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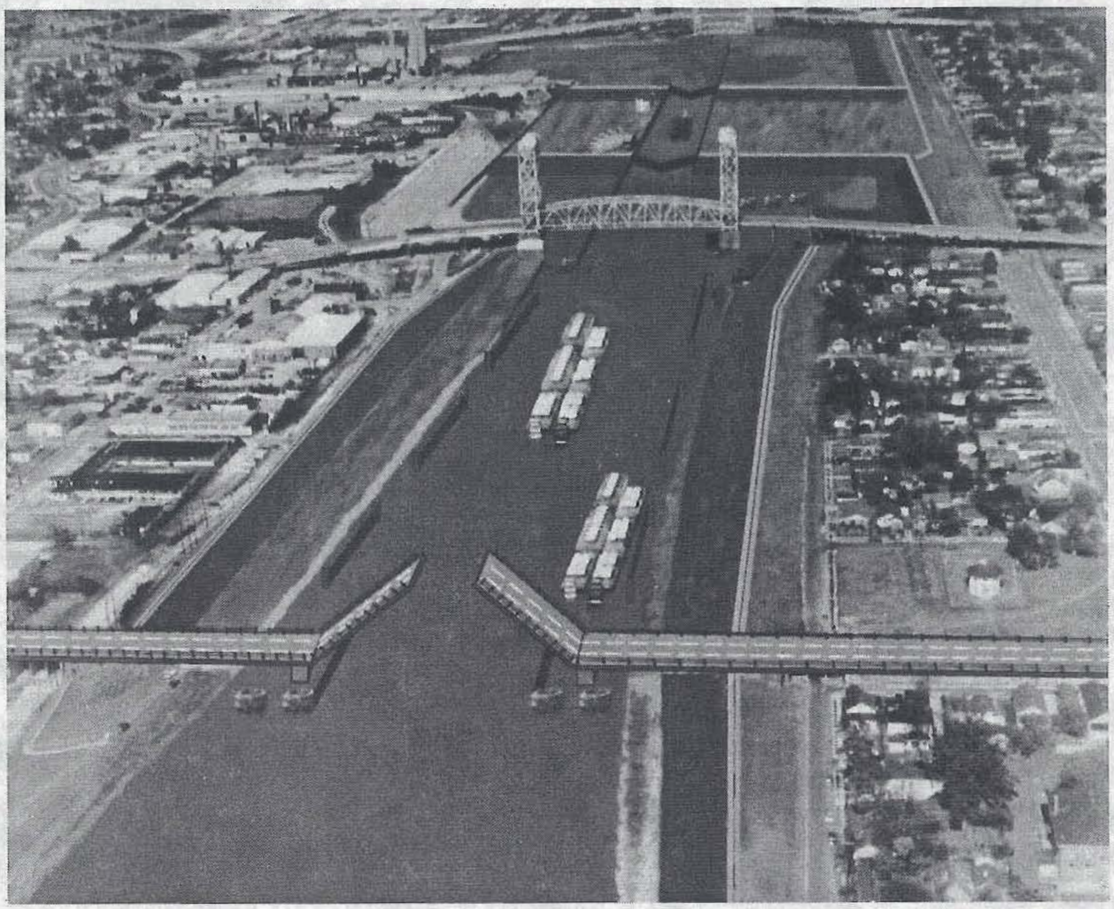
of Engineers
New Orleans District

Mississippi River - Gulf Outlet

New Lock and Connecting Channels



Evaluation Report

Environmental

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APPENDIX D
ENVIRONMENTAL DOCUMENTATION

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CULTURAL RESOURCES INVESTIGATIONS

Introduction

New Orleans District has completed studies of all potentially significant historic properties in the area to be impacted by construction of the new lock.

In 1987 the New Orleans District completed a study that determined the Inner Harbor Navigation Canal Lock eligible for the National Register of Historic Places (Dobney, et. al. 1987).

In 1991 the New Orleans District completed a research design for archeological and architectural investigations in the project area (Franks, et. al. 1991) This study concluded that the St. Claude Bridge was eligible for the National Register of Historic Places. It presented a research design for archeological investigations in the Holy Cross Historic District.

The New Orleans District completed an archeological study of the Holy Cross Historic District. Archeological testing concluded that archeological features associated with a 19th century brickyard and slave quarters, late 19th to early 20th century residences, commercial establishments and truck farms were eligible for the National Register of Historic Places. A data recovery plan for mitigation of adverse impacts to these historic properties was developed (Earth Search 1992a).

The New Orleans District contracted for a study of Sewerage Pumping Station B that concluded that the property is eligible for the National Register of Historic Places because of its architectural and engineering significance (Earth Search, Inc., 1992b).

A comprehensive architectural assessment and preliminary archeological review of 64 city blocks west of the IHNC was completed by R. Christopher Goodwin & Associates, Inc., under contract to the New Orleans District from November 1991 to January 1992. This draft study concluded that it is unlikely that significant prehistoric archeological deposits are located within the project area. Archeological testing was recommended to determine if historic sites exist in the project area. Architectural investigations concluded that the project area contains a number of structures that contribute to the significance of the Bywater Historic District.

Prehistory of the study area

Cultural resource investigations have traced the prehistory of the project area beginning with the Tchula Period

(250 B.C. to A.D. 0). Tchula period occupations in the Lower Mississippi Valley are associated with the Tchefuncte culture, the early ceramic period in the area.

The Tchula period was followed by the Marksville Period (A.D. 0 to A.D. 300). The Marksville period is associated with a Hopewellian culture and tradition manifested throughout the Lower Mississippi Valley.

The Baytown Period (A.D. 300 to A.D. 700) was the next period in Southeastern Louisiana. It has been defined as the interval between the end of Hopewellian/Marksville culture and the emergence of Coles Creek culture.

The Coles Creek Period (A.D. 700 to A.D. 1000) was characterized by small ceremonial centers with mounds. These were surrounded by villages of varying size. In southern Louisiana generally, the early phase for the Coles Creek period is Bayou Cutler, and the late phase is Bayou Ramos. However, in southeast Louisiana, only the Bayou Cutler phase is recognizable.

The Mississippi Period (A.D. 1000 to A.D. 1700) is associated with the Barataria phase. Shell middens, shell mounds, earth and shell mounds, and probable extensive habitation areas are represented in this complex.

Aboriginal occupation during the Colonial Period is difficult to determine because the identities and locations of Indian tribes in Louisiana cannot be definitively determined for any period prior to ca. 1700. The protohistoric and early historic periods were traumatic for aboriginal society in southeastern Louisiana. The effects of disease and of the ever-increasing European population are reflected in the declining aboriginal population and in the migrations by remnants of various tribes. Internecine warfare typified relations between the various groups.

Review of archaeological studies in the area revealed no evidence of prehistoric archeological sites. The project area is located adjacent to the Mississippi River in a section of the Mississippi River delta plain which was deposited only a few thousand to a few hundred years ago. The extensive disturbance resulting from construction at the existing lock and other factors has destroyed any prehistoric sites that may have existed in the project area.

History of New Orleans area

New Orleans has a rich and fascinating history during the 18th, 19th, and 20th centuries. New Orleans was founded as a result of French attempts to colonize the Mississippi River and Gulf Coast. Although LaSalle had claimed for France all of mid-continental America drained by the Mississippi in 1682, France initially did little to develop the new territory. In 1698, Pierre LeMoyne d'Iberville, accompanied by his younger brother Jean-Baptiste LeMoyne de Bienville, was sent to establish French sovereignty over the Mississippi Valley and the Gulf Coast in the vicinity of the river's mouth. Bienville established Fort Maurepas at Biloxi Bay in 1699, and the following year he founded Fort de la Boulaye on the east bank of the Mississippi River. Both sites were abandoned within a few years, and a settlement at Mobile became the center of French activity.

John Law's Company of the West assumed responsibility for the Louisiana colony in 1717. That same year, the Company directed that a city named New Orleans be established on the Mississippi River some thirty leagues from the mouth.

In 1718, Bienville, now commandant general of the colony, selected the site of the present-day Vieux Carré as the locale for establishing this new city. Colonists were recruited in France, Germany, and other European countries, and they were granted large concessions on the Mississippi River and some of its tributaries.

Construction began in 1718. An area was cleared for construction for a store-house, warehouses, barracks, and residential cabins. The earliest clearing probably was located at the foot of present-day Conti Street.

The engineer De la Tour and his assistant Pauger were responsible for a series of plans for the city drawn up between 1720 and 1723. A plan dated April of 1722 placed the public square (Place d'Armes) in the center of the city. The city extended for four square blocks above and below the square, and six blocks back from the river. The blocks flanking the public square were reserved for use by the Crown and the church. Squares as far back as Bourbon Street were divided into lots, which were to be granted to those individuals best able to construct houses. Subsequent plans from the 1720s show the city extended along the river to provide a total of eleven squares front.

Early concessions of land were granted above, below, and across from the city. Bienville received a concession extending from the upper limits of the Vieux Carré to a point near the present-day Orleans/Jefferson Parish boundary. He also received a large concession across from the city, extending from just below Algiers Point for a distance of two leagues downriver. A series of smaller concessions below New Orleans and on the same side of the river were granted to several individuals.

In September of 1722, a hurricane destroyed most of the public and private buildings within the city proper. Immediately afterwards, Bienville ordered the inhabitants to enclose their houses or lands within wooden palisades or forfeit their property to the Company.

One significant achievement of the 1720s was construction of a levee to prevent inundation of the city by the river's floodwaters. Construction represented either replacement or improvement of an earlier levee built under the direction of Claude Dubreuil. In 1724, the levee was almost 3000 feet in length. By 1727, it was 5400 feet long, three feet high, and eighteen feet wide at the top with a roadway on its crown. By 1735, the levee extended about twelve miles below and thirty miles above the city.

When the Crown took possession of Louisiana in 1731, total population of the territory was about 5000, of whom approximately 3000 were slaves. The population was concentrated in New Orleans and its environs, and included 1000 soldiers and male civilians. Population remained stable in the city until 1745. The 1730s and 1740s were arduous for the colonists, as hurricanes and flooding alternated with years of drought. Crop losses were frequent and severe.

Between 1745 to 1763, the population in New Orleans increased. Port traffic also increased as ocean-going vessels, canoes, dugouts, pirogues, batteaux, and flats anchored in the vicinity of the market, the King's Storehouses, and the Intendant's quarters. During this period, New Orleans was a frontier market town, a seaport, a provincial capital, and a military center.

Owners of large and well-equipped plantations in the vicinity of New Orleans probably cultivated indigo as the major cash crop, while rice was grown on at least some tracts. Large herds of cattle were maintained, and corn and vegetables were supplemental crops.

France had, then, succeeded in establishing a settlement on the Lower Mississippi that would in the next century become, for a time, one of the world's major ports. Further, she had fostered the growth of a plantation system capable of partially supplying the local market with food and of producing some exportable commodities. However, French economic policy in the colony was largely a failure, for it enhanced the position of neither the mother country or the colony in the developing world economy.

Hostilities between France and Britain subsequently termed the Seven Years' War in Europe and the French and Indian War in North America, with Spain intervening on the side of France, ended in 1763 with the signing of the Treaty of Paris. New Orleans and all of French territory west of the Mississippi were ceded to Spain. Spain's initial attempts to take control of the colony were marked by disorder.

During the six years (1763-1769) when the Spanish presence was inadequate to govern affairs in the colony, trade and commerce at New Orleans were conducted primarily by British citizens. The 1763 treaty had granted Great Britain the right to navigate the Mississippi. British merchants brought flour to New Orleans which alleviated a food shortage, and thereby established a pattern whereby British and American traders furnished the city with most of its food supply through the remainder of the century. Britain also used the period of political instability to consolidate her hold on the Indian and fur trades.

The final three decades of French rule of Louisiana had seen little change in population size or productive capacity. It was during the Spanish period that new settlements grew throughout the entire Mississippi Valley which was New Orleans' natural hinterland. The city's promise as a major port, foreseen by early Company officials such as Bienville, began to be realized.

During the 1790s, most of the plantations along the Mississippi River from Baton Rouge to south of New Orleans switched from cultivation of indigo to sugar production.

Louisiana, including New Orleans, was retroceded to France in 1803, and in the same year became a part of the United States. In 1805, the City of New Orleans incorporated with its downriver boundary at Canal des Pecheurs (Fisherman's Canal) just below the U.S. Barracks.

Development of those portions of Esplanade Avenue below the original city was underway by 1810. Five years earlier, Bernard de Marigny had received permission from the City Council to subdivide his plantation below Esplanade Avenue and fronting the river, whereupon the tract was surveyed for sale as small residential lots. In 1810, the City bought Claude Treme's plantation that extended along the Old Bayou Road. This, and the adjacent commons beyond Ramparts Street, were surveyed and lots sold. The city, having already expanded upriver, was now growing in all available directions.

The antebellum years of rapid population growth resulted in subdivision for residential use of many of the old plantations below Faubourg Marigny.

Because of early surrender in the Civil War, New Orleans' port and commercial facilities and residential neighborhoods were undamaged by the war. Plantations in southern Louisiana were generally less devastated than those elsewhere in the South.

In 1896, the Board of Commissioners for the Port of New Orleans was established by law. That group, commonly referred to as the "Dock Board," undertook projects from 1900 to 1910 to rebuild and expand the city's port facilities.

Inner Harbor Navigation Canal lock

The Inner Harbor Navigation Canal lock complex is located at the intersection of Urquhart Street and the Inner Harbor Navigation Canal (also called the Industrial Canal). Construction of the lock complex was begun in 1918 and completed in 1921, when the canal was connected to the river and the lock complex first was opened to traffic.

The Inner Harbor Navigation Canal lock consists of a reinforced concrete lock chamber with a usable length of 675 feet; the usable width is 75 feet. The machinery used to open and close the massive gates at the locks is very similar in design to that at the Panama Canal. In addition, the complex contains an emergency dam which is utilized when the lock is dewatered; it also serves as a defense mechanism against storm surges. The IHNC lock facility has been in continuous operation (with the exception of occasional dewaterings for maintenance purposes) since it was completed in 1923. Several of the components designed and constructed at the IHNC locks were the first of their kind.

The construction of the lock and of the Industrial Canal was funded through bond issue by the citizens of New Orleans. The catalyst for the project was the decline in shipping which occurred in New Orleans during the late nineteenth and early twentieth centuries. The port was growing at a rate during this period that demanded comprehensive planning in order to maximize economic benefits to the community and the state. Louisiana's General Assembly responded to this need by creating the Board of Commissioners of the Port of New Orleans in 1896, popularly known as the "Dock Board."

In July, 1914 the state legislature authorized the Port Commission to build the Industrial Canal at a location to be determined by the Commission Council of New Orleans. The Dock Board was given the right to expropriate any property necessary and to issue bonds to pay for the construction.

The Industrial Canal originally was planned as a barge canal. Even that modest conception was delayed by the outbreak of World War I. In 1915, the project was revived by a group of businessmen and newspaper editors, spurred by the growing realization of the opportunities offered by the opening of the Panama Canal. The engineering firm of Ford, Bacon, and Davis was retained to prepare a "Report on the New Orleans Ship Canal and Terminal" issued in 1915.

The engineers proposed a barge canal 175 feet wide at the top, 80 feet wide at the bottom, 10 feet deep, and 5.3 miles long. On January 16, 1916, Governor Luther E. Hall endorsed the project. In August, the Governor dismissed the Board of Commissioners and appointed a new Board. During the resultant reorganization, the project once again was delayed.

By 1918, there was a growing need for ships as a result of the pressures of World War I. A group of New Orleans civic leaders formed the "Shipbuilding Committee," and in February of 1918, they proposed plans for an industrial basin to be connected to the Mississippi River by a lock.

The actual location of the canal was to be determined by the Commission Council of New Orleans. The Council decided on a site in the Third Municipal District which was virtually uninhabited. The site chosen for expropriation was 5 1/3 miles long, 2,200 feet wide covering 897 acres. The canal was projected to be 18 feet deep, and the lock was to be 70 X 600 feet. Before construction began, the dimensions were altered again. By June 11, 1918, a 25-foot channel had been designed, increasing the projected cost to $6 million.

On March 15, 1918, the George W. Goethals Company, Inc. was retained by the Dock Board as consulting engineers. Goethals had been Chief Engineer in charge of the construction of the Panama Canal from 1907-1914. By 1917, he had retired from the U.S. Army and announced his intention to work as a consulting engineer in a firm that changed its name to take advantage of his fame. But Goethals had very little involvement in the design and construction of the Inner Harbor Navigation Canal and Lock in New Orleans. George M. Wells designed the lock, Henry Goldmark designed the gates, and Colonel George R. Goethals, George W. Goethals' son, was the resident engineer. The similarity of names and the fact that both served as colonels in the Army probably are responsible for the confusion about whether the Chief Engineer of the Panama Canal built the Inner Harbor Navigation Canal and Lock. Records indicate that George W. Goethals lived in New York throughout the period of construction. His son, on the other hand, lived in New Orleans from 1919 to 1920.

Construction of the IHNC lock and canal complex began on June 6, 1918. The canal site presented a variety of problems and challenges to the engineers. The area nearest the river consisted of low, flat, meadowland occupied by a few houses. The middle part of the site was a cypress swamp. The lake end was a soft prairie marsh.

The levees were constructed by hand. The material dug from the canal's path served as banks for the lock and canal and prevented the excavated liquid material from running back into the excavation.

