

Rockefeller Wildlife Refuge Fish Laboratory

Louisiana Department of Wildlife and Fisheries

FEMA-1607-DR-LA

July 2012



FEMA

U.S. Department of Homeland Security
Federal Emergency Management Agency, Region VI
Louisiana Recovery Office
New Orleans, Louisiana 70114

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
TABLE OF CONTENTS	i
LIST OF APPENDICES	ii
LIST OF ACRONYMS	iii
1.0 INTRODUCTION	1
1.1 Project Authority	1
1.2 Background	1
2.0 PURPOSE AND NEED	2
2.1 Purpose	2
2.2 Need	2
3.0 ALTERNATIVES	3
3.1 Alternative 1 – No Action	3
3.2 Alternative 2 – Proposed Action	3
3.3 Alternatives Eliminated from Further Consideration	4
4.0 AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS	4
4.1 Prime Farmland	4
4.2 Water Resources and Water Quality	5
4.2.1 Surface and Groundwater	5
4.2.2 Wetlands	7
4.2.3 Floodplains	7
4.3 Coastal Resources	8
4.4 Biological Resources	9
4.5 Cultural Resources	10
4.5.1 Regulatory Setting	10
4.5.2 Existing Conditions	11
4.6 Air Quality	12
4.7 Noise	12
4.8 Safety	13
4.9 Hazardous Materials	13
4.10 Environmental Justice	14
5.0 CUMULATIVE IMPACTS	15
6.0 CONDITIONS AND MITIGATION MEASURES	16
7.0 PUBLIC INVOLVEMENT AND AGENCY CONSULTATION	18
8.0 LIST OF PREPARERS	19
9.0 REFERENCES	20

APPENDICES

Project Plans	Appendix A
Flood Zone Maps	Appendix B
8-Step Decision Making Process and Pubic Notice	Appendix C
Photographs of Pre-storm Fish Laboratory Facilities	Appendix D
Agency Correspondence	Appendix E
Location Map	Appendix F
Letter from LDNR to the USACE	Appendix G
Photographs of Proposed Project Site	Appendix H
Rockefeller Fish Laboratory Complex Wastewater Control Systems	Appendix I
Draft Finding of No Significant Impact (FONSI)	Appendix J

DRAFT

LIST OF ACRONYMS

ABFE	Advisory Base Flood Elevation
APE	Area of Potential Effect
BFE	Base Flood Elevation
CAA	Clean Air Act
CBRA	Coastal Barrier Resources Act
CBRS	Coastal Barrier Resources System
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CUP	Coastal Use Permit
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DFIRM	Digital Flood Insurance Rate Map
DNL	Day – Night Average Sound Level
EA	Environmental Assessment
EO	Executive Order
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FLC	Fish Laboratory Complex
FONSI	Finding of No Significant Impact
GOHSEP	Governor's Office of Homeland Security and Emergency Preparedness
LDEQ	Louisiana Department of Environmental Quality
LDWF	Louisiana Department of Wildlife and Fisheries
LDNR	Louisiana Department of Natural Resources
LUST	Leaking Underground Storage Tank
NAVD88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NOAA	National Oceanic & Atmospheric Administration
NRCS	Natural Resources Conservation Service
PA	Public Assistance; Programmatic Agreement
RECAP	Risk Evaluation/Corrective Action Program
RCRA	Resource Conservation and Recovery Act
RWR	Rockefeller Wildlife Refuge
SFHA	Special Flood Hazard Area
SHPO	State Historic Preservation Office/Officer
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VRP	Voluntary Remediation Program

1.0 INTRODUCTION

1.1 Project Authority

Hurricane Rita, with a strong storm surge, made landfall on September 24, 2005, causing catastrophic damage to the western parishes of Louisiana. Maximum sustained winds at landfall were estimated at 120 miles per hour. A major federal disaster declaration was made for the state of Louisiana due to damages from the hurricane. The declaration (FEMA-1607-DR-LA) was signed by President George W. Bush on September 24, 2005, authorizing the Department of Homeland Security's Federal Emergency Management Agency (DHS/FEMA) to provide federal assistance in designated areas of Louisiana. FEMA administers this disaster assistance pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), PL 93-288, as amended. Section 406 of the Stafford Act authorizes FEMA's Public Assistance (PA) Program to repair, restore and replace facilities damaged as a result of the declared event.

This Environmental Assessment (EA) is being prepared in compliance with the National Environmental Policy Act of 1969 (NEPA), the President's Council on Environmental Quality (CEQ) regulations implementing NEPA (Title 40 of the Code of Federal Regulations [CFR] Parts 1500 to 1508), and FEMA's regulations implementing NEPA (44 CFR Parts 9 and 10). The purpose of this EA is to analyze potential environmental impacts of the proposed project. FEMA will use the findings in this EA to determine whether to prepare an Environmental Impact Statement or a Finding of No Significant Impact (FONSI).

1.2 BACKGROUND

The RWR is located in the Cameron and Vermilion coastal parishes of southwest Louisiana. The RWR is located along the shoreline of the Gulf of Mexico in eastern Cameron Parish and western Vermilion Parish on land donated to the state by the Rockefeller Foundation in 1920. The RWR, which is managed by the Louisiana Department of Wildlife and Fisheries (LDWF), has approximately 24 straight line miles of shoreline along the gulf and originally encompassed 86,000 acres of wilderness. Coastal erosion has taken a significant toll on the land with the most recent surveys indicating that less than 76,000 acres remain.



Common resident animals include mottled ducks, nutria, muskrat, rails, raccoon, mink, otter, opossum, white-tailed deer, and alligators. An abundant fisheries population provides recreational opportunities to fishermen seeking shrimp, redfish, speckled trout, black drum, and largemouth bass, among others. The refuge is a flat, treeless area with highly organic soils which are capable of producing immense quantities of waterfowl foods in the form of annual emergent and submerged aquatic vegetation. Since 1954, the RWR has functioned as a national laboratory for research on marsh management, plant ecology, pond culture, and life histories of many forms of wildlife.

