83 million square miles, including tributaries from 32 U.S. states and two Canadian provinces. Lake Pontchartrain is a large, brackish shallow estuary which receives fresh water from various lakes, rivers, bayous, and canals, while receiving salt water from the Gulf of Mexico (Environmental Atlas of the Lake Pontchartrain Basin 2002). The IHNC Lock provides the aquatic connection between Lake Pontchartrain and the GIWW/MRGO and the Mississippi River.

LDEQ has prescribed water quality standards for surface waters of the state of Louisiana in order to promote a healthy and productive aquatic system. Surface water standards are set to protect the quality of all waters of the state, including rivers, streams, bayous, lakes, reservoirs, wetlands, estuaries, and many other types of surface water. The project area is located in the LDEQ IHNC 041501 sub-watershed. The water quality concerns associated with IHNC 041501 and neighboring watersheds are presented in Table 5-17.

Table 5-17. List of LDEQ Sub-watersheds Found in the Project Study Area and Water Quality Attainment Status

Sub-watershed Name & LDEQ ID	Water Quality Attainment Status	Suspected Causes of Impairment	Suspected Sources of Impairment
Mississippi River 070301	Fully meeting standards	NA	NA
IHNC 041501	Fully meeting standards	NA	NA
Bayou Bienvenue 041801	Fully meeting standards	NA	NA
Lake Pontchartrain 041001	Not meeting primary contact	Fecal coliform	Sanitary sewer overflow and urban runoff
New Orleans drainage canals 041302	Not meeting primary and secondary contact	Fecal coliform	Municipal and urban runoff

Source: LDEQ 2006 303 (d) Water Quality Inventory Integrated Report List of Impaired Watersheds [303 (d) list].
NA – Not Applicable

In the past, sub-watershed IHNC 041501 was not meeting designated uses for Primary Contact Recreation, Secondary Contact Recreation, and Fish and Wildlife Propagation. LDEQ suspected that the causes of past impairment to the Primary and Secondary Contact Recreation designated uses were fecal coliforms from sanitary sewer overflows during sewerage system failures, and from urban municipal wastes. Low dissolved oxygen (DO) levels were impairing the quality of water for fish and wildlife propagation. Non-point source pollution from high-density urban areas was the suspected source of oxygen demanding substances. The runoff of oxygen demanding substances and the failure of sewerage systems are associated with rain events (LDEQ 2006).

The water quality in sub-watershed IHNC 041501 has been improving over recent years. In 2004, water quality monitoring indicated that sub-watershed IHNC 041501 was not meeting criteria for fecal coliforms and was not sustaining designated uses for Primary and Secondary Contact Recreation (LDEQ 2004). New LDEQ water quality monitoring data (2005-2006) indicated that the fecal coliform levels have decreased and that the water body reached attainment for Primary and Secondary Contact Recreation. Sub-watershed IHNC 041501 is currently meeting all water quality designated uses (LDEQ 2006).

The adjacent sub-watershed 041001 (Lake Pontchartrain) is in violation of LDEQ criteria for fecal coliforms. The water body is not supporting designated uses for Primary Contact Recreation; however, sub-watershed 041001 is meeting designated uses for Secondary Contact Recreation and Fish and Wildlife Propagation. The suspected sources of impairment to the water body are overflows of sanitary sewerage systems (LDEQ 2006).

There are two distinct salinity regimes in the study area. Freshwater habitat is associated with the Mississippi River to the south of the lock, while brackish waters occur north of the lock in the GIWW, Lake Pontchartrain, and MRGO. Coastal waters of Louisiana contain a number of diverse habitats and a wide-range of salinities, making the estuary suitable for a wide variety of fish and crustaceans at varying times of the year.

Lake Pontchartrain contains diverse habitats and a wide-range of salinities. Fish in Lake Pontchartrain are comprised of 85 known species; some common species include bay anchovy (*Anchoa mitchilli*), Atlantic croaker (*Micropogonias undulatus*), Gulf menhaden (*Brevoortia patronus*), and members of the silverside family (Atherinidae) (Stone *et al.* 1980). Fish populations in Lake Pontchartrain also include a number of important gamefish, such as spotted seatrout (*Cynoscion nebulous*) and red drum (*Sciaenops*

ocellata). The estuarine habitat produces many species of fish that serve as prey for predatory fish. Common prey species include rainwater killifish (*Lucania parva*), naked goby (*Gobiosoma bosc*), Gulf pipefish (*Syngnathus scovelli*), clown goby (*Microgobius gulosus*), pinfish (*Lagodon rhomboides*), bay anchovy, and speckled worm eel (*Myrophis punctatus*) (Duffy and Baltz 1998).

Lake Pontchartrain's substratum constitutes a major nursery ground for commercially valuable species harvested in Louisiana's coastal waters (National Oceanic and Atmospheric Administration Fisheries Service [NOAA Fisheries] 2007). Post-larval, juvenile, and adult white (*Farfantepenaeus setiferus*) and brown shrimp (*Litopenaeus aztecus*) are abundant in Lake Pontchartrain year-round. White and brown shrimp landings represent large portions of the total harvest, constituting 33 and 21 percent of the total value of annual fish landings in Louisiana, respectively. Across the state of Louisiana, white and brown shrimp, blue crab (*Callinectes sapidus*), and Gulf menhaden fisheries produce $250 million annually, which constitutes 80 percent of the total value of landings in the state.

The prey organisms found in Lake Pontchartrain provide food for large finfish harvested both commercially and recreationally along the Louisiana coast and continental shelf (NOAA Fisheries 2007). Commercial landings for all finfish combined constitute 7 percent of value of Louisiana's annual total landings. The large Federally-managed finfish species, such as grouper (*Serranidae* sp.), snapper (*Lutjanidae* sp.), and mackerel (*Scombridae* sp.), represent $5.2 million and 2 percent of the total value of the annual landings in Louisiana.

Commercial fisheries create $2.8 billion annually in economic benefits for the Louisiana economy (Southwick 1997). Approximately 3,300 commercial vessels are licensed to fish in Louisiana coastal and estuarine waters. The commercial fishing vessels directly provide 31,400 jobs and economic benefits of commercial fishing support several other fishery sectors, such as boat building and repairs, net construction, and value added seafood items. In Louisiana, coastal and offshore recreational fishing generates $745 million in local revenue and creates 7,786 jobs (American Sportfishing Association 2002). Lake Pontchartrain is an important estuarine component of the coastal fisheries in Louisiana, and contributes to these benefits directly through active commercial fishing, and indirectly by providing nursery grounds and prey organisms for commercial fish.

The freshwater commercial fishery within the Mississippi waterway target channel catfish (*Ictalurus punctatus*), blue catfish (*Ictalurus furcatus*), flathead catfish (*Pylodictis olivaris*), alligator gar (*Atractosteus spatula*), and spotted gar (*Lepisosteus oculatus*). The annual commercial harvest of freshwater species is significantly smaller compared to the marine fish harvest. A total of $2.3 million of freshwater catfish and $423,607 in alligator and spotted gar were landed in Louisiana in 2006 (NOAA Fisheries 2007). Sport fishermen pursue striped bass (*Morone saxatilis*), largemouth bass (*Micropterus salmoides*), white crappie (*Pomoxis annularus*.), black crappie (*Pomoxis nigromaculatus*) and various species of sunfish (*Lepomis* spp.) in freshwater tributaries of the Mississippi River.

The IHNC's benthic habitats can be categorized into two distinct regimes defined by salinity levels present in the water. The southern portion of the IHNC is freshwater and the benthic invertebrates consist of several species of freshwater and freshwater tolerant chiromomids, oligochaetes, amphipods, and isopods. On the northern side of the existing lock, is a brackish aquatic habitat that contains similar organisms tolerant to higher salinities. The IHNC's northern brackish side also contains large benthic organisms such as mollusks and blue crabs. Some species of benthic organisms, such as rangia clams

(Rangia cuneata), are tolerant of a range of freshwater and brackish conditions and may be found on both sides of the lock.

Water Quality and Sediment Evaluation
CoC found in the 1993 sampling efforts were described in the 1997 EIS, and are incorporated herein by reference. In summary, seven locations were sampled (four in the IHNC and three in the proposed disposal area east of the IHNC), and recovered samples were analyzed using Toxic Characteristic Leachate Procedure methods for metals, volatile organics, extractables, herbicides and pesticides in elutriates. CoC identified in the analyses above the 1993 applicable acute toxicity criteria were zinc, lead, chromium and copper.

As part of the soil sampling for the 1997 EIS on the banks of the IHNC, numerous surface, near-surface and deep auger samples (-35 feet) were collected and analyzed at locations identified as sites of past activities generating hazardous material. Depending on the location of the samples and the suspected types of CoC at each site, analysis was performed for a wide range of contaminants, including polynuclear aromatic hydrocarbons (PAH), oil and grease, halogenated hydrocarbons, metals, volatile organics, pesticides and herbicides. The results of the soil analysis were described in the 1997 EIS and are incorporated herein by reference; most of the detectable CoC were found in the surface and near-surface samples, and the deeper (-35 feet) soil samples commonly indicated only background levels of most contaminants. The primary CoC identified included seven metals, 21 volatile organics, 21 base/neutral semivolatile organics and two pesticides. The Toxic Characteristic Leachate Procedure analyses found only lead present at one site above the regulatory limits.

Spot sampling of surface and shallow subsurface soils at suspected or known hot spots for petroleum hydrocarbons contamination yielded higher concentrations of heavy hydrocarbons, with metals and chlorinated hydrocarbons near engine repair sites. Fuel contamination was localized in soil near fuel tanks and transfer stations. Lead contamination was prevalent at sites containing sandblast materials.

Water Quality and Sediment Evaluation Implementation
Sediment sampling started in 2005, but was interrupted by Hurricane Katrina. In 2007, the project was enjoined and additional analysis of impacts based on post-Katrina conditions was required. Therefore, an expanded sediment sampling was completed by Weston Solutions, Inc. during the period July 9, 2007 to September 10, 2007. The objective of that investigation was to evaluate the physical, chemical and biological characteristics of material (non-native sediment and fill and native subsurface soil) to be dredged or excavated as part of the IHNC lock construction project. The reported information was used to develop an environmentally acceptable management strategy for material generated from the IHNC Lock construction dredging project and provide scientific evidence to support decisions regarding the placement of IHNC excavated and dredged material at one of the proposed disposal options.

Within each of the 10 DMMUs sampled (see Figure 4-5), coring and sample target depths were established based on the proposed depth of dredging or disturbance by the proposed project as interpreted from bathymetric data collected in 2003. Cores and samples were collected from submerged locations using an electric vibracore apparatus or a box core device, depending on the type and depth of sample required for each location. Samples on land were collected with a motorized auger unit using a split barrel sampler or a thin-walled tube sampling sleeve.

All cores were advanced to the target depth except for one, which was stopped short due to refusal by subsurface debris. Numerous cores were required at some locations in order to collect the amount of material required for laboratory analysis. All samples were composited, as necessary, at a field processing station prior to separation of aliquots for analysis. A total of 69 stations were sampled, with four to 20 cores collected at each station, depending on the amount of sample material needed for testing. A total of 339 cores were successfully recovered.

In addition to samples taken from the proposed project area, reference samples were collected from the Mississippi River Reference Site, the Mitigation Site, the Marine Reference Site, and the Bayou LaLoutre Reference Site (see Figure 4-6) to provide reference material as a baseline to compare with samples from the project area. Water was also collected from all sites, including the DMMUs, for water chemistry analysis and to generate elutriates for analysis.

Sampling was conducted at each site using protocols defined by the EPA and the USACE for sample collection at proposed dredge sites. Sampling protocol includes complete chain-of-custody documentation and sample preservation during collection and shipment to off-site laboratories. Laboratories used for analysis and biological testing of the collected samples were:

- U.S. Army Engineer Research and Development Center, Environmental Laboratory, Vicksburg, Mississippi.
- TestAmerica, Pittsburgh, Pennsylvania
- Weston Solutions, Inc., Carlsbad, California
- NewFields Northwest, Port Gamble, Washington
- PACE Laboratories, St. Rose, Louisiana

These laboratories used protocols established by the *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Inland Testing Manual* (ITM; EPA/USACE 1998) to determine suitability for disposal of dredged material in open water. Samples were also analyzed for suitability for upland disposal according to protocols set by the *Evaluation of Dredged Material Proposed for Disposal at Island, Nearshore, or Upland Confined Disposal Facilities – Upland Testing Manual* (USACE 2003b).

Physical analyses included geotechnical analyses, such as grain size distribution, soil classification, Atterberg limits, moisture content, organic content, specific gravity, pH, and hard carbon, as well as Simplified Laboratory Runoff Procedure. This analysis was performed to determine runoff water content following disposal. Column settling tests were utilized to determine the disposal area needed for sediment settling and water column clarification prior to effluent discharge.

Sediments and soils were analyzed for the quantification of over 170 CoC, including metals, organotins, PCB, semi-volatiles, total petroleum hydrocarbons, pesticides, herbicides, and volatiles according to methods approved by EPA and the American Society for Testing and Materials, as well as standard operating procedures for the laboratories involved. Physical characterization and chemical inventories were used in the interpretation of biological tests (described below) and to identify sediment properties that may have contributed to observed adverse impacts on water column and benthic test organisms.

The guidance provided by the ITM required that bioaccumulation potential and toxicity testing using appropriate type species be conducted to determine the potential long-term impact of dredged material disposal on biological resources at open water disposal sites. Separate freshwater and estuarine biological evaluations of water column and benthic impacts were conducted.

Sediments and soils were used for the preparation of elutriates used in freshwater and estuarine suspended phase toxicity tests and for conducting freshwater and estuarine solid phase toxicity and bioaccumulation potential tests. An elutriate is an aqueous extract derived from material proposed for dredging, in which the dissolved contaminants are compared to water quality standards with consideration of mixing and used directly in toxicity tests. Elutriates are prepared using water collected at the same site as the proposed dredged material.

Freshwater and estuarine juvenile fish were exposed to elutriates to predict any potential water column toxicity at the Mississippi River and mitigation site, respectively. In addition to the toxicity evaluation, the potential for water column impacts were assessed by comparison of measured CoC concentration in individual samples elutriates and comparison of measured CoC concentration in elutriates to background levels in receiving waters and to water quality standards. Dilution requirements were then determined for each elutriate CoC to meet background levels, or site-specific and regulatory water quality standards. Maximum dilution required for each DMMU to meet the above criteria at each disposal area was identified, and mixing zone models were evaluated to determine if sufficient dilution occurred within regulatory mixing zones specified by LDEQ. Further details on the methodology are included in the Water Quality and Sediment Evaluation Report (Appendix C).

Plan 1. No-build/Deauthorization

There would be no change to water quality under the no-build alternative. A long-term reduction in salinities is anticipated with the closure of the MRGO. Tate *et al.*, (2002) modeled salinity changes resulting from the MRGO closure. Modeled changes at Little Woods on Lake Ponchartrain (closest modeled data point to the IHNC) showed that average annual salinities in Lake Ponchartrain were reduced from 6.9 parts per thousand to 4 parts per thousand at Little Woods. Short-term salinity reductions would also occur with periodic closures of hurricane and storm damage risk reduction structures which are being constructed in the IHNC at Seabrook and in the GIWW. However, no changes in salinity are expected while the gates are open. Reduced long-term salinities due to the MRGO closure would potentially change the aquatic organism use in the project area.

Plan 2. 1997 Plan

The impacts on aquatic resources were described in the 1997 EIS and are incorporated herein by reference. Impacts on the aquatic environment would occur from dredging and filling activities, as well as other construction-related activities such as pile driving and concrete pours. Past detailed studies such as elutriate testing provide estimates of the impacts on aquatic habitats from these construction activities. Disposal of material at the CDF site, the mitigation site and into the Mississippi River would also impact aquatic habitats. These impacts would be mainly related to increased concentrations of ammonia, copper, manganese and zinc, and increased suspended sediments. The impacts on aquatic habitats would be short-term, and the concentrations of copper and zinc would be similar to those normally experienced under ambient conditions. Only small amounts of material were found to contain high levels of manganese, and these would be dredged in a short time frame. Additionally, all materials that exceed water quality criteria would be placed in the CDF and contained in upland disposal in perpetuity or be used for backfill at the

lock construction site, placing the material in the location from which it generally originated and appropriately covered with clean fill material.