In addition to the men building the levees by hand, a dredge was sent to the lake end of the canal to begin excavation. The Mississippi batture could not be breached until the lock was in place, so excavation was limited to the area between the lock and the lake. The 2000-foot stretch between the river and the lock would be excavated last, when the lock was completed and the new levees in place. Because the turning basin site was located only a few hundred yards from Bayou

Bienvenu (which empties into Lake Borgne), an excavator was sent to open a small channel into the turning basin. This channel was significant because it enabled the huge 22-inch suction dredges to get into the turning basin and work outward toward both the lake and the lock site.

Completion of the canal was set for January, 1920. The cost of the canal continued to escalate. By mid-1919, George Wells of the Goethals Company had informed the Board that skyrocketing labor and material costs had doubled the anticipated cost of the project. At this point, and for the final time, the scope of the project was changed again. The Goethals Company engineers raised the question of whether New Orleans really wanted a 25-foot deep lock when most loaded ocean-going vessels required a 27-foot draft. Therefore, the engineers recommended a 30-foot depth. These changes were adopted, requiring another $7.5 million, bringing the total cost of the canal and lock to $19.5 million.

Throughout these changes in plans, excavation of the canal continued. The excavation ultimately would amount to between eight and ten million cubic yards; 95 per cent was wet excavation using 20 and 22-inch suction dredges. Innovative thinking was required to make the process efficient, because of the subsurface conditions with huge stumps and buried tree trunks. Even with 1,000 horsepower engines, the dredges could not remove the wood. An employee of the city's sewerage and water department, A. B. Wood, already had designed a centrifugal impeller to handle sewerage containing trash. When W. J. White, superintendent of dredging on the project, learned of this design, he asked Wood to adapt his design for use on the dredge "Texas." The results were impressive: average excavated yardage increased from 152 to 445 cubic yards per hour. By September, 1919, the entire canal had been dredged except for the last 2,000 feet between the lock and the river.

The greatest challenge of all was construction of the lock. The lock was unique in that it was the only lock in the world with a high water level at either end of the lock. Under normal circumstances, the Mississippi River is higher than Lake Pontchartrain; however, if the river should be at extreme low stage at the same time that strong winds push waters through the Rigolets causing the water to back up in the canal prism north of the lock, the lake end can be higher than the river end of the lock. This unique situation posed unusual engineering problems. Both the gates and the control machinery had to be designed to cope with the possibility of high water at either end of the lock.

The foundation of the lock required an excavation fifty feet deep. Quicksand and swamp gas caused problems in the excavation. The only reliable construction method was by driving 10-inch pipe casings, two or three feet at a time, excavating, then repeating the process until the desired depth was reached.

Excavation of the lock site began in November, 1918. The excavation would be 350 feet wide by 1500 feet long, with a very gradual slope (one-to-four ratio) to the center of the canal to retard crumbling and sliding of the banks. The outside dimensions of the lock to be built in this excavation were 1,020 by 150 feet. Two hydraulic dredges which had been working on the canal were assigned to begin dredging the lock site. They operated on either side of the center line, making a cut twelve feet deep the entire length of the lock prism. The process was repeated four times until the project depth was achieved.

During dredging a wooden sheet pile cofferdam was constructed to cut off the flow from the first stratum of quicksand. The cofferdam served the additional function of maintaining the water table in the surrounding area, in order to minimize settling of nearby buildings when the water level was lowered in the lock prism. When excavation was well along, a second ring of sheet piling was driven 150 feet inside the original cofferdam to cut off the second stratum of quick sand located only a foot below the planned level of the floor of the lock. The second cofferdam was completed in May, 1919. The land between the south end of the lock and the river had not been disturbed, so the lock prism was enclosed once a temporary cofferdam and earth dike was placed across the north end of the lock.

The next problem was to remove the water from the canal prism without allowing the banks to collapse or the bottom to blow up as a result of the pressure from the quicksand. It was also important to follow procedures which would not damage the integrity of the clay stratum separating the second and third quicksand strata. Once the second cofferdam was in place, the dewatering process began. However, after pumping out 6.5 feet of water to -3.5 feet below Cairo datum, trouble developed. Cracks appeared along the top of the south and east banks. These rapidly widened and in a short period about one-third of the south bank was in motion. This bank movement consisted of a vertical drop followed by lateral movement toward the center of the lock. The force of the movement was great enough to shear off 300 linear feet of the inner cofferdam and deposit it 30 feet closer to the center of the lock.

After the cofferdam was repaired, a third cofferdam built of steel was driven adjacent to the line of outer lock wall construction. By enclosing a relatively small area, it would be possible to install cross-braces (wooden beams ten inches square) to prevent collapse.

Another safeguard took the form of artesian wells. One hundred and thirty ten-inch steel pipes were driven into the third quicksand stratum, which had a static head of 75 feet. These wells were located inside the steel cofferdam. Gravel was forced down and beyond the bottom of the pipe, forming a bulb which acted as a filter. Gravel was also placed in the pipe proper for a distance of twelve feet from the bottom. An additional fifty-six wells were driven to dry out the second stratum of quicksand as much as possible. Half of these wells were driven between the second and third cofferdam.

On November 18, 1919, the dewatering process was resumed. Initially, the level was dropped one foot every other day to allow observation of possible effects on the banks. The work was completed on January 4, 1920.

The next task was to drive the 24,000 piles on which the lock would rest. These piles were fifty to sixty feet long. The concrete was laid in fifteen-foot sections because only a few braces could be removed at one time. The final product, finished in April, 1921, was a steel and stone monolith weighing 225,000 tons, including gates and machinery. Filled with water, it weighed 350,000 tons. It was 1,020 feet long, 150 feet wide, and 68 feet high. The walls of the lock were 13 feet thick at the bottom, and 2 feet at the top. The 90,000 cubic yards of concrete required 125,000 barrels of cement. Lock construction required six thousand tons of reinforcing steel and two and half million feet of lumber for building forms. To withstand the pressures of the quicksand, a unique lock design was developed.

The usable dimensions of the lock as finally built were 640 feet long, 75 feet wide, and 30 feet deep (at minimum low water level in the river). The top of the lock stands twenty feet above the ground. The design utilizes the natural gravity flow of water to raise and lower the water level in the locks. A series of culverts was built into the base, each culvert measuring 8 by 10 feet (narrowing to 8 x 8 feet at the opening). They are closed off by eight sluice gates, each operated by a 52 horsepower electric motor. To fill the lock, the sluice gates at the river end would be opened; to empty it, the lake end sluice gates would be opened. It could be filled or emptied in ten minutes. The lock was equipped with five sets of gates, each 4 1/2 feet thick and weighing 200 tons. Four pairs of gates were 55 feet high; one pair was 42 feet high. The gates were designed by Henry Goldmark, who also designed the gates at the Panama Canal.

The lock and canal formally were dedicated on May 2, 1921. However, the 2,000-foot section between the lock and the river had not yet been excavated. The final cut would not be made until January 29, 1923. Completion of dredging took several days, and the canal finally was opened to river traffic on February 6, 1923. Regular barge line service through the canal was inaugurated by the Mississippi Warrior Barge Line on February 22, 1923.

The first two tenants on the canal were companies dependent on World War I shipbuilding contracts. The number of industries operating on the canal between the wars was modest: Jones & Laughlin Steel (1923); Lone Star Cement (1925); Gulf, Mobile, and Northern Railroad (1931); U.S. Lighthouse Service (1934); Lester F. Alexander's ship repair service (1936-37); and the Louisiana Material Company (1939). World War II meant that shipyards once again would become important tenants on the canal.

Another event which moved the Industrial Canal closer to full utilization was the designation of the lock and part of the canal as an integral section of the Gulf Intracoastal Waterway. The GIWW was a federal project designed to provide a sheltered waterway along the Gulf Coast from Apalachee Bay, Florida, to Brownsville, Texas. Some of the elements of the GIWW were executed before the idea of a GIWW had been conceptualized.

The Rivers and Harbors Act of 1910 authorized the construction of a number of projects which would become part of the GIWW. By 1925, a continuous waterway existed from the Mississippi River to the Sabine River. The River and Harbor Act of 1942 assured the successful completion of the GIWW. It authorized a channel 12 feet deep and 125 feet wide from Apalachee Bay, Florida, to the Mexican border. This Act also authorized Federal acquisition and control of the state owned Inner Harbor Navigation Canal and Lock.

The Dock Board had approached members of Congress as early as 1939 about making the Industrial Canal part of the GIWW. However, the outstanding debt on the canal prevented an outright transfer of ownership. The bonds which paid for construction of the canal and lock were not liquidated until 1960. The bonds also required the Board to operate and maintain the canal and lock. The New Orleans District leased the IHNC in March of 1944. Under the terms of the lease, the Government would pay the Dock Board $240,000.00 a year, and would operate and maintain that section of the canal from the point at which the GIWW entered the canal to the Mississippi River, including the lock, the St. Claude Avenue Bridge, and the Florida Avenue Bridge. The Dock Board's primary obligation was for major repairs.

The GIWW eventually entered the Industrial Canal through the Vickery Canal. Higgins Industries, Inc. was awarded a government contract to build ships at a place called Michoud Station. Although the plant was well along in construction, and ships were being fabricated, there was still no access to the Gulf. On April 16, 1942, dredging began in the Industrial Canal. A canal was dredged to the Michoud Shipyard (a distance of seven miles).

In 1976, the Dock Board requested a renegotiation of the rent to reflect changed economic conditions. After four years of study, the Government agreed to increase the annual rent from $240,000.00 to $1.2 million. A corollary Agreement to donate Real Property was basically a lease/purchase agreement.

The transfer of title would occur once rental payments equaled $11,752,624.00 (fair market value as of the date of the agreement), or if the Government should request land for construction of a new lock as provided in Public Law 455 dated March 29, 1956. In effect, the United States Government committed to the eventual acquisition of total ownership of the leased facilities.

The Inner Harbor Navigation Canal Lock has been determined eligible for the National Register of Historic Places. Demolition of the IHNC Lock required by this project will be mitigated by recordation of the structure to Historic American Engineering Record standards.

Sewerage Pumping Station B

Sewerage Pumping Station B was built during the first decade of the twentieth century and represents one of the original components of New Orleans' sewerage system.

A study for the New Orleans District based on archival research, architectural and engineering studies, and on-site evaluations of Station B. recommended that it should be considered eligible for inclusion in the National Register of Historic Places. The State Historic Preservation Office has concurred with this recommendation.

Since the founding of New Orleans in 1718, two of the most fundamental problems faced by its citizens were drainage and the sanitary disposal of sewage. The 1890s was a crucial decade in terms of public utilities for New Orleans. In 1893, prominent citizens of New Orleans came to realize that an adequate drainage and sewerage system and an adequate supply of drinking water were necessary for further economic growth. The New Orleans Drainage Commission was organized in 1896 to address this issue. The sewage problem was to be addressed by a private firm, the New Orleans Sewerage Company, beginning in 1894.

Little progress was achieved on New Orleans' drainage, sewerage, and water supply problems until the creation of the New Orleans Sewerage and Water Board by the Louisiana State Legislature in 1899. The Sewerage and Water Board planned to build three sewerage pumping stations from which waste would be pumped into the Mississippi River, including one at St. Claude Street in the Ninth Ward. The centrifugal pumps located in these stations would drive the sewage into cast iron force mains leading uphill to the river. By 1905, construction of the sewerage system had begun.

Sewerage Pumping Stations B and a number of others were completed in 1906. Most of the sewers were put into operation in that year. At this date there were 304.48 miles of sewers. The system had two steam driven and one electrically driven pumping stations discharging into the river, and had six intermediate lift stations.

Station B was the largest of the sub-stations. It contained two 18" centrifugal pumps directly connected to 100 H.P. 200 volt vertical shaft, variable speed induction motors. The pumps are designed to discharge 670 feet per minute against a 44 foot head. A new force main from Station B to the River was in place by the end of 1919. Wood trash pumps were installed in Station B during 1930 or shortly thereafter.

The sewerage station was not built exactly to the plans of 1903-1904. The original plans indicated that the first two pumps and motors would be installed at positions on the south side of the octagonal portion of the structure. However, the 1929 plans indicate that the original pumps and motors had been installed on the north side, which is the side closest to the main entrance of the structure. Minor changes were made to the facility after 1949, including replacement of the original wooden doors with metal doors in 1954.

Sewer Station B is associated with the career of Albert B. Wood. His work for the Sewerage and Water Board resulted in new pump designs that were subsequently adopted throughout the world. Wood was born in New Orleans in 1879. In 1899 he graduated from Tulane University in engineering. He accepted a job as a mechanical inspector for the newly formed New Orleans Sewerage and Water Board. He continued his association with that body from 1899 until his death in 1956. In 1906, Wood was promoted to the position of mechanical engineer. In 1908, he was placed in charge of the water works pumping station and the various sewerage stations. In 1939 Wood was elected general superintendent of the Board.

In 1906, Wood invented a six-foot centrifugal pump which was the answer to New Orleans' need for large capacity, low head pumps for its drainage system. At the time, it was the largest of its kind in the world. A short time later, he invented "flapgates" to stop water from backing up when the pumps were stopped. These flapgates soon became the industry standard.

In 1912, the City of New Orleans recognized its urgent need for increased drainage pumping station facilities. Wood offered to design a special pump, and in 1913 presented plans for the twelve-foot Wood Screw Pump. The pump consists of a siphon in the summit of which a screw type, steel bladed impeller rotates. The casing is split horizontally to facilitate access to the interior of the pump. The pumps were placed at the summit of a pipe siphon and pipe connections are made to the suction and discharge canals without the intervention of valves or gates. Priming is accomplished by means of rotary vacuum pumps. By admitting air to the casing before stopping the pump the vacuum is broken and the water prevented from siphoning back into the suction basin. Wood's twelve-foot screw pump was the largest and most powerful in the world, and it attracted the attention of engineers both in the United States and abroad.

Four of the pumps were installed and tested in 1915. In 1916, Wood patented his Trash Pump which revolutionized the sewerage system in New Orleans and throughout the world. He designed it to solve the problem of rags and trash, which were being introduced into the sewers and clogging the system. The invention alleviated the need for on-site attendants to unclog the screens needed on the pumps then in use. As a result, New Orleans' sewerage system was the first in the United States to become automatically operated.

James Wadsworth Armstrong was the architect of Pumping Station B and all of the other New Orleans Sewerage and Water Board buildings designed before 1910. Unfortunately, little is known of his early life and professional training. However, based on documented aspects of his career in New Orleans and Baltimore, it appears that he may represent an important figure in the history of American public works. He came to New Orleans in 1899 to work for the Sewerage and Water Board. Three years later, Superintendent Earl placed him in charge of pumping, power, and purification plant design. Prior to 1909, Armstrong provided the architectural design for all of the New Orleans buildings that were used for pumping sewage, pumping water, and purifying water, as well as the associated power stations.

The station today, which retains its original color scheme, stands alone on a block bounded by St. Claude, Sister, Marais, and Jourdan Streets. The station and its concrete yard are surrounded by a chain link fence. The yard and fence were added in the late 1970s. The rest of the block is a grassy lot. Originally, there was a small shed behind the station and a superintendent's house to the east of it. They were removed sometime between 1937 and the present.

Sewerage Station B is a two story, octagonal building with a one story, rear wing. The structure features a stucco wall treatment over brick that is accented with a reddish trim. The specifications called for terra cotta trim, but it appears to have been made of concrete with an integral dye. This appears to represent a difference between the plans and the "as built" structure.

The roofs of both sections of the building are clad in asphalt shingles and display exposed rafter ends. The roofs were originally covered in red tiles. The front and side planes of the octagon each display a round arch accented in trim and resting on pilasters crowned by simple capitals. The slightly recessed area under each arch contains either a round-arched window or, in the case of the front plane, a double-leaf, round-arched door. The present-day metal doors are replacements for the original, wooden doors. The original doors were flat topped with a round-arched fanlight above them. Two of these early windows are still extant, but the other round arched window openings contain louvers.

On the second story, above each arch, are triads of narrow, round-arched windows which are either boarded up or contain louvers. Originally, these window spaces contained pivoted, single-light windows. All of the windows have lugsills. On the rear elevation, an exterior stuccoed chimney rises above the hip roof of the wing and pierces the main roof. Plans for the building had specified brick corbelling. The chimney is now shorter and much plainer than the construction plans indicate. No historic photographs obtained for this study showed views of the original chimney so no determination could be made concerning whether the present chimney is a replacement or an "as built" modification to the original design plans.

The engineering aspects of Station B are relatively simple. Two 24-inch Wood trash pumps with drive motors and associated controls are present. When the water coming in from the sewers gets high enough, a float mechanism turns the pumps on, and when it decreases the mechanism turns them off. There are valves on the inlet and outlets of the pumps to allow them to be isolated and check valves are present to prevent backflow under unusual conditions. A new addition, which does not affect the station's integrity, is the addition of other valves which allow the outflow to be piped to the new treatment plant rather than the river. The old valves could be used to divert outflow to the river should an emergency make it necessary, but the present operational procedure calls for any diversion to take place at the treatment plant. A cleanout is provided for the pump sumps by means of a two-inch connection to city water so that it can be flushed. This simple arrangement is possible because the pumps will not clog with trash.

Two of the original pumps remain in place without motors and are considered spares. These are the predecessors of the trash pumps designed by A. Baldwin Wood. They had been installed and were operational by 1907. Also present are the two Wood trash pumps installed about 1930 and still in use. Two 275-horsepower Westinghouse motors are present. They were installed at the same time as the Wood trash pumps. Some rewiring of the motors has been done by Westinghouse.

Some changes have been made to the exterior of Station B. Nevertheless, the building retains its architectural character. The major alterations to the structure are: (1) the roof is now covered in asphalt shingles; (2) the majority of the windows have been replaced by metal louvers and those on the rear wing have been stuccoed over; (3) the original wooden doors with their fanlights have been replaced by taller, metal doors, and the fanlights have been removed; (4) the chimney has apparently lost its brick corbelling.