The RWR hosts hundreds of thousands of ducks, geese, coots, and numerous wading birds each year. It also serves as a resting area for many of the transient birds that winter in Central and South America. RWR is one of the most biologically diverse wildlife areas in the nation, and has the distinction of having the highest alligator nesting densities of any place in the United States. The RWR is classified as one of the most important wildlife areas in the United States.

The RWR serves to protect and manage fish and wildlife resources and as an outdoor laboratory for applied wetlands research and pioneering research in alligator life history, which has led to the development of a successful, and economically valuable statewide farming and harvesting program. Other research topics include benefits of terracing, oil spill/fire clean-up, invertebrate animals, 3D seismic effects, and fisheries and vegetative change in response to management.

The alligator research facility, a component of the Fish Lab facilities, has been used extensively by leading local researchers and researchers from around the world. Scientists have come from around the world to the facility to research alligators and other aquatic life associated with the marsh habitats. The facility has also supported Louisiana coastal restoration research.

The RWR is an example of how mineral development, with appropriate controls for environmental protection and human safety, can be compatible with wildlife management. There have been over 100 wells drilled on the refuge since the 1940's with sales revenues used to fund refuge management and research operations, and establish a perpetual trust fund for continuing operations.

2.0 PURPOSE AND NEED

2.1 Purpose

The purpose of the project is to provide RWR with facilities that will allow the refuge to continue important functions which protect and manage the resources along with functioning as an outdoor laboratory for applied wetland research. Through the PA program, FEMA provides grants to states and local governments to assist in the recovery of a major disaster. The objective of the PA Grant Program is to provide assistance to State, Tribal, and local governments, and certain types of Public Non Profits so that communities can quickly respond and recover from major disaster or emergencies.

2.2 Need

Hurricane Rita destroyed Louisiana's west coast with high winds and storm surge. Located on the coast, the research and supporting facilities of RWR sustained devastating damages. One of the essential components to the research and management activities of the RWR, known as the Fish Laboratory (Fish Lab), was completely destroyed. It was comprised of multiple damaged and/or destroyed buildings having a wide range of uses as follows: sorting, identifying, and recording marine organisms collected in research sampling; identification and measuring of vegetation from sample plots; hatching and tank culture of marine organisms; alligator and other animal dissections; implanting radio telemetry units in waterfowl, alligators and other animals; and alligator egg incubation. Over 500 publications have resulted from this research.

The problem to be addressed at the RWR is loss of facilities which are vital to the continuation of management and research activities at the refuge. The a of facilities has hindered research and other programs which serve as guidance to other state, federal, corporate, and private land managers in the pursuit of sustainable, aquatic-related biological resources for the state of Louisiana and areas around the world.

3.0 ALTERNATIVES

Three (3) alternatives were evaluated, No Action, Proposed Action, and Action Eliminated from Further Consideration.

3.1 Alternative No. 1 - No Action

Although this alternative would have no direct environmental impacts, it would not restore the RWR's lost capability for conducting scientific biological research valuable to the management and protection of biological resources within the state of Louisiana and areas around the world. Hence, it will not be carried forward in this environmental assessment.

3.2 Alternative No. 2 - Proposed Action

This alternative involves the consolidation of approved funding for the repair and/or replacement of seven (7) damaged and/or destroyed facilities located within the RWR. The project would include the contribution of approved funding to the construction of six (6) new facilities, which would comprise the Fish Laboratory Complex (FLC), at a new location. The six (6) new facilities would be as follows: Fish Laboratory, Alligator Incubator Shed, Fish Laboratory Boathouse, Fuel Tanks, Domestic Waste Treatment Plant and Alligator Waste Treatment Plant, see Plans, Appendix A. The proposed FLC would be constructed at or in close proximity to latitude 29.72791 and longitude -92.81966.

The four (4) damaged and/or destroyed Fish Laboratory facilities contributing funds to the proposed FLC are as follows: Fish Laboratory; Alligator Storage Shed; Chemical Shed, and Freezer Storage Shed, see Pictures, Appendix D. Additional damaged and/or destroyed contributing facilities, which would supplement funding for the proposed project, are as follows: Alligator Pen Pump House; Trapper's Camp, and Gravel Base Course of Air Strip. All contributing facilities had approved FEMA funding for repair and/or replacement prior to the submittal of the application for the proposed project. Any remaining portions of the contributing facilities and remaining debris would be removed from all affected areas, which would return the areas to open space. Although these impacts would occur, this alternative would allow valuable scientific biological research capability at the RWR to be re-established, having ceased almost seven (7) years prior as a result of Hurricane Rita.

3.3 Alternative No. 3 - Action Eliminated from Consideration

This alternative involves the replacement of the damaged or destroyed Fish Laboratory facilities at the damage site, which has an approximate elevation of 0 (zero) feet NAVD88 and is located within Zone AE, EL 13 NAVD88 (see Appendix B). This alternative would require substantial elevation on pilings to be above ABFE. It would also require construction beyond the limits of the berms, on which the damaged facilities were built, into adjacent aquatic/wetland areas. These areas are periodically pumped during periods of excessive rainfall (i.e. water-controlled units contained by berms and managed by RWR). Further, it would require an expansion of the pre-disaster footprint to accommodate ramp construction on pilings required for vehicle access. Ramp(s) constructed for vehicular access would be substantial in size and would further encroach into adjacent aquatic/wetland areas. Although eligible for FEMA funding, this alternative has been determined to be impracticable and, thus, is not being carried forward for further consideration.

4.0 AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

4.1 Prime Farmland

The Farmland Protection Policy Act (USDA 1981) was enacted to minimize the unnecessary conversion of farmland to non-agricultural uses as a result of federal actions. Prime farmland is characterized as land with the best physical and chemical characteristics for the production of food, feed, forage, fiber and oilseed crops (USDA 1989). Programs administered by federal agencies must be compatible with state and local farmland protection policies and programs. The Natural Resources Conservation Service (NRCS) is responsible for protecting significant agricultural lands from irreversible conversions that result in the loss of an essential food or environmental source.