During dredging activities suspended sediment concentrations would temporarily increase, and DO would decrease in the immediate area of dredging and disposal. Under low current conditions such as occur in the IHNC, elevated levels of suspended sediments would be localized in the vicinity of the cutterhead as the dredge moves across the dredging site. High concentrations of suspended sediments would be highest within 10 feet of the cutter and decrease exponentially from the cutter to the water surface (USACE 1983). This would have short-term impacts on aquatic organisms located in the IHNC, especially during summer months when water temperatures are higher. There would be some loss of less motile aquatic organisms; however, mature finfish would avoid these areas of low DO. Silt curtains could be used, if necessary, to insure that increased turbidity was contained to the immediate area of dredging. The daily sediment load discharge for the Mississippi River ranges from 436,000 tons per day to 219,000 tons per day, with an average of 341,000 tons per day (Louisiana Department of Natural Resources 2008). The total proposed sediment discharge into the Mississippi River for the entire project is 324,000 tons. Assuming the length of dredging would be 300 days, approximately 1,080 tons would be discharged into the Mississippi River per day, which represents 0.33 percent of the of the river's sediment load. If dredging activities take longer than 300 days, the daily volume of sediment discharge would be less than predicted. No measurable adverse impacts on aquatic life or drinking water supply intakes downstream would be expected.

Plan 3a. Cast-in-place Plan

Impacts on aquatic resources would be similar to Plan 2. However, an expanded Water Quality and Sediment Evaluation program was implemented, and the impacts on aquatic resources from dredging and filling activities have been analyzed based upon the more detailed evaluation.

Water Column Toxicity Evaluation

The water column toxicity evaluation is provided in Appendix C. Based on the results of the suspended particulate phase water column toxicity tests, dredged materials from some DMMUs are not predicted as toxic to freshwater water-column organisms (Appendix C). Dredged materials from other DMMUs, are predicted as potentially toxic to freshwater water column organisms (Appendix C). Those dredged materials are further analyzed for their potential to cause impacts on water column organisms at the Mississippi River disposal site according to available dilution across an allowable mixing zone. Potential for dredged material disposal causing adverse impacts on water column organisms at the Mississippi River disposal site was further evaluated by comparing potential for state or Federal water quality standards to be exceeded outside the mixing zone.

Based on the results of the suspended particulate phase water column toxicity tests, dredged materials from all DMMUs are not predicted as acutely toxic to estuarine column organisms. Potential for dredged material disposal causing adverse impacts on water column (*i.e.*, pelagic) organisms at the mitigation site was further evaluated by comparing potential for state or Federal water quality standards to be exceeded outside the mixing zone.

Elutriate Evaluation

Based on the modeling conducted for disposal in the Mississippi River (Appendix C), a 700 fold dilution could be met within 2,100 feet from the discharge point for low flow conditions, and within 1,000 feet for high flow conditions. This would meet the most stringent dilution requirements based on comparison of elutriate concentrations to water

quality criteria, and would also satisfy the maximum dilution requirements based on the elutriate toxicity testing. This distance is consistent with the point at which non-detectable concentrations have been observed during disposal operations in the past. Also, the dilutions required to be protective based on toxicity can be met within approximately 1,400 feet for worst case conditions (low flow, pipeline disposal), as the maximum dilution based on toxicity was less than 400 fold. As these mixing zone dimensions appear to be reasonable and consistent with past operations, it appears that none of the materials tested would be excluded from open water disposal on the basis of water column impacts outside of an authorized mixing zone.

Further, evaluation of potential impacts on the St. Bernard Parish waterworks inlet indicates that dilution required in order to meet drinking water standards would be achieved within no more than 300 feet from the point of disposal for all scenarios. It is not known if the proposed mixing zone for the Mississippi River disposal site would intersect with mixing zones for other permitted discharges. This seems unlikely to be an issue given the long-standing nature of the disposal site, but State criteria require verification that overlap would not result in unacceptable conditions. Without further information regarding mixing zone dimensions for nearby permitted discharges, this remains to be confirmed.

Based on available information, maximum attainable dilution ratio for discharge of effluent to the GIWW is 1:120. Assuming maximum effluent concentrations for all DMMUs, adequate dilution would be attainable within a mixing zone complying with State of Louisiana requirements for all constituents except tributyltin, total PCBs, Arochlor 1016, and dieldrin (assuming adjusted dilution requirements for copper and lead, as previously discussed). Effluent treatment may be required when dredging areas of the IHNC with elevated concentrations of these constituents. However, the mixing that is inherent in hydraulic dredging would likely reduce peak predicted effluent concentrations, as reflected by the geometric mean elutriate concentrations. For the mean predicted effluent concentrations, all dilution requirements could be met within the prescribed mixing zone in the GIWW.

For maximum runoff concentrations discharged to the GIWW, which were conservatively estimated for the unoxidized case using effluent concentrations, all acute criteria would be met within the prescribed mixing zone (assuming adjusted dilution requirements for copper and lead, as previously discussed). Dilutions for oxidized conditions are pending evaluation of the Simplified Laboratory Runoff Procedure data.

Based on limited information available regarding bathymetry and flow in Bayou Bienvenue, attainable dilution would be insufficient to accommodate effluent flows. Maximum attainable dilution ratios for runoff (occurring concurrently with surface runoff and pumping to the bayou) are estimated to range between 1:44 and 1:380, assuming the entire width and depth of the bayou are enveloped in the mixing zone. This is adequate to meet dilution requirements for runoff from unoxidized material without treatment. Dilution requirements for runoff from oxidized material have not yet been determined, but are expected to be higher due to increased solubilization of metals under oxidized conditions.

Based on estimates of dilution requirements for standard and modified elutriates for selected DMMUs, available dilution in both the mitigation site and in Bayou Bienvenue are insufficient to meet water quality criteria during dredged material disposal. Because none of the elutriates demonstrated toxicity in marine suspended phase toxicity tests, and because there is potentially significant environmental and community benefit associated with restoration of the wetland, a waiver may be justified.

Benthic Toxicity Evaluation
Based on the results of the solid-phase toxicity tests, two DMMUs (Appendix C) are predicted to be acutely toxic to freshwater benthic organisms. All remaining IHNC DMMUs are not predicted to be acutely toxic to freshwater benthic invertebrates. Based on the results of the solid-phase toxicity tests, dredged material from five DMMUs are predicted to be acutely toxic to estuarine benthic invertebrates. All remaining IHNC DMMUs are not predicted to be acutely toxic to freshwater benthic invertebrates.

Bioaccumulation Evaluation
For freshwater open water disposal, tissue concentrations of all contaminants for DMMUs not predicted to be toxic to benthic organisms were either statistically less than USFDA action levels or there are no USFDA levels for the contaminants. For those DMMUs, tissue concentrations of contaminants of concern in organisms exposed to dredged material statistically exceeded those of organisms exposed to the reference material. However, the IHNC DMMUs evaluated for bioaccumulation potential are not predicted to be toxic to benthic organisms, and would not likely have an unacceptable adverse effect on survival, growth or reproduction of aquatic organisms due to bioaccumulation.

The disposal of dredged material (from DMMUs 9-2,4 NN, 3 F, 4/5 N, and 7 N) to the mitigation site would not likely have an unacceptable adverse effect on survival, growth or reproduction of benthic invertebrates or fish due to bioaccumulation.

For estuarine open water disposal, tissue concentrations of all contaminants for DMMUs not predicted to be toxic to benthic organisms and further evaluated for open water placement at the mitigation site (DMMUs 4/5 N, DMMU 7 N, DMMU 9-2,4 NN) were either statistically less than USFDA action levels or there are no USFDA levels for the contaminants. For those DMMUs, tissue concentrations of CoC in organisms exposed to dredged material statistically exceeded those of organisms exposed to the reference material, except for DMMU 4/5 N. However, the technical evaluation of the bioaccumulation data determined that DMMUs not predicted to be toxic to benthic organisms would not likely have an unacceptable adverse effect on survival, growth or reproduction of aquatic organisms due to bioaccumulation.

Dredged Material Placement Decisions
The sediment evaluation (Appendix C) recommends a revised dredged material disposal plan that includes an open water disposal area in the Mississippi River, a wetland creation disposal site within the mitigation area, a CDF disposal site for material unsuitable for open water placement (restricted material), and a separate fill storage site within the CDF. Results from aquatic and benthic toxicity tests, and water column mixing zone analyses were evaluated to determine the suitability of DMMUs for discharge into the four disposal areas. Based upon the sediment evaluation, dredged material would be disposed of in the following manner.

- DMMUs 3 NN, 3 N, 4 NN, 7 F, 7 N (area underlying channel sediments), 8 NN, 9 NN (area south of the existing lock), 10 NN, 10 F, and 10 N would be placed in the Mississippi River;
- DMMUs 3 F, 4/5 N, 7 N (area underlying east bank fill), and 9 NN (area north of the existing lock) would be placed at the mitigation site for wetland creation;
- DMMUs 1 NN, 2 NN, 5 NN, and 7 NN would be placed in the CDF; and
- The majority of DMMUs 6 NN, 6 F, and 6 N would be temporarily stockpiled in the CDF and later used as backfill at the construction site. Portions of DMMU 6 NN, 6 F, and/or 6 N would be placed in the Mississippi River.

Landfill Disposal Option
Under the landfill disposal option, dredged material from DMMUs 1NN, 2NN, 5NN, and 7NN would be transported to a permitted Type 1 landfill in the vicinity of the project area. The material could be transported by truck or barge, and disposed of without drying.

However, to reduce the volume of material to be transported and disposed of in the landfill, a contractor may choose to dewater the material. If dewatering was implemented prior to the transport of the dredged material to a landfill, the material would be dewatered in the disposal cell of the CDF as proposed by the CDF disposal option. However, instead of creating a permanent CDF disposal cell, the material would be removed and delivered to a landfill after it was dewatered, and the disposal cell of the CDF would be regraded and allowed to revegetate following project completion.

Plan 3b. Float-in-place Plan (Recommended Plan)
Impacts from Plan 3b would be similar to those described for Plan 3a, except that all of DMMUs 6 NN, 6 F and 6 N would be temporarily stockpiled in the CDF and later used as backfill at the construction site.

5.3.20. Essential Fish Habitat
This resource is institutionally important because of the Magnuson-Stevens Fishery Conservation and Management Act. Essential Fish Habitat is technically important because, as the Act states, it is "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity." Essential Fish Habitat is publicly important because of the high value that the public places on the seafood and the recreational and commercial opportunities it provides.

Affected Environment
Specific categories of Essential Fish Habitat occurring in the project area include estuarine emergent wetlands, estuarine water column and estuarine mud substrate (bottom). Submerged aquatic vegetation occurs in some isolated areas along Bayou Bienvenue, but is not a major component of the Essential Fish Habitat in the immediate project area. The estuarine emergent wetlands are located along the edges of the 440-acre triangular-shaped area lying east of the IHNC, north of Florida Avenue and south of Bayou Bienvenue. The shorelines of Bayou Bienvenue and nearby tidally-influenced areas to the east of the triangular area, as well as the shorelines of the GIWW/MRGO, also contain estuarine wetlands. Since the water salinity in this area is normally brackish, the wetlands are comprised of species suited to brackish conditions. The two dominant herbaceous species are smooth cordgrass and marsh hay cordgrass or wiregrass (*Spartina patens)*. Wooded species occurring on slightly higher elevations are dominated by groundseltree. This habitat is tidally inundated, at least occasionally, and serves as important escape and feeding habitat for a variety of estuarine species, especially the small juveniles of larger species like spotted seatrout and all life stages of smaller species like killifishes (family Cyprinodontidae). Estuarine water column and estuarine mud substrate occurs throughout all of the tidally-influenced waters of the project area, including the IHNC, GIWW/MRGO, Lake Pontchartrain, and numerous bayous, canals, and ponds.

Three Federally-managed estuarine/marine species are commonly to abundantly found in the project area; brown shrimp, white shrimp, and red drum. Brown shrimp occur as post-larvae, juveniles, and subadults. The postlarvae show up in large numbers beginning in late March to in early April. The juveniles and sub-adults are abundant and heavily fished in May, June, and July. White shrimp also occur as post-larvae, juveniles, and sub-adults. Post larvae begin to show up in June and July. The peak of white shrimp

abundance and harvest is August through November. Both species are brought into the project area as post-larvae from the Gulf of Mexico and more saline waters through tidal action and emigrate from the project area as juveniles and sub-adults, also by tidal action as they make their way to spawning grounds. Red drum of various age classes from small juveniles up to sub-adults also occur in the project area and are occasionally caught by recreational anglers, although the highest abundances and catches of red drum in southeast Louisiana are located in estuarine waters outside of the immediate project area.

The IHNC at the proposed new lock construction site provides poor Essential Fish Habitat due to the industrialized nature of the area and the influence of fresh water through lockages from the Mississippi River. However, the IHNC from its intersection with the MRGO/GIWW to Lake Pontchartrain and the MRGO/GIWW are major artificial tidal passes through which the postlarvae of countless brown and white shrimp pass into the lake, and those that survive then later exit the lake as juveniles and sub-adults. Although the IHNC is closed to all fishing activities for safety reasons, large quantities of brown and white shrimp are harvested in the GIWW/MRGO usually at night on a falling tide with boats pushing wing nets, also known as butterfly nets. The intersection of the IHNC and Lake Pontchartrain, locally known as "Seabrook" is a major recreational fishing location. While spotted seatrout are the predominant sport fish caught at this location, red drum are also occasionally caught.

It is widely known that much of the coastal wetlands of Louisiana have been lost and continue to convert to open water due to a variety of causes including subsidence of underlying sediments, lack of riverine sediment input, and the construction of thousands of canals for various purposes that have allowed salt water and tidal influence to move far inland from the coast. As a result of this loss of emergent wetlands, major efforts are underway by a variety of governmental agencies to restore the lost wetlands which provide fish and wildlife habitats and storm surge attenuation. The conversion of shallow estuarine open water back to emergent wetlands is considered to produce beneficial effects on the overall environment, and nearly all coastal restoration projects that have been implemented and those envisioned for future construction are designed to cause wetlands to be restored or provide protection for existing wetlands. Additionally, compensatory mitigation projects for impacts on coastal wetlands usually have similar designs.

Plan 1. No-build/Deauthorization

The MRGO closure structure to be constructed across the MRGO at Bayou LaLoutre as part of the MRGO Deauthorization plan, is expected to decrease salinity levels upstream in and near the MRGO, including the project area. Additionally, another closure structure will be placed across the MRGO just downstream from Bayou Bienvenue, and water control structures will be placed across Bayou Bienvenue, the GIWW, and the IHNC at its intersection with Lake Pontchartrain as part of the HSDRRS. Those structures, especially the one that blocks off the MRGO, would cause short-term lowering of salinities in the project area when the structures are closed in response to storm events. Accordingly, the abundance of estuarine aquatic species that require higher salinities is expected to decrease in the project area. Conversely, the abundance of species that are tolerant of low salinity levels should remain the same or possibly increase. Since brown shrimp require a moderate salinity level, the abundance of brown shrimp could decrease in the immediate project area following closure of the MRGO. Conversely, white shrimp are very tolerant of low salinity levels and should not be adversely affected. Their seasonal abundance may actually increase in the project area from the decrease in salinity levels. Red drum are found throughout the estuaries from highly saline areas to areas of very low salinity. The abundance of red drum in the project area, considering the anticipated effects of these projects, is not expected to be changed significantly.

Plan 2. 1997 EIS Plan
The direct impact of this plan on Essential Fish Habitat would be the conversion of approximately 100 acres of shallow open water to emergent wetlands within the 440-acre, triangular-shaped area to emergent wetlands as mitigation for the proposed off-site construction area. This conversion of estuarine water column and estuarine water bottom to estuarine emergent wetlands is considered beneficial due to widespread loss of coastal wetlands in Louisiana.

Plan 3a. Cast-in-place Plan
This plan would cause direct impacts almost entirely on wetlands that are not intertidal along the south bank of the MRGO/GIWW. These wetlands, where the CDF would be developed, are mainly composed of woody vegetation and provide no Essential Fish Habitat, since they are not tidally inundated except during extreme high tides and major rainfall events. The mitigation for impacts on these non-tidal wetlands consists of using suitable dredged material from the IHNC to rebuild approximately 100 acres of emergent, intertidal wetlands in the triangular-shaped area south of Bayou Bienvenue. This conversion of estuarine water column and estuarine mud substrate to estuarine emergent wetlands is considered beneficial due to widespread loss of coastal wetlands in Louisiana.