Despite the alterations, Sewerage Pumping Station B retains its original architectural character. Its massing and form have not been changed. The structure has not received any additions. The building's original color scheme is still extant. The heavy, stuccoed walls and round arched openings inherent in the Mediterranean style are still present on Station B. The original concrete trim which articulates the structure's round arches and octagonal form can still be seen.

Although Sewerage Station B has lost some of its architectural details, it still retains sufficient integrity to represent an important example of a locally significant building type that is associated with New Orleans' early-twentieth-century sewerage system as well as with the city's architectural history during the same period.

It is recommended that Sewerage Station B should be considered significant in terms of association (Criterion A), architecture (Criterion C), and engineering (Criterion C).

In terms of engineering, as well as architectural design, Sewerage Station B retains its historic integrity. Two of the original centrifugal pumps remain in place, although these are no longer used. Also, two Wood Trash pumps that were probably installed in ca. 1930 are present. These are still in use. The ca. 1930 changes made to the station in order to increase its capacity were the last major renovations made. These changes consisted of the installation of new pumps and new motors. The original 1904 plans were drawn with this installation in mind. Also, until those changes, few if any modifications had been made to the station since it was built during the first decade of the twentieth century.

Area West of the Industrial Canal

A comprehensive architectural assessment and preliminary archeological review of 64 city blocks west of the IHNC was completed by R. Christopher Goodwin & Associates, Inc., under contract to the New Orleans District from November 1991 to January 1992. No subsurface archeological testing was conducted. Fieldwork consisted of architectural evaluation and recordation of 179 buildings and industrial complexes, as well as assessment of the project area's potential to contain significant archeological deposits.

The Bywater area extends along the western side of the IHNC, from the Mississippi River northward to the northern end of the Galvez Street Wharf. Its antebellum development revolved around the Andry Plantation and the Ursuline Convent, both located near the Mississippi River. By the early postbellum period, the land was subdivided into city blocks. Other than a few residences along St. Claude Avenue, however, other postbellum development consisted of scattered truck farms and dairies. By the early twentieth century a complete rearrangement of project area settlement was underway. A combination of early twentieth century factors, including introduction of city water and sewerage services into the project area, and widespread ownership of automobiles, resulted in the subdivision of former truck farms and dairies into residential lots. In addition, the 1918 - 1923 construction of the IHNC and the adjacent rail system prompted industrial development along the northern and eastern portions of this area. By the mid-1930s, nearly all of the farms were either subdivided into residential lots, destroyed by marine and railroad construction, or used by industry. With notable exceptions, such as razing of the Poland Street Yard, the project area structural development has remained largely intact from the late 1930s.

Extensive historical research of the project area provided the necessary context for evaluating the surviving architecture, and for ascertaining the nature and age of the area's anticipated cultural resources.

The architectural component involved recordation and evaluation of all historic standing structures situated within the project area; a number of these also are included in the Bywater Historic District. The objectives of the architectural investigations were: (1) to identify historic built resources located within the boundaries of the project area; (2) to assess the potential significance of the identified properties utilizing National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]); and, (3) to evaluate potential impacts to significant historic properties located in the project area.

The archeological component consisted of the analysis of historic data to ascertain the probable nature and distribution of the area's archeological resources; it also included the development of a research design for guiding future archeological investigations. A series of cartographic overlays was used to compile relevant archeological data concerning the historic development of the project area.

Archeological fieldwork was limited to pedestrian and drive-by survey. Fieldwork was designed to evaluate the degree to which historic and modern disturbances have impacted the area's prehistoric and historic archeological resources. Through examination of compiled historic, cartographic, and disturbance data, as well as through comparisons of other urban studies conducted elsewhere in New Orleans and the United States, a research design was developed to guide subsequent archeological testing in the project area.

Previous to this study Gagliano et al. (1975) conducted archeological survey along the Gulf Intracoastal Waterway; a portion of the survey covered those parts of the IHNC located adjacent to the Bywater project area. This is the only study conducted within the current project area. Fieldwork included bankline survey and visual inspection of known and probable site locations within the study area; the survey was augmented by pedestrian survey and surface reconnaissance at each site area. A total of 158 prehistoric sites and 42 historic sites were located during survey. Five significant prehistoric sites were identified. Thirty-one sites were judged to be of moderate significance; eleven sites were assessed as possibly significant. None of the identified sites, however, fall within the Bywater area.

The Bywater area is best understood as part of the development of the city of New Orleans. The Creole neighborhoods below the Vieux Carré became the Third Municipality in 1836. After the Revolutions of 1848 in Europe, many German immigrants came to New Orleans and settled in the Third District.

A major feature of growth in the project area was development of streets. Streets in the area were unpaved in 1880, and their situation changed very little by 1896. The shell paving, planking, and gravel on streets in the project area in 1896 proved to be impermanent. Later in the twentieth century, New Orleans improved its streets and began to provide them with adequate hard surface paving, such as asphalt. By 1918, just before construction began on the IHNC, St. Claude Avenue, Burgundy Street, and Poland Avenue were paved. Other streets in the project area were paved soon afterwards.

During the railroad boom in 1837 a group of promoters in St. Bernard Parish chartered the Mexican and Gulf Railroad. Funded by a loan from the state and a $30,000.00 grant from the city of New Orleans, the company began construction in 1839 by laying tracks down Good Children Street (now St. Claude Avenue). The line ran through the project area and beyond the city limits for 19 miles. After the Civil War the Mexican and Gulf went out of business.

The New Orleans City Railroad Company opened the first line in the project area on July 1, 1861. Known as the Rampart and Dauphine line, it originated, like all the lines, on Canal Street. By 1884 one of the routes, known as the Levee and Barracks line, ran through the project area. Its cars came down Chartres Street to Poland Avenue, where they turned up to the car barn. The cars returned to town by Royal Street.

A sign that St. Claude Avenue in the project area was preparing for residential development was a city ordinance passed in 1897 forbidding dairies within certain limits in New Orleans. After 1900, St. Claude Avenue was no longer subject to flooding after every rainfall; new drainage machinery pumped off the water. By 1910, city water and sewerage had also been provided to residents along the street. St. Claude Avenue had been the traditional boundary between adequate and inadequate drainage in the project area and between the developed and the rural area. An examination of density of population in 1910 reveals that St. Claude Avenue also served as the boundary between inhabited and very largely unoccupied portions of the project area.

Just as New Orleanians decided to supervise and control their docks, wharves, and maritime terminals, so the city also decided to regulate railroad terminals. Closely related to the activities of the Dock Board was the operation of the Public Belt Railroad. Under public operation and control, this rail line was intended to serve the public wharves and such planned public facilities as the public cotton warehouse, the public grain elevator, the Inner Harbor Navigation Canal, and the U.S. Army Base. The Public Belt Railroad began operating in 1908. Its operations affected the project area; construction of the tracks, for example, probably forced the demolition of the Andry house. The tracks from the Mississippi River to Florida Walk originally lay on a right of way the railroad purchased from the Ursuline Convent. After plans for the IHNC were adopted, the Public Belt Railroad relocated. Its present path runs from the upper parish line to France Street, then diagonally through seven blocks in a northeasterly direction. It then runs approximately parallel to the IHNC in a northerly direction to a point near Galvez Street. From there, the tracks proceed west over a right of way immediately north of and parallel to Miro Street to its terminus at Poland Avenue, a distance of one and one-half miles.

Most of the surviving structures in this area date from the 1920s and the decades following. In the 1920s St. Claude Avenue began to change in character from a residential area to a street of small shops. The site of the old streetcars barns had been taken over by the city. In the block the city erected the Fifth Precinct Police Station, ca. 1935.

Throughout its history the project area remained a neighborhood that developed differently from uptown New Orleans. Project area settlement throughout the postbellum period consisted of the Ursuline Convent, the Andry Plantation, and scattered family truck and dairy farms. The blocks between Chartres and N. Rampart streets (south of St. Claude Avenue), and north of Marais Street (north of St. Claude Avenue) were occupied entirely by farmers and their families.

However, land-use patterns gradually changed during the first few decades of the twentieth century. A number of blocks formerly used for farming were being subdivided into residential lots; much of the project area continued in cultivation and pasture in 1910.

The area's transformation from a predominantly agrarian economic base to a mostly residential and industrial area accelerated following construction of the IHNC; by the late 1930s, farming accounted for a very small portion of the area's economic base and land-use. By the late twentieth century, the property no longer was cultivated as a commercial farm.

An influx of small, typically family-owned businesses in the project area mirrored the area's postbellum and twentieth century development. Little is known about small business development over the next several decades. A variety of small businesses were operating within the project area by 1937.

If project construction activities occur in the Bywater area, mitigation of adverse impacts to archeological properties will be necessary. Archeological investigations carried out during a disturbance study performed during January 1992 indicate four levels of perceived subsurface disturbance throughout the project area. These designations refer to anticipated integrity of potential archeological resources, and not to the current accessibility of those resources. Minor disturbance generally was assigned to empty lots, and to lots where the major structures such as residences and stores were constructed on piers. Areas designated as moderate disturbance include locations with modern constructions apparently built on fill, large parking lots, and lots with historic buildings apparently constructed on slabs. Heavily industrialized or commercialized properties, in which considerable subsurface disturbance has occurred, were classified as areas with major disturbance. Portions of these areas include whole blocks, small parts of which may exhibit only minor or moderate disturbance. Finally, the area along the IHNC, as well as the approach to the N. Claiborne Avenue Bridge, exhibited total disturbance, i.e., no substantive in situ archeological deposits are anticipated. Portions of that area may be covered with 1 to 3 m of dredged material deposited during excavation of the Industrial Canal.

Both surface and buried archeological deposits can be expected to occur within a natural levee. Unfortunately, these are also the areas that have been disturbed greatly by agriculture along with residential and industrial development. Given the degree the surface of the natural levee has been disturbed, it is highly unlikely that intact, undisturbed prehistoric archeological deposits will be found within the project area. Only those prehistoric sites buried under a protective layer of fill prior to intensive industrial and urban development of the project area have any chance of remaining intact and undisturbed. Although known examples are lacking, archeological deposits could be found buried within the natural levee terrain. Because the natural levees of the Mississippi River had been continuously aggrading since 1000 to 1300 years B.P., Troyville, Coles Creek, Mississippian, or Protohistoric archeological deposits might have accumulated on and would have been buried within the natural levees. However, it is unlikely that significant prehistoric archeological deposits are located within the project area.

As discussed earlier, historic development of the project area began in the early nineteenth century with the Ursuline Convent and the Andry Plantation. By that time, the established artificial levee system contained the Mississippi River, and prevented the deposition of large quantities of flood deposits into the project area. Therefore, historic sites buried by natural levee deposits are not anticipated within the project area.

On the other hand, historic archeological deposits have been impacted considerably by post-depositional historic and modern disturbances. The most dominant disturbances consisted of the 1918 - 1923 construction of the IHNC, and building of the adjacent New Orleans Public Belt Railroad extension. These constructions destroyed most remains associated with the Ursuline Convent, resulted in razing of the Andry Plantation structures, and covered much of the land adjacent to the canal with 1 to 3 m of dredged material from the canal. Related impacts included construction of the artificial levee which aligns the canal, erection of canal and railroad maintenance structures, and use of the northern portion of the project area as an industrial sector. All of these activities damaged and destroyed cultural resources.

The residential portion of the Bywater project area also has been damaged by late historic and modern constructions. A number of structures, especialy in the vicinity of St. Claude Avenue, have been destroyed to make way for modern development. The Poland Street Yard was razed. In addition, construction of the N. Claiborne Avenue bridge approach just west of the IHNC destroyed most historic cultural resources in that area.

Archeological investigations will consist of archeological testing followed by data recovery in the small areas of the ground to be disturbed if project impacts occur in this area. Decisions on the areas to be tested must be done on a block-by-block, and lot-by-lot basis which will consider area-specific disturbances to historic resources.

Intensive architectural investigations were undertaken within an area located in and near the Bywater National Register Historic District. Architectural investigations involved archival research and field investigation. Preliminary background research focused on identifying previously recorded historic properties within and in the vicinity of the project area. The history of the area was researched through an examination of previous cultural resources reports, National Register files, historic period maps, and pertinent secondary sources. Building-specific archival research was undertaken subsequently, in order to identify historically significant events or personages associated with buildings located within the project area. Sources consulted included city directories, period insurance maps, census population schedules, and New Orleans water connection records.

Architectural field investigations then were undertaken to compile sufficient data to enable evaluation of the architectural significance and integrity of the built resources, applying the National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]).

These field investigations incorporated two levels of architectural survey. First, a comprehensive reconnaissance survey was implemented in order to assess the integrity and period of construction of each building within the project area. A total of 179 buildings, complexes, and structures were examined. Information collected included data on use, placement, general architectural characteristics, building type, architectural style, and condition. In addition, all buildings were documented using 35 mm black and white photography, and all structures were keyed to an area map using current block and street numbers. Field assessments were made concerning construction dates and architectural integrity. Based on reconnaissance field data, buildings were classified into three categories: (1) buildings constructed after 1945; (2) substantially modified buildings lacking architectural integrity from a pre-1945 construction period; and, (3) buildings requiring intensive architectural survey and further evaluation. Fifty-four buildings, complexes, or structures were constructed after 1945. Six buildings from a pre-1945 construction period were evaluated as substantially modified and lacking integrity. Buildings classified in these two categories were eliminated from further consideration. In addition, data generated through architectural reconnaissance survey and preliminary archival research were used to develop an architectural context appropriate for evaluating building stock within the project area. This analysis indicated that the appropriate working context for the project area focused on architectural, commercial, and industrial development dating from ca. 1880 to ca. 1945.

Second, 113 buildings, complexes, and structures constructed before 1945 and that retained architectural integrity from the pre-1945 period were subject to intensive architectural survey. On-site survey was limited to exterior inspection from the public right-of-way. Building interiors and secondary elevations not visible from the street were not inspected as part of this investigation. Each building was documented using Louisiana Division of Historic Preservation's Historic Structures Inventory forms. Written data were supplemented by 35 mm black and white photographs of each structure. All forms were keyed by block and street address to a current project area map. Four major categories of information were assembled for each structure. These categories included building identification, physical description, architectural significance, and historical significance.

Reconnaissance and intensive survey field forms were reviewed for content, clarity, and accuracy. Multiple-building industrial and governmental complexes were consolidated, where appropriate. Edited reconnaissance and intensive survey data forms were integrated to produce a comprehensive data base on built resources for each block within the project area.

Upon completion of archival research and field investigations, data were analyzed in accordance with the

National Register of Historic Places Criteria for Evaluation (36 CFR 60.4 [a-d]). Buildings were assessed individually and collectively using these criteria. In addition, an impact assessment was undertaken for each proposed project segment applying the Advisory Council on Historic Preservation's Criteria of Effect [Section 800.9 (a-d)].

A literature search was undertaken to identify previous cultural resource investigations related to the current project area. Four earlier studies were identified that contained information pertinent to the current architectural investigation. Each of these efforts utilized different methodologies tailored to the objectives of the respective project.

Portions of the current project area were included in the 1979 *Architectural Survey and Evaluation of the Mississippi River - Gulf Outlet Shiplock Project in the Vicinity of the Industrial Canal* undertaken by Jerry C. Toler for the New Orleans District. The dual purposes of that investigation were to identify architecturally significant historic structures and to determine their significance. The objectives of the project were accomplished through a combination of archival research, field investigation, and data analysis. Although no individual buildings of major architectural or regional importance were identified within the current area of investigation, Toler noted that the housing stock in the area west of St. Claude Avenue "illustrates an important characteristic in that many of these newer houses are constructed employing the traditional housing patterns and house types that were used in nineteenth century development."

Other studies included the 1979 study entitled *Recommendations for National Register Districts in Community Development Areas*. The firms of Koch and Wilson Architects and Urban Transportation and Planning Associates, Inc., conducted the investigation on behalf of the Historic District Landmarks Commission of the City of New Orleans; the objective was to identify potential National Register Historic Districts and individual National Register properties in selected areas of the city. The methodology adopted for the Koch and Wilson/Urban study utilized comprehensive reconnaissance survey and building evaluation. In addition, noteworthy buildings in the proposed districts were identified and discussed briefly.

Bywater was one of the potential historic districts identified in the Koch and Wilson/Urban study. The area was assessed as significant for the overall quality and design cohesion of its collection of low-scale residential and commercial structures. The boundaries proposed for the district were the Inner Harbor Industrial Canal, the Mississippi River, Press Street, and several blocks on the lake side of St. Claude Avenue. This suggested boundary incorporated the majority of the blocks included in the current project area.

Data generated as a result of the Koch and Wilson/Urban study were used in 1985 by the State of Louisiana Division of Historic Preservation, assisted by the Bywater Neighborhood Association, in the development of National Register District documentation for the Bywater National Register Historic District. This district is architecturally significant on a state and regional level for the quality of its mixed collection of residential and commercial buildings dating from the period 1807 to 1935.

The project area of the architectural study incorporates all or portions of 64 historic city blocks. The project area is urban in character and includes examples of residential, commercial, industrial, and governmental development. Commercial development is concentrated along St. Claude Avenue and in the vicinity of the N. Claiborne Avenue bridge. An historic commercial area was documented on N. Robertson Street through surviving commercial building types. These buildings are no longer in service; inspection indicates a ca. 1900 - 1920 date of construction. Industrial development in the vicinity of the IHNC includes buildings representative of both heavy and light industrial use.