Eleven (11) impoundments are currently in place at RWR with some type of water control. Most units are managed with stop-logged, flap-gated pipes. Low-lift diesel pumps, which provide a greater level of control, are in operation on five (5) management units. One set of large locks and two (2) radial-arm, steel-gated cement structures are also used to manage water levels and salinities on the refuge and surrounding private marshes on a broader scale. Several weirs are used on the un-impounded southeast portion of the refuge. Management units range in size from 90 to 13,500 acres, with a total of 44,510 acres under intensive management.

Alternative 1 - No Action – This alternative would have no impact on farmland.

Alternative 2 - Proposed Action – The new site for the proposed FLC is at approximate elevation 10 feet above NAVD88 located on a dredged spoil pile created approximately fifty years ago as a result of adjacent boat harbor dredging activities. The dredge spoil pile is approximately 1.5 acres in size measured at the base of the side slopes. The site is located on the northern boundary of the RWR adjacent to one of the above addressed impoundments. Based on these site conditions and non-agricultural land use within the RWR, this alternative would have no effect on farmland. The NRCS stated in a letter dated April 25, 2012 that the proposed project construction will not impact prime farmland and is, therefore, exempt from the rules and

regulations of the Farmland Protection Policy Act, Subtitle I of Title XV, Section 1539 – 1549 (see Appendix E).

4.2 Water Resources and Water Quality

4.2.1 Surface and Groundwater

Surface Water

Cameron Parish has 354,924 acres of surface water. The Sabine, Calcasieu, and Mermentau Rivers are the largest sources of surface water. Sabine Lake, Calcasieu Lake (six miles north of the proposed action), and Grand Lake (north of the Town of Cameron) are the largest lakes in the parish. The major streams are at the low elevations. They are heavily contaminated with salt water from the Gulf of Mexico (USDA, 1995). As a result, most of the surface water is unsuited to agriculture and domestic uses and to some industrial uses. A review of the Louisiana Department of Environmental Quality (LDEQ) Clean Water Act (CWA) Section 303(d) list identifies that both Calcasieu Lake and Calcasieu Ship Canal as being impaired water bodies (LDEQ, 2008). Excess sediments, nutrients, and hydrology alterations are the leading reasons for the findings of high concentrations of oil/grease, fecal coliform bacteria, pesticides, and heavy metals in these impaired water bodies.

There are no wild or scenic rivers, as designated under the Wild and Scenic River Act, on or near the proposed project site. The project vicinity outside the proposed site includes extensive surrounding fresh and brackish marshes merging with small bayous and canals that provide drainage and water exchange for significant parish surface waters. These bayous, marshes and other surface waters receive stormwater runoff from the site.

Since 1954 Rockefeller Wildlife Refuge has been a test site for various marsh management strategies, including levees, weirs, and several types of water control structures utilized to enhance marsh health and waterfowl food production. Eleven impoundments are currently in place with some manner of water control. Management units range in size from 90 to 13,500 acres, with a total of 44,510 acres under intensive management. The basic management scenario utilized on Rockefeller is to stabilize water levels and reduce salinities to encourage growth of submerged aquatics and, in the fresher units, spring and summer draw-downs encourage production of annual emergents. Both are prime waterfowl foods and are the major attraction of the refuge to waterfowl.

Groundwater

The groundwater used for irrigation and for municipal, industrial, and domestic purposes in Cameron Parish is obtained from wells screened in the Chicot Aquifer. The Chicot aquifer system consists of fining upward sequences of gravels, sands, silts, and clays of the Pleistocene Prairie, intermediate, and high terrace deposits of southwest Louisiana (USGS, 1998b). The medium to coarse-grained sand and gravel aquifer units dip and thicken toward the Gulf of Mexico, thin slightly toward the west to Texas, and thicken toward the east where it is overlain by alluvium of the Atchafalaya and Mississippi Rivers (LDEQ, 2002). The project site overlies

recharge zones of the Chicot Aquifer. Recent sands overlies the aquifer. Depth to the base sands that contain fresh water ranges from less than 100 feet below sea level in the southeast and the southwest corners of the parish to about 1,025 feet below sea level in the south central part, the location of the proposed project site. The cumulative thickness of these sands is 16-600 feet along the coast and is as much as 400-800 feet in the northern and eastern parts of the parish, respectively (USDA, 1995).

Alternative 1 - No Action – This alternative would have no impact on water quality.

Alternative 2 - Proposed Action – Plans for the Fish Laboratory and Alligator Incubator include activities that would result in domestic wastewater and animal wastewater, which would require separate treatment systems due to the significant differences in waste concentrations and treatment needs. These two streams of wastewater require treatment and subsequent discharge to nearby surface water. Domestic wastewater would result from accommodations for visiting students and biologists working in the Fish Laboratory. The Alligator Incubator would be utilized for egg incubation and grow out of alligators indigenous to the area. Rare situations may include research on turtles, shrimp, etc. Anticipated maximum stock capacity will be 600 hatchling/juvenile alligators. The primary food source would be granular pellets of specially formulated feed. The maximum animal waste discharge is estimated at 13,000 gallons per day, resulting from containment tank washouts occurring on average four times per week. The specimens would remain in the tanks during washouts; therefore no harmful chemicals would typically be utilized. Compatible household cleaners would be utilized for more aggressive tank cleaning (LDWF, 2011).

Wastewater would be processed by two separate packaged wastewater treatment plants: one dedicated exclusively to the Fish Laboratory domestic waste, and one dedicated to the Alligator Incubator wastewater. The anticipated systems, based on an effective aerobic operational principle, would utilize a multi-step process with pre-engineered components sized specifically for the given application. Routine maintenance and testing shall be performed by Rockefeller personnel. All necessary steps shall be taken to maintain a safe effluent that is introduced back into the adjacent waterway (LDWF, 2011).

The operation of the proposed FLC would generate wastewater requiring approved methods of disposal, treatment, and effluent discharge. Those wastes include domestic wastewater generated from the Fish Laboratory and animal wastewater generated at the Alligator Incubator. Louisiana's Water Quality Regulations (LAC 33:Chapter IX) require permits for the discharge of pollutants from any point source into waters of the State of Louisiana. This surface water discharge permitting system is administered under the Louisiana Pollutant Discharge Elimination System (LPDES) program. LDEQ became a state delegated to administer the NPDES Program in August of 1996.