Landfill Disposal Option
The choice of dredged material disposal options (*i.e.*, CDF vs. landfill disposal) would have no impact on Essential Fish Habitat.

Plan 3b. Float-in-place Plan
This plan is similar to Plan 3a, except that there would be less acreage affected by construction of the CDF, since less dredging is necessary in the IHNC for lock construction. However, there would be impacts on wetlands from the construction of an off-site construction area. There would also be a reduced mitigation requirements and less material available for wetland restoration/mitigation compared to Plan 3a, so only about 85 acres of estuarine emergent wetlands would be developed with dredged material in the triangular-shaped area. Again, this conversion of estuarine water column and estuarine mud substrate to estuarine emergent wetlands is considered beneficial due to widespread loss of coastal wetlands in Louisiana.

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

Affected Environment
Several Federally-listed species are known to occur in the vicinity of the project area. These species are brown pelican (*Pelecanus occidenetalis,* endangered), pallid sturgeon (*Scaphirhynchus albus,* endangered), West Indian manatee (*Trichechus manatus*, endangered), and Gulf sturgeon (*Acipenser oxyrhynchus desotoi*, threatened). The green (*Chelonia mydas*, threatened); hawksbill (*Eretmochelys imbricate*, endangered); Kemp's ridley (*Lepidochelys kempi*, endangered), leatherback (*Dermochelys coriacea*, endangered), and loggerhead (*Caretta caretta*, threatened), sea turtles and the finback (*Balaenoptera physalus*, endangered); sei (*Balaenoptera borealis*, endangered), blue (*Balaenoptera musculus*, endangered), and sperm whales (*Physeter macrocephalus*, endangered), might occur in the vicinity of the project area. The IHNC channel,

proposed off-site construction area, proposed mitigation site, and proposed CDF site have been heavily impacted by human activities and provide no or low quality habitat for threatened and endangered species.

Plan 1. No-build/Deauthorization
Under the no-build alternative, it is anticipated that that existing conditions and operations would have little, if any, effect on threatened or endangered species in the area.

Plan 2. 1997 EIS Plan
Brown pelican nesting colonies are found on small, off-shore islands protected from mammalian predators (U.S. Fish and Wildlife Service [USFWS] 1995). No brown pelican breeding or nesting areas are known to occur in the vicinity of the project area due to the lack of spits and off-shore sandbars. The brown pelican is more likely to use the waters and associated habitats in the project area for foraging and feeding. The mobility of the species is such that construction activities are not expected to harm nor interfere with their activities, and the brown pelican would be able to migrate to similar habitats in the vicinity of the project area for foraging and feeding.

Pallid sturgeons occur in large rivers within the Mississippi River and Missouri River basins from Montana to Louisiana. The pallid sturgeon tends to select main channel habitats of the Mississippi River in south Louisiana (USFWS 2007). Since the IHNC Lock is located in a highly industrialized area of New Orleans and navigation traffic regularly passes through the lock, the canal presents poor quality habitat for pallid sturgeon. The canal is outside of the main current of the Mississippi River and there is no strong current flowing through the canal. The floor and walls of the lock would be composed of concrete and pallid sturgeons are not likely to occur or forage in areas where the natural water bottom has been altered. The intake culverts of the lock are covered with grates and are expected to prevent pallid sturgeon from being pulled into the culverts while a vessel is locking through the structure. Pallid sturgeons feed on benthic invertebrates and dredging activities could temporarily reduce the availability of forage items for the pallid sturgeon through the loss or damage of small invertebrates. It is anticipated that pallid sturgeons would forage and rest in unaffected areas at a sufficient distance from the project features as to cause no adverse impact during construction activities.

West Indian manatees can be found in shallow, slow-moving rivers, estuaries, salt-water bays, canals, and coastal areas (Louisiana Department of Wildlife and Fisheries [LDWF] 2007). West Indian manatees graze on a variety of aquatic plants and are typically found in waters with dense submerged aquatic beds or floating vegetation. They occasionally enter Lake Pontchartrain and associated coastal waters from June through September, and could pass through the project area or forage on nearby grass beds in Lake Pontchartrain. However, the likelihood of a manatee occurring in the project area is extremely low since it is outside of their normal range and no aquatic plants suitable as a food source are located in the project area.

According to the LDWF, hawksbill sea turtles are rarely encountered in Louisiana or along the coasts of the Gulf of Mexico. The loggerhead sea turtle, Kemp's ridley sea turtle, and the green sea turtle have been sighted in the MRGO in the vicinity of the bar channel where the MRGO connects to the Gulf of Mexico. Construction in the project area would be conducted well above the bar channel; therefore, it is highly unlikely any sea turtles would be impacted as a result of the project. There is no suitable habitat for sea turtles in the proposed project area. Since all species of threatened and endangered

whales tend to occur well beyond the coastal area in the Gulf of Mexico, the proposed project is not likely to adversely affect any whale species.

Due to the developed and industrialized nature of the project area, the construction of the off-site construction area and placement of dredged material in the CDF and marsh creation areas would not likely have an adverse effect on threatened or endangered species. Because of the lack of foraging or nesting habitat in the project vicinity, CEMVN has determined the proposed IHNC Lock Replacement project may affect but is not likely to adversely affect the brown pelican. Dredging could temporarily reduce the availability of forage items for pallid sturgeon and West Indian manatee through the loss or damage of invertebrates and aquatic vegetation. However, these species would be able to forage and rest in unaffected areas at a sufficient distance from the project features. CEMVN has determined the proposed project may affect but is not likely to adversely affect the pallid sturgeon or the West Indian manatee.

By letter dated October 7, 1996, USFWS concurred with CEMVN's determination that the proposed activities would not significantly affect listed or proposed threatened or endangered species. By letter dated October 17, 1996, the NOAA Fisheries concurred with CEMVN's determination that the proposed project would not significantly affect listed or proposed threatened or endangered species.

Plan 3a. Cast-in-place Plan

The impacts on threatened and endangered species would be similar to those described in Plan 2. However, critical habitat for Gulf sturgeon was designated in 2003, subsequent to Plan 2 selection in 1997 and prior threatened and endangered species consultations. The Gulf sturgeon is an anadromous fish that occurs in many rivers, streams, and estuarine waters along the northern Gulf coast between the Mississippi River and the Suwanee River, Florida. In Louisiana, Gulf sturgeon have been reported at Rigolets Pass, rivers and lakes of the Pontchartrain Basin, and adjacent estuarine areas, including the MRGO inland reach (USFWS 2003). The Gulf sturgeon critical habitat unit 8 includes the portion of Lake Pontchartrain east of the Causeway, all of Little Lake, the Rigolets, Lake St. Catherine, Lake Borgne, and the Mississippi Sound. The project area is west of the critical habitat and CEMVN determined no Gulf sturgeon critical habitat exists within the areas that would be affected by the project. It is anticipated the proposed project would have no effect on Gulf sturgeon or their critical habitat due to the industrialized nature of the project area, the hydrodynamics within the IHNC, and the distance from the project area and dredging locations to Lake Pontchartrain, Lake Borgne, and designated critical habitat unit 8. In addition, use of the upper reaches of the MRGO by Gulf sturgeon in the vicinity of the proposed off-site construction area has not been observed, nor is it expected, due to the available habitat and conditions in the area.

CEMVN began informal consultation as per Section 7(a)(2) of the Endangered Species Act with the USFWS through a letter dated 20 February 2008. CEMVN determined that the proposed project would not likely adversely affect any threatened or endangered species in the project area. The USFWS requested continuation of consultation to acknowledge the possible occurrence of pallid sturgeon within the IHNC and possible interaction with the lock structure and associated culverts. CEMVN reinitiated consultation with USFWS by a letter dated 15 August 2008. The USFWS concurred with CEMVN's determination that the proposed action may affect, but is not likely to adversely affect, any threatened or endangered species in the project area on 19 September 2008 (Appendix B).

CEMVN began informal consultation with the NOAA Fisheries by a letter dated 10 April 2008. NOAA Fisheries requested continuation of consultation to acknowledge the

possible occurrence of Gulf sturgeon and associated critical habitat in the vicinity of the project area. CEMVN reinitiated consultation by a letter dated 11 July 2008. CEMVN determined the proposed action may affect, but is not likely to adversely affect any threatened or endangered species within the proposed project area. Further, CEMVN determined the proposed action would have no effect on Gulf sturgeon or their critical habitat due to the industrialized nature of the project area, the hydrodynamics within the IHNC, and the distance from the project area and dredging locations to Lake Pontchartrain, Lake Borgne, and designated critical habitat. Consultation with NOAA Fisheries is continuing and it is anticipated that NOAA Fisheries will concur with CEMVN's determination.

Landfill Disposal Option
The choice of dredged material disposal options (*i.e.*, CDF vs. landfill disposal) would have no impact on threatened and endangered species.

Plan 3b. Float-in-place Plan (Recommended Plan)
The impacts on threatened and endangered species would be similar to those described in Plan 2 and Plan 3a.

5.3.22. Aesthetic Values
This resource's institutional significance is derived from laws and policies that affect visual resources such as NEPA, the Coastal Barrier Resources Act of 1990, and National and Local Scenic Byway programs. This resource is technically significant because of visual accessibility to unique combinations of geological, botanical, and cultural features that may be an asset to a study area. Public significance is based on expressed public perceptions and professional evaluation.

Affected Environment
A significant aesthetic resource of the study area is the Holy Cross levee and batture area, which is a passive recreational area used for fishing, picnicking, jogging, and walking (Photograph 5-8). This area provides a visual amenity for residents of the Holy Cross neighborhood who view the river and watch barges and ships passing, and provides views upriver of downtown New Orleans. Prior to Hurricane Katrina, it was estimated that 20 percent of the Holy Cross residents and 5 percent of the Lower Ninth Ward residents, or about 2,000 people, used the levee and batture annually. Another significant aesthetic resource in the IHNC area is the stand of 18 live oaks (*Quercus virginiana*) located north of the St. Claude Bridge on the east bank of the IHNC (Photograph 5-9). This site is owned and maintained by the CEMVN. Although the area is fenced and not available to the public, it provides a visual amenity for residents of the Lower Ninth Ward who live near Jourdan Avenue and for other residents passing over the St. Claude Avenue Bridge.

Photograph 5-8. Holy Cross levee with recreational trail.

Photograph 5-9. Stand of live oaks located along Sister Street.

The Bywater and Holy Cross Historic districts are the two neighborhoods in the IHNC study area listed on the National Register of Historic Places. Within these historic districts, the majority of the buildings have historic and architectural significance which is high in aesthetic value. The Bywater Historic District is a mixed residential-commercial area spanning 120 city blocks. The Holy Cross Historic District is primarily residential, covering a 60-block area. Building types in both historic districts include Creole cottages, shotgun houses, camelback houses, side hall plan houses, and bungalows. Both districts are aesthetically unique due to the diverse style and complementary architectural features present. Most of the residential structures are painted in light pastel colors. Mature trees are present along the streets in both neighborhoods, and they provide shade and a visual softness to the street environment. Many of the residential homes in the Holy Cross neighborhood were severely damaged by Hurricane Katrina, and are now gutted and in various stages of restoration. Substantial damage to residences and businesses also occurred in the Bywater Community, although the level of damage was much less than experienced in the Holy Cross neighborhood.

There is a community garden located on the east side of the IHNC, just north of St. Claude Avenue. The garden is on the same square block as an octagonal building housing a sewage pumping station. This community garden is maintained by local residents and serves as a cohesive element in a small area of the Lower Ninth Ward neighborhood. The community garden exists, even post-Katrina, and now produces food items that are sold at local area Farmer's Markets. The Upper Ninth Ward Farmer's Market is located at Holy Angels Convent on St. Claude Avenue and is open on Saturday afternoons.

Plan 1. No-build/Deauthorization

There would be no change to the aesthetic resources of the project area. However, it is anticipated that as renovation and rebuilding of the Holy Cross and Bywater neighborhoods continues, aesthetics in the project area would improve.

Plan 2. 1997 EIS Plan

The impacts on aesthetic resources were described in the 1997 EIS and are incorporated herein by reference. During construction activities, including levee and floodwall construction, new lock construction, demolition of the existing lock and bridge replacement, there would be adverse impacts on aesthetics, as views of the IHNC would include construction equipment and activities.

Plan 2 would reduce access to sections of the levee and batture adjacent to the IHNC because of the realignment of levees and replacement of levees with combination levees and floodwalls. The levees with a 4-foot high T-wall cap would create a visual barrier. The new St. Claude Avenue Bridge would have adverse impacts on the visual environment because the new structure would be 18 feet higher in the center than the existing structure. The slope of approaches would be slightly steeper and residents that have homes facing the approaches would be most negatively impacted. However, the new bridge approaches would remove a large portion of the concrete wall under the existing bridge approaches replacing the supporting wall with open space beneath the ramps. These new bridge approaches would allow passage beneath their decks and lighting would be provided beneath the ramps to deter vandalism and increase safety.

The stand of live oak trees between Sister Street and the IHNC lock would be lost with the construction of new levees and floodwalls. These are mature trees that are anticipated to have a substantial life expectancy.

Features of the project have been designed to minimize impacts on aesthetics of adjacent neighborhoods. Exterior surface of the new lock walls, floodwalls, bridge approaches and bridge piers would be finished with textured surfaces and shadow patterns to add visual appeal. All areas surrounding levees, floodwalls and bridge approaches would be landscaped. Lighting along existing roads used for detour routes would be improved and lighting along new detour roads would be provided. Green space at the new lock site would be created by back-filling the area created by tying the lock walls to the Claiborne Avenue and Florida Avenue bridges on the east side and the North Claiborne Avenue Bridge on the west side. The green space would be available for local agencies to develop into recreational areas.

The CDF would have an initial 17-foot high and 15-foot high berm, and at completion, construction would be visible from parts of the Lower Ninth Ward and from bridge crossings. Immediately following construction of the CDF, only herbaceous vegetation would be growing on the CDF and unvegetated areas would be visible detracting from the visual environment. However, given its proximity to a metal scrap yard, which currently piles debris (plastic and metal) at elevations equivalent to the final elevation of the CDF, and that the CDF would be allowed to revegetate with trees and shrubs, there would not be a long-term impact on aesthetic resources from the CDF.

Several mitigation measures would be implemented as part of Plan 2 to reduce the impacts on aesthetics. These include:

- Compensation for the loss of the stand of live oak trees near the existing lock would be provided by either transplanting some of the trees to nearby public lands, or planting of nursery stock of equivalent size to those lost, or/with an equivalent number of trees that in total equal the size of those trees destroyed (*e.g.*, five 2-inch diameter trees to replace one 10-inch diameter tree).
- A recreational path located south of the St. Claude Bridge in the Holy Cross neighborhood would be constructed on the protected side of the 4-foot high T-wall cap to provide recreational opportunities equivalent to the existing levee path. The path would be extended to the Chalmette Unit of the Jean Lafitte National Park in St. Bernard Parish.
- One or more observation decks with interpretive displays and benches would be constructed near the new floodwall to preserve the current recreational viewing opportunities.
- Areas within the public right-of-way along existing streets would be landscaped to add green spaces and visual buffers between the road and houses or lots.

Plan 3a. Cast-in-place Plan
Impacts on aesthetics from Plan 3a would be similar to those described under Plan 2.

Landfill Disposal Option
The placement of dredged material unsuitable for open water disposal in a landfill instead of in a CDF would reduce the size of the CDF. Further, the CDF would only be a temporary feature used to store dredged material until it could be re-used as backfill around the new lock, and potentially for material that needed to be dewatered before being transported to a landfill. Therefore, there would be no long-term visual impacts from dredged material storage.

Plan 3b. Float-in-place Plan
Impacts on aesthetics from Plan 3b would be similar to those described under Plan 3a.

5.3.23. Recreational Opportunities

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

Affected Environment

Prior to Hurricane Katrina there were 10 parks and playgrounds, two recreation centers and swimming pools operated by the New Orleans Recreation Department. All of the recreation areas sustained damage as a result of Hurricane Katrina and most are still in need of repair. Some are occupied residential and construction trailers, and trash litters some of the parks. Open space is also present in portions of the neighborhoods. The IHNC and Mississippi River levee and batture located south of the St. Claude Bridge within the Holy Cross neighborhood includes a jogging and walking path (see Photograph 5-8) and is still heavily used post-Hurricane Katrina (Figure 5-10). There are opportunities for passive recreation, such as viewing the river and downtown from the levee and batture. Subsided wetland areas along Bayou Bienvenue north of the railroad tracks provide open space for passive recreation for residents of the Lower Ninth Ward.