The remainder of the project area is dominated by residential use. Single, double, and multiple unit structures are represented. The building stock is low scale; block density ranges from low to medium. The plan of the area utilizes a grid design, resulting in a regular sequence of rectangular blocks of varying dimensions. St. Claude Avenue and Poland Avenue serve as principal east-west and north-south transportation arteries, respectively. Both streets include landscaped central medians, features of the New Orleans streetscape that reinforce the city's pedestrian scale and serve as practical noise buffers in high-traffic areas. These major avenues are augmented by N. Claiborne Avenue, a major street providing direct vehicular access across the IHNC.

The majority of the primary and secondary streets are lined by formal and informal walkways. Paved sidewalks generally are found in the area west of Poland Avenue and along St. Claude Avenue. Informal pedestrian paths generally are located in residential blocks east of Poland Avenue. Public landscape improvements are confined to St. Claude and Poland avenues.

The buildings contained in the project area represent examples of urban vernacular design. While these buildings frequently incorporate high style ornamentation, none exemplify high style design integrating the associated architectural characteristics of scale, proportion, massing, materials, texture, and ornamentation.

Four major building types were identified in the area. These included shotguns, camelbacks, bungalows, and pyramidal cottages. Subcategories within the building types of shotgun, double shotgun, and camelbacks also were represented.

Sixty-one per cent of the 113 buildings subjected to intensive survey were identified as shotgun building types. Subcategories in this classification include one-bay shotguns, two-bay shotguns, three-bay shotguns, four-bay double shotguns, raised two-bay shotguns, and raised four-bay double shotguns.

Built resources documented during the intensive architectural survey were assessed using the National Register Criteria for Evaluation (36 CFR 60.4 [a-d]). Each resource was evaluated individually for integrity, individual significance, and potential for contributing as elements to potential historic districts or thematic resource classifications.

Archival research and on-site investigation indicated that three primary historic contexts were appropriate for assessing the resources contained in the project area. In addition, two buildings, 4212 St. Claude Avenue (Block 351), and the Outboard Machine Shop (Coast Guard Complex), required the development of resource-specific historic contexts to facilitate their assessment.

Six blocks fall within the boundaries of the Bywater Historic District, an area listed on the National Register of Historic Places on January 23, 1986. These are Blocks 347, 348, 349, 350, 351, and 413. The Bywater National Register Historic District is an urban historic district encompassing 120 blocks; it contains 2,051 buildings. The district is significant under Criterion C of the National Register Criteria for Evaluation. The area is important architecturally on a local and regional level for the quality and number of buildings constructed during the period 1807 to 1935. Of particular note is the district's collection of intact shotgun buildings, which accounts for 61 per cent of the building stock.

Thirty-four buildings within the Bywater Historic District are included in the area studied. Twenty-six of these buildings were investigated intensively. Five of these structures are classified as intrusions in the historic district documentation. Two additions to this category were identified as a result of the current study. Both structures have been altered substantially since the preparation of the National Register district documentation, and no longer retain design integrity from the district's period of significance.

Archival investigations indicated that one contributing building to the Bywater Historic District also was associated with a person of local significance. The building is an example of a ca. 1910 Bungalow style dwelling that has been converted to commercial use. The structure survives intact with minimal alterations to the original exterior building fabric. The building retains its overall integrity from its period of construction. The dwelling was associated with William V.

Seeber (1880 - 1954), Judge, Section C, First City Court, who resided at the address from 1908 to 1942. Seeber graduated from Tulane Law School in 1902. He practiced law and became official notary of the city of New Orleans in 1904. In the same year, he was elected to the state legislature, where he became the youngest member then serving. In 1924, he was first elected Judge, Section C, First City Court, a post he occupied until his death in 1954. At the time of his death, which was noted on the front pages of both local newspapers, he resided on Alvar Street in the Third District. The Claiborne Avenue bridge, constructed between 1953 and 1957, has as its official name the Judge Seeber Bridge.

Several additional resources within the project area were evaluated within the context of the development of the Industrial Canal Zone. These include the Flintkote Industrial Complex, the Claiborne Street Storehouse, and the Public Belt Railroad Switchyard. These resources have been altered over time through modification, addition, and new construction; they do not retain integrity from the pre-1940 period of significance of the Industrial Zone.

The final structure located in the vicinity of the Industrial Canal Zone is the U.S. Coast Guard Outboard Machine Shop. This two-and-one-half story, six-bay, rectangular building is supported by a concrete slab foundation; it terminates in a shallow gable roof defined by a concrete coping. The masonry building is faced in five course common bond brick and includes Art Deco stylistic references. The building survives intact with minimal alterations. Archival research and on-site investigation do not suggest that the building possesses those qualities of significance necessary for individual listing in the National Register of Historic Places.

Holy Cross Historic District

The Holy Cross Historic District was investigated to identify and evaluate historic properties and develop a mitigation plan to avoid adverse impacts on historic properties.

An architectural survey was conducted of all areas east of the Industrial Canal which might be directly impacted, in terms of destruction or removal of structures. The purpose of the survey was: (1) to identify all historic properties located within the project corridor east of the Industrial Canal; (2) to assess the architectural significance of those historic properties according to NRHP criteria; and (3) to assess the impact to the Holy Cross National Historic District. A previous study by Toler in 1979 was also used.

Vehicular and pedestrian surveys were conducted within the study area in order to assess the architecture, streetscapes, and physical conditions of the built environment. The surveys allowed an accurate determination of the current condition of the architectural stock. Structures that appear to be over fifty years old and that retain their integrity were evaluated in terms of NRHP criteria with the exception of structures within the boundaries of the Holy Cross National Historic District.

In the following discussion, the project corridor is divided into three sections or neighborhoods: Upper, Middle, and Lower. All three are bounded on the east by Deslonde Street and on the west by the Industrial Canal. The term "neighborhood" is used because the areas are almost exclusively residential. The "Upper Neighborhood," or northernmost section, is the area between Claiborne and Florida Avenues. The "Middle Neighborhood" is the area between St. Claude and N. Claiborne Avenues. The "Lower" or southernmost neighborhood is the area between the Mississippi River and St. Claude Avenue. The industrial facilities on the levee between N. Claiborne and Florida Avenues are described in the section concerning the Upper Neighborhood.

In summary, the three neighborhoods within the project area appear to represent three periods of settlement. The Lower is primarily historic, the Upper is modern, and the Middle represents a transition between these two. "Walls" between the three areas have been created by the up-ramps of the St. Claude and N. Claiborne Avenue Bridges. These walls further define the three neighborhoods, and represent architectural boundary lines as well. They divide areas that are distinctive in terms of architectural texture, landscaping, and building types.

Almost all of the structures in the Upper Neighborhood are modern. Dwellings built more than fifty years ago appear to be practically non-existent. This is the result of the fact that this portion of the study area was the last to be developed.

The area does not represent a typical "New Orleans Urban" scene. Rather, the Upper Neighborhood in certain places possesses rural characteristics stemming from the simplicity of the building types and their late period of construction. The majority of the homes here are side gable, four room square, or doubles of the same nature. There are few attempts to use traditional New Orleans archetypes such as shotguns or cottages. It appears, on the basis of supporting piers, that many of those which do represent such types were moved to their present sites from other parts of the city.

In recent years, that portion of Jourdan Avenue within the Upper Neighborhood has been newly paved, and a drainage canal in its center changed from open to subsurface.

The levee along Jourdan Avenue screens residences to the east from the industrial complex located to the west. Architectural evaluation of the industrial complex indicated that it is thoroughly modern. The buildings are typically steel panel industrial types. None of the structures associated with this industrial complex exhibit historical or architectural significance.

In the middle neighborhood the architectural fabric begins to change. Historic structures older than fifty years are the exception rather than the rule. Even these few historic structures appear later than many that are present in the Lower Neighborhood. Some are typological oddities that combine architectural techniques and local building types into hybrids. The proliferation of modern, buildings is apparent. North of N. Villere Street, historic components are no longer present. The settlement pattern here is reminiscent of that of modern subdivisions: equal size houses centered on equal size lots.

The number of historic structures increases from north to south within the Middle Neighborhood. Although modern structures predominate, a greater proportion of older buildings are present here than is true of the Upper Neighborhood. Most of these are located on Jourdan Avenue.

The housing types in the Middle Neighborhood are many and varied. Some shotguns and cottages older than 50 years do exist. It is sometimes difficult to determine whether those buildings were constructed on their sites or were moved from other areas. This is a primarily modern architectural assemblage, and historic structures are a distinct minority. None of these structures are significant.

The Lower Neighborhood (St. Claude to the Mississippi River) contains a relatively large number of shotguns and doubles.

The architectural assemblage of the Lower Neighborhood is dramatically different from that of either the Middle or Upper. Much of this area is included within the Holy Cross National Historic District. Architecture here is similar to that of other historic residential areas of New Orleans. Many of the older buildings have been significantly altered, modified, or otherwise renovated.

Many of the structures here still exhibit a high degree of architectural integrity. Beautifully carved brackets and frieze mouldings along with cornices and tracery millwork adorn practically every facade. The fronts of most homes exhibit at least one local ornamental tradition.

Generally speaking, the architecture of the Lower Neighborhood consists of classic New Orleans archetypes. The majority of the homes are single and double shotguns which possess either Italianate or Eastlake details.

Several of the oldest houses in the project area present the appearance of having been severely modified. However, the nature of these modifications are not changes to the plan but to the skin. When modern building materials such as asphalt roofing and siding and aluminum frame windows became available, many original components of older buildings were lost.

In 1991, the Museum of Geoscience of Louisiana State University submitted to the New Orleans District a final report that included a research design for archeological investigations within the Holy Cross area. Based on this research design, Earth Search, Inc. received a work order to conduct field investigations to examine the significance and integrity of archeological deposits which archival research and reconnaissance level investigation indicated might be present.

Prior to field investigations, various historic maps of the study area were digitized by the CADGIS Laboratory at the Louisiana State University College of Design. Results were used to refine previous predictions concerning locations of suspected historic features. Predicted features included remains of a nineteenth-century brickyard, a slave quarters, a truck farm, and post-1869 residential lots.

Archeological testing in the Holy Cross District was undertaken for the New Orleans District by Earth Search, Inc. Site maps were prepared for these areas, and shovel tests were excavated at 5 m gridded intervals. Subsequently, three units were excavated within these squares. The results confirmed predictions based on historical research and computerized map research. Excavations also indicated that subsurface archeological deposits in these areas have integrity and further research potential (criterion d) in that they could yield information that would advance our understanding of history.

Another goal of the research effort undertaken by Earth Search, Inc., was to determine whether significant archeological deposits were present in residential and commercial lots where structures are still standing. The New Orleans District provided Earth Search, Inc., with ownership information for selected lots which the earlier study had predicted might contain significant deposits. Earth Search, Inc., then obtained right-of-entry to some of those lots and excavated shovel tests at 5 m gridded intervals. An excavation unit was placed within one of the lots. Results of this effort indicated that archeological deposits and features are present within such lots in the study area. The results also indicated that these deposits and features exhibit the qualities of integrity and research potential, both of which are necessary for archeological sites to be considered eligible for inclusion on the National Register of Historic Places.

Excavations were not conducted within every lot or square that may be impacted by construction. However, archival research indicates that since 1869, land use has been similar on all of the squares. Therefore, the sample of squares and lots where excavations were conducted is considered to be representative of the study area as a whole.

Bridges

Modification of the IHNC Lock will require replacement of the St. Claude Avenue Bridge and alteration of the Claiborne Avenue Bridge. For this reason, the significance of these engineering structures was assessed according to National Register criteria.

Archival research was conducted to obtain dates of construction and information concerning subsequent modifications to the bridges under evaluation. Oral interviews were also conducted. The St. Claude Bridge is an examples of a type, the Strauss Heel Trunnion Bascule Bridge. The Claiborne Avenue (Judge Seeber) Bridge is an example of the vertical lift type. For this reason, research was conducted into the history of the development of movable bridge types in order to determine the place and role of these bridges in the history of their respective types. Also, research focused on determining whether there was a direct association between Joseph B. Strauss, one of America's great civil engineers, and the two bascule bridges. Finally, field visits were made to each of the bridges to assess their integrity and to obtain a photographic record for comparison with the original plans and with other, similar bridges located elsewhere.

St. Claude Bridge

The St. Claude Bridge has been determined eligible for the National Register. Built between 1918 and 1921, it crosses the canal, actually straddling the southern end of the IHNC lock. The bridge is a Strauss Heel Trunnion Bascule bridge. Two vehicular (once streetcar) lanes are located between the trusses and two cantilevered lanes outside the trusses. The northern cantilevered lane was built for a single track of the Louisiana Southern Railroad Company, leaving only one vehicular lane in 1921. There is a tower-like addition on the eastern or pivoting end of the bridge which carries a large concrete counter-weight. The opening end of the bridge rests on the west wall of the IHNC lock.

In 1949, the St. Claude Avenue Bridge was improved by the removal of the unused streetcar tracks. This resulted in a gain of two additional automobile lanes between the trusses. At this time, wooden decking was rebuilt in steel in order to meet heavier traffic loads. At this time, 9,240 pounds were added to the moving leaf and counteracted by the addition of 44 concrete blocks into the counterweight. Despite these changes the principal features of the design and construction of the bridge remain intact.

This type of bridge is significant in the history of American engineering. This was a commonly built type because it represented a relatively economic, efficient solution to the problem of accommodating vehicular and rail traffic over navigable waterways used by commercial boats. Application of Criterion C to the St. Claude Bridge indicates that it represents a significant type of engineering structure which was in common use throughout the United States. As a representative of its type the St. Claude Bridge is eligible for inclusion in the NRHP under Criterion C.

The construction of a new lock will require destruction of the St. Claude Bridge. Mitigation will require documentation to Historic American Engineering Record (HAER) standards Level II. This level will serve to document the bridge as representative of a significant type and will result in mitigation of its research potential through curation of documents, plans, and photographs of the structures. HAER Level II Documentation consists of drawings, photographs, and a history and description of the bridge.

Claiborne Avenue Bridge

The North Claiborne Avenue or Judge Seeber Bridge is a vertical lift bridge built between 1954 and 1957. On this bridge the moving span is 360 feet long and 57 feet wide and is a steel through Warren truss with verticals. The overall bridge length, including approaches, is 2,418 feet. The approaches are of steel and concrete construction. The piles and piers are cast-in-place concrete. The raised bridge offers a 156-foot vertical clearance from mean high water, sufficient for ocean-going vessels. Closed clearance is 40 feet. The steel towers are approximately 178 feet high (230 feet above water). They contain the machinery at the top, consisting of a power cable strung between the two towers, and stairs, as well as counterweights and counterweight chains (to balance the counterweight cables).

National Register Bulletin 15 entitled "Guidelines for Applying the National Register Criteria for Evaluation" states that "...properties that have achieved significance within the past 50 years shall not be considered eligible for the National Register..." with the exception of "...a property... of <u>exceptional</u> importance." The North Claiborne Avenue or Judge Seeber Bridge was erected between 1954 and 1957. It is not 50 years old. Archival research and field examinations indicate that, in terms of its historic significance and engineering qualities, this bridge is not an exceptional structure. Rather, it is an ordinary bridge for its time without any particular merit in design or construction. In terms of Criterion C, then, it warrants no further consideration for nomination to the NRHP.

The North Claiborne Avenue Bridge, like many similar projects in Louisiana, was a subject of controversy among local and state politicians, particularly Mayor deLesseps Morrison and Governor Earl Long. However, the bridge itself was of minor rather than exceptional importance in terms of state and local history. In terms of Criterion A, then, it warrants no further consideration for nomination to the NRHP. Similarly, the bridge is not directly associated with the lives of persons significant in our past (Criterion B). Further, its lack of exceptional engineering qualities obviates any potential to yield information important to history (Criterion D).

Galvez Street Wharf

The Galvez Street Wharf, designed by the office of the Board of Commissioners of the Port of New Orleans in 1922 and erected by 1929, was among four facilities established in the Industrial Canal Zone by that date. Originally known as the Claiborne Avenue Wharf, the facility was among the first improvements to the Industrial Canal Zone.

This large, single-story facility occupies a site adjacent to the canal. The rectangular, multi-bay industrial structure is supported by a metal frame and rises to a shallow gable roof sheathed in corrugated zinc. Interior bay divisions are defined by narrow tongue-and-groove paneling and accessible by steel overhead doors; natural lighting is provided by skylights. The building is functional in design and survives with its original design intact. Inspection indicates that the exterior walls, now sheathed in corrugated metal panels, originally were clad in vertical boards.

The building is significant locally and regionally for its historical associations with the early period of development of the IHNC. The building possesses those qualities of historical association with a pattern of events necessary to qualify for National Register listing under Criterion A.

The Galvez Street Wharf would be demolished for construction of the North of Claiborne alternative. The destruction of the Galvez Street Wharf would constitute an adverse effect on this historic property. Recordation of the property in accordance with standards of the Historic American Engineering Record (HAER) will mitigate this finding. The appropriate level of recordation would include documentation meeting the technical and substantive standards of HAER Level III documentation. Level III documentation requires graphic recordation of the building through large format archival photography, preparation of proportional floor plans, and compilation of summary descriptive and historical data. This permanent record of the structure would be housed at the Library of Congress in Washington, D.C.

Detour Route

A detour route will be constructed along the eastern side of the Gueringer Canal and in in an area between the Walk Canal and the back protection levee. A research design for the study of cultural resources in this area was completed for the New Orleans District (Irion, et. al., 1994).