The Louisiana Department of Environmental Quality (LDEQ) responded to the Scoping Notification and Solicitation of Agency Views by letter dated April 3, 2012, stating no objections to the proposed project with general comments added. LDEQ further added that if the proposed project results in a discharge to waters of the state, submittal of a Louisiana Pollutant Discharge Elimination System (LPDES) application may be required (see Appendix E). The proposed

action includes wastewater discharges that are regulated by the LDEQ and project funding will be conditioned to include obtaining all necessary permits and approvals and further will require compliance with all permit conditions. Compliance with permit conditions will mitigate minor potential adverse impacts that might otherwise result from site activities.

4.2.2 Wetlands

The U.S. Army Corps of Engineers (USACE) regulates the discharge of dredged or fill material into waters of the U.S., including jurisdictional wetlands, pursuant to Section 404 of the CWA. Wetlands are identified as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. The USACE also regulates the building of structures in waters of the U.S. pursuant to the Rivers and Harbors Act. FEMA regulations found in 44CFR Part 9 set forth the policy, procedures and responsibilities to implement and enforce Executive Order 11990, Protection of Wetlands. This regulation directs FEMA to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the values of wetlands for federally funded projects.

Alternative 1 - No Action – This alternative would have no effect on wetlands or other waters of the United States and would not require permits under Section 404 of the CWA or Section 10 of the Rivers and Harbors Act.

Alternative 2 - Proposed Action – According to the U. S. Fish and Wildlife Service (USFWS) National Wetland Inventory, scattered wetland areas were identified throughout the refuge and within the vicinity of the proposed new site. Based on site observations on July 29, 2010, the scattered nature of these wetland areas is the result of the refuge land being extensively managed (manipulated) with berms and water control structures to provide food and habitat for waterfowl (see Appendix F). This alternative constructed at a new site, approximate elevation 10 feet above NAVD88, would not have any direct impacts on wetlands. The approved project would be conditioned to minimize indirect impacts (erosion, off-site sedimentation, dust and other construction-related disturbances) to the surrounding area, including scattered wetlands. To reduce runoff of disturbed soils into adjacent aquatic/wetland areas, a silt fence would be entrenched and staked with hay bales around the periphery of all ground disturbing activities and equipment staging areas. Watering and other necessary measures would be required for dust control.

In a response dated May 1, 2012, USACE stated that the proposed project would not adversely impact any USACE projects and further stated that a permit will be required under Section 404 of the Clean Water Act and /or Section 10 of the Rivers and Harbors Act.

4.2.3 Floodplains

Executive Order (E.O.) 11988, Floodplain Management, requires federal agencies to avoid direct or indirect support or development within or affecting the 1% annual chance special flood hazard area (SFHA), i.e. 100-year floodplain, whenever there is a practicable alternative (for “Critical Actions”, within or affecting the 0.2% annual chance SFHA, i.e., the 500-year floodplain).

FEMA's regulations for complying with E.O. 11988 are found in 44 CFR Part 9, Floodplain Management and Protection of Wetlands. The National Flood Insurance Program (NFIP) Preliminary Digital Flood Insurance Rate Map Panel (DFIRM) was used to determine the flood hazard zone for the proposed project location. In compliance with FEMA policy implementing E.O. 11988, the proposed project was reviewed for possible impacts associated with occupancy or modification to a floodplain. According to the NFIP revised preliminary DFIRM panel number 22 023C 1100 H, dated November 21, 2011, the proposed project site lies within special flood hazard area Zone AE, Elevation 13, NAVD88 (1% annual chance flood area, 100-year floodplain, base flood elevation [BFE] determined (see Appendix B).

Alternative 1 - No Action – This alternative involves no construction and no impacts on floodplains.

Alternative 2 - Proposed Action – This alternative involves the proposed construction of the FLC within a special flood hazard area, as described herein. All facilities that comprise the FLC with the exception of the floating boat shed would be elevated or flood proofed related to BFE 13 and NFIP requirements. The proposed location, which is in Zone AE, EL 13, NAVD88, has an approximate elevation of ten (10) feet above NAVD88, which has resulted from historical adjacent dredging of a boat harbor and disposal of dredged material (see Appendix B). Based on an appeal by Cameron Parish, the preliminary digital Flood Insurance Rate Map issued by FEMA on March 28, 2008 was revised on November 11, 2012 changing the proposed project's location from Zone VE, EL 15, NAVD88 to Zone AE, EL 13, NAVD88 (see Appendix B).

This EA forms part of the Eight-Step Planning Process outlined in 44 CFR Part 9. No acceptable practicable alternatives outside of the special flood hazard area were identified by Jefferson Parish or the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) that meet the proposed project objectives. Mitigation of potential adverse impacts, if any, must be accomplished by incorporation of mitigation and minimization measures including compliance with relevant codes and standards. The proposed project must be conducted in accordance with conditions for federal actions in the floodplain as set forth in E.O. 11988, Floodplain Management, and E.O. 11990, Protection of Wetlands, and the implementing regulation found at 44 CFR Part 9, Floodplain Management and Protection of Wetlands. These regulations apply to agency actions, which have the potential to affect floodplains or wetlands or their occupants, or which are subject to potential harm by location in floodplains or wetlands (see Appendix C).

Additionally, FEMA Public Assistance grant funded projects carried out in the floodplain or affecting the floodplain must be coordinated with the relevant floodplain administrator for a floodplain development permit and the action must be undertaken in compliance with relevant, applicable, and required local codes and standards.

4.3 Coastal Resources

The Coastal Barrier Resources Act of 1982 (CBRA) established the John H. Chafee Coastal Barrier Resources System (CBRS). The CBRS, which is regulated by the USFWS, is comprised of undeveloped coastal barriers along the Atlantic, Gulf, and Great Lakes coasts. The CBRA

encourages the conservation of hurricane prone, biologically rich coastal barriers by restricting Federal expenditures that encourage development, such as Federal flood insurance through the National Flood Insurance Program and FEMA's administration of disaster assistance pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), PL 93-288, as amended. Approximately 3.1 million acres of land and associated aquatic habitat are part of the CBRS. USFWS maintains the repository for CBRA maps enacted by Congress that depict the CBRS. The Service also advises Federal agencies, landowners, and Congress regarding whether properties are in or out of the CBRS and what kind of Federal expenditures are allowed in the CBRS.