Recently, a wooden staircase and viewing/fishing platform was constructed over the levee and sheetpile floodwall that separates the Lower Ninth Ward from the degraded wetlands area along Bayou Bienvenue (Photograph 5-10).

Photograph 5-10. Temporary viewing platform in the Lower Ninth Ward

Both the Stallings and the Sanchez Recreation Centers were damaged by Hurricane Katrina and remain closed. The Stallings Center has been used as a trailer site since Hurricane Katrina.

Plan 1. No-build/Deauthorization

Since Hurricane Katrina, recreational opportunities in the area surrounding the IHNC Lock have been limited primarily to the use of open space areas such as the levee and batture within the Holy Cross neighborhood and the newly constructed temporary Bayou Bienvenue fishing and bird watching platform in the Lower Ninth Ward. New Orleans Recreation Department lacks the resources to improve and maintain the parks, playgrounds and recreational areas within the project area. It is anticipated that recovery of recreational areas would be accomplished through local community organizations and volunteers, and trailers located on public properties would be removed. The area along the levee and battue in the Holy Cross neighborhood is zoned light industrial; therefore, the possibility exists that the open space could be developed in the future (CMBC 2007).

Figure 5-10: Recreational Resources

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Plan 2. 1997 EIS Plan
The greatest impact on recreational opportunities would be the loss of accessibility to the levee area during construction activities. Following construction, a path on the protected side of the 4-foot high T-wall cap would continue to provide access for walking and jogging south of the St. Claude Avenue Bridge. There would also be impacts during construction on pedestrian and bicycle access across the IHNC for residents to reach parks and recreation centers.

Although at this time, most of the parks and recreation centers in these neighborhoods are not functioning, it is anticipated that they will be rebuilt during the project's construction life. The reduced accessibility to parks and recreation areas because of bridge closures and construction activities would be temporary and would return to pre-construction conditions following completion of the new IHNC Lock.

Community facilities, such as playgrounds, gardens, tot lots and linear parks, would be constructed in the four nearby neighborhoods as mitigation for impacts on recreational areas. These facilities would be constructed by the Federal government but operated by non-Federal interests. Also, a walking, jogging and biking path would be constructed near the new lock providing additional recreation opportunities for nearby residents.

Restoration of portions of the 440-acre triangular-shaped area located south of Bayou Bienvenue as mitigation for impacts on wetlands would provide improved habitat quality, thereby increasing bird watching and fishing opportunities for nearby residents.

Plan 3a. Cast-in-place Plan
The impacts on recreational resources from the implementation of Plan 3a would be similar to those described by Plan 2.

Landfill Disposal Option
The choice of dredged material disposal options (*i.e.*, CDF vs. landfill disposal) would have no impact on recreational resources.

Plan 3b. Float-in-place Plan
The impacts on recreational resources from the implementation of Plan 3b would be similar to those described by Plan 2.

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

Affected Environment
CEMVN completed studies of the potentially significant historic properties in the area that would be impacted by construction of the new lock. These studies were conducted between 1987 and 1992 and investigated the archaeological and historic property potential for the area of potential effect. A comprehensive summary of these studies is presented in the 1997 EIS and is incorporated herein by reference.

The IHNC Lock, which was completed in 1923, was evaluated and determined to be eligible for listing or the National Register of Historic Places. A detailed history and description of the IHNC Lock is presented in the 1997 EIS and is incorporated herein by reference.

The Galvez Street Wharf, originally known as the Claiborne Wharf, was designed by the Board of Commissioners in 1922 and erected in 1929. It was one of the first improvements to the Industrial Canal Zone. The building was evaluated and determined eligible for the National Register of Historic Places for its locally and regionally significant association with the early period of development of the IHNC (Criterion A). The Galvez Street Wharf was demolished in 2001 as part of the implementation of the IHNC Lock construction.

Sewage Pump Station B was built during the first decade of the 20th century and represents one of the original components of the New Orleans sewerage system. A detailed description and history of Sewage Pump Station B is presented in Appendix D of the 1997 EIS and is incorporated herein by reference. Sewage Pump Station B exhibited only minor alterations through the years and, overall, retained good integrity. The Sewerage Pumping Station B was evaluated and determined to be eligible for the National Register of Historic Places. Sewage Pump Station B was considered eligible for its association with events important to the settlement of New Orleans and the establishment of the city's early 20th century sewage system (Criterion A). In addition, the station was considered eligible for its Mediterranean architectural style, important to the city's early 20th century architectural history (Criterion C). Finally, the structure is also considered eligible for its engineering (Criterion C), and retains two of the original centrifugal pumps, along with two Wood Trash pumps which were installed around 1930, the latter of which are still in use. The 1930 changes made to the station in order to increase its capacity consisted of the installation of new pumps and new motors. The original 1904 plans were drawn with these future installations in mind.

Two historic districts listed on the National Register of Historic Places are located in the project area: the Holy Cross Historic District to the east of the IHNC, and the Bywater Historic District to the west of the IHNC. The Bywater Historic District was determined eligible for the National Register of Historic Places due to its architectural importance on both the local and regional levels for the quality and number of buildings built between 1807 and 1935. The predominant architectural type within the historic district is the shotgun type, which accounts for 61 percent of the structures in the district. The Holy Cross National Register of Historic Places Historic District was determined to be eligible for the National Register of Historic Places under Criterion D and also consists of predominantly single or double shotguns with Italianate and Eastlake details. A detailed discussion of both the Bywater and Holy Cross National Register of Historic Places historic districts is presented in Appendix D of the 1997 EIS and is incorporated herein by reference.

Hurricanes Katrina and Rita damaged many historic buildings in New Orleans, including buildings in both the Bywater and Holy Cross historic districts. As part of the Federal Emergency Management Agency's (FEMA) compliance with Section 106 of the NHPA, FEMA and the SHPO have completed surveys of affected New Orleans neighborhoods in order to evaluate the historic integrity of the districts currently listed on the National Register of Historic Places, confirm the existing boundaries of these National Register of Historic Places districts, and identify other neighborhoods that may also be eligible for National Register of Historic Places consideration. As a result of these surveys, FEMA and SHPO concluded that the historic boundaries of both the Bywater and Holy Cross National Register of Historic Places historic districts have expanded. FEMA is still

conducting the public involvement process to determine which buildings would be demolished that the City of New Orleans has identified as in imminent threat of collapsing. Through consultation with the public, FEMA is seeking to identify alternatives to the demolition of structures determined eligible for the National Register of Historic Places. Many of these structures are located in the Bywater and Holy Cross National Register of Historic Places historic districts, along with adjacent neighborhoods.

The St Claude Avenue and North Claiborne Avenue bridges were evaluated for their inclusion on the National Register of Historic Places. The St. Claude Avenue Bridge, built between 1918 and 1921, was determined to be eligible for inclusion on the National Register of Historic Places. The bridge is a Strauss Heel Trunnion Bascule bridge and represents a significant type of engineering structure which was in common use throughout the U.S. Because the St. Claude Avenue Bridge is a representative of its type, it is eligible for the National Register of Historic Places under Criterion C. The North Claiborne Avenue Bridge was determined not eligible for the National Register of Historic Places, as it was not considered an exceptional structure, rather an ordinary bridge for its time without any particular merit in design or construction. The bridge was also not associated with significant events in the past or significant people. As a result, the bridge is not considered a historic property.

The potential for intact archaeological deposits was evaluated for east and west of the IHNC Lock and along the originally proposed off-site construction area on the north bank of the GIWW/MRGO. Given the recent development, its location on the Mississippi River delta plain, which was deposited only a few thousand to a few hundred years ago, and the extensive disturbance resulting from the construction of the existing lock, it is anticipated that any prehistoric sites that may have existed in the construction footprint of the lock have been destroyed. To the west, near the Bywater neighborhood, archaeological investigations indicated that disturbance in the area varied from minor disturbance to total disturbance. Total disturbance was noted for the area along the IHNC and the approach for the Claiborne Avenue Bridge. Another archaeological study was conducted to the east of the IHNC. For this study, computerized mapping and historic archival material were used to predict the locations of historic features. The results of the archaeological investigations confirmed the predictions and it was noted that the deposits had good integrity and further research potential. In addition to empty lots, occupied residential and commercial lots were also tested. These also yielded cultural deposits and features that had good integrity and, as a result, good research potential.

Two archaeological sites have been recorded as being located along the south bank of the GIWW/MRGO near the proposed CDF and off-site construction area. These sites (16OR40 and 16OR41) have been determined to be not eligible to the National Register of Historic Places. A study in 1982 (Thomas 1982) found that widening and maintenance dredging of the GIWW had destroyed 16OR40. A large portion of the proposed off-site construction area on the south bank of the MRGO/GIWW was surveyed in 1984 as part a planned levee enlargement (Pearson 1984). The investigation focused on the relocation and evaluation of the Paris Road site (16OR41). The study area was tested through the use of a hydraulic, self-propelled, four-wheel drive drilling unit capable of wet and dry drilling. A total of 27 auger samples were taken across the study area to a depth of 17 to 20 feet. All the auger holes extended through what was identified as dredge spoil deposits. No cultural material was recorded in any of the auger holes and it is presumed that historic dredging destroyed most of the site (SHPO Correspondence dated 2 June 2008).

Plan 1. No-build/Deauthorization

Under the no-build alternative the IHNC Lock would continue to be operated and maintained by USACE and no adverse effects on the National Register of Historic Places-eligible IHNC Lock would occur.

The St. Claude Avenue Bridge would eventually need extensive rehabilitation or replacement by the State of Louisiana. Any rehabilitation would need to be in consultation with the Louisiana SHPO and would have to adhere to the Secretary of the Interior's standards for rehabilitation of historic structures. Although documentation to the standards of Historic American Engineering Record have been completed for the St. Claude Avenue Bridge by CEMVN, if it is determined that the rehabilitation would adversely affect the bridge's integrity or if the bridge needed to be replaced, then coordination with the SHPO and the Advisory Council on Historic Preservation by the State of Louisiana would be required. While the Historic Districts Landmark Commission and ordinances in place would protect the integrity of both the Bywater and Holy Cross National Register of Historic Places historic districts, historic structures in these neighborhoods would likely continue to deteriorate or be modernized. Over time this would adversely impact the historic character of the area.

Plan 2. 1997 EIS Plan

The impacts on cultural resources under Plan 2 would be the same as those described in the 1997 EIS and are incorporated herein by reference. Under this alternative the IHNC Lock and St. Claude Avenue Bridge would be demolished. These structures are eligible for the National Register of Historic Places and would be mitigated through the recordation to Historic American Engineering Record and Historic American Building Survey standards, which has been completed. Consultation with SHPO and Advisory Council on Historic Preservation has been completed and a Memorandum of Agreement prepared that outlines the mitigation efforts. There would be no other impacts on any historic or archaeological properties as a result if the implementation of this alternative.
The proposed mitigation measures outlined in the 1997 EIS would be the same and are incorporated herein by reference. Proposed mitigation measures include salvaging of one or more key, historically significant components of the existing lock and/or St Claude Avenue Bridge, publication of a brochure on the historical significance of the existing lock and St Claude Avenue Bridge; historical markers and displays of the lock, bridge, and/or surrounding neighborhoods patterned after those located at National Register locations; collection of oral histories from local residents; and the construction of a large display on maritime history.

There is the potential for deeply buried cultural resources at the proposed off-site construction and CDF sites. However, because this area has been used for dredged material disposal in the past, any cultural resources would be either highly disturbed or buried to a depth that could not be reasonably reached during surveys. Therefore, on 1 June 2008, a meeting was held among the Louisiana Division of Archaeology, CEMVN and a CEMVN cultural resources contractor. At that meeting it was decided that investigations for the proposed project would entail periodic monitoring of the CDF and off-site construction area to determine if either of the two previously discovered archaeological site still exists. If intact cultural deposits are found, all work in that area will stop and a plan to document the remains and to determine National Register of Historic Places eligibility will be made in consultation with the Division of Archaeology and any affected Indian Tribes. If either site is determined to be eligible to the National Register of Historic Places, consultation under Section 106 of the National Historic Preservation Act will be initiated (Appendix A).

Plan 3a. Cast-in-place Plan
The impacts from Plan 3a would be the same as those described for Plan 2, with the exception of potential impacts on cultural resources at the proposed off-site construction area, which would not be needed for the implementation of the cast-in-place design.

Landfill Disposal Option
The choice of dredged material disposal options (*i.e.,* CDF vs. landfill disposal) would have no impact on cultural resources because a smaller CDF would still be constructed to temporarily store dredged material that would be re-used as backfill around the new lock.

Plan 3b. Float-in-place Plan
The impacts from Plan 3b would be the same as those described for Plan 3a, with the exception of the proposed off-site construction area on the south bank of the MRGO/GIWW. The off-site construction area was thought to be the location of potentially eligible site. However, recent surveys were unable to locate the site, and it is believed to be destroyed or disturbed beyond the point of having any further research potential, and concurrence from SHPO has been received (Appendix A). Therefore, the construction of an off-site construction area on the south bank of the MRGO/GIWW east of the Paris Road Bridge would not impact any cultural resources.

5.3.25. Human Health and Safety
This resource is institutionally and publically important because of the potential for exposure of workers and the public to safety hazards, interference with adopted emergency response and evacuation plans, and exposure to hazardous materials in the environment.

Affected Environment
The project area is contained behind 12 and 15 foot high floodwalls and is relatively inaccessible to the public. No hazardous materials are stored in the project area, and lock and bridge workers follow Occupational Safety and Health Agency (OSHA) standards for workplace safety. The CDF and off-site construction area locations are also relatively inaccessible and are comprised of natural wooded lands; no public safety issues are associated with these two areas. Those neighborhoods surrounding the project area that were not severely damaged by Hurricane Katrina are densely populated and have typical public safety issues found in urban environments. Nearby neighborhoods that were severely damaged by Hurricane Katrina have been cleaned of debris by the Federal government and no substantial health and safety concerns remain.

Plan 1. No-build/Deauthorization
No changes to human health and safety are anticipated under the no-build alternative. OSHA regulations for workers would continue to be implemented for lock and bridge maintenance activities, and the lock would not be accessible to the public for safety reasons.

Plan 2. 1997 EIS Plan
All lock construction and demolition activities would occur within the IHNC and public access to these construction areas would be restricted. Additionally, during levee and floodwall reconstruction, fencing and signage would be placed along the perimeter of the construction areas to restrict access to construction sites. All workers would follow applicable OSHA regulations during construction to insure worker safety at all times. These regulations specify the amount and type of training required for industrial workers, the use of protective equipment and clothing, engineering controls, and maximum exposure limits with respect to workplace stressors. Construction workers at the construction sites would be exposed to safety risks from the inherent dangers of

construction sites. Contractors would be required to establish and maintain safety programs at the construction site. The proposed lock construction would not expose members of the general public to increased safety risks because of the site access restrictions.

As part of compliance with Section 402 of the Clean Water Act, a Stormwater Pollution Prevention Plan (SWPPP) would be developed for the project, and the use of Best Management Practices (BMPs) would be implemented as standard operating procedures during all construction activities, including measures for dust suppression and proper handling, storage, and/or disposal of hazardous and/or regulated materials. All non-recyclable hazardous and regulated wastes would be collected, characterized, labeled, stored, transported, and disposed of as regulated by the EPA and managed by construction contractor, pursuant to compliance with the Resource Conservation and Recovery Act (RCRA) and other applicable laws and regulations.

Solid waste receptacles would be maintained at staging areas. Non-hazardous solid waste (trash and waste construction materials) would be collected and deposited in on-site receptacles. Solid waste would be collected and disposed of properly in accordance with the Solid Waste Disposal Act [PL 89-272, 79 Stat. 997, as amended by RCRA, PL 94-580, 90 Statute 2795 (1976)].

The CDF would be designed to fully contain IHNC dredged material, is located within the HSDRRS, and receives the same level of risk reduction as businesses and residences east of the IHNC. Most of the CDF catastrophic scenarios are associated with the effects of hurricanes. Risks associated with forces of nature such as hurricanes and earthquakes are typically dealt with using statistical methods. For example, the 100-year flood protection is defined as the flood elevation that has a 1 percent chance of flooding in any given year (or a recurrence interval of 100 years). For purposes of designing the HSDRRS protection levels, the USACE has established a protection system designed with elevations sufficient to provide protection from a Standard Project Hurricane (1 percent chance of occurrence). Additionally, other circumstances have to be considered. For the CDF, even if a levee were to be breached, the CDF dike itself would serve as a backup system and it would be unlikely for both the primary and the secondary system to fail. Therefore, the selection of the 100-year protection level appears appropriate and the overall risk associated with hurricanes is estimated to be small.