This area consisted of undeveloped cypress swamp throughout much of its history. Based on known prehistoric settlement patterns, few if any Native American archeological deposits are anticipated in the project area. The area consists of drained inland swamp deposits, a terrain that has been not been found to be conducive to long-term occupation. In historic times, it formed the hinterlands of both the Languille and Macarty plantations, plantations that fugured significantly in the Battle of New Orleans in 1815, but no activities related to the battle were in the project area. An examination of sources from the eighteenth and nineteenth centuries provided no evidence of habitation, agricultural production, or military activity in the project area. No known improvements were made in the area until the second half of the twentieth century.

Based on this intensive background research no significant cultural resources are anticipated in the area of the detour route.

Graving Site

A cultural resources investigation of the Graving Site is underway. Detailed background information on the project area has been gathered including a review of literature, maps and records to develop a comprehensive understanding of the area. This research included a review of historic maps, aerial imagery, the State Archeologists site files, the National Register of Historic Places, geological and geomorphological data, archeological reports, archives, and public records. This information allows predication of any cultural resources existing in the project area.

Background research and field inspection indicates that no cultural resources exist in the project area. A report recommending no further cultural resources investigations will be coordinated with the State Historic Preservation Office.

References Cited

Dobney, Frederick D. et. al.
1987 Evaluation of the National Register Eligibility of the Inner Harbor Canal Lock in Orleans Parish, Louisiana. R. Christopher Goodwin and Associates, Inc., New Orleans.

Earth Search
1992a Archeological Survey and Testing in the Holy Cross Historic District, New Orleans, Louisiana. New Orleans.

Earth Search
1992b National Register Evaluation of Sewerage Station B, New Orleans, Louisiana.

Herschel A. Franks, et. al.
1991 A Research Design for Archaeological Investigations and Architectural Evaluations within the Proposed Upper Site, New Lock and Connecting Channels, Inner Harbor Navigation Canal, New Orleans, Louisiana. Museum of Geoscience, Louisiana State University, Baton Rouge.

Irion, Jack, Ralph Draughon, Jr., Paul Heinrich, and William P. Athens.
1994 Research Design for a Detour Route for a New Lock, Orleans Parish, Louisiana. R. Christopher Goodwin & Associates, Inc., New Orleans.

Section 2

THREATENED AND ENDANGERED SPECIES

SECTION 2
THREATENED AND ENDANGERED SPECIES AND SPECIES OF LOCAL CONCERN

In accordance with Section 7 of the Endangered Species Act, letters were sent to the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) requesting information on threatened and endangered species that could be affected by the proposed project. Information on species present at both the Violet and Inner Harbor Navigation Canal sites were requested in the letters. (At the time of the request, the Violet Site was still considered a viable alternative.)

USFWS Consultation. The USFWS responded in a letter dated April 21, 1989 that no endangered, threatened, or proposed species are likely to reside in the study area and that no critical habitat is located in the vicinity. The USFWS also referenced a previous letter, dated September 17, 1981, that stated no listed species were present in the area. Copies of the USFWS letters are provided.

Since 1989, the gulf sturgeon (*Acipenser oxyrinchus desotoi*) has been listed as a threatened species and the pallid sturgeon (*Scaphirhynchus albus*) has been listed as an endangered species. The gulf sturgeon is native to the coastal streams and estuaries along the northeastern Gulf of Mexico, from the Mississippi River to southern Florida. The pallid sturgeon is native to the Missouri River drainage and ranges as far south as the lower Mississippi River. The USFWS was consulted by telephone in February 1994, concerning the possibility of either of these two species being affected by the study alternatives. The USFWS and USACE concluded informally that neither of these two species are likely to be in the vicinity of the IHNC and that they would not likely be affected by any alternatives under consideration.

In October 1996, the USFWS was consulted to update endangered species information. Information concerning the plans under consideration was provided to the USFWS, including the proposed graving site. The USFWS responded that the proposed activities would not significantly affect listed or proposed threatened or endangered species. A copy of the correspondence is provided.

NMFS Consultation. In a letter dated March 29, 1989, the NMFS supplied a list of endangered and threatened species which might occur in the vicinity of the proposed project. The list included the finback, humpback, right, sei, and sperm whales and the green, hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles. A biological assessment was prepared for these species and submitted to the NMFS on May 9, 1989. The assessment concluded that it would be unlikely for the proposed project to have a impact on any of the listed species. In a letter dated May 24, 1989, the NMFS concurred with the determination that populations of endangered/threatened species under their purview would not be adversely affected by the any alternatives under consideration. A copy of their letter is provided.

In October 1996, the NMFS was consulted to update endangered species consultation. Information concerning the plans under consideration was provided to the NMFS, including the proposed graving site. The NMFS responded that the proposed activities would not significantly affect listed or proposed threatened or endangered species. A copy of the correspondence is provided.

Louisiana Natural Heritage Program. A letter was also sent to the Louisiana Natural Heritage Program requesting information on species of local concern. The Natural Heritage Program identified a rare species of holly on canal banks in St. Bernard Parish. This area would have been affected by a project at the Violet site. Since the Violet site is no longer a viable alternative, no impacts to this species or other species of local concern are expected. A copy of the Natural Heritage Program's letter is provided.

FACSIMILE TRANSMITTAL HEADER SHEET

For use of this form, see AR 25-11; the proponent agency is ODISC4

	COMMAND/ OFFICE	NAME/ OFFICE SYMBOL	OFFICE TELEPHONE NO. (AUTOVON/Comm.)	FAX NO. (AUTOVON/Comm.)
FROM:	RICHARD BOE	CELMN-PD-RS	(504) 862-1505	(504) 862-2572
TO:	TERRY RABOT	USFWS - Lafayette	(318) 262-6662	(318) 262-6663

CLASSIFICATION	PRECEDENCE	NO. PAGES (Including this Header)	DATE-TIME	MONTH	YEAR	RELEASER'S SIGNATURE
		4	7 th	Oct	96	

REMARKS

As per our telephone conversation Oct 4

THE PROPOSED ACTIVITIES WOULD NOT SIGNIFICANTLY AFFECT LISTED OR PROPOSED THREATENED OR ENDANGERED SPECIES.

Space Below For Communications Center Use Only

Terrence E Rabot

ENDANGERED SPECIES COORDINATOR
U.S. FISH & WILDLIFE SERVICE
LAFAYETTE, LOUISIANA
DATE: 10/9/96

DA FORM 3918-R, JUL 90 DA FORM 3918-R, AUG 72 IS OBSOLETE USAPPC V2.10

We are preparing to release the feasibility report and draft EIS for the MRGO New Lock and Connecting Channels in the near future. I need to update our threatened and endangered species consultation. As you are familiar with the basic features of the project, I'll explain only some recently added features. An offsite construction yard (Graving Site) has been added for construction of the new lock modules. The graving site is located along the north bank of the MRGO just west of Paris Road (LA 47). The site would be excavated with bucket dredges to form a slip alongside the channel. Other project features include the disposal of dredged material into previously-used MRGO disposal areas and into an area of shallow water as mitigation for impacts of the Graving Site.

We believe the proposed action would not likely affect any species under your purview. We are aware of a West Indian manatee that appeared near the heated outfall of a power plant last year. The power plant is located about 1 mile east of the proposed Graving Site. The likelihood of additional manatees showing up in this area seems very low, since it is outside of their normal range. No aquatic plants suitable for their food source occurs in this vicinity. However, any manatee that may wander into this general area during cold weather could be attracted to the heated outfall of the power plant. Even if that occurred, the project features would be sufficiently distant to cause no impact.

I'll be looking forward to your reply.

P.S. I have enclosed a copies of two letters from your office for reference and a map showing the project features discussed above.

United States Department of the Interior
825 Kaliste Saloom Rd.
Brandywine Bldg. II, Suite 102
Lafayette, Louisiana 70508

April 21, 1989

Mr. R.H. Schroeder, Jr.
Chief, Planning Division
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160

Dear Mr. Schroeder:

This responds to your March 27, 1989, letter requesting updated information on threatened or endangered species that may be affected by the proposed Mississippi River-Gulf Outlet, New Lock and Connecting Channels Project. Enclosed with your letter were copies of two previous letters from the Fish and Wildlife Service (Service) to the Corps that provided information concerning threatened or endangered species in the study area, and a map of the proposed project area.

Based on our review of the map you provided, the Service has determined that the information provided in our letter of September 17, 1989, (copy attached) is current. That letter stated that there are no endangered, threatened, or proposed species likely to reside in the project area, and no Critical Habitat in the vicinity. Therefore, no further coordination is required unless a new project site is proposed.

If you need further assistance, please call Terry Rabot (318/264-6630).

Sincerely yours,

David M. Smith
Acting Field Supervisor

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
200 EAST PASCAGOULA STREET, SUITE 300
JACKSON, MISSISSIPPI 39201

September 17, 1981

IN REPLY REFER TO:
Log no. 4-3-81-203

Mr. R.H. Schroeder, Jr.
Department of the Army
New Orleans District, Corps of
Engineers
P.O. Box 60267
New Orleans, Louisiana 70167

ATTN: LMNPD-RE

Dear Mr. Schroeder:

This responds to your letter of August 26, 1981, requesting Endangered species information for the vicinity of the proposed project entitled: Mississippi River - Gulf Outlet, New Lock and Connecting Channels.

Our records indicate that there are no endangered, threatened, or proposed species likely to reside in the project areas, and there is no Critical Habitat in the vicinity. Therefore, this project, at its present location, will require no further coordination with our office.

If you require further information or if you anticipate any changes in the location or scope of this project, please contact Judy Jacobs of our staff, telephone FTS 490-4909, commercial 601/960-4909.

We appreciate your participation in the effort to promote the survival of endangered species.

Sincerely,

Dennis B. Jordan

acting for Gary L. Hickman
Area Manager

cc: ~~RD, FWS, Atlanta, GA (ARD-FA/SE)~~
ES, FWS, Lafayette, LA
Department of Wildlife & Fisheries
New Orleans, LA

Encl 1

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
9721 Executive Center Drive N.
St. Petersburg, FL 33702

F/SEO13:JBM

OCT 17 1996

Mr. Richard Boe
New Orleans District, Corps of Engineers
Department of the Army
P.O. Box 60267
New Orleans, Louisiana 70160-0267

Dear Mr. Boe:

This responds to your facsimile dated October 7, 1996, concerning replacement of a lock within the alignment of the Inner Harbor Navigation Channel in New Orleans. This is a highly developed and industrialized area and all dredging would be done with cutterhead and bucket dredges.

On May 9, 1989 you submitted a Biological Assessment (BA) pursuant to Section 7 of the Endangered Species Act of 1973 (ESA), requesting consultation. We determined at that time that populations of endangered and threatened species under the purview of the National Marine Fisheries Service would not likely be adversely affected by the proposed action. After reviewing the project material recently provided, we have concluded that there is no new information to change the basis for our previous determination.

This concludes consultation responsibilities under Section 7 of the ESA. However, consultation should be reinitiated if new information reveals impacts of the identified activity that may affect listed species or their critical habitat, a new species is listed, the identified activity is subsequently modified or critical habitat determined that may be affected by the proposed activity.

If you have any questions, please contact Colleen Coogan, Fishery Biologist, at (813) 570-5312.

Sincerely yours,

Andrew J. Kemmerer
Regional Administrator

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9450 Koger Boulevard
St. Petersburg, FL 33702

May 24, 1989 F/SER23:TAH:td

Mr. R. H. Schroeder, Jr.
Chief, Planning Division
U.S. Dept. of the Army
New Orleans District, COE
Post Office Box 60267
New Orleans, LA 70160-0267

Dear Mr. Schroeder:

This responds to your May 9, 1989, letter regarding the proposed Mississippi River-Gulf Outlet, New Lock and Connecting Channels project. A Biological Assessment (BA) was transmitted pursuant to Section 7 of the Endangered Species Act of 1973 (ESA).

We have reviewed the BA and concur with your determination that populations of endangered/threatened species under our purview would not be adversely affected by the proposed action.

This concludes consultation responsibilities under Section 7 of the ESA. However, consultation should be reinitiated if new information reveals impacts of the identified activity that may affect listed species or their critical habitat, a new species is listed, the identified activity is subsequently modified or critical habitat determined that may be affected by the proposed activity.

If you have any questions, please contact Dr. Terry Henwood, Fishery Biologist at FTS 826-3366.

Sincerely yours,

Charles A. Oravetz

Charles A. Oravetz, Chief
Protected Species Management
Branch

cc: F/PR2
F/SER1

State of Louisiana

Virginia Van Sickle
SECRETARY

DEPARTMENT OF WILDLIFE AND FISHERIES
LOUISIANA NATURAL HERITAGE PROGRAM

Buddy Roemer
GOVERNOR

P.O. Box 98000
Baton Rouge, LA 70898

April 5, 1989

Mr. R. H. Schroeder, Jr.
Chief, Planning Division
New Orleans District
U.S. Army Corps of Engineers
P.O. Box 60267
New Orleans, LA 70160-0267

RE: Proposed Mississippi River-Gulf Outlet, New Lock and Connecting Channels Project

Dear Mr. Schroeder:

A search of the Louisiana Natural Heritage data base for threatened and endangered species and state rare species in the area of the above proposed project revealed the possible occurrence of a state rare plant, Dahoon Holly (Ilex cassine). This species was recorded 4 miles northeast of Violet, La., on marsh canal banks with Spartina, Iva, Eupatorium, and Baccharis. The record, however, is old (from 1960), and recent surveys have not been conducted by LNHP in the area. This species, which is a small tree or large shrub, is known in the state only from the coastal zone in southeast Louisiana.

The Louisiana Natural Heritage Program has compiled data on rare, endangered, or otherwise significant plant and animal species, plant communities, and other natural features throughout the state of Louisiana. While this information is available for preparation and review of environmental assessments, it is not a substitute for on-site surveys. The quantity and quality of data collected by this inventory are dependent on the research and observations of many individuals and organizations. In many cases, information on environmental elements is not the result of comprehensive field surveys. For this reason, the Louisiana Natural Heritage Program cannot provide an absolute definitive statement on the presence, absence, or degree of health of environmental elements in any part of Louisiana.

Please contact the Louisiana Natural Heritage Program section at the above address or phone (504)765-2821 if additional information is needed.

Sincerely,

Robert Misso

Virginia Van Sickle
Secretary

VVS:NMG/plh
cc: Blue Watson, Ecological Studies
La. Natural Heritage Program

Section 3

SECTION 404(B)(1) EVALUATION

SECTION 3
SECTION 404(b)(1) EVALUATION

This section contains two Section 404(b)(1) evaluations. The first evaluation is for the removal and disposal of material dredged from the Inner Harbor Navigation Canal. Disposal sites covered in the evaluation include the Mississippi River, the Inner Harbor Navigation Canal, a mitigation site where dredged material would be used for wetland restoration, and a confined disposal site along the south bank of the MRGO/GIWW. This evaluation is in "long-form" format. The second evaluation is for dredging and disposal at a graving site to be used for off-site lock module construction. It is in "short-form" format.

SECTION 3
SECTION 404(b)(1) EVALUATION
MRGO, NEW LOCK AND CONNECTING CHANNELS

NOTE: A Separate Evaluation Has Been Prepared for the Graving Site.

I. PROJECT DESCRIPTION

a. Location

The proposed new lock would be constructed in the Inner Harbor Navigation Canal (IHNC), Orleans Parish, Louisiana. The lock would be constructed between the Claiborne Avenue Bridge (Judge Seeber Bridge) and the Florida Avenue Bridge. The IHNC connects the Mississippi River-Gulf Outlet (MRGO) and the Gulf Intracoastal Waterway (GIWW) with the Mississippi River and Lake Pontchartrain.

b. General Description

The following narrative describes the major construction items in the recommended plan. The Galvez Street wharf and the U.S. Coast Guard facility on the west bank of the IHNC, along with businesses along the east side of the IHNC between the river and Florida Avenue, would be demolished and removed. Utilities crossing the IHNC would be relocated to three corridors - one corridor to be located adjacent to each bridge that crosses the IHNC between the river and the GIWW. A temporary bypass channel (the north bypass channel) would be excavated on the east side of the site designated for the new lock. Bank protection, either rip-rap or sheet piling, would be used to stabilize the east side of the bypass channel. Protection cells would be provided at each end of the bypass channel to prevent vessels from striking bridges. The site for the new lock would be prepared by dredging the canal bottom, placing bedding material, and driving pilings. Material dredged for the bypass channel and from the canal bottom would be hydraulically deposited along the south bank of the MRGO in an area previously used for dredged material disposal and in a shallow open water area to develop marsh as mitigation for impacts of an offsite construction yard. Meanwhile, reinforced concrete lock modules would be partially constructed at the offsite construction yard (graving site) along the north bank of the MRGO/GIWW, just west of Paris Road. The existing hurricane protection levee, running parallel to the waterway, would be reconfigured to form a slip, within which the lock modules would be constructed. (A separate Section 404 evaluation has been prepared for the graving site.) The four partially completed lock modules would be individually floated to the present site of the Galvez Street wharf where lock walls and accessories would be added. (In order for the lock sections to be floated into place, the Florida Avenue bridge would already have been removed and replaced by others.) The completed modules would be floated to the prepared foundation site and ballasted into position.

A detour road would be constructed through an undeveloped area in St. Bernard Parish to link St. Bernard Highway, Judge Perez Boulevard, and Florida Avenue. The road would allow commuters to easily access the Florida Avenue bridge and thereby bypass the chronically congested St. Claude and Claiborne Avenue bridges. Two temporary, single bascule bridges would be constructed adjacent to the St. Claude Avenue bridge to provide a comparable level of traffic flow at this location while the St. Claude Avenue bridge is replaced with a low-level, double bascule bridge. The towers and lift-span of the Claiborne Avenue Bridge will be replaced to allow for the lift-span to be raised higher. Levees and floodwalls would be relocated and upgraded as necessary to provide uninterrupted hurricane and river flood protection. The new lock would become operational and the north bypass channel would be back-filled mainly with material taken from a south bypass channel (demolition bypass channel) to be excavated around the east side of the old lock.