Alternative 1 - No Action – This alternative would have no effect on the CBRS.

Alternative 2 - Proposed Action – USFWS determined the proposed site to be located in the CBRS and determined this alternative to be consistent with CBRA (see Appendix E). Per 44 CFR 206.347(c) (4) For the repair of facilities used for the study, management, protection or enhancement of fish and wildlife resources and habitats and related recreational projects; air and water navigation aids and devices and access thereto; and facilities used for scientific research, including but not limited to aeronautical, atmospheric, space, geologic, marine, fish and wildlife and other research, development, and applications; and, nonstructural facilities that are designed to mimic, enhance or restore natural shoreline stabilization systems: (i) Consultation in accordance with § 206.348 shall be accomplished; (ii) No such facility may be repaired, reconstructed, or replaced unless it is otherwise consistent with the purposes of CBRA in accordance with § 206.349.

The Coastal Zone Management Act of 1978 (CZMA) enables coastal states, which includes Louisiana, to designate state coastal zone boundaries and develop coastal management programs to improve protection of sensitive shoreline resources and guide sustainable use of coastal areas. CZMA establishes a system of Coastal Use Permits (CUPs) administered by the Louisiana Department of Natural Resources (LDNR) to regulate projects which have a direct or indirect impact on coastal waters.

Alternative 1 - No Action – This alternative would have no effect on the coastal zone.

Alternative 2 - Proposed Action – Although the proposed project site is located in a designated Louisiana Coastal Management Zone, LDNR has declared management activities conducted by the Louisiana Department of Wildlife and Fisheries on state wildlife refuges and other managed areas are exempt from CUP requirements (see Appendix G).

4.4 Biological Resources

The Endangered Species Act (ESA) of 1973 prohibits the taking of any listed, threatened, and/or endangered species unless specifically authorized by permit from USFWS or the National Marine Fisheries Service. "Take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct." Harm is further defined by the ESA regulations to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering.

USFWS lists the following federally endangered (E) and threatened (T) animal species for Cameron Parish (USFWS, 2009):

Common Name	Scientific Name	Status
Gulf sturgeon	<i>Acipenser oxyrhynchus desotoi</i>	T (CH)
West Indian manatee	<i>Trichechus manatus</i>	E
Brown pelican	<i>Pelecanus occidentalis</i>	E
Pallid sturgeon	<i>Scaphirhynchus albus</i>	E
Piping Plover	<i>Charadrius melodus</i>	T (CH)
Green Sea Turtle	<i>Chelonia mydas</i>	T
Hawksbill Sea Turtle	<i>Eretmochelys imbricata</i>	E
Kemp's Ridley Sea Turtle	<i>Lepidochelys kempii</i>	E
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	E
Loggerhead Sea Turtle	<i>Caretta caretta</i>	T
(E) Endangered (T) Threatened (CH) Listed with critical habitat		

Alternative 1 - No Action – This alternative would have no impacts on biological resources.

Alternative 2 - Proposed Action – This alternative would directly disturb and displace less than one and one-half acres of elevated land area with established and maintained grass ground cover. In correspondence dated April 10, 2012, USFWS stated that the project had been reviewed for effects to Federal Trust Resources under their jurisdiction and was currently protected by the ESA. Further, the proposed project would have no effect on those resources (see Appendix E).

4.5 Cultural Resource

4.5.1 Regulatory Setting

The consideration of impacts to cultural resources is mandated under Section 106 of the National Historic Preservation Act (NHPA) as implemented by 36 CFR Part 800. Requirements include the identification of significant historic properties that may be impacted by the proposed action or alternatives within the project's area of potential effect. Historic properties are defined as archaeological sites, standing structures or other historic resources listed in or determined eligible for listing in the National Register of Historic Places. If adverse effects on historic, archaeological or cultural properties are identified, agencies must consider effects of their activities and attempt to avoid, minimize, or mitigate the impacts to these resources.

FEMA has reviewed this project in accordance with the Statewide Programmatic Agreement (PA) dated August 17, 2009 between the Louisiana State Historic Preservation Officer (SHPO), the Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP), the Alabama-Coushatta Tribe of Texas, the Caddo Nation, the Chitimacha Tribe of Louisiana, the Choctaw Nation of Oklahoma, the Coushatta Tribe of Louisiana, the Jena Band of

Choctaw Indians, the Mississippi Band of Choctaw Indians, the Quapaw Tribe of Oklahoma, the Seminole Nation of Oklahoma, the Seminole Tribe of Florida, the Tunica-Biloxi Tribe of Louisiana, and the Advisory Council on Historic Preservation. The PA was created to streamline the Section 106 review process.

4.5.2 Existing Conditions

The Louisiana Department of Wildlife and Fisheries proposes to consolidate funding approved for the repair or replacement of seven (7) facilities and contribute the funding to the construction of six (6) new facilities, which comprise the FLC, at a new location. The proposed FLC would be constructed at or near latitude 29.72791 and longitude -92.81966. Based on research using the National Register nomination on the Louisiana Division of Historic Preservation's website and FEMA's National Register maps, updated in coordination with SHPO since Hurricane Katrina, FEMA has determined that the area of potential effects, approximately five (5) acres in size, which includes the proposed project construction, near Highway 82 in Cameron Parish, was not located in close proximity to any previously identified archaeological sites or historic districts. The demolition and construction activities would occur on Creole Mucky Clay characterized as poorly-drained marsh soils. In addition, the project area has been severely disturbed by the modification of the landscape within the project area to create a man-made canal, boat harbor, and dredged material spoil pile. Given the low elevation and poor drainage of the area in addition to the landscape modification, it is unlikely that any historic resources would be encountered during demolition and construction.

Alternative 1: No Action – This alternative does not include any FEMA undertaking; therefore FEMA has no further responsibilities under Section 106 of the National Historic Preservation Act.