Because the CDF would not have any use other than storage of dredged material, comparison to LDEQ-derived screening standards, also known as RECAP standards, was preformed. RECAP addresses risks to human health and the environment posed by the release of chemical constituents to the environment. RECAP screening standards represent contaminant concentrations within a specific environmental media that are protective of human health and the environment (LDEQ 2003). The screening standard for soil and groundwater may be for non-industrial (residential) or industrial land use scenarios. For the CDF-contained material, comparisons to the screening standard for industrial land use provides a conservative evaluation for potential human health risks, while comparison to screening standards for residential use provides an overly conservative screening evaluation of those risks. Results of the human health risk evaluation indicate that, even during catastrophic failure of the CDF during filling, exposure through direct contact (*i.e.*, ingestion, skin contact, and inhalation) or recreation (*e.g.*, boating and ingestion of fish/crabs caught in Bayou Bienvenue, IHNC, or GIWW) would not be expected to cause adverse health effects.

The perimeter of the CDF is expected to be fenced and, as such, would have limited accessibility to the general public. Therefore, under normal circumstances, potential

human exposures to material stored in the CDF would only occur within the perimeter of the CDF. People that may be exposed to the dredged material within the CDF during filling would likely be limited to authorized personnel working in the disposal operation or site maintenance (*i.e.*, workers) and perhaps an occasional unauthorized visitor (*e.g.*, trespassing recreational user). Workers and trespassers may be exposed to contaminants of potential concern in dredged materials and surface water primarily through incidental ingestion and dermal contact. However, workers would be expected to mitigate potential exposures by using appropriate personal protective equipment and following appropriate health and safety procedures. Inhalation of vapors or particulates would not likely be a significant exposure pathway for workers and recreational users due to surface water overlying the dredged materials, moist conditions, and because the vast majority of volatile organic compounds (VOCs) were below detection limits in dredged material (*i.e.*, limited number of chemicals present that are capable of volatilizing). Off-site receptors such as fishermen, crabbers, and other recreational users of the GIWW and Bayou Bienvenue would not be expected to be exposed to contaminants of potential concern in CDF dredged materials and surface water unless they were to trespass onto the site itself. In the event of intrusive work (*e.g.*, construction, excavation), appropriate exposure precautions (*e.g.*, use of personal protective equipment) would be taken to mitigate potential exposures of construction workers.

Plan 3a. Cast-in-place Plan
The impacts on human health and safety from Plan 3a would be similar to those described in Plan 2.

Landfill Disposal Option
The choice of dredged material disposal options (*i.e.*, CDF vs. landfill disposal) would have no impact on human health and safety, because both a landfill and a CDF are designed to permanently contain dredged material and are both subject to overtopping and flooding during a severe tropical storm event.

Plan 3b. Float-in-place Plan
The impacts on human health and safety from Plan 3b would be similar to those described in Plan 3a.

5.4. CUMULATIVE EFFECTS

NEPA requires a Federal agency to consider not only direct and indirect impacts of a proposed action, but also cumulative impacts of the action. Cumulative impacts are defined as the "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR 1508.7)." Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Hurricane Katrina damaged substantial portions of the HSDRRS and flooded most of the project area. The HSDRRS is divided into three CEMVN authorized projects: 1) LPV; 2) West Bank and Vicinity; and 3) New Orleans to Venice. West Bank and Vicinity and New Orleans to Venice projects are not discussed further because their alignments are not located within the project region. The LPV project was authorized by Section 204 of the Flood Control Act of 1965 (PL 89-298 as amended), and currently provides for enlargement of hurricane and storm damage risk reduction levees along Lake Pontchartrain in Orleans, Jefferson, and St. Charles parishes and in portions of Orleans and St. Bernard parishes between the Mississippi River and MRGO. Impacts of Hurricane Betsy on New Orleans in September 1965 (81 deaths and billions of dollars in

property damage) prompted Congress to authorize the LPV project to protect areas in the vicinity of Lake Pontchartrain and surrounding parishes from storm surges. Various projects that make up the LPV have resulted in construction of 125 miles of levees, concrete floodwalls and other structures. The LPV project has provided increasing levels of hurricane and storm damage risk reduction for the New Orleans area as funding for various component projects has been approved during the past 40 years.

Damage from Hurricane Katrina was immediately repaired through the Task Force Guardian Program, whose mission was to restore pre-Katrina levels of risk reduction by 1 June 2006. All construction efforts for Task Force Guardian were completed by the end of November 2006, and included 1.3 miles of new floodwall and 6.8 miles of scour repair along the IHNC. Following Hurricane Katrina, it was recognized that portions of the levees and floodwalls that comprise the LPV project were never constructed to authorized elevations, or had not been maintained to keep previously constructed structures at the authorized elevation. Therefore, CEMVN is in the process of implementing construction projects to raise the hurricane and storm damage risk reduction levees and floodwalls associated with the LPV project to authorized elevations.

In addition to ongoing construction in association with raising levee and floodwall elevations to authorized levels within various reaches of the LPV project, CEMVN is planning to raise levees, floodwalls, and floodgates, and construct new structures within all reaches of the LPV to provide 100-year level of risk reduction. This includes modifications in St. Charles Basin, Jefferson East Bank Basin, Orleans East Bank Basin, New Orleans East Basin, and Chalmette Loop Basin. Levee improvements throughout the LPV project would require substantial amounts of borrow material, and borrow pits have been identified to provide adequate material in proximity to proposed hurricane and storm damage risk reduction projects. In addition to modifying and raising existing structures, three new outfall canal closure structures are proposed at 17th Street, Orleans Avenue, and London Avenue canals in Orleans East Bank Basin, and new floodgates are proposed within the IHNC. All of the 100-year level of risk reduction projects are currently in planning and design stages, and impacts from these component projects are being addressed in separate Individual Environmental Reports (IER) and collectively in a Comprehensive Environmental Document.

CEMVN is also involved in other regional risk reduction and coastal restoration planning efforts. Louisiana Coastal Protection and Restoration efforts involve comprehensive planning for protection and restoration for all of coastal Louisiana. CEMVN as well as other Federal agencies participate in coastal restoration projects through the Coastal Wetlands Planning, Protection, and Restoration Act which are specific prioritized restoration projects implemented coast-wide by LDNR, Coastal Restoration Division in cooperation with Federal agencies. Within Lake Pontchartrain Basin there are 14 projects proposed or constructed under the Coastal Wetlands Planning, Protection, and Restoration Act, which are designed to restore, enhance or build marsh habitat and prevent erosion of marsh habitat. Projects involve numerous protection and restoration methods, including rock armored shoreline protection breakwaters, dredge material marsh construction, marsh terracing and planting, fresh water and sediment diversion projects, and modification or management of existing structures. One of these projects, the Bayou Bienvenue Restoration Project, is proposed at the location of the wetland mitigation site in the triangular-shaped area south of Bayou Bienvenue. The Bayou Bienvenue Restoration project proposes to create 440 acres of bald cypress-water tupelo swamp through the placement of dredged sediments from the Mississippi River. Following the placement of dredged sediments, and freshening through beneficial use of disinfected, secondarily treated sewage effluent, the area would be planted with bald cypress and water tupelo (*Nyssa aquatica*). The treated effluent would be provided by the

Orleans Wastewater Treatment Plant, contiguous with the restoration site. The area will be monitored to optimize the correct water levels and salinities for bald cypress and water tupelo growth and regeneration.

On 30 January 2009, CEMVN started the closure of the MRGO at the Bayou LaLoutre ridge which would stop all maritime access (deep-draft and shallow-draft) in the MRGO to the Gulf of Mexico from the IHNC. The closure structure will be constructed of rip rap and built to an elevation of +5 feet NAVD (after settling), connecting the historic Bayou LaLoutre ridgeline. Once completed, there would be no further access for maritime traffic between the Mississippi River, Breton Sound and Gulf of Mexico to the eastern leg of the GIWW besides the IHNC lock. CEMVN is also investigating large-scale habitat restoration of areas impacted by the MRGO, and includes coastal marshes, bayous and upland ridges between the GIWW and Breton Sound.

Following Hurricane Katrina, private property owners and insurance companies, financed by FEMA, demolished approximately 9,000 structures in the City of New Orleans. The City of New Orleans estimates that 1,881 additional properties would be demolished by 29 August 2008 when FEMA discontinues funding for demolitions. Rebuilding efforts throughout southeast Louisiana and along the Mississippi and Alabama Gulf Coast. The Insurance Information Institute (2007) has estimated that the total insured loss from Hurricane Katrina was $40.6 billion in six states, and in Louisiana insured losses are estimated at $25.3 billion; much of those insured losses will be a component of regional rebuilding efforts. Although it is unknown how many structures will be rebuilt in Orleans Parish and throughout the Gulf Coast over the next 5 to 10 years, a large-scale rebuilding effort is underway.

FEMA is also providing funding to the various public agencies in the City of New Orleans and St. Bernard Parish for rebuilding efforts. This includes funding for street repairs, including 6,000 city blocks in Orleans Parish, sidewalk repairs, repairs to damaged sewer and potable water infrastructure, and repairs or replacement of public buildings.

As discussed previously, to assist in guiding rebuilding efforts by planning district, District Plans for the project area were prepared as part of the Unified New Orleans Plan, which is a comprehensive post-Katrina planning effort. The plan recommends specific prioritized projects for future implementation. Unified New Orleans Plan primarily focused on housing recovery, redevelopment of neighborhood parks and schools, a regional library, utility and transportation upgrades, and redevelopment of retail shopping complexes.

Several transportation projects in the area are proposed. The completion of the new Florida Avenue Bridge by Louisiana Department of Transportation and Development could present increased growth scenarios, including pressure to extend the Florida Avenue corridor to the west to tie into Interstate 10 (I-10). Improved access across the IHNC along Florida Avenue to I-10 and downtown New Orleans, and improved access to the new Florida Avenue Bridge from connector streets in the Lower Ninth Ward, St. Bernard Parish and Florida neighborhoods, could induce redevelopment and growth.

A LA 46 (St. Bernard Highway) overpass of the Norfolk-Southern Railroad near Mehle Street in St. Bernard Parish is proposed. This project would improve traffic flow in the LA 46 corridor via the construction of a bridge over the rail operation of the Norfolk Southern Railroad.

The replacement of the Almonaster Bridge over the IHNC is proposed. The replacement of the Almonaster Bridge with a four-lane bridge would make Almonaster Boulevard a continuous four-lane roadway from Franklin Avenue to Interstate 510 and Old Gentilly Road in Eastern New Orleans. Further, the existing bridge, which is now nearly 90 years old, suffers from chronic maintenance problems and has been closed to vehicular traffic since Hurricane Katrina. The Almonaster Bridge also serves as the crossing for the CSX Railroad between their intermodal yard just east of the IHNC and the New Orleans Public Belt system that serves the extensive port facilities and other Class I railroads in the region, and a new bridge would make this crossing more reliable.

The widening of the I-10 high-rise bridge at the IHNC (north of the IHNC lock) to an eight-lane highway, with breakdown lanes, between the Almonaster exit of I-10 and Crowder Boulevard in eastern New Orleans is also proposed. The replacement of the I-10 bridge across Lake Pontchartrain between New Orleans East and Slidell is currently under construction.

RTA has proposed the extension of the streetcar system from Canal Boulevard to Poland Avenue along the Desire Line, which would extend streetcar service along Rampart Boulevard between the French Quarter and Treme neighborhoods and continue along St. Claude Avenue between the Bywater and St. Roch/Florida neighborhoods to the IHNC. This extension would be 2.9 miles in length and would have 24 stops along the route (RTA 2003).

Bicycle lanes are proposed for many of the streets in New Orleans, and bicycle lanes have recently been added to St. Claude Avenue. The new bicycle lanes extend from the St. Bernard/Orleans Parish line west to Elysian Fields Boulevard.

The development of a Wal Mart is proposed in the Meraux Tract. The Meraux Tract, the location for the originally proposed access road (1997 EIS) to relieve traffic in St. Bernard Parish, is one of the few undeveloped areas in western St. Bernard Parish. DOTD originally proposed a connector road similar to the connector road that was described in the 1997 EIS; however, public opposition to alternative road alignments between Judge Perez Drive and the new Florida Avenue extension caused DOTD to abandon the Meraux Tract alternatives in favor of access through Paris Road (DOTD 2005). Although the Florida Avenue Bridge and extension is currently on hold, it is anticipated that when funding becomes available, the project would be constructed.

Much of the container cargo installations located at the France Road Terminal, north of the IHNC Lock, have shifted to the Port of New Orleans' facilities along the Mississippi Riverfront. There are still container cargo installations located at the France Road Terminal, but this Port of New Orleans facility has adequate space for expansion. Other privately owned maritime and industrial facilities are still present along the IHNC; however, many of privately-owned facilities relocated to the Mississippi River or out of state immediately following Hurricane Katrina.

University of Colorado students have built a temporary viewing platform overlooking the triangular mitigation site area south of Bayou Bienvenue. The viewing platform includes steps providing access over the Sewerage and Water Board's levee and sheetpile flood wall. Additionally, the University of Wisconsin-Madison has been planning restoration concepts for the 440-acre triangular mitigation site with the goal of restoring cypress swamp.

Following delisting from closure under the Base Realignment and Closure Act of 2005 (2005 BRAC Law), Naval Support Activity New Orleans is on schedule to develop into a

"Federal City" housing regional Department of Homeland Security offices and other Federal agencies (West Bank). The $200 million state-of-the- art facilities are planned for Algiers, with space leased to government tenants at bargain rates. Historic Properties, Inc. and Environmental Chemical Corporation, LCC were selected as the master developer for the project on October 17, 2007. Construction (ground breaking) began on Federal City on 30 September 2008 (NOLA Federal City 2008).

Naval Support Activity East Bank consists of approximately 25 acres of land bound by residential housing on the west and north, the IHNC on the east, and the Mississippi River on the south. Military personnel currently located at the site are expected to relocate to the Federal City on the West Bank in Algiers by 2010. Efforts are currently underway by the Naval Support Activity New Orleans Advisory Task Force soliciting potential uses for surplus property.

Nearby Jackson Barracks, the 100-acre headquarters for the Louisiana National Guard is slated for $200 million worth of restoration. Community services such as fire and police stations, a health center,and a Veterans Administration outreach program are planned for the area. Below-ground utilities have been installed and armories and headquarters buildings have been constructed. A total of 16 buildings are expected to meet their January 2010 completion dates (New Orleans Times Picayune 2008b).

Plan 1. No-build/Deauthorization

Under the no-build alternative, improved hurricane risk reduction and traffic flow to I-10 and downtown from the new Florida Avenue Bridge and road corridor would increase redevelopment and growth in the project area. It is anticipated that much of the Meraux Tract would be developed in response to the improved conditions, and redevelopment of the Lower Ninth Ward would increase. However, without the replacement of the existing IHNC Lock, and the continued operational delays, additional maritime facilities would leave the IHNC area and relocate either out of state or to Mississippi River facilities. Additionally, with closure of the MRGO, the IHNC Lock would become the only east-west route for shallow draft navigation moving between Florida, Alabama and Mississippi and west Louisiana and Texas. As mentioned previously, Louisiana leads the Nation in tonnage of waterborne transported cargo. Ports in Louisiana are vital to the state and Nation's economic growth and development. Continued, and potentially increased, delays in the future, due to operations of the antiquated lock at the IHNC, would have significant adverse cumulative impacts on the economy of southeast Louisiana, and potentially the Nation as a whole, as port facilities and cargo would need to relocate to more reliable locations in the southeast, such as along the Tennessee-Tombigbee Waterway, Port of Mobile or the Houston Ship Channel. Additionally, increased delays would severely degrade the utility of the GIWW for waterborne transportation.