The existing lock would be demolished and material hauled away. Final dredging would be required in the vicinity of the old lock site, the old lock fore-bay, and the new lock fore-bay. Some of this material would be used for additional backfill around the new lock site, with the excess pumped to the Mississippi River. The new lock guide walls would be installed and permanent mooring facilities would be constructed. The entire construction phase is expected to take about 11 years.

The majority of the soil and sediment excavated for lock site preparation and for the north bypass channel would be hydraulically pumped to the northeast of the new lock site into previously-used, MRGO disposal areas. This material has been determined to be unsuitable for aquatic disposal or for wetland restoration. Part of the area required is jurisdictional wetland, and therefore disposal into this area is covered in this evaluation.

The soil from the east bank of the IHNC, below 5 feet in depth, is not contaminated. It would be used to develop wetlands as mitigation for impacts of the graving site. The material would be deposited into an area of shallow, brackish water. Low level dikes would be used to contain the material until settlement occurs. Afterwards, the dikes would be breached to allow tidal exchange.

c. Authority and Purpose

Authority for replacement of the navigation lock connecting the Mississippi River Gulf Outlet (MRGO) and the Mississippi River was established in the River and Harbor Act of 1956 (Public Law 84-455), and amended by Section 186 of the Water Resources Development Act of 1976 (Public Law 94-587). The Water Resources Development Act of 1986 (Public Law 99-622) provides that a new lock and connecting channels shall be in the area of the existing lock or at the Violet site and specifies cost sharing procedures for the project.

The purpose of the proposed project is to provide sufficient lock and channel capacity for waterborne commerce between the Lower Mississippi River and the MRGO, IHNC, and GIWW.

d. General Description of Dredged or Fill Material

(1) General Characteristics of Material. The Holocene soils which would be excavated are alluvial deposits. Such soils generally contain varying thicknesses of interfingering layers of fat and lean clays and sandy silt. Grain size analysis indicates most of the soil would be classified as silt or clay, with most particles (90 percent) less than 0.1 mm in size, and approximately 50 percent less than 0.02 mm in size. The soil pH ranges from 6.1 to 8.4, but approximately 18 inches below the surface the range is 7.4 to 8.4.

(2) Quantity of Material. The total estimated amount of material to be excavated and redeposited is 3,043,000 cubic yards. Table 1 shows the locations and quantities of material that would be excavated along with the proposed disposal sites.

The total amounts of dredged material that would be deposited into each of the disposal areas are: 200,000 cubic yards replaced in the utility corridors; 172,000 cubic yards in the Mississippi River; 1,364,000 cubic yards in the MRGO disposal area; 667,000 cubic yards in the mitigation area; and 640,000 cubic yards used for random backfill in the construction area.

(3) Source of Material. All of the material to be excavated for project construction is alluvial sediment. During construction of the IHNC and the existing lock in the 1910's and 1920's, some of the excavated material was used to raise the elevation of the banks and build levees on the banks of the canal. Hydraulic dredges were used to remove the remaining material, some of which was deposited on the opposite sides of the levees. Two bypass channels would be constructed; one alongside the IHNC across from the Galvez Street Wharf and the other around the east side of the

TABLE 1
ESTIMATED DREDGING QUANTITIES

Location of Dredging and Disposal		Quantity
Utility Corridors (Stockpiled and used for backfill)	St. Claude Avenue	75,000 cu yds
	Claiborne Avenue	87,000 cu yds
	Florida Avenue	38,000 cu yds
North Bypass Channel	Above 5 feet deep (Pumped to MRGO site)	206,000 cu yds
	Below 5 feet deep (Pumped to mitigation site)	667,000 cu yds
New Lock Excavation (Pumped to MRGO site)		1,100,000 cu yds
Main Channel North of New Lock (Pumped to MRGO site)		58,000 cu yds
South Bypass Channel (Random Backfill)		145,000 cu yds
Main Channel Between New Lock and Old Lock (Random Backfill)		440,000 cu yds
Main Channel From Old Lock Site to River (Random Backfill)		55,000 cu yds
(Pumped into River)		172,000 cu yds

existing lock. One of these areas is industrial and the other is an undeveloped area containing a grove of live oak trees.

e. Description of the Proposed Discharge Sites

(1) Location. Four disposal sites are covered in this evaluation: the main channel of the Mississippi River (river site); an area where clean soil would be deposited to develop wetlands as mitigation for the graving site (mitigation site); previously-used MRGO disposal area where soils and sediments considered too contaminated for aquatic disposal, because of contaminant levels, would be deposited (MRGO site); and backfill around the new lock (IHNC site). Refer to Plate 1, at the end of this evaluation.

The river site would be used to dispose some of the material excavated between St. Claude Avenue and the Mississippi River. The remaining material from this area would be used for random backfill along the construction corridor. This effort would occur near the end of the construction period. Material deposited in the river would be discharged beyond the 50-foot contour of the river, in the vicinity of the IHNC.

The mitigation site is located to the northeast of the new lock construction site, in a large triangular-shaped body of shallow, brackish water. The triangular area is bounded by Bayou Bienvenue (Main Outfall Canal) on the north and west, the Back Protection Levee of the 9th Ward on the south, and a landfill and sewerage treatment plant on the east. Wetlands would be created within the large triangular area, adjacent to the south bank of Bayou Bienvenue.

The MRGO site is located between Bayou Bienvenue and the MRGO/GIWW, near the intersection of the MRGO/GIWW and the IHNC. This area has not been used in recent years and has overgrown with early successional woods and scrub/shrub.

The IHNC site would be within the corridor of the IHNC. Since the new lock would be built in the IHNC, large amounts of backfill would be required to fill in the canal on both sides of the new lock.

(2) Size. The river site is not defined by topographical limits. Material deposited in the river would mix with the suspended and bedload material and be transported downstream. The mitigation site is approximately 137 acres, consisting shallow, brackish water with scattered, remnant cypress stumps. Confinement dikes would be erected around the border of the site to confine the dredged material. The MRGO site would require about 240 acres. Existing dikes would be upgraded and new dikes

would be constructed as necessary to confine the dredged material. The IHNC site extends from the Claiborne Avenue Bridge to the Florida Avenue Bridge and from the levee on the east side of the IHNC to the levee on the west side. This area measures approximately 4,150 feet long (north to south) by a maximum of 1,150 feet wide (east to west), or about 110 acres. Only the existing canal is currently subject to Section 404(b)(1). The canal banks are completely developed.

(3) Type of Site. The river site is the main channel of the Mississippi River where the depth is over 50 feet. Under the Cowardin, et al. (1979) system, the area is riverine, lower perennial, unconsolidated sand and mud bottom. The mitigation site consists of shallow, open, tidal, brackish water. According to the Cowardin, et al. (1979) system of classifying wetlands, the area is estuarine, subtidal, unconsolidated mud and organic bottom. The MRGO site consists of early succession woods with pioneer species including black willow and Chinese tallow, and scrub/scrub areas. The Cowardin, et al. classification is palustrine, forested and scrub/scrub wetland, broad-leaved deciduous, saturated to seasonally flooded soil, and impounded. The IHNC site is all developed area, with existing industrial activity, and the IHNC itself. Under the Cowardin, et al. system, the IHNC is estuarine (excavated), subtidal, unconsolidated mud bottom. The shoreline of the IHNC is nearly all bulkheaded. Remaining shoreline is rip-rapped or dominated by upland grasses.

(4) Type of Habitat. The existing subaqueous habitat at the river site is characterized by moving sediments, mostly of fine sand and silt. The number of fish species that utilize the main channel of the Mississippi River is limited by high flow rates, lack of food items, and normally high turbidity levels. Some species that may be found in this area are blue catfish, gizzard shad, channel catfish, buffalo fish, and river shrimp.

The mitigation site provides sheltered, shallow water, estuarine habitat. The most economically important species utilizing the area are blue crab, brown and white shrimp, spotted seatrout, and menhaden. Common wildlife include mottled ducks, red-breasted mergansers, lesser scaup, and various species of terns, seagulls, wading birds, and shorebirds. The area has been heavily impacted by human activities. A large municipal landfill forms the eastern border, and the area receives significant quantities of urban stormwater runoff which is pumped out of the developed areas to the south.

The MRGO site consists of dredged sediments placed on top of historic forested wetlands. The site is isolated from the tidal system by its elevation which ranges from approximately +3 to +10 above sea level. Confinement dikes and hurricane protection levees surround the area.

The IHNC disposal site provides poor habitat for aquatic species and no habitat for terrestrial species since it is entirely industrialized.

(5) Timing and Duration of Discharge. The entire project construction schedule is expected to last about 11 years. Discharge of material in the river disposal site would occur at the end of the construction period and would last for up to several weeks. Discharge of material into the mitigation site and the MRGO site would occur during the first, second, and third years of the construction period and may be intermittent over a period up to two years. Discharge of material into the IHNC disposal site for backfill would occur intermittently from the sixth year of the construction period to the end of the construction period.

f. Description of Disposal Method

The material deposited at the river site would be in a hydraulic slurry. The slurry would be deposited at the surface of the river. Heavier suspended particles would fall through the water column and become part of the river's bedload. Finer, lighter particles would remain in suspension and would be carried with the river's suspended sediments, eventually to the Gulf of Mexico or coastal estuaries. The material deposited in the mitigation site and MRGO site also be deposited hydraulically and would be confined by low level dikes. Material at the mitigation site would be restricted to a settled height of approximately +1.5 feet National Geodetic Vertical Datum (NGVD) so that the area develops into a vegetated wetland.

The material used for backfill at the IHNC site may be deposited by either hydraulic and bucket dredge. All material deposited hydraulically would be deposited inside of containment levees to prevent the material from running into the IHNC.

II. FACTUAL DETERMINATIONS

a. Physical Substrate Determinations

(1) Substrate Elevation and Slope. Disposing of material in the river site would have a insignificant effect on the bottom elevation since it would be spread out for a distance downstream. The depth of the Mississippi River in the vicinity of the proposed disposal is approximately 95 feet. The elevation of mitigation site would be purposefully altered in order to

establish an emergent wetland. The existing elevation of about -2 feet NGVD would be raised to as much as +1.5 feet NGVD. Slope of the created marsh would range from approximately 1 vertical on 25 horizontal to 1 vertical on 50 horizontal. The elevation of the MRGO site is about +3 to + 10 NGVD. The elevation would be raised about 3 to 6 feet. The IHNC disposal site varies from about +10 feet NGVD along the industrialized banks of the canal which is a non-wetland area to the bottom of the canal which varies between 30-40 feet deep in the center of the channel. Parts of the channel would be deepened, while other areas would be filled-in.

(2) Sediment Type. The material to be excavated is limited to the confines of the IHNC from the existing lock forebay to the Florida Avenue crossing. It will include canal sediments as well as in-situ material on the east and west banks of the canal. The material to be dredged consists of Holocene soils, classified as alluvial deposits, generally containing varying thicknesses of interfingering layers of fat and lean clays and sandy silt.

The bottom of the Mississippi River has been described as unconsolidated sand and mud. Since disposed material will not become a part of the Mississippi River bottom, but instead be transported as part of the river's sediment load to the gulf, no sediment type effects are expected to arise as part of this site disposal.

The bed material at the mitigation site currently consists of unconsolidated mud and organic bottom. Since the IHNC excavation site and the mitigation site are located in a geographically similar area, it is expected that sediment types would be similar although the mitigation site would have a higher fraction of organic material. The in-situ material on the canal banks would also be expected to be similar, especially in areas where excavated material from IHNC construction in the 1910s and 1920s was used on the banks of the canal.

The bed material at the MRGO site currently consists of previously dredged sediments of the MRGO placed on top of historic forested wetlands. It is expected that sediment types disposed into this are would be similar.

The sediment material of the IHNC is described as an unconsolidated mud bottom. It is made up of the same material which will be used as backfill, therefore no effects on sediment type are expected.

(3) Dredged Material Movement. The Mississippi River will transport the finer dredged material deposited in the river disposal site downstream and eventually to the Gulf of Mexico.

Heavier sediment particles would settle out downstream of the disposal site but would gradually shift downriver with the bed load.

The material deposited at the mitigation site is expected to subside due to dewatering and consolidation of the soil. Minimal export of dredged material out of the confinement dikes is expected. The material deposited at the previously-used MRGO disposal area will also be confined by low-level dikes and is not expected to shift or move.

Material deposited at the IHNC disposal site will be used to create land around the newly constructed lock. Movement of dredged material out of the confined disposal area would not be allowed.

(4) Physical Effects on Benthos. Because of high turbidity, high current velocities, and shifting substrates, the Mississippi River does not support a large benthic population. Therefore, the potential impact to benthos would be slight at the river disposal site.

Sessile benthos living in the mitigation site would be buried beneath the material deposited there. Primary effects should be limited to the 41 acres of emergent land and the 96 acres surrounding the wetland islands which would be made shallower, approximately 137 acres total. A benthic population similar to that which now occurs in the area would establish in the shallow waters within the site.

Benthos living in the sediments at the MRGO site would be largely destroyed by dredging operations. The disposal site would be expected to become drier because of increased elevation. The benthic community could then be expected to switch to species more adapted to drier conditions.

The IHNC disposal site probably contains a limited benthic population due to poor water quality. Whatever benthos are present would be buried beneath in the area to be back filled.

(5) Other Effects. The mitigation site currently contains a large number of cypress tree stumps and standing dead cypress trees. The stumps and dead root systems would be covered to varying degrees with dredged material. The woody debris not believed to be critical to the aquatic ecosystem of the site.

(6) Actions Taken to Minimize Impacts. No actions at the river and IHNC disposal sites are warranted. Confinement of dredged material at the mitigation site and MRGO site would minimize impacts outside of those areas.

b. Water Circulati

(1) Water.

(a) Salinity. Salinity levels in the mitigation site and the IHNC disposal site can be attributed mainly to the MRGO because the MRGO provides a direct route of flow from the high salinity waters of the gulf. The MRGO is a straight and deep channel in comparison with the natural meandering streams and sluggish water movement found in the area. No salinity changes are expected at the river and IHNC disposal sites as a result of disposal activities. Since the mitigation site is a confined type of disposal, salinity differences may occur within the confined area as compared to tidal waters outside of the disposal area until dikes are breached following consolidation of dredged material. No long-term changes in salinity levels are expected.

(b) Water Chemistry. Ambient pH values in the Mississippi River and IHNC range from: 6.9-8.2 with an average of 7.6 su; 3.4-9.8 with an average of 7.5 su, respectively. There is no historic pH data for the mitigation or MRGO sites. The Mississippi River data was taken from USGS station 07374508, Mississippi River at New Orleans from the period 1970-1988. The IHNC data was taken from various sampling stations on the IHNC during the time period 1970-1982. Factors typically associated with dredging activities may cause pH in receiving area waters to shift toward more acidic conditions. These factors include increased turbidity, organic enrichment, chemical leaching, reduced dissolved oxygen, and elevated carbon dioxide levels among others. Based on these factors, a temporary reduction in pH in the surrounding waters would be expected, specifically for the mitigation site, MRGO site, and IHNC site. These pH variations would be minor and short-lived. The pH levels would return to background shortly after the end of disposal activities at each site.

(c) Clarity. The highest turbidity effects of the project are expected to occur in the mitigation site and MRGO site, with turbidity levels expected to remain elevated until exposed substrate is colonized by vegetation. Turbidity levels would be increased in Bayou Bienvenue by runoff from the MRGO site.

Turbidity affects water quality in several ways. The suspended sedimentary particles decrease the light penetration and interferes with the photosynthetic production of oxygen. At the same time these particles absorb solar energy from the sunlight and transform this energy into heat, thus elevating the temperature of the water. The fact that oxygen is less soluble in warm water than in cold water coupled with the decreased photosynthetic oxygen production can result in decreased oxygen levels.

Increased concentrations of suspended sediments being discharged at the river disposal site would not cause any significant adverse impacts because of the normal heavy sediment load carried by the river. Turbidity levels in the Mississippi River are naturally high, thus any increase in turbidity as a result of the disposal activity would only minimally reduce water clarity. It is estimated that the amount of dredged material discharged into the river would only be about 4% of the average sediment load.

Placement of sheetpiles, transport and placement of material, placement and driving of pilings, and operation of equipment during construction would cause effects on IHNC water clarity, although the effects are expected to be localized and short term. Excavation, dredging and disposal into the IHNC disposal site would be expected to increase turbidity levels, at a minimum, for the duration of disposal operations.

(d) Color. During construction, temporary changes in color may occur at the four disposal sites. These temporary color changes would be associated with the disturbance of organic soils at the mitigation site as a result of dredging and disposal as well as other construction activities. Water color would return to background conditions after completion of disposal activities at each site, and no significant long-term changes in water color would occur.

(e) Odor. Since the soils to be excavated are not considered highly organic in nature, no odor is expected from excavation of the materials in the IHNC due to the organic nature of the soil. Dredging of organic sediments at the mitigation site for the construction of retaining dikes may produce a locally noticeable odor for a short period of time until sediments are oxidized.