Alternative 2: Proposed Action – This alternative would contribute consolidated FEMA funding, previously approved for the replacement of seven (7) damaged or destroyed facilities on the RWR, to the construction of six (6) new facilities, which comprise the FLC, at a new location. These new facilities are as follows: Fish Laboratory; Alligator Incubator Shed, Fish Laboratory Boathouse, Fuel Tanks, Domestic Waste Treatment Plant, and Alligator Waste Treatment Plant. The damaged and/or destroyed contributing facilities proposed for demolition do not meet the 50-year-criterion or criteria consideration G of the National Register guidelines to be considered eligible for the National Register of Historic Places. Ground disturbing activities include construction of the FLC on a dredged material spoil pile created approximately 50 years ago as a result of adjacent boat harbor excavation. Data provided by the SHPO indicates that there are no known archaeological sites within the project area and all work will occur within a previously disturbed area. Therefore, the scope of work meets the criteria in FEMA's Programmatic Agreement (PA) dated August 17, 2009, Appendix C: Programmatic Allowances, Item I, Section A and F. In accordance with this PA, FEMA is not required to consult with the SHPO where work performed meets these criteria. The applicant must comply with the Louisiana Unmarked Human Burial Sites Preservation Act (R.S. 8:671 et seq.) and the Inadvertent Discovery Clause, which can be found under the Environmental Review NHPA conditions.

4.6 Air Quality

The Clean Air Act (CAA) of 1963, as amended, provides for federal protection of air quality by regulating air pollutant sources and setting standards for air pollutants. Under the CAA states adopt ambient air quality standards in order to protect the public from potentially harmful amounts of pollutants. Under the CAA, the U.S. Environmental Protection Agency (USEPA) establishes primary and secondary air quality standards. Primary air quality standards protect the public health, including the health of sensitive populations, such as people with asthma, children, and older adults. Secondary air quality standards protect public welfare by promoting ecosystem health, and preventing decreased visibility and damage to crops and buildings. The USEPA has set National Ambient Air Quality Standards for the following six (6) criteria pollutants: ozone, particulate matter, nitrogen dioxide, carbon monoxide, sulfur dioxide, and lead. According to USEPA, Cameron Parish, Louisiana is classified as in attainment, meaning that criteria air pollutants do not exceed the National Ambient Air Quality Standards (USEPA 2009).

Alternative 1 - No Action – This alternative would have no impact on air quality.

Alternative 2 - Proposed Action – This alternative would have short-term impacts on air quality during construction. Particulate emissions from the generation of fugitive dust during project construction would be increased temporarily in the immediate project area as a result of this alternative. Other emission sources on site would be internal combustion engines and heavy construction equipment. To reduce temporary impacts to air quality, the construction contractors would be required to water down construction areas when necessary to minimize particulate matter and dust. Emissions from fuel-burning internal combustion engines (e.g., heavy equipment and earthmoving machinery) could temporarily increase the levels of some of the criteria pollutants, including carbon dioxide, nitrogen oxide, ozone, particulate matter and non-criteria pollutants such as volatile organic compounds. To reduce the emission of criteria pollutants, fuel-burning equipment running times would be kept to a minimum and engines would be properly maintained.

4.7 Noise

Noise is generally defined as unwanted sound. Sound is most commonly measured in decibels on the A-weighted scale, which is the scale most similar to the range of sounds that the human ear can hear. The Day-Night Average Sound Level (DNL) is an average measure of sound. The DNL descriptor is accepted by federal agencies as a standard for estimating sound impacts and establishing guidelines for compatible land uses. USEPA guidelines, and those of many other Federal agencies, state that outdoor sound levels in excess of 55 decibels DNL are “normally unacceptable” for noise-sensitive land uses including residences, schools, or hospitals (USEPA, 1974).

Alternative 1 - No Action – Under the No Action Alternative, there would be no short- or long-term impact to noise levels because no construction would occur.

Alternative 2 - Proposed Action – This alternative would result in short-term increases in noise during the construction period. Equipment and machinery utilized on the proposed project site

would meet all local, state, and federal noise regulations. Normal activities at the new facilities are unlikely to affect sensitive receptors in the area.

4.8 Safety

Safety and security issues considered in this EA include the health and safety of the general public, including area residents and motorists and that of the personnel involved in activities related to construction of the proposed project.

Alternative 1 - No Action – This alternative would have no effect on the safety of construction workers or the general public.

Alternative 2 - Proposed Action – This alternative could present safety risks. To minimize risks to safety and human health, all construction activities would be performed using qualified personnel trained in all appropriate safety precautions, including the proper use of the appropriate equipment. Additionally, all activities would be conducted in a safe manner in accordance with the standards specified in Occupational Safety and Health and Administration regulations. The proposed Fish Lab and Boat Shed would also be located in the immediate vicinity and would be a component of the RWR headquarters complex. The operation of the proposed facility would involve a minor increase in the number of vehicles entering and departing the complex associated with the use of the new facility. There would be a minor, but temporary, increase in traffic due to ingress/egress construction equipment and vehicles to the site. This ingress/egress would result in intermittent interruptions of traffic flow along Highway 84 at the entrance to the headquarters complex during construction. Construction traffic would be controlled and monitored as appropriate. To alert motorists and pedestrians of project activities, appropriate signage and barriers would be on site prior to and during construction activities.

4.9 Hazardous Materials

The management of hazardous materials is regulated under various federal and state environmental and transportation laws and regulations, including the Resource Conservation and Recovery Act (RCRA); the Comprehensive Environmental Response, Compensation, and Liability Act; the Emergency Response and Community Right-to-Know Act; the Hazardous Materials Transportation Act; and the Louisiana Voluntary Investigation and Remedial Action statute. The purpose of the regulatory requirements set forth under these laws is to ensure the protection of human health and the environment through proper management (identification, use, storage, treatment, transport, and disposal) of these materials. Some of these laws provide for the investigation and cleanup of sites that have already been contaminated by releases of hazardous materials, wastes, or substances.

Alternative 1 - No Action – This alternative would not disturb any hazardous materials or cause any hazard to human health.

Alternative 2 - Proposed Action – This alternative would not cause any hazard to human health based on findings indicating that no hazardous materials, wastes, or substances (including contaminated soil or groundwater) appear to be present at the proposed site. If hazardous constituents are unexpectedly encountered in the project area during the proposed construction

operations, appropriate measures for the proper assessment, remediation and management of the contamination would be initiated in accordance with applicable federal, state, and local regulations.