The HSDRRS is fully funded at $12.8 billion. These improvements are scheduled to be completed by June 2011. The socioeconomic impacts of this volume of construction work in the New Orleans MSA is difficult to quantify; however, the increased spending, demand on natural resources (*e.g.*, borrow material, fuel), need for housing for construction workers, and purchase of equipment and materials from the HSDRRS improvements would have secondary cumulative socioeconomic impacts region-wide. Furthermore, short-term cumulative impacts on transportation from increased construction worker traffic and temporary road closures are anticipated from the implementation of the 100-year level of risk reduction projects. Long-term beneficial cumulative impacts on socioeconomics of the region are anticipated after completion of the 100-year level of risk reduction projects and reduced risk from flooding due to large storm events.

Plan 2. 1997 EIS Plan

Cumulative impacts from Plan 2 were described in the 1997 EIS and are incorporated herein by reference. Much of the project area is defined by the IHNC, and many residents still feel that construction of the IHNC and IHNC Lock in the 1920s was a great injustice to the community and that the community has suffered since their construction.

The proposed off-site construction area located on the north bank of the GIWW/MRGO is owned by the Port of New Orleans. CEMVN would obtain a temporary easement on the site to construct the lock modules. Following completion of construction, the site would be available for the Port of New Orleans to use or lease at their discretion. The development of the site for graving operations would make the site more attractive for potential users, including vessel repair companies and shipping industries. Industrial use of the site could continue after construction and further spur development on adjacent lands east of Paris Road on the north bank of the GIWW/MRGO.

Lock replacement would likely increase the attractiveness of the GIWW and IHNC for waterborne cargo. It is also likely that the number of business and industries along the IHNC and GIWW would increase in response to the convenience and predictability of the new lock. Furthermore, it is predicted that there would be a considerable increase in the number of tows on the Mississippi River north of the IHNC and in the GIWW east of the IHNC with implementation of deep-draft lock compared to the no-build condition. The number of tows using the GIWW west of the IHNC would also increase in later years.

There is potential that the number of deep-draft trips would increase in the IHNC as the deep-draft lock would provide access where access is now limited because of the lack of dredging operations and closure of the MRGO. A potential increase in deep-draft and shallow- draft traffic in the GIWW would increase bank erosion in the channel. Wakes from ship traffic is the primary cause of bank erosion, and the additional traffic would contribute to cumulative wetland loss along the eastern leg of the GIWW. Additionally, the construction of the off-site construction area and a CDF to contain contaminated dredged material in combination with other projects being implemented in the region such as 100-year level of risk reduction projects, would lead to the loss of hundreds of acres of wetlands and bottomland hardwood forest habitat. Impacts on these habitats, including wetlands would be mitigated by restoration or creation of wetlands, and this mitigation would be a component of all projects in the region. However, even with mitigation in place, there would be a temporary cumulative loss of function of wetland and bottomland hardwood forest habitats until such a time as the mitigation sites have achieved adequate wetland functions.

Should the Florida Expressway be completed, it would be expected to divert significant traffic flow from Claiborne and St. Claude avenues, which would reduce traffic. Additional proposed traffic improvement projects, such as the Almonaster Bridge replacement project and the I-10 Bridge widening project, would provide cumulative beneficial impacts on the long-term traffic movement in the study area. Traffic improvements implemented by CEMVN as mitigation would also provide cumulative long-term benefits to the project area. Furthermore, it is likely that the traffic demands on the corridor in the future will be only marginally greater than they are at present, providing adequate capacity for local residents and commuters.

Short-term cumulative impacts on residents from construction and traffic noise would also include ongoing residential and commercial redevelopment construction activities. The renovation of existing structures and new construction in now vacant lots would add to the overall noise levels during the IHNC Lock construction. Additionally, 100-year level of risk reduction projects would contribute to the short-term cumulative noise

impacts in the region, until 2011 when these projects are anticipated to be completed.

Expenditures in the study area and regionally for redevelopment and risk reduction projects, in combination with expenditures for the IHNC Lock replacement would have cumulative socioeconomic benefits. These expenditures would contribute to sales tax revenue for the Orleans Parish and provide local and regional employment opportunities for both skilled and un-skilled labor. Greater employment opportunities also increase housing needs, which can lead to increase rental costs regionally, but also would increase home ownership rates and further contribute to redevelopment in the region. Alternatively, large construction projects, such as the IHNC Lock replacement project and 100-year level of risk reduction projects, reduce the livability of nearby neighborhoods, reduce aesthetics and interrupt linear recreational opportunities. These are cumulative short-term adverse socioeconomic impacts.

Plan 3a. Cast-in-place Plan
The cumulative impacts from Plan 3a would be similar to those described by Plan 2. However, no off-site construction area would be constructed which would reduce the cumulative impacts on wetlands and bottomland hardwood forest habitat.

Plan 3b. Float-in-place Plan
The cumulative impacts from Plan 3b would be similar to those described by Plan 2.

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SECTION 6.
PUBLIC INVOLVEMENT, REVIEW AND CONSULTATION

6. PUBLIC INVOLVEMENT, REVIEW AND CONSULTATION

6.1. PUBLIC INVOLVEMENT PROGRAM AND STUDY HISTORY

The public involvement process, including scoping and receipt of comments, was described in the 1997 EIS and is incorporated herein by reference. In summary, the initial public meeting was held on February 1, 1960 in the St. Bernard Parish Courthouse, Chalmette, Louisiana to discuss the MRGO new lock and connecting channels study. The public's opinion was that the new lock site should be adjacent to the existing lock. The public was adamantly opposed to the Upper Site located upstream of Violet and also opposed, but not as strongly, to the Lower Site, located downstream of Violet. The Meraux location, although described in the authorizing legislation, was determined to be unsatisfactory because of industrial development and adverse river conditions at that location. The public's overall opinion was that if they were forced to accept a location in St. Bernard Parish for the construction of a new lock, the Lower Site would be preferred.

Contrary to the public's opinion, navigation interests preferred the Upper Site because it offered better river conditions for accessing the lock. The Port of New Orleans had no preference between the Upper and Lower Sites.

A Lock Study Report produced by CEMVN in March 1961 addressed three alternative sites: a site adjacent to the IHNC Lock, the Upper Site and Lower Site. The report recommended construction of a barge lock at the Upper Site. After thorough review by CEMVN, it was recognized that no authority existed for the construction of a barge lock, and planning was curtailed until 1964, with the Port of New Orleans requesting that CEMVN re-initiate planning for a ship lock. The Port of New Orleans furnished new data for justification of a ship lock in June 1966, and requested the construction of a ship lock be considered near the existing IHNC Lock. In September 1966, CEMVN completed the Mississippi River, Baton Rouge to the Gulf of Mexico, Mississippi River Gulf Outlet, Report on the Need for a New Ship Lock report, which recommended that a general design memorandum be prepared for a new ship lock at the IHNC location. The Chief of Engineers authorized the general design memorandum, and the authorizing memo contained comments to the effect that limitations on vessel size imposed by the present small lock have, in all probability, caused ship traffic to remain at a fairly low level, and that much more detailed study of anticipated traffic, growth of port activity, and growth of industry should be made to support any conclusion as to the most feasible and desirable plan, including adopted lock size.

During 1967, three alignments for a new lock and connecting channels 375 feet, 500 feet and 1,750 feet east of the existing lock were investigated. During a conference concerning the project, the Port of New Orleans indicated that they could not support the development of a new alignment 1,750 feet east of the existing lock because of the disruption to the community. The consensus from the conference was to plan for a lock 500 feet east of the existing lock if the rail traffic over the canal would not impair the canal's utility. Planning for a new lock 500 feet east of the existing lock proceeded with contracts awarded for surveys and a marine and rail interference study. CEMVN compiled data for parts of the general design memorandum and a combined 7-year planning-construction schedule was approved by the Lower Mississippi Valley Division Office. In July 1969, the Port of New Orleans was informed by CEMVN that, due to foundational considerations and using conventional construction methods, the new lock could be constructed no closer than 750 feet from the existing lock. Because of their responsibility to provide real estate, bridge replacements, and other relocations and the tremendous social and economic impacts, the Port of New Orleans withdrew the State of

Louisiana's support for a new lock at the IHNC site and requested that sites in St. Bernard Parish be re-evaluated in accordance with the authorizing legislation.

During 1969, the Port of New Orleans suggested a new site in St. Bernard Parish, the Saxonholm Site, might be worthy of evaluation. This site, located upstream of the Upper and Lower sites, was determined to be the most disruptive to St. Bernard Parish residents. Due to the relatively greater impact on local residents by the Saxonholm Site alignment, and the conflict with the proposed interstate highway, planning for this site was discontinued.

From 1969 to 1972, the Upper and Lower sites were further refined. During this same period, considerable opposition from citizens groups and elected officials developed. A public meeting scheduled for April 1972 was postponed at the request of St. Bernard Parish officials so they could further study the proposed plan. The meeting was rescheduled for November 1972, but was again postponed when the St. Bernard Parish Police Jury demanded that the meeting be canceled and that only alternate sites be the topic of such meeting. Two public meetings were eventually held: one in New Orleans on November 29, 1972, and another in Chalmette on December 9, 1972. The meetings were well attended with a total for both meetings of approximately 1,600 people. The first meeting lasted 12 hours and the second meeting lasted 15 hours. Both meetings continued until no persons remained to testify. The major concerns voiced at the two meetings were the fear of environmental damage to wetlands, disruption of transportation and utilities by cutting the parish in half, and a fear of increased danger from flooding. Those in favor of the project included the Governor of Louisiana backed by all state agencies with the exception of LDWF, which took no position at the time of the meetings, but subsequently went on record favoring the IHNC site on environmental grounds; Port of New Orleans; Congressman F. Edward Hebert; Mayor of New Orleans; organized labor; the shallow-draft navigation industry (American Waterway Operators); numerous shipping firms; civic groups; and individuals. The opposition to a new lock in St. Bernard Parish included the political leadership, citizens of the parish, a number of environmental organizations and a small segment of local shallow-draft navigation interests. Petitions against the project being located in St. Bernard Parish contained over 18,000 names.

The State of Louisiana's support for a deep-draft lock at the Lower Site required that certain conditions be met. These conditions are summarized as follows:

- A four-lane high-level highway bridge would be constructed at Federal expense over the new channel;
- All utilities, such as gas and water lines and railroads, would be relocated so that no interruption of services would occur to residents;
- Construction of the lock and channels would not commence until construction of the highway bridge and relocation of all utilities and traffic arteries are completed;
- Construction of levees along the connecting channels would be to project grade and section to withstand the project design hurricane, and that these levees be completed before the hurricane and storm damage risk reduction levee along the MRGO is cut;
- The EIS would be prepared prior to the start of construction of the project so that the EIS may be thoroughly considered and reviewed by all appropriate state agencies; and,

- Upon completion of the project, the connecting channel and the land immediately adjacent to the channel would be placed under the jurisdiction and control of the appropriate St. Bernard Parish authorities.

In view of the considerable opposition and controversy raised by the use of a site in St. Bernard Parish, investigations were made of possible new sites suggested during the 1972 public meetings and sites previously investigated. These included:

- IHNC Site, Orleans Parish;
- Saxonholm Site, St. Bernard Parish;
- Upper Site, St. Bernard Parish;
- Lower Site, St. Bernard Parish;
- Caernarvon Site, St. Bernard and Plaquemines Parishes;
- Scarsdale Site, St. Bernard and Plaquemines Parishes; and,
- Bohemia Site, St. Bernard and Plaquemines Parishes.

Fourteen alternative plans comprising these seven sites were compared and ranked independently by CEMVN and the Port of New Orleans based upon criteria such as cost, construction difficulty, navigation benefits, navigation adequacy, local economics, relocations, social impacts, ecological impacts, operation and maintenance difficulties and public sentiment. A CEMVN planning conference to discuss the IHNC Site construction techniques was held on March 27-28, 1973 and the consensus of expert technical opinion was that by using a unique cofferdam construction method, a ship lock could be constructed on the east side of the IHNC within real estate limitations previously determined to be the maximum acceptable. This opinion, along with successive screening of the 14 alternative plans, resulted in the elimination of plans at the Saxonholm, Caernarvon, Scarsdale and Bohemia sites, and carrying four plans forward for continued analysis:

- IHNC Site – east of channel center, opposite Galvez Street Wharf;
- IHNC Site – east of the existing lock;
- Lower Site with a land bridge at the IHNC (filling of the IHNC); and,
- Lower Site.

An interim report containing relative considerations of various plans and modes of operation for a new lock at the IHNC and Lower Sites was sent to city, parish, state and Federal agencies and officials directly concerned or representing a segment of the public potentially impacted by a new lock. Of the 72 packages mailed, 27 responses were received. In general, those persons representing or living in St. Bernard Parish, and ecologists were opposed to a new lock at the Lower Site, while those persons living in Orleans Parish and elsewhere, and those persons associated with the State of Louisiana and the transportation industry, were in favor of the Lower Site.

As a result of the interim report and responses from its review, in 1973 two plans were selected for more detailed study; the IHNC Site – east of channel center, opposite Galvez Street Wharf and the Lower Site. These two plans were compared in detail in the Mississippi River – Gulf Outlet, New Lock and Connecting Channels, Site Selection Report, prepared by CEMVN in March 1975. After considering the views of other agencies and the concerned public relative to site selection and economic effects, the District Engineer considered the Lower Site Plan to provide the best solution to the total problem and one that offered the most effective means of achieving the purposes of the authorized project. In April 1976, the St. Bernard Parish Police Jury released the "Official Presentation of the Governing Authority and the People of St. Bernard Parish, State of Louisiana," an 8-page long denouncement of the proposed lock project in St.

Bernard Parish. The preparation of a general design memorandum for construction of a lock at the Lower Site proceeded with the approval of the Chief of Engineers.

In April 1977, President Jimmy Carter, citing environmental considerations, directed the CEMVN to undertake further studies of a replacement lock at the IHNC Site with emphasis on actions to minimize the displacement and disruption of residents. The Steering Committee for a New Ship Lock was formed in 1978 by the Port of New Orleans to provide a forum for exchange of information between interested parties and CEMVN and Port of New Orleans. On May 2, 1978, shortly after the formation of SCANS and after general guidance from the USACE's Washington D.C. headquarters was received by CEMVN relative to President Carter's instructions, SCANS and the Dock Board held a public meeting for the purpose of soliciting feedback from the community around the IHNC. The primary concern voiced by the local community representatives was to provide the opportunity to make community and neighborhood desires known before decisions were made. Responding to this request, the Port of New Orleans, in conjunction with the City of New Orleans and with CEMVN participation, hired the consulting firm of EDAW, Incorporated to prepare a Community Development Plan for the Ninth Ward (IHNC Site) and a Social Impact Assessment of the possible alternatives. EDAW developed and instituted an involvement program consisting of three main communication elements: workshops, newsletters, and a project field office. The program resulted in direct citizen participation in a study of the Ninth Ward, local residents' recognition of common neighborhood problems and issues, and cognizance of the status of various planning efforts by government agencies.

Information gathered by the Steering Committee for a New Ship Lock and extensive comparative economic analysis were used by the CEMVN to prepare a preliminary draft, feasibility-level report with accompanying EIS in 1982, with the tentatively selected plan being a new lock at the IHNC Site, adjacent to and east of the existing lock. CEMVN identified this site as the National Economic Development plan on the basis of economic considerations, but also recognized that this site had the most severe negative impacts on local neighborhoods. After the draft report had been reviewed by the USACE's Lower Mississippi Valley Division office, and subsequently revised by the CEMVN, CEMVN was instructed not to release the report to the public and to cease working on the study because of unresolved issues. The study was put on hold from 1982 until 1987 when planning efforts resumed after passage of the WRDA of 1986 (PL-99-662) and receipt of a letter of support from the Governor of Louisiana. WRDA of 1986 modified Public Law 455 of 1956 "…to provide that the replacement and expansion of the existing Industrial Canal Lock and connecting channels or the construction of an additional lock and channels shall be in the area of the existing lock or at the Violet Site… The Secretary is directed to make maximum effort to assure the full participation of members of minority groups, living in the affected areas, in the construction of the replacement or additional lock and connecting channels…"

A Notice of Intent to prepare an EIS was published in the *Federal Register* on April 11, 1988. A scoping input request was mailed to Federal, state and local elected officials and government agencies, local news media, concerned citizens, residents of the Ninth Ward near the IHNC, affected industries, and other interested parties on June 6, 1988. From the 595 letters sent, 19 responses were received. A Scoping Document, summarizing the comments, was sent to all of the persons who responded to the original request. A copy of this Scoping Document was included in the 1997 EIS and is incorporated herein by reference.