Soils along the east bank of the IHNC where past industrial activities have taken place are known to have been contaminated with odorous constituents such as petroleum hydrocarbons and chlorinated hydrocarbons. As a result of the hazardous, toxic, and radioactive waste (HTRW) remedial investigation, conducted as a part of the engineering investigations for this project, all "industrial waste" soil materials will be excavated and removed to an industrial landfill. This material is currently estimated at approximately 26,000 cubic yards. Excluding this material which has been deemed industrial waste, other materials excavated from the east bank of the canal should have no odor associated with them. No information is available from the west bank HTRW investigation which would indicate an odor problem.

During IHNC vibracore sampling in May 1993, bottom sediments of the IHNC were noted to have a slight petroleum odor associated with them. However, results of testing did not classify the bottom sediments as hazardous or industrial waste. A previous investigation of toxic substance chemistry of the tidal passes into Lake Pontchartrain was conducted by the University of New Orleans under contract from the Corps of Engineers as part of the Lake Pontchartrain, Louisiana, and Vicinity, Hurricane Protection Study. One sampling station was located in the IHNC near the entrance to Lake Pontchartrain. The majority of pollutants detected in the IHNC were polynuclear aromatic hydrocarbons (PAHs). It is noted that of the three tidal passes into Lake Pontchartrain, the IHNC has the highest general organic pollutant burden, the highest level of PAH contaminations, and the highest level of industrial organic pollution. It was also noted during the HTRW initial assessment and HTRW remedial investigation that many of the industrial facilities located on the IHNC banks reportedly had spills, deteriorated drums and tanks, and in some cases dumped materials directly into the canal, or allowed spills to runoff into the canal. Chemicals and compounds are too numerous to list and tanks and drums stored on the premises have not been tested to determine contents, but it is obvious that a large variety of chemicals are present on these industrial sites or once were present. All drums and underground storage tanks have subsequently been removed from Port property by the Port of New Orleans.

Since the material to be disposed in the river will only constitute about 4% of the river's normal sediment load, mixing is expected to confine odor to the immediate disposal site with no odor expected to be associated with the Mississippi River water downstream of the disposal site. The nearest municipal water supply intake is 4.7 miles downstream of the proposed disposal activities and odor is not expected to be a concern.

Urban runoff from the industrialized area surrounding the IHNC canal in combination with a total pumping capacity of 3,770 cubic feet per second (cfs) from stormwater drainage pumping and small amounts of domestic sewage from infiltration/exfiltration of the sewer system, all combined with sluggish flow in the canal creates additional potential odor problems. Stagnant water and sewerage odors may also be present during dredging and disposal activities of the IHNC sediments. Petroleum and sewerage odors may occur both at the dredging site and the disposal sites.

Material used as fill at the IHNC disposal site will be obtained from the south bypass channel (excavation around east side of existing lock) and the main channel south of the new lock as well as dredging at the old lock forebay and the old lock site. Material obtained from the east side of the existing lock is an area of open land covered with oak trees. This land has had no prior land use for the last 50 years and is not expected to have a potential odor problem during excavation and disposal. However, dredging and disposal activities in the main channel south of the new lock and old lock forebay and the lock site may have a slight petroleum or sewage odor associated with them.

(f) Taste. The nearest potable water intake along the Mississippi River is 4.7 miles downstream of the IHNC entrance. Any possible effects would diminish long before reaching the closest municipal water intake. There are no potable water intakes along the IHNC or in the vicinity of the mitigation site or the MRGO site. Therefore alteration of taste in these areas will also be of no consequence.

(g) Dissolved Gas Levels. The only dissolved gas of concern affected by construction, dredging, and disposal would be dissolved oxygen. Ambient dissolved oxygen levels in the Mississippi River ranged from 5.4 to 13.3 mg/L with an average of 8.2 mg/L for the period 1970-1988. Ambient levels in the IHNC over the time period 1970-1982 ranged from 0.1 to 13.4 mg/L with an average of 7.2 mg/L. Lake Pontchartrain averaged 8.2 mg/L with a range of 1.1 to 13.6 mg/L for the time period 1967-1981. Short-term decreases in dissolved oxygen could occur due to release of nutrients from the organic soils and increased turbidity levels. Turbidity affects water quality in several ways, one which may markedly affect dissolved oxygen levels. The suspended sedimentary particles decrease the light penetration and interfere with the photosynthetic production of oxygen. At the same time these particles absorb solar energy from the sunlight and transform this energy into heat, thus elevating the temperature of the water. The fact that oxygen is less soluble in warm water than in cold water coupled with the decreased photosynthetic oxygen production can result in decreased oxygen levels. These turbidity and nutrient effects are expected to be most significant at the mitigation site. Significant effects on oxygen levels in the tidal waters outside of the confinement dikes are not expected, but within the disposal site, low oxygen levels, coupled with high turbidity would eliminate fish and shellfish during dredging operations. Low dissolved oxygen levels are also expected within the confinement dikes for the MRGO disposal site. In a New Orleans Harbor dredging study, dissolved oxygen decreased from 8.0 mg/L to 4.0 mg/L at the discharge point, but returned to 7.8 mg/L within 100 yards downstream. Therefore, for the Mississippi River, no effects on dissolved oxygen levels are expected except in the immediate disposal area. Beside the effects listed above, no long term effects on dissolved oxygen levels are expected.

(h) Nutrients. No nutrient testing was undertaken for this study. Existing conditions of nutrient-related problems were addressed in an investigation of the nutrients and toxic substance chemistry of the tidal passes into Lake Pontchartrain, conducted by the University of New Orleans under contract with the Corps of Engineers as part of the Lake Pontchartrain, Louisiana, and Vicinity, Hurricane Protection Study. Nutrient data at the sampling station located in the IHNC near the entrance to Lake Pontchartrain indicated that in comparison to the passes at Chef Menteur and Rigolets, the IHNC had higher average concentrations of ammonia, nitrite plus nitrate, orthophosphate, and total phosphorus. Although none of these constituents exceeded the EPA criteria, the ammonia concentration indicated that certain industries along the waterway could be contributing additional quantities of ammonia above natural levels.

The 1986 EPA Quality Criteria for Water presents the following rationale in limiting total phosphate phosphorus concentrations. EPA recommends that to prevent the development of biological nuisances and to control accelerated or cultural eutrophication, total phosphates as phosphorus should not exceed 50 ug/L in any stream at the point where it enters any lake or reservoir, nor 25 ug/L within the lake or reservoir. A desired goal for the prevention of plant nuisances in streams or other flowing waters not discharging directly to lakes or impoundments is 100 ug/L total phosphorus. Existing data on total phosphorus is available for the IHNC, Lake Pontchartrain, and the Mississippi River. IHNC total phosphorus data averaged 189 ug/L, with a minimum of 30 ug/L and a maximum of 310 ug/L. This data was recorded from 1970-1982. For Lake Pontchartrain, data recorded from 1967-1981 shows high total phosphorus concentrations on average at 97 ug/L, minimum of 10 ug/L and a maximum of 600 ug/L. The Mississippi River exceeded the EPA established level of 100 ug/L for total phosphorus during the time frame 1970-1988 with an average of 251 ug/L (minimum of 20 ug/L, maximum of 860 ug/L). Increases in total phosphorus above the ambient levels are not expected as a result of construction, dredging, and disposal activities. Existing conditions are already conducive to eutrophication, and no impacts are expected to increase this tendency to eutrophy. In addition, the study of New Orleans Harbor dredging showed nitrates and phosphates returned to ambient levels within 100 yards downstream of the discharge point in the Mississippi River.

Elutriate data from a mixture of IHNC water and sediment taken from the bottom in a 1982 study indicates that one of the potential problem constituents would be ammonia. The concentration of ammonia as NH_4^+ is approximately 50% higher than the level which contains the criterion amount of un-ionized ammonia. Short-term increases in ammonia levels at all four disposal sites may occur, but will return to ambient levels shortly after the end of dredging and disposal operations.

(i) Eutrophication. Increased nutrient levels occurring during construction, dredging, and disposal activities should not be substantial enough to cause an increase in eutrophic conditions. After completion of the project, no additional nutrients would be available to contribute to an increase in eutrophication.

(j) Others as Appropriate. None.

(2) Current Patterns and Circulation. Tidal currents will be blocked from the mitigation site so that dredged material is not transported out of the site. For a period of 1-3 years following disposal into the mitigation site, tidal flows would be curtailed by the confinement dikes. The dikes would be breached following consolidation and colonization of dredged material by vegetation, thereby reestablishing tidal flows. Although the mitigation site is currently open to tidal fluctuation, tidal currents are very sluggish. There is no flow through the area into other wetlands or water bodies. It is a "dead-ended" area. Tidal flows enter and exit the site through several connections with Bayou Bienvenue. No stratification of waters at this site is expected because of its shallow nature. Current and circulation patterns are not expected to change at the river and IHNC disposal sites. The MRGO site is elevated above tidal influence. The area impounds water and would continue to do so after the project.

The proposed IHNC lock would be located further north into the IHNC than the existing lock. The IHNC between the river and the new lock site would then be influenced by the Mississippi River instead of Lake Pontchartrain. This is not expected to significantly change current patterns, flows, and velocities through the proposed lock, as opposed to currents passing through the existing lock. Stratification in the vicinity of the project area is not expected to be significantly altered as a result of project implementation.

No effect is expected on the current patterns, flow, and velocity of the Mississippi River as a result of dredged disposal activities in the river. No effect on the stratification in the Mississippi River is expected.

(3) Normal Water Level Fluctuations. Normal water levels at the mitigation site and the IHNC disposal site are generally dependent upon tidal action and storm water runoff. Water level fluctuation at the river disposal site is dependent upon upstream runoff and, to a lesser extent, tidal fluctuation.

The water levels within the confined mitigation site would vary from normal tidal levels during deposition of dredged material and afterwards, until confinement dikes are breached. Water levels would be elevated during the deposition of material and may be either higher or lower than normal levels until dikes are breached depending on rainfall and evaporation.

Water levels within the MRGO site currently are affected by rainfall and evaporation and are not affected by tidal action. The site is generally isolated from tidal influence due to the retaining dike along it's south end (Bayou Bienvenue) and the hurricane protection levee to it's north along the MRGO. Water levels would be elevated during the deposition of material and may remain elevated for a period of time depending upon rainfall and evaporation rates.

Water level fluctuations will remain the same at the IHNC disposal site except in that portion of the IHNC between the existing lock and the new lock site. That area would be influenced by the river instead of tidal fluctuations. No change in water levels fluctuations in the Mississippi River are expected from lock construction.

(4) Salinity Gradients. The salinity levels within the mitigation site would vary from the tidal waters nearby during deposition of material and for a period afterwards, until dikes are breached. Salinity levels may be higher or lower within the confined disposal site depending on rainfall and evaporation. The MRGO site would receive estuarine water associated with the dredged material from the IHNC. The salinity of the water within the MRGO site is likely to be nearly fresh, since salinity associated with material deposited there years ago would have leached from the sediments and been carried away in runoff. The MRGO site would likely experience an increase in salinity. Salinity levels at the IHNC between the existing lock and the new lock site would have considerably lower salinity levels since it would be open to the Mississippi River instead of estuarine tidal waters.

(5) Actions That Would Be Taken to Minimize Impacts. Breaching ~~of confinement dikes at the mitigation site following~~ consolidation and colonization of dredged material with vegetation would return the site to normal salinity and water level patterns. No particular actions are warranted at the other sites.

c. Suspended Particulate/Turbidity Determinations

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site. Excavation, dredging and

disposal into the mitigation site, the MRGO site, and the river disposal site would be expected to increase turbidity levels, at a minimum, for the duration of disposal operations. Placement of sheetpiles, transport and placement of material, placement and driving of leveling piles, and operation of equipment during construction would cause effects on IHNC turbidity levels, although the effects are expected to be present only during construction activities.

The most pronounced turbidity effects of the project are expected to occur in the mitigation site and MRGO site, with turbidity levels expected to remain elevated until the dredged material consolidates and becomes vegetated. Turbidity affects water quality in several ways. The suspended sedimentary particles decrease the light penetration and interferes with the photosynthetic production of oxygen. At the same time these particles absorb solar energy from the sunlight and transform this energy into heat, thus elevating the temperature of the water. The fact that oxygen is less soluble in warm water than in cold water coupled with the decreased photosynthetic oxygen production can result in decreased oxygen levels.

Increased concentrations of suspended sediments discharging into the river disposal site would not cause any significant adverse impacts because of the normal heavy sediment load carried by the river. Turbidity levels in the Mississippi River are naturally high, thus any increase in turbidity as a result of the disposal activity would only minimally reduce water clarity. It is estimated that the amount of dredged material discharged into the river would only be about 4% of the average sediment load.

Discharge of material into the IHNC disposal site will be in a confined manner, using a ring levee to prevent material from flowing into the IHNC. A slight increase in turbidity is expected in the local area outside of the levees as a result of back filling, but effects will be short term and turbidity levels in the IHNC will soon return to normal levels with the end of dredging activities.

(2) **Effects on Chemical and Physical Properties of the Water Column.**

(a) Light penetration. Decreased light penetration would be associated primarily with water-column turbidity and suspended material generated during construction, dredging and disposal activities. This condition would be localized and short-lived at the river and IHNC disposal sites. For these two areas, once construction is completed, and dredging and disposal activities cease, light penetration would return to background levels.

Turbidity levels are expected to remain elevated at the mitigation site and MRGO site until material consolidates and vegetation is established. Therefore, light penetration within the confined disposal sites is expected to remain low for this time period. This will interfere with the photosynthetic production of oxygen. No significant effects outside of the confined disposal site are expected after dredging operations are completed. Vegetation is expected to occur within the time frame of two to three years after material deposition is completed.

(b) Dissolved oxygen. Dissolved oxygen levels will be affected by construction, dredging, and disposal activities. Ambient dissolved oxygen levels in the Mississippi River ranged from 5.4 to 13.3 mg/L with an average of 8.2 mg/L for the period 1970-1988. Ambient levels in the IHNC over the time period 1970-1982 ranged from 0.1 to 13.4 mg/L with an average of 7.2 mg/L. Lake Pontchartrain averaged 8.2 mg/L with a range of 1.1 to 13.6 mg/L for the time period 1967-1981.

At the mitigation site and MRGO site, where turbidity levels are expected to remain high until deposited sediments are vegetated, dissolved oxygen levels may remain low for an extended period of time within the disposal site. High turbidity levels affect water quality in several ways. The suspended sedimentary particles decrease the light penetration and interferes with the photosynthetic production of oxygen. At the same time these particles absorb solar energy from the sunlight and transform this energy into heat, thus elevating the temperature of the water. The fact that oxygen is less soluble in warm water than in cold water coupled with the decreased photosynthetic oxygen production can result in decreased oxygen levels. Once vegetation is established and the mitigation site is opened to tidal circulation, dissolved oxygen levels are expected to return to pre-construction levels. Once vegetation is established at the MRGO site, dissolved oxygen levels are also expected to return to pre-construction levels.

(c) Toxic metals and organics. The elutriate data collected for the lock replacement study are attached as Tables B-26 through B-36. Samples were collected on May 10 and 11, 1993 by New Orleans District personnel. Analyses utilized sediment samples taken from the IHNC at four sites, which were mixed with the appropriate disposal site water.

Sampling Site A is located in the IHNC south of the existing lock between the St. Claude Avenue crossing and the Mississippi River. This sediment was mixed with Mississippi River water to generate the elutriate. The elutriate from this site will determine the effects at the river disposal site. Sampling Site C is located in the IHNC north of the existing lock and south of North

Claiborne Avenue. This sediment was mixed with the IHNC water sample. This elutriate is an indicator of the effects of dredging activities as opposed to disposal activities. Sampling Site G is located adjacent to the Galvez Street Wharf in the IHNC between North Claiborne Avenue and Florida Avenue. This sediment was mixed with water from the mitigation site. Sampling Site E is located in the IHNC near the turning basin at Florida Avenue. The sediment from these samples was also mixed with water from the mitigation site.

The elutriate test is a simplified simulation of the disposal process wherein predetermined amounts of dredging site water and sediment are mixed together to approximate a dredged material slurry. The test provides an indication of the chemical constituents likely to be released to the water column during a disposal/filling operation.

For the 1993 elutriate testing effort, the mixtures were tested for twenty-seven metals and ninety-seven organic. A composite sample of material from various depths at Sampling Site A was analyzed and the results are in Table B-26. At Sampling Site C the vibracore sample was divided into top, middle, and bottom sections and the results are in Tables B-27 through B-29. Tables B-30 through B-32 show the analysis of Sampling Site G's top, middle, and bottom vibracore layers. Sampling Site E was analyzed with two vibracore samples, both divided into two samples. These are shown in Tables B-33 through B-36.

Sampling Sites G and E were analyzed as indicators of the effects of disposal into the mitigation site. For Sampling Site G (adjacent to the Galvez Street Wharf in the IHNC between North Claiborne Avenue and Florida Avenue), two metals showed an increase in elutriate concentration over ambient water concentration to a concentration above the stated criteria, namely copper and zinc. Copper concentrations increased from an ambient water concentration of <14 ug/L to a maximum of <100 ug/L for the three layers sampled from the vibracore. The acute saltwater aquatic life criteria for copper is 2.9 ug/L. It should be noted that the ambient water concentration possibly exceeds this acute saltwater copper criteria. Zinc concentrations rose from an ambient water level of <20 ug/L to a maximum of 310 ug/L from the three samples taken in the vibracore. The acute saltwater aquatic life criteria for zinc is 95 ug/L. Other parameters which have no saltwater aquatic life criteria, but show significant increases from ambient water concentrations to elutriate mixture concentrations for Sampling Site G were: barium (increased from 120 ug/L to 810 ug/L maximum), iron (increased from 530 ug/L to 1,600 ug/L maximum), manganese (increased from 250 ug/L to 1,300 ug/L maximum), and bis(2-ethylexyl)phthalate (increased from 1 ug/L to 75 ug/L maximum). Barium, manganese, and phthalate esters are discussed in the paragraph which follows for Sampling Site C. Iron, because it is complex and relatively inactive chemically or physiologically, has little effect of aquatic life.