Project construction may involve the use of hazardous materials (e.g., petroleum products, cement, caustics, acids, solvents, paint, electronic components, pesticides/herbicides and fertilizers, treated timber) and may result in the generation of small volumes of hazardous wastes. Appropriate measures to prevent, minimize, and control spills of hazardous materials must be taken, and any hazardous and non-hazardous wastes generated must be disposed of in accordance with applicable federal, state, and local requirements.

A database search prepared for the proposed project site revealed that there are no Louisiana Voluntary Remediation Program/Brownfield sites located on the proposed site. No sites of concern were found during a review of other hazardous waste management and disposal, solid waste disposal, storage tank, enforcement, and other databases on the proposed site. A search of LDEQ Leaking Underground Storage Tank (LUST) revealed no recorded LUST sites within 0.25 miles of the site. A database search prepared for the proposed project site revealed that there are no Louisiana Voluntary Remediation Program/Brownfield sites located within 0.5 miles of the site.

4.10 Environmental Justice

Executive Order 12898, entitled “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” mandates that federal agencies identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. Socioeconomic and demographic data for the project area were reviewed to determine if the proposed action would have a disproportionate high and adverse impact on minority or low-income persons. According to the 2010 U.S. Census, 95.7 % of the Cameron Parish is white, 1.7% is Black/African American, and .1% is Asian. The remaining population is collectively categorized as “other”. Median household income is \$32,292.00, and 10.1% of families earn below poverty level. The closest town to the project site is Grand Chenier, Louisiana, approximately ten (10) miles to the west. According to the U.S. Census, 97.4 % is white, .01 % is black, .01% is Hispanic, and the remaining population is collectively categorized as “other”.

Alternative 1 - No Action – This alternative would have no disproportionately high or adverse impacts on minority or low-income populations.

Alternative 2 - Proposed Action – This alternative would not have adverse or disproportionate impacts on low-income or minority populations. The proposed project is a public research facility within a sparsely populated area within the RWR that will serve the interests of all local and state residents.

5.0 CUMULATIVE IMPACTS

According to the Council on Environmental Quality (CEQ) regulations, cumulative impacts represent 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. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).” In accordance with NEPA and to the extent reasonable and practical, this EA considered the combined effect of the Proposed Action Alternative and other actions occurring or proposed in the vicinity of the proposed project site. These actions and the proposed project would have cumulative temporary impacts on air quality, noise, traffic, and surface water resources in the Louisiana Gulf Coast Region. No other cumulative effects are anticipated.

6.0 CONDITIONS AND MITIGATION MEASURES

Based upon the studies and consultations undertaken in this EA, several conditions must be met and mitigation measures must be taken by the applicant prior to and during project implementation.

- Applicant must prepare and carry out a storm water pollution prevention plan to minimize any detrimental effects to water quality during project implementation.
- Applicant must source any fill or borrow material used in the repair activities from sites that do not contain any buried cultural materials (i.e. wells, cisterns, foundations, basements, prehistoric Indian artifacts, human burials, and the like). If during the course of work, archaeological artifacts (prehistoric or historic) or human remains are discovered, the applicant shall stop work in the vicinity of the discovery and take all reasonable measures to avoid or minimize harm to the finds. The applicant shall inform their Public Assistance (PA) contacts at FEMA, who will in turn contact FEMA Historic Preservation (HP) staff. The applicant will not proceed with work until FEMA HP completes consultation with the SHPO. In addition, if unmarked graves are present, compliance with the Louisiana Unmarked Human Burial Sites Preservation Act (R.S. 8:671 et seq.) is required. The applicant shall notify the law enforcement agency of the jurisdiction where the remains are located within twenty-four (24) hours of the discovery. The applicant shall also notify FEMA and the Louisiana Division of Archaeology at 225-342-8170 within seventy-two (72) hours of the discovery. Failure to comply with these stipulations may jeopardize receipt of FEMA funding.
- Applicant must take appropriate measures to minimize potential short-term effects to air quality from construction related activities, such as increased dust and equipment exhaust emissions.
- Applicant must conduct all construction activities in a safe manner in accordance with Occupational Safety and Health Administration requirements.
- Applicant must initiate appropriate measures for the proper assessment, remediation, and management of unexpected encounters with hazardous materials during construction, in accordance with applicable federal, state, and local regulations.
- Applicant must take appropriate measures to prevent, minimize, and control spills of hazardous materials, and must disposed of any hazardous and non-hazardous materials in accordance with applicable federal, state, and local requirements.
- Applicant must install a silt fence prior to commencement of project construction. The silt fence must be entrenched and staked with hay bales, around the periphery of all ground disturbing activities and equipment staging areas to reduce runoff of disturbed soils into adjacent aquatic/wetland areas.

- Applicant must coordinated all construction with the local floodplain administrator and comply with floodplain ordinance. All permits and certificates, and all coordination pertaining to these permit(s), should be documented and provided to the local floodplain administrator, to Louisiana Governor's Office of Homeland Security and Emergency Preparedness (LA GOHSEP) and to FEMA as part of the permanent project file. Per 44 CFR 9.11(d) (9), the replacement of building contents, materials and equipment, where possible, disaster proofing of the building and/or elimination of such future losses by relocation of those building contents, materials and equipment to or above the Advisory Base Floodplain Elevation (ABFE).
- Applicant must coordinate proposed methods for treating all wastes generated by the operation of the proposed project with the Louisiana Department of Environmental Quality and obtain a point source effluent discharge permit.
- Applicant must remove all remaining portions of damaged or destroyed contributing facilities and remaining debris from all affected areas.
- Applicant must obtain all required federal, state, and local approvals and authorizations prior to commencement of project construction.