From 1987 to 1990, various lock sizes and construction techniques at both the IHNC site and the Violet site were investigated. Efforts were made to minimize environmental

impacts and socioeconomic disruption at the Violet site, while planning efforts for the IHNC alternatives concentrated on minimizing impacts on local residents. In January 1989, a meeting of various local, state, and Federal agencies was convened by CEMVN to discuss environmental mitigation options from impacts at the Violet Site. With the exception of the USFWS, who, by law, must assist the USACE in mitigation planning for impacts on natural resources, the other agencies offered little assistance in identifying potential mitigation options. In fact, the Governor's Assistant for Coastal Affairs stated that it was a waste of time to even discuss the subject because a lock at Violet would never be consistent with Louisiana's Coastal Resources Program.

On 18 April 1989, the St. Bernard Parish Police Jury unanimously passed a resolution reiterating its previous opposition to a connecting link at Violet or any other site in the parish. In addition, the St. Bernard Planning Commission stated in a letter dated 21 August 1989, that a parish-wide planning study would be necessary to identify impacts of a lock at Violet and to identify potential mitigation sites for losses of fish and wildlife resources. The letter contained numerous other demands, some of which were not within USACE authority. During meetings with residents and elected officials of St. Bernard Parish, criticism of the USACE was repeatedly raised regarding the construction of the MRGO through St. Bernard Parish, with criticism focusing on economic development associated with the MRGO never materializing. Also the long-term adverse environmental effects of the MRGO continued to anger the local populace. It was for these reasons that many residents remained opposed to any new Federal navigation project in St. Bernard Parish.

At the 27 March 1990 meeting of the Inland Waterway User Board, CEMVN announced the decision to consider any plans for a new lock in the vicinity of Violet as un-impenetrable on environmental grounds. Public comments at the meeting were in favor of constructing a new lock at the IHNC as soon as possible. A "mini-report" justifying the elimination of the Violet Site as a viable alternative was prepared by the CEMVN in January 1991, and sent to the higher authority for approval. The Assistant Secretary of the Army for Civil Works office concurred with the CEMVN's recommendation, but instructed that the rationale for eliminating the Violet Site from further consideration must be detailed in the feasibility report/EIS.

The Committee on Appropriations of the U.S. House of Representatives, in conjunction with the Fiscal Year 1991 Appropriations Act, directed the USACE "…in conjunction with the local project sponsor… to implement a community participation process with affected residential, business, and governmental entities… The Corps shall designate an advisory group for the purposes of exchanging information and receiving community opinion and advising the District Engineer on various aspects of the project. The Corps shall give maximum consideration to lock replacement alternatives which minimizes [sic] residential and business disruption while meeting the goals of improving waterborne commerce…"

In an initial response, CEMVN established the Industrial Canal Lock Advisory Council, made up of four community representatives, three business representatives, four navigation industry representatives, and four local elected officials. The Council held two contentious public meetings in February and June 1991 that underscored the extent of opposition in the neighborhoods to construction of a replacement lock and the depth of distrust that the neighborhood residents had for the other stakeholders in the process. The lack of progress by the Council prompted CEMVN to try a more direct approach in communicating with local interests. A Neighborhood Working Group was established with representatives of the Holy Cross Neighborhood Association, the Lower Ninth Ward Neighborhood Council, the Bywater Neighborhood Association, the St. Claude Avenue

Business Association, the Historic Districts Landmark Association, the New Orleans City Planning Commission, Regional Planning Commission, the Port of New Orleans, and CEMVN as members.

At the first meeting of the Neighborhood Working Group held in August 1991, CEMVN representatives explained that the group was established to provide a more direct and effective means of communicating with the community. Although local community representatives on the Neighborhood Working Group repeated their determined opposition to building a replacement lock and bridges within their neighborhoods, they approved of the new, direct approach and indicated their willingness to listen and work with CEMVN. Subsequent meetings were held every 2 weeks over a period of 4 months. Local representatives repeatedly asked why a location in the IHNC, north of Claiborne Avenue, which had been identified in a socioeconomic impact evaluation and mitigation plan prepared by a local consultant for CEMVN, was not being presented as an alternative construction site. According to the consultant's report, a site for a new lock north of Claiborne Avenue had the potential to significantly reduce project-related impacts on the community. Although CEMVN explained that previous design studies showed that lock construction at this location would be more costly and would require the closure of the IHNC for a period of up to 6 years, community representatives insisted that the North of Claiborne Avenue site represented the least objectionable location from a community impact standpoint. Community leaders also voiced strong opposition to a mid-level replacement bridge at St. Claude Avenue, which was a critical feature of plans for a new lock located at a site adjacent to the existing lock. As a result of the group's deliberations, CEMVN agreed to further investigate the prospect of constructing a replacement lock north of Claiborne Avenue with a low-level replacement bridge at St. Claude Avenue. At a meeting of representatives of CEMVN, the Port of New Orleans and local elected officials in December 1991, the elected officials expressed a desire to be more involved with the project. At the request of the Port of New Orleans, CEMVN delayed any further meetings of the Neighborhood Working Group to give the elected officials the opportunity to become more involved in the planning process. At a follow-up meeting, the Port of New Orleans and local elected officials agreed that only the North of Claiborne Avenue plan is implementable and refused to support other plans at the IHNC because of intolerable and unmitigable neighborhood impacts.

During 1992 and the first half of 1993, while the Neighborhood Working Group was inactive, CEMVN developed a new plan for constructing a replacement lock at the North of Claiborne Avenue Site. In August 1993, the Port of New Orleans, in conjunction with CEMVN, re-activated the Neighborhood Working Group in an attempt to identify community needs and mitigation requirements for the North of Claiborne Avenue Site. On the basis of Neighborhood Working Group meetings, CEMVN formulated a comprehensive mitigation plan that incorporates many of the ideas, concerns, and desires of local residents. The action by CEMVN to consider input from the Neighborhood Working Group in the preparation of a comprehensive plan complies with the guidance outlines in the Fiscal Year 1991 reports of the House and Senate Appropriations Committees. Consequently, the tentative selection of the North of Claiborne Avenue Site, coupled with the process used to develop the project mitigation plan, fulfill Congressional guidance.

CEMVN has also established a Navigation Working Group that includes representatives of the American Waterway Operators, the Gulf Intracoastal Canal Association, the Louisiana Association of Waterways and Shipyards, the Louisiana Intracoastal Seaway Association, the Inland Waterway Users Board, the New Orleans Steamship Association, the Port of New Orleans, the U. S. Coast Guard, the Greater New Orleans Barge Fleeting Association, USACE, and other users of the IHNC. The Navigation Working Group has

met on several occasions since December 1991, for productive discussions on a variety of topics. The group's position to date is that, even if the North of Claiborne Avenue Site causes some inconveniences to the navigation users during construction, it is the alternative that has the best potential of being constructed.

In August 1994, the Port of New Orleans and CEMVN opened a project information office in the Sanchez Center, a community center located in the Lower Ninth Ward. The office provided an easily-accessible location for local residents and served as a clearinghouse for information about the lock replacement plan. Community representatives had requested such an office. Office staff provided information about the lock replacement plan and received feedback from residents. In addition, informational brochures and a display were located in the Alvar Street Library.

Many of the meetings at which representatives of CEMVN met in preparation of the 1997 EIS were recorded and the results of the meetings presented in the EIS, and are incorporated herein by reference. Meetings with local interests to discuss the project and associated community impact mitigation plan took place up to the release of the draft EIS and continued during preparation of the final EIS.

A public meeting to present the tentatively selected plan to the public and for the public to voice their comments and concerns was held on 27 January 1997, at the Holy Cross Middle and High School. Approximately 300 people attended the meeting, with 48 people presenting oral comments. The majority of the people providing comments were residents of the neighborhoods adjacent to the IHNC, who voiced their opposition to the tentatively selected plan. Their opposition was mainly due to the disruption of their communities that would occur during project construction. Specific comments voiced were decreased real estate values, increased vacancy rates, loss of customers at local businesses, increased travel times, traffic delays, loss of access across the canal, decreased school enrollment, noise, vibrations, loss of green space, destruction of the historic neighborhoods, and release of contaminated sediments. Traffic detours and delays during the bridge outage periods were the basis for most of the concerns expressed by local residents. Several commenters criticized the mitigation plan for containing items which are not mitigation, but rather are required features of a project in an urban environment. There were some representatives from the shallow-draft navigation industry who spoke in favor of the project. A complete transcript of the public meeting, and responses to the comments presented, and the letters received on the draft EIS, were provided in the 1997 EIS and are incorporated herein by reference.

Based on the comments received on the draft EIS, the final EIS was revised to include a temporary bridge at St. Claude Avenue during the replacement of the existing bridge; a revised plan for modifying the North Claiborne Avenue bridge which reduces the outage time; a fold-down floodwall in the Holy Cross area in lieu of a fixed floodwall; and a revised community impact mitigation plan. The community impact mitigation plan was revised considerably, with some mitigation items contained in the draft mitigation incorporated as part of the construction plan. The funding amounts for some of the items remaining in the mitigation plan were increased, and some new items were added. The total estimated cost of the mitigation plan remained the same, at $33 million.

A Record of Decision was signed on 18 December 1998 selecting the location and construction method of the replacement lock and several additional project components to improve the surrounding project area. CEMVN's decision was challenged in U.S. District Court and the Court's Order for Motions for Summary Judgment was issued on 3 October 2006 as part of Case No. 2:03-cv-00370-EEF-KWR, District Court Eastern District of Louisiana. The Court's decision enjoined CEMVN from continuing with the

project until additional NEPA compliance was completed. As such, this SEIS was prepared to update and supplement the 1997 Final EIS to determine if any significant changes are necessary to the project and to ensure sufficient environmental analysis of the project impacts.

A public scoping meeting was held on 4 April 2007, in the cafeteria trailer of the Holy Cross School in New Orleans, Louisiana. In the announcement for the scoping meeting sent in March 2007, two questions were provided as a means of focusing the public's concerns:

Question #1: What are the most important issues, resources, and impacts that should be considered in the SEIS?

Question #2: Are there any other alternatives or modifications to the tentative alternatives that should be considered in the SEIS?

At the scoping meeting, CEMVN presented a brief description of the scoping process, CEMVN study process, and CEMVN compliance procedures for implementing the NEPA process, with particular emphasis on the SEIS. Facilitators recorded participants' comments and 44 individuals participated in the scoping meeting. Scoping meeting participants presented their concerns regarding the proposed study. Every individual comment was recorded until no new comments were expressed. A Scoping Report is provided in Appendix P. The majority of comments focused on noise or vibration impacts from the pile driving; the length of time of bridge closures during construction; the economic viability of the proposed IHNC replacement lock and a deep-draft channel versus a shallow-draft channel; and dredging and disposal of contaminated materials. These comments were addressed in the SEIS by conducting a new noise analysis; a new traffic impact analysis; an economic analysis update; and implementing the Water Quality and Sediment Evaluation plan.

The draft SEIS was provided to the public on 10 October 2008 for a 45 day review and comment period. Due to the volume of materials to be reviewed, several requests were received to extend the public review and comment period. CEMVN granted an additional 60 day review period, extending the comment period to 26 January 2009. The public was provided a total of 105 days for review and comment. During the draft SEIS review and comment period, a public hearing was held to describe the NEPA process, the proposed project components and solicit public input. Comments received during the public hearing and the 105-day long review and comment period, and responses to those comments are provided in Appendix S.

6.2. REQUIRED COORDINATION

Construction of the recommended plan will not commence until the recommended plan achieves environmental compliance with all applicable laws and regulations, as described below. Environmental compliance for the recommended plan would be achieved upon: coordination of this SEIS with appropriate agencies, organizations, and individuals for their review and comments; USFWS and NOAA Fisheries confirmation that the recommended plan would not be likely to adversely affect any endangered or threatened species or completion of Endangered Species Act Section 7 consultation (USFWS concurrence received 19 September 2008; see Appendix B); LDNR concurrence with the determination that the recommended plan is consistent, to the maximum extent practicable, with the Louisiana Coastal Resources Program (concurrence received 13 February 2009); receipt of a Water Quality Certificate from the State of Louisiana; public review of the Section 404(b)(1) Public Notice, which ended on 12 November 2008;

signature of the Section 404(b)(1) Evaluation; EPA concurrence with ocean disposal of dredged material in accordance with Section 103 of the Marine Protection, Research, and Sanctuaries Act; coordination with the Louisiana SHPO, which was completed on 8 March 2001; receipt and acceptance or resolution of all USFWS Fish and Wildlife Coordination Act recommendations; receipt and acceptance or resolution of all LDEQ comments on the air quality impact analysis documented in the SEIS; and receipt and acceptance or resolution of all NOAA Fisheries Essential Fish Habitat recommendations. Table 6-1 provides a list of the relevant laws and regulations that guided the preparation of the SEIS.

6.3. STATEMENT RECIPIENTS

Copies of the draft SEIS were provided to U.S. Senators and Congressmen representing Louisiana, USFWS, NOAA Fisheries, NRCS, FEMA, HUD, EPA, state and local elected officials from the New Orleans region; LDNR, LDEQ, LDWF, environmental groups, local libraries, and other interested parties. Copies were also made available at public libraries on the www.nolaenvironmental.gov website. A complete list of recipients of the draft SEIS is provided in Section 10.

6.4. PUBLIC VIEWS AND RESPONSES

Public views and responses have been described in detail in Section 6.1, Public Involvement Program and Study History, as well as in the Scoping Summary Report located in Appendix P. Based upon a long history of widespread opposition to a new lock location in St. Bernard Parish and damage to coastal wetlands from any location evaluated, CEMVN has determined that a new lock cannot be constructed in St. Bernard Parish. Numerous studies, input from the public, the local sponsor and navigation interest has led to the determination that the only reasonable location for a new lock is the North of Claiborne Site. Opposition to a new lock located north of Claiborne Avenue in the IHNC has occurred from local residents and elected officials due to disruption of the community. The draft SEIS was circulated for a 105-day long public review and comment period. A public hearing to describe the proposed project and solicit input was held on 12 November 2008 at the Martin Luther King, Jr. Charter School. The transcripts from the public meeting and comments on the draft SEIS are provided in Appendix S. The majority of the comments concerned the construction and maintenance of the CDF, the economic analysis and justification for the lock replacement, impacts on wetlands, noise and traffic during construction activities, wetland mitigation planning, and the community based mitigation.

6.5. FISH AND WILDLIFE COORDINATION ACT

USFWS has provided a Final Coordination Act Report which is contained in Appendix N. USFWS has coordinated their report with NMFS and LDWF and incorporated their comments. The Coordination Act Report contains specific recommendations for minimizing adverse impacts on the natural environment. The following are the USFWS conservation recommendations and the CEVMN responses.

1. CEVMN and local sponsor shall obtain 36.28 habitat units by either creating at least 85 acres of marsh in the area south of Bayou Bienvenue, as proposed, or by mitigating elsewhere, or by a combination of the two to compensate for the unavoidable, project-related loss of the early successional forested wetlands. The USFWS, NOAA Fisheries, LDWF, and LDNR should be consulted regarding the adequacy of any proposed alternative mitigation sites.

Table 6-1. Relevant Laws and Regulations Providing Guidance in the Development of this SEIS

Action Requiring Permit, Approval, or Review	Agency	Permit, License, Compliance, or Review/Status	Relevant Laws and Regulations
Sound/Noise			
Construction and operations	EPA	Compliance with surface carrier noise emissions	Noise Control Act of 1972 (42 United States Code (USC) 4901 *et seq.*), as amended by Quiet Communities of 1978 (PL 95-609)
Air			
Construction and operations	EPA	Compliance with NAAQS and emission limits and/or reduction measures	Clean Air Act and amendments of 1990 (42 USC 7401(q)) 40 CFR 50, 52, 93.153(b)
Water			
Construction sites with greater than 1 acre of land disturbed	EPA	Section 402(b) National Pollutant Discharge Elimination System General Permit for Storm Water Discharges for Construction Activities	Clean Water Act of 1977 (33 USC 1342) 40 CFR 122
Construction in or modification of floodplains	Water Resources Council, FEMA, and Council on Environmental Quality	Compliance	Executive Order (EO) 11988 (Floodplain Management), as amended by EO 12608 (Elimination of unnecessary Executive orders and technical amendments to others)
Construction in or modification of wetlands	USACE and USFWS	Compliance	EO 11990 (Protection of Wetlands), as amended by EO 12608
Potential discharge into waters of the state (including wetlands and washes)	LDEQ	Section 401 Permit	Clean Water Act of 1977 (33 USC 1341 *et seq.*) 40 CFR 121
Discharge of dredge or fill material to a watercourse	USACE	Section 404 Evaluation	Clean Water Act of 1977 (33 USC 1344) 40 CFR 230
Consistency with the Louisiana Coastal Management Program	Administered by LDNR	Compliance	Coastal Zone Management Act of 1972 (16 USC 1456(c)) Section 307
Soils			
Current operation involving hazardous waste and/or remediation of contamination site	EPA	Proper management, and in some cases, permit for remediation	Resource Conservation and Recovery Act of 1976 (42 USC 6901(k)), as amended by Hazardous and Solid Waste Amendments of 1984 (PL 98-616; 98 Statute 3221)
Release or threatened release of a hazardous substance	EPA	Development of emergency response plans, notification, and cleanup	Comprehensive, Environmental Response, Compensation, Liability Act of 1980 (42 USC 9601), as amended by Emergency Planning and Community Right-To-Know-Act of 1986 (42 USC 11001 *et seq.*)
Prime and unique farmlands	NRCS	NRCS determination via Form AD-1006	Farmland Protection Policy Act of 1981 (7 USC 4201 *et seq.*) 7 CFR 657-658
Soil conservation of Federal lands	NRCS	Compliance	Soil Conservation Act (16 USC 590(a) *et seq.*)

Table 6-1, continued

Action Requiring Permit, Approval, or Review	Agency	Permit, License, Compliance, or Review/Status	Relevant Laws and Regulations
Natural Resources			
Identification of threatened and endangered species and their habitats	USFWS, NMFS	Compliance by lead agency and/or consultation to assess impacts and, if necessary, develop mitigation measures	Endangered Species Act of 1973, as amended (16 USC 1531) Sections 7 and 9 50 CFR 17.11-17.12
Protection of migratory birds	USFWS	Compliance by lead agency and/or consultation to assess impacts and, if necessary, develop mitigation measures	Migratory Bird Treaty Act of 1918 (16 USC 703) 50 CFR Chapter 1
Protection of bald and golden eagles	USFWS	Compliance by lead agency and/or consultation to assess impacts and, if necessary, obtain permit	Bald and Golden Eagle Act of 1940, as amended (16 USC 688(d)) 50 CFR 22.3
Conserve and promote conservation of non-game fish and wildlife and their habitats	USFWS, NMFS	Compliance	Fish and Wildlife Conservation Act (16 USC 2901)
Protection of marine mammals	NMFS	Compliance by lead agency and/or consultation to assess impacts and, if necessary, develop mitigation measures	Marine Mammal Protection Act of 1972 (16 USC 1361)
Requires agencies to restrict the introduction of exotic organisms into natural ecosystems	USACE and Port of New Orleans	Compliance	EO 13112 (Invasive Species)
Health and Safety			
Health and safety standards	Occupational Safety and Health Administration (OSHA)	Compliance with guidelines including Material Safety Data Sheets	Occupational Safety and Health Act of 1970 (29 USC 651) 29 CFR 1975
Cultural/Archaeological			
Disturbance of historic properties	USACE, SHPO and Advisory Council on Historic Preservation	Section 106 Consultation	NHPA (16 USC 470 *et seq.*) 36 CFR 800 Army Regulation 200-4 Cultural Resources Management Presidential Memorandum regarding government to Government Relations (April 29, 1994) EO 13007 (Sacred Sites Native American Graves Protection and Repatriation Act)
Investigation and excavation of cultural resources	Affected land-managing agency	Permits to survey and excavate/ remove archeological resources on Federal lands; Native American tribes with interests in resources must be consulted prior to issue of permits	Archeological Resources Protection Act of 1979 (16 USC 470(a)(a)-470(ii)) 43 CFR 7
Socioeconomic			
Disproportionately high and adverse human health or environmental effects on minority and low-income populations	EPA	Compliance	EO 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations)

Response: CEMVN is committed to mitigating for the project impacts on wetlands, and will either create marsh in the area located south of Bayou Bienvenue or mitigate elsewhere or by combination of the two, to compensate for the loss of forested wetlands due to the construction of the CDF and off-site construction area.

2. The USFWS strongly supports using all clean dredged material to create brackish marsh that will improve fish and wildlife habitat in the project area. Furthermore, such marsh creation could provide fish and wildlife habitat benefits to offset unavoidable habitat losses at the proposed CDF, graving and stockpile sites.

Response: The recommended plan is to use only clean dredged material to create marsh in the area south of Bayou Bienvenue. Dredged material being disposed in the Mississippi River is suitable for freshwater disposal but not for estuarine disposal and is not proposed to be used for marsh creation in the area south of Bayou Bienvenue.

3. All containment features should be breached or degraded, if necessary to restore tidal connectivity, once the marsh creation/nourishment areas have at least 80 percent coverage of emergent vegetation.

Response: Following the placement of dredged material in the mitigation area located south of Bayou Bienvenue and adequate coverage with emergent marsh vegetation, the containment berms would be breached to restore tidal connectivity.

4. The created wetlands should be monitored over the project life to help evaluate the effectiveness of these features and to document both the elevation and acreage of wetland areas created as mitigation.

Response: CEMVN is committed to insuring the success of the emergent marsh area created to mitigate for impacts on early successional forested wetlands. As such, CEMVN proposes to monitor the mitigation site over the life of the project to insure that it is functioning successfully (see Appendix M for the conceptual mitigation plan).

5. The monitoring plan and reports should be provided the USFWS, NOAA Fisheries, and LDWF. Please add language to sections 5.0, 5.2.2, and 5.2.3 stating these agencies will receive copies of the monitoring reports for review.

Response: CEMVN will provide the monitoring plan and reports to the USFWS, NOAA Fisheries and LDWF. The monitoring plan is included in the conceptual mitigation plan (Appendix M) and language describing the distribution of the monitoring plan and reports was added to Sections 5.0 and 5.3.18.

6. The USFWS recommends the use of silt curtains while dredging and disposal of dredged material whether at the IHNC, CDF, graving and stockpile site, or marsh creation site to minimize siltation and the spread of contaminated materials.

Response: CEMVN will use silt curtains in open water areas such as the IHNC and marsh creation site during the dredging and disposal of material to minimize siltation and increased turbidity. Silt curtains would not be necessary during dredged material placement in the CDF, graving or stockpile sites because these areas would be fully contained and separated from adjacent water bodies by containment berms.

7. The suggested graving and associated stockpile site designated in the recommended plan is not the mandatory site to be used for those purposes. The

contractor who is awarded the work on those sites may choose an alternate site. If an alternative graving and stockpile site are used, the impacts analysis will need to be re-evaluated for the site specific impacts.

Response: If an alternate off-site construction area or stockpile site is selected for lock module construction by the contractor, CEMVN is committed to re-evaluating impacts at the alternate off-site construction area and stockpile site.

8. If contaminated material placed in the CDF is used for backfill at the new lock, that material must be contained or capped so that it is not open to or redistributed in the IHNC.

Response: Any contaminated material that would be utilized for backfill at the new lock would be contained during placement and a clean cover would be placed over the contaminated material so that it would not be open to the IHNC or be accessible to living organisms.

9. The USFWS and NOAA Fisheries shall be provided an opportunity to review and submit recommendations on future detailed planning reports (*e.g.*, Design Document Report, Engineering Document Report, *etc.*) and the draft plans and specifications on the IHNC Lock Replacement Project addressed in this report.

Response: CEMVN will provide USFWS and NOAA Fisheries the opportunity to review and submit recommendations on future detailed planning reports and draft plans and specifications for the IHNC Lock Replacement project.

10. Part of Bayou Bienvenue is a Louisiana designated Natural and Scenic River. CEMVN should check with the LDWF, Scenic Rivers Program prior to initiating any of the proposed activities within or adjacent to the banks of that bayou. Scenic Rivers Coordinator Keith Cascio can be contacted at (318) 343-4045.

Response: Bayou Bienvenue is only designated as a Natural and Scenic River by the Louisiana Natural and Scenic River Act between Bayou Villere and Lake Borgne in St. Bernard Parish; this designated segment is located approximately 4 miles east of the project area. No impacts on this segment of Bayou Bienvenue are anticipated.

11. Coordination should continue with the USFWS and NOAA Fisheries on detailed contract specifications to avoid and minimize potential impacts on manatees, Gulf sturgeon, and pallid sturgeon.

Response: USFWS has concurred that the recommended plan will not likely adversely affect any threatened or endangered species. Consultation with NOAA Fisheries is ongoing. CEVMN will continue to coordinate with USFWS and NOAA Fisheries to insure that the conservation measures described in the SEIS and in the informal consultation coordination will be included in contract specifications.

12. If the proposed project has not been constructed within 1 year or if changes are made to the proposed project, CEMVN should re-initiate Endangered Species Act consultation with USFWS.

Response: CEMVN commits to re-initiating Endangered Species Act consultation with USFWS if the implementation of the proposed project has not started within 1 year of the completion of the SEIS.

13. The proposed mitigation area is reported to have been previously subdivided into lots for urban development. The multiple land-ownerships created by this subdivision could adversely affect the ability to implement the proposed mitigation. Therefore, to ensure mitigation is implementable and occurs concurrently with construction the USFWS and NOAA Fisheries recommend that prior to completion of the IHNC engineering and design efforts CEMVN should begin addressing this potential real estate problem. If this issue prohibits implementation of mitigation at the proposed site CEMVN should immediately notify all natural resource agencies to begin reformulation of mitigation alternatives.

Response: CEMVN is actively addressing the real estate issues associated with the implementation of the wetland mitigation. If real estate issues prohibit implementation of the mitigation at the proposed site, CEMVN would immediately notify the natural resource agencies to plan and implement a mitigation alternative.

SECTION 7.
LIST OF PREPARERS

7. LIST OF PREPARERS

The point of contact for the SEIS is Mr. Richard Boe, CEMVN. Table 7-1 lists the preparers of relevant sections of this report. Mr. Boe can be reached at the USACE, New Orleans District; P.O. Box 60267; New Orleans, Louisiana 70118.

Table 7-1. Supplemental Environmental Impact Statement Preparation Team

SEIS Section	Team Member	Years Experience
Environmental Manager	Richard Boe, CEMVN	25
Technical Review/404(b)(1) Analysis	William Porter, CEMVN	25
WVA	Cathy Breaux, USFWS	10
Project Management; Report Production	Eric Webb, GSRC	15
Geology, Soils and Dredged Material	Steve Oivanki, GSRC	20
Air, Noise, Transportation, and Aquatic Resources	Steve Kolian, GSRC	8
WVA Assistance; Wooded Lands	Michael Hodson, GSRC	5
Recreational Resources	Shanna McCarty, GSRC	3
Socioeconomics	Jesse McDonald	39
Socioeconomics	Carl Welch, GSRC	7
Cultural Resources	John Lindemuth, GSRC	12
Geographic Information Systems	Chris Cothron, GSRC	2
Technical Review	Chris Ingram, GSRC	32
Technical Review	Denise Rousseau Ford, GSRC	14

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SECTION 8.
LITERATURE CITED

8. LITERATURE CITED

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SECTION 9.
INDEX

9. INDEX

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SECTION 10.
MAILING LIST

10. MAILING LIST

The following distribution list is based on the NEPA Compliance Database maintained by the CEMVN and was used to distribute copies of the draft SEIS. The database includes Federal, State, and local governments' agencies, as well as elected officials, environmental organizations, media, and other interested parties. Additional organizations and individuals known to have an interest in this project were added to the database for this project and received a notice of the draft SEIS availability. An electronic file of the distribution list is available by request. The following sections contain a partial list of the agencies, tribes, elected officials, organizations, and new media that were sent a notice of the draft SEIS availability or a hard copy or electronic copy of the draft SEIS.

10.1. FEDERAL AGENCIES

U.S. Advisory Council on Historic Preservation
U.S. Environmental Protection Agency, Region VI
U.S. Department of Energy, Office of Environmental Compliance
U.S. Department of the Interior, Office of Environmental Policy and Compliance
U.S. Department of the Interior, Fish and Wildlife Service
U.S. Department of the Interior, National Park Service
U.S. Department of the Interior, Minerals Management Service
U.S. Department of Commerce, National Marine Fisheries Service
U.S. Department of Agriculture, Natural Resources Conservation Service
U.S. Department of Agriculture, Forest Service
U.S. Department of Transportation, Federal Aviation Administration
U.S. Coast Guard, 8th District
Gulf of Mexico Program
U.S. Department of Homeland Security, Federal Emergency Management Agency

10.2. STATE

Governor's Executive Assistant for Coastal Activities
Governor's Office of Indian Affairs
Louisiana Department of Culture, Recreation & Tourism
Louisiana Department of Wildlife and Fisheries
Louisiana Department of Natural Resources, Coastal Management Division
Louisiana Department of Natural Resources, Coastal Restoration Division
Louisiana Department of Environmental Quality, PER-REGC
Louisiana Department of Environmental Quality, EP-SIP
Louisiana State Historic Preservation Officer
Louisiana Department of Transportation and Development
State Library of Louisiana
Louisiana Division of Administration
Louisiana State Attorney General's Office
LA State Board of Commerce & Industry Research Division
Louisiana Department of Agriculture & Forestry
Louisiana Department of Public Works

10.3. LOUISIANA PARISHES

Orleans Parish
St. Bernard Parish
Plaquemines Parish

10.4. TRIBES AND NATIONS

Chitimacha Tribe of Louisiana
Alabama-Coushatta Tribe of Texas
Coushatta Tribe of Louisiana
Mississippi Band of Choctaw Indians
Tunica-Biloxi Indians of Louisiana
United Houma Nation
Inter-Tribal Council of Louisiana, Inc
Caddo Nation of Oklahoma
Chickasaw Nation
Choctaw Nation of Oklahoma
Jena Band of Choctaw Indians
Quapaw Tribe of Oklahoma
Seminole Nation of Oklahoma
Seminole Tribe of Florida

10.5. NON-GOVERNMENTAL ORGANIZATIONS

Lake Pontchartrain Basin Foundation
Holy Cross Neighborhood Association
Sierra Club
University of New Orleans
University of Wisconsin Madison
Gulf Restoration Network
Association of Community Organizations for Reform Now
The Energy Authority, Inc.
CH2M Hill
Neighborhood Empowerment Network Association
Coalition of Coastal Parishes
Louisiana Audubon Council
Louisiana Collection / Special Collections Division Tulane University
Louisiana State University
Louisiana State University AgCenter
National Wildlife Federation
Natural Resources Defense Council, Inc.
Baton Rouge Advocate
Times Picayune
Port Aggregates, Inc.
American Rivers, Inc.
Arkansas State Bank Department
AUX, LLC
B.W. Farrell, Inc.
Louisiana League of Women Voters
Bernard Mcmenamy Cont, Inc.
Berry Brothers General Contractors, Inc.
WWL-TV, Channel 4
WVUE-TV, Fox 8 LiveBonnet Carré Rod & Gun Club

Carr Oil Company, Inc.
CF Bean Corporation
Circle, Inc.
CL Jack Stelly & Associates, Inc.
Louisiana State University – Louisiana Geographic Information Center
Crescent River Port Pilots Association
Diamond Services Corporation
Ducks Unlimited
Engineering Development Group, Inc.
Entergy
Ford Construction Company
New York Times
Grand Isle Shipyard, Inc.
Hydro Consultants, Inc.
J.H. Menge & Co.
Journal of Commerce
JE Jumonville Contractor, Inc.
Louisiana State University – Sea Grant Legal Program
SSA Gulf Terminals
Kansas City Southern Railway Company
Lafourche Telephone Company, Inc.
Associated Press
Living Foods
LUHR Brothers, Inc.
Digital Engineering and Imaging, Inc.
Massaman Construction Company
Plaisance Dragline & Dredging Company, Inc.
Gulf States Maritime Association
National Audubon Society
Norfolk Southern
Plaquemines Newspaper Publishing, Inc.
Pontchartrain Materials Corporation
Port of Greater Baton Rouge
Port of New Orleans
Potashnick-Harrison Construction Company
Louisiana Wildlife Federation
Tennessee Gas Pipeline
The Currents, Naval Support Activity PAO
Trigon Exploration, Inc.
Tulane University
Vinson & Elkins Attorneys
Walk Haydel's Association
WHC, Inc.
White Castle Times
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