7.0 PUBLIC INVOLVEMENT AND AGENCY CONSULTATION

FEMA is the lead Federal agency for conducting the NEPA compliance process for this Public Assistance project. It is the responsibility of the lead agency to conduct the preparation and review of NEPA documents in a way that is responsive to the needs of the Cameron Parish community while meeting the spirit and intent of NEPA and complying with all NEPA provisions. As part of the development of early interagency coordination related to the proposed action, State and Federal resource protection agencies were contacted. These agencies include Louisiana Department of Environmental Quality, Louisiana Department of Natural Resources, Louisiana Department of Wildlife and Fisheries, State Historical Preservation Office, United States Environmental Protection Agency, United States Fish and Wildlife Service, National Oceanic and Atmospheric Administration, Natural Resources Conservation Service, and United States Army Corps of Engineers. FEMA has received no objections to the project as proposed subsequent to these notifications. See agency comments, Appendix E.

FEMA is also inviting the public to comment on the proposed action between July 5, 2012 and July 19, 2012. A legal notice was published in the Cameron Pilot on July 5, 2012. The Draft EA and Draft FONSI can be reviewed during this fifteen (15) comment period at the Grand Chenier Library or on FEMA's website. The Grand Chenier Library is open from 8:30 AM to 5:30 PM on Thursdays, 8:00AM to 4:00 PM on Fridays, and 9:00 AM to 1:00 PM on Saturdays. The library is located at 2867 Grand Chenier Highway, Grand Chenier, Louisiana. A copy of the Public Notice is attached in Appendix C.

9.0 LIST OF PREPARERS

Tiffany Spann-Winfield – Deputy Environmental Liaison Officer
Environmental Section – FEMA Louisiana Recovery Office

Jerame Cramer – Deputy Environmental Liaison Officer
Historic Preservation Section, FEMA Louisiana Recovery Office

Leschina Holmes – Lead Environmental Specialist
Environmental Section – FEMA Louisiana Recovery Office

Melanie Pitts – Environmental Specialist
Environmental Section – FEMA Louisiana Recovery Office

Daphne Owens – Historical Preservation Specialist
Fluor – Contractor Support to FEMA
Louisiana Recovery Office

Keith Whittinghill – Environmental Specialist
Fluor – Contractor Support to FEMA
Louisiana Recovery Office

Alan Johnson – Floodplain Specialist
NISTAC/Black & Veatch – Contractor Support to FEMA
Louisiana Recovery Office

10.0 REFERENCES

Environmental Protection Agency. 2006. Nonattainment Status for each Parish by year. [Online] Available: <http://www.epa.gov/oar/oaqps/greenbk/anay.html>

Environmental Protection Agency. Envirofacts. [Online] Available: <http://www.epa.gov/enviro/>

Environmental Protection Agency. EnviroMapper. [Online] Available: <http://www.epa.gov/enviro/katrina/emkatrina.html>

Environmental Protection Agency (EPA). 1974. EPA Identifies Noise Levels Affecting Health and Welfare. <http://www.epa.gov/history/topics/noise/01.htm>. Accessed June 17, 2009.

Geology.com. Louisiana Geology Data. [Online] Available: <http://geology.com/states/louisiana.shtml>

Louisiana Department of Environmental Quality. Air quality data. [Online] Available: <http://www.deq.louisiana.gov/portal/tabid/37/Default.aspx?Search=non-attainment+areas>

Resource Conservation and Recovery Act (RCRA) 42 U.S.C. §6901 et seq. (1976) <http://www.epa.gov/lawsregs/laws/rcra.html>

Emergency Response and Community Right-To-Know Act (EPCRA) <http://www.epa.gov/agriculture/lcra.html>

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) <http://www.epa.gov/superfund/policy/cercla.htm>

Louisiana Voluntary Investigation and Remedial Action Statute
La. R.S. 30:2285-2290
<http://www.deq.louisiana.gov/portal/Default.aspx?tabid=1667>

Louisiana Department of Environmental Quality. Electronic Document Management System. [Online] Available: <http://www.deq.louisiana.gov/portal/tabid/2604/Default.aspx>

Louisiana Department of Environmental Quality. State Brownfields list. [Online] Available: <http://www.deq.louisiana.gov/portal/tabid/2620/Default.aspx>

Louisiana Department of Environmental Quality. Leaking Underground Storage Tank list. [Online] Available: http://www.deq.louisiana.gov/portal/Portals/0/RemediationServices/UST/form_52_22.xls

Louisiana Department of Natural Resources. Coastal Zone Management Act. [Online] Available: <http://dnr.louisiana.gov/crm/coastmgt/coastmgt.asp>

Louisiana State University. Louisiana Coastal Law. [Online] Available:

http://www.lsu.edu/sglegal/pdfs/lcl_30.pdf

Louisiana State University. Louisiana Geological Survey. [Online]
Available: <http://www.lgs.lsu.edu/>

National Oceanic and Atmospheric Administration. Coastal Barrier Resources Act. [Online]
Available: http://www.csc.noaa.gov/cmfp/reference/Coastal_Barrier_Resources_Act.htm Accessed January 17, 2010.

National Resources Conservation Services. Web Soil Survey. [Online] Available:
<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>

U.S. Census Bureau. 2000 Census Data. [Online] Available:
<http://factfinder.census.gov/home/saff/main.html>

U.S. Department of the Army, Corps of Engineers, New Orleans District. Letter dated July 20, 2009. Account number MVN-2009-01706-SE

U.S. Fish and Wildlife Service. Endangered Species Data. [Online] Available:
<http://www.fws.gov/endangered/wildlife/htm>

U.S. Fish and Wildlife Service, Louisiana Field Office. Letter dated February, 2009, Deborah A. Fuller

U.S. Fish and Wildlife Service 2009. National Wetlands Inventory Maps.
<http://www.fws.gov/wetlands/Data/mapper.html>. Accessed January 16, 2010.

U.S. Department of Agriculture. Natural Resources Conservation Service. Farmland Protection Policy Act, 1981 www.nrcs.usda.gov/wps/portal/nrcs/index.html

U.S. EPA Noise Control Act of 1972, 42 U.S.C. §4901 et seq. (1972), EPA April 4, 1974 Press Release

FPPA: P.L. 97-98, Sec. 1539-1549; 7 U.S.C. 4201, et. seq.

Coastal morphodynamics and Chenier-Plain evolution in southwestern Louisiana, USA: A geomorphic model (McBride et. al. 2002)