For Sampling Site E (IHNC near the turning basin at Florida Avenue), the same two metals were again shown to increase to concentrations above the stated criteria, these two metals being copper and zinc. Copper increased from an ambient water concentration of <14 ug/L to a maximum of 60 ug/L. It should be noted that the ambient water possibly exceeds the acute saltwater copper criteria of 2.9 ug/L. Zinc concentrations increased from an ambient water concentration of <20 ug/L to a maximum of 120 ug/L. The acute saltwater zinc criteria is 95 ug/L. Other parameters which have no saltwater aquatic life criteria, but show increases in concentrations of elutriate at Sampling Site E over the ambient water samples were: barium (increased from 120 ug/L to 890 ug/L maximum), calcium (increased from 100,000 ug/L to 300,000 ug/L maximum), iron (increased from 530 ug/L to 1,500 ug/L), manganese (increased from 250 ug/L to 1,300 ug/L maximum), acenaphthene (increased from 10 ug/L to 70 ug/L maximum), and 2-methylnaphthalene (increased from 10 ug/L to 30 ug/L). The available data for acenaphthene indicate that acute toxicity to saltwater aquatic life occurs at concentrations as low as 970 ug/L and would occur at lower concentrations among species that are more sensitive than those tested. The available data for naphthalene indicate that acute toxicity to saltwater aquatic life occurs at concentrations as low as 2.35 ug/L and would occur at lower concentrations among species that are more sensitive than those tested.

Sampling Site C was analyzed as an indicator of IHNC area disposal effects. For Sampling Site C (IHNC north of the existing lock and south of North Claiborne Avenue), two metals were shown to increase to a concentration above the LDEQ saltwater acute criteria: copper and zinc. Copper increased from an ambient water concentration of <14 ug/L to a maximum of 200 ug/L from the three layers collected from the vibracore at Sampling Site C. It should be noted that the ambient water possibly exceeds the acute saltwater copper criteria of 2.9 ug/L. Zinc concentrations rose from an ambient water concentration of <20 ug/L to a maximum of 220 ug/L for the three levels of samples taken from the vibracore. The acute saltwater criteria for zinc is 95 ug/L. Other parameters showing significant increases from ambient water concentration to elutriate concentrations were: barium (increased from 66 ug/L to 420 ug/L maximum), magnesium (increased from 250,000 ug/L to 290,000 ug/L maximum), manganese (increased from 180 ug/L to 2,300 ug/L maximum), and bis(2-ethylexyl)phthalate (increased from 1 ug/L to 7 ug/L maximum). No saltwater aquatic life criteria exists for the above four parameters. The physical and chemical properties of barium generally will preclude the existence of the toxic soluble form under usual marine and fresh water conditions. Calcium and magnesium are the two most common cations defining the hardness of a waterbody. In general, these metal ions are not cause for concern to health, although there are some indications that they may influence the effect of other metal ions on some organisms. Few data are available on the toxicity of manganese to marine organisms. The major problem with manganese may be concentration (bioaccumulation) in the edible portions of mollusks. The available data for phthalate esters indicate that acute toxicity to saltwater aquatic life occurs at concentrations as low as 2,944 ug/L and would occur at lower concentrations among species that are more sensitive than those tested.

In summary, the water quality impacts due to metals and organic at the mitigation site, the MRGO site, and the IHNC disposal site are mostly related to the potential of temporarily increased concentrations of copper, manganese, and zinc. Copper is relatively plentiful in the natural environment and is the result of industrial sources including petroleum refiners. Copper criteria is based upon the protection of animal species and does not appear to bioaccumulate in animal tissues. Although the 1993 elutriate copper concentrations ranged from two to fourteen times above the ambient water concentration, most were still generally within the range of concentrations normally found in the Mississippi River, the IHNC and surrounding areas. Historic monitoring shows that copper levels in the waters of the project area frequently exceed the applicable acute criteria under ambient conditions. Manganese is normally imported to the United States, and is used in metal alloys, dry-cell batteries, fertilizer additives, and chemical reagents. Available data indicate manganese is a cargo transported on the GIWW and MRGO, and spillage during off-loading could be a source of the high levels in the sediments. In addition, manganese tends to flocculate and settle out of the water column. Elutriate samples from 1993 showed levels of manganese at a maximum of 2,300 ug/L, with greater concentrations in the upper sediment levels. The relatively small amount of material containing high levels of manganese would be dredged in a short time frame, and its effluent would be diluted by the effluent from continued placement of dredged material. Zinc is abundant in surface water and is used as an oxide pigment in rubber and paint, in agricultural fertilizers and sprays, and battery production. Zinc is known to bioaccumulate in animal tissues. Elutriate testing in 1993 showed zinc concentrations at a maximum of 310 ug/L.

Sampling Site A was analyzed as an indicator of disposal effects in the Mississippi River. This sampling site (IHNC south of the existing lock between the St. Claude Avenue crossing and the Mississippi River), showed three metals which increased to a concentration above the stated criteria: chromium, copper and zinc. Total chromium increased from 4 ug/L for ambient Mississippi River water conditions to 17 ug/L. This concentration possibly exceeds the acute criteria of 16 ug/L for chromium VI. It should be noted that the criteria is for chromium VI and not for total chromium and therefore should only be interpreted as a possible criteria violation. Copper increased from <14 ug/L to 190 ug/L, exceeding the freshwater acute criteria of 22 ug/L. Zinc's freshwater criteria of 165 ug/L is exceeded by the elutriate concentration of 190 ug/L, up from an ambient Mississippi River water concentration of 100 ug/L. Other parameters which have no freshwater aquatic life criteria but show a significant increase from ambient water to elutriate mixture were: aluminum (increased from 4,200 ug/L to 12,000 ug/L), iron (increased from 3,900 ug/L to 12,000 ug/L), magnesium (increased from 14,000 ug/L to 34,000 ug/L), manganese (increased from 160 ug/L to 2,400 ug/L), and potassium (increased from 4,000 ug/L to 14,000 ug/L). A large percentage of the parameters were not analyzed due to breakage of the sample jars. Aluminum, magnesium, and potassium are also common cations defining the hardness of a waterbody. In general, these metal ions are not cause for concern to health, although there are some indications that they may influence the effect of other metal ions on some organisms. For example, freshwater criteria levels for metals become less stringent as the hardness of a waterbody increases.

In summary, water quality effects due to metals and organic in the Mississippi River as the result of disposal of dredged material at the river disposal site are expected to be minimal, with increases in chromium, copper, zinc, and manganese expected. The toxicity of chromium to aquatic life will vary with valence state, form, pH, and the species of organism present. In long-term studies on the effects of heavy metals on oysters, it was shown that mortalities occurred at concentrations of 10 to 12 ug/L chromium. Copper is relatively plentiful in the natural environment and is the result of industrial sources including petroleum refiners. Copper criteria is based upon the protection of animal species and does not appear to bioaccumulate in animal tissues. Although the 1993 elutriate copper concentrations were elevated to 190 ug/L, it is still generally within the range of concentrations normally found in the Mississippi River, the IHNC and surrounding areas. Historic monitoring shows that copper levels in the waters of the project area frequently exceed the applicable acute criteria under ambient conditions. Manganese is normally imported to the United States, and is used in metal alloys, dry-cell batteries, fertilizer additives, and chemical reagents. In addition, manganese tends to flocculate and settle out of the water column. Elutriate samples from 1993 showed levels of manganese at 2,400 ug/L. The relatively small amount of material containing high levels of manganese would be dredged in a short time frame, and its effluent would be diluted by the effluent from continued placement of dredged material. Zinc is abundant in surface water and is used as an oxide pigment in rubber and paint, in agricultural fertilizers and sprays, and battery production. Zinc is known to bioaccumulate in animal tissues. Elutriate testing in 1993 showed zinc concentrations at a maximum of 190 ug/L. Other studies on dredging and disposal into the Mississippi River have shown similar increases expected in the immediate area of dredging and disposal, but no toxic metal or organic constituents were found to exceed state or Federal water quality criteria beyond 100 yards downstream from the effluent discharge point.

(d) Pathogens. The waterbodies in the vicinity of the project area, the Mississippi River, the IHNC, and Lake Pontchartrain, fall under the fecal coliform criteria cited for primary contact recreation. The criteria states that based on a minimum of not less than five samples taken over not more than a 30-day period, the fecal coliform content shall not exceed a log mean of 200/100 mL nor shall more than 10 percent of the total samples during any 30-day period or 25 percent of the total samples collected annually exceed 400/100 mL.

Mean fecal coliform levels in the Mississippi River over a period of 10 years averaged 392/100 mL. Levels in Lake Pontchartrain historically averaged 269/100 mL. In the IHNC, urban runoff, storm water discharge, and small amounts of domestic sewage combine with a sluggish flow in the canal (between the GIWW/MRGO and the river) to yield the highest levels of bacterial contamination in the study area. Sewer line settlement and fracture has occurred to the degree that much of the stormwater runoff is contaminated with domestic sewage. A composite of data from various measurements in the IHNC yield an average of 8119/100 mL fecal coliform.

Although existing conditions in the IHNC are not good with respect to pathogen levels, the project would not have any significant effect on fecal coliform or pathogenic organism concentrations.

(e) Aesthetics. During excavation, the river at and below the river disposal site would not be visually pleasing to many observers, even though disposal of dredged material into the river is not uncommon in the New Orleans area. The mitigation site is in close proximity to populated areas, but it is separated by levees and floodwalls and is visually isolated. The only people who would be able to see the disposal operations would be those who venture to the area to fish, hunt, or sightsee. Increased turbidity from the disposal operations would likely extend into Bayou Bienvenue which flows past a small developed area along Louisiana Highway 47 (Paris Road). Persons in this area would likely view the turbid water in the bayou as undesirable, but would probably be more concerned about the effect of the turbidity on aquatic life than on its appearance. Bayou Bienvenue, on the other side of Paris Road is a heavily used recreational fishing area. Dredging and disposal at the IHNC disposal site would be part of the overall construction plan, which would not be aesthetically pleasing to nearby residents and commuters. No adverse, long-term aesthetic impacts would be expected from dredging and disposal activities. Exposed soils at the mitigation site would become vegetated with marsh plants and the IHNC disposal site would be landscaped. Neither area would be aesthetically unappealing.

(f) Others as Appropriate. None

(3) Effects on Biota.

(a) Primary production. The decrease in light penetration from increased suspended sediment would result in a decline of phytoplankton populations in the mitigation site until the deposited material becomes consolidated and vegetated and the area is reconnected to tidal waters. The decline in primary productivity would also reduce zooplankton populations and populations of filter feeders and higher order predators.

Primary production is not the major food energy source in the Lower Mississippi River. Instead, the system is based more on detritus and other organic particles, and that would not be significantly affected by the disposal process.

Disposal activities at the IHNC disposal site are not likely to cause a decrease in primary production outside of the immediate work area. Low current velocities in the IHNC between the Mississippi River and the junction with the GIWW/MRGO would tend to confine impacts to this section of the IHNC. This section of the IHNC suffers from poor water quality and is considered to be poor habitat for aquatic organisms.

(b) Suspension/filter feeders. Increased turbidity levels at the mitigation site and in connected waters are expected for a period of up to 2 years for disposal activities. Effects within the confined disposal site may continue for an additional 1-3 years afterwards. This would have a negative impact on filter feeders including gulf menhaden, threadfin shad, and gizzard shad. Menhaden and gizzard shad support commercial fisheries and all three species provide forage for predators. These fish, as well as other estuarine species, would probably be absent from the confined mitigation site until the site is reconnected to tidal waters.

The MRGO site does not contain enough permanent water to support filter-feeding fish populations.

The main channel of the Mississippi River probably contains a very limited number of suspension/filter feeders due to high velocity and turbidity levels, although gizzard shad are likely present. No adverse impacts are expected for this site.

The IHNC in the vicinity of the new lock site likely has a limited population of filter feeders due to poor water quality. Gizzard shad may be attracted to the fresh water discharged from the lock since they are known to congregate around other structures which divert freshwater from the lower Mississippi River into estuarine waters. Whether or not congregations of shad occur in the IHNC is unknown. The gizzard shad congregations around freshwater flows are seasonal, occurring mainly in the spring.

(c) Sight feeders. Species which depend solely on sight for feeding are likely not numerous at the mitigation site because of high turbidity levels common in the area. Wind blown wave action tends to keep the area quite turbid from re-suspension of bottom sediments. Also, storm water runoff pumped into connecting waters is normally very turbid. Sight feeders which are likely present include spotted and sand seatrout, southern flounder, and various species of killifishes. Other species which may feed by sight, smell, or other senses include Atlantic croaker, spot, red drum, black drum, spotted and alligator gar, and blue crab. All of these species trapped within the site by confinement dikes would likely be killed when dredging operations commence, and these species (except for killifish) would probably not occur in the mitigation site until tidal influence is reestablished. Sight feeders outside of the confined site would also be adversely affected by turbid runoff during dredging operations. Once the dredged material islands become vegetated and shallow water habitats develop around the islands, the area would likely be more productive for most aquatic organisms including forage feeders and sight feeders (compared to the future without-project condition). This would be due to the organic material production from the emergent wetlands created by the dredged material deposition, the marsh-water edge habitat developed, and the aquatic vegetation expected to establish in the shallow waters around the islands.

Sight feeders in the main channel of the Mississippi River are probably uncommon due to normally high turbidity levels. Since increased turbidity is expected only a short distance downstream of the dredging operations, no adverse impacts are expected to sight feeders.

Sight feeders are also likely uncommon at the IHNC disposal site due to disturbances from vessel traffic, poor water quality, and lack of forage organisms. Whatever sight feeders were in the area would be displaced by dredging and disposal operations. Impacts to sight feeders at the IHNC disposal site are not considered to be a high concern because of existing poor quality habitat.

(4) Actions Taken To Minimize Impacts. Confinement of dredged material at the mitigation site for a period of time after dredging operations would prevent significant adverse impacts in the tidal waters outside of the site. No actions are proposed to reduce impacts inside of the site. Impacts at the river, MRGO, and IHNC disposal sites are not a concern, and no actions to minimize impacts at those locations are proposed.

d. <u>Contaminant Determinations</u>

The elutriate data analyzed in 1993 indicate, with the exception of copper, chromium, zinc, and manganese, contaminants would not be introduced into the water column in concentrations that would exceed applicable criteria. This is based upon samples of sediment taken in the IHNC, and would simulate dredging and disposal activities from IHNC sediments into the proposed disposal sites.

Although no soil samples were collected and analyzed as elutriates from the existing industrialized east bank of the IHNC nor the west bank of the IHNC, the HTRW Remedial Investigation which was conducted as a part of the lock replacement study presented soil contaminant concentrations on the east bank of the IHNC. The HTRW testing indicated that the total concentrations of constituents in soils below depths of 5 feet on the east bank of the IHNC had levels ranging from comparable to moderately higher than the levels of constituents found in canal bottom sediments. Some soils within the first 5 feet have been designated "industrial waste" and will not be used for aqueous disposal, but rather will be disposed at an industrial landfill. No material was deemed "hazardous". HTRW testing conducted on the west bank of the IHNC uncovered no hazardous material. No material which is deemed "industrial" or "hazardous" from this proposed testing will be used for aqueous disposal. The material on the east bank and west bank is designated to be used at the mitigation site, MRGO site, and the IHNC disposal site, and similar constituents found in the 1993 elutriates from canal bottoms would be expected to be present in this material. Since constituent levels ranged from comparable to moderately higher than the canal bottom material, levels would be expected to be the same to moderately higher than what was found for these two disposal sites.

e. Aquatic Ecosystem and Organism Determinations

(1) Effects on Plankton. Plankton populations at the mitigation site and MRGO site would be decreased substantially during the period of dredged material disposal. Adverse, but less definitive effects would linger for a period of time afterwards due to elevated turbidity levels which would decrease light penetration and photosynthetic processes. Once the disposed material becomes consolidated and vegetated and the site is reconnected to the tidal system, planktonic populations should return to levels similar to existing conditions.

At the river disposal site, effects are expected to be localized at the site of disposal, and no adverse impacts to plankton populations are expected.

At the IHNC disposal site, plankton levels would be expected to decrease during project construction and disposal operations. This is not considered to be a major consideration, since the existing water quality of this portion of the IHNC is poor and no significant amount of fishery resources occur there.

(2) Effects on Benthos. The benthic population would likely change in the mitigation site. No benthic information is available from the site or areas nearby, but the diversity of the benthic community is expected to be low due to the substrate type and the proximity of the site to urban stormwater pumping stations and urban landfills. The bottom of the site consists of fine-grained sediments mixed with a larger portion of decaying organic material. Most of the organic material is the remains of cypress trees and other woody vegetation which once occurred on the site. Cypress wood is very resistant to decay organisms and organisms which live in decaying wood. The dredged material to be deposited at the site would be mainly alluvial, mineral soils. Benthic organisms typical of muddy, silty water bottoms would be expected to colonize the area after placement of dredged material. Limiting factors to the colonization would be water quality and the pollutants found in the dredged sediments.

Benthic populations at the MRGO site would be expected to return to approximately the same as exiting conditions following deposition of dredged material.

No effects to the benthic population at the river disposal site are expected. The benthic population at the IHNC disposal site is likely very limited by poor water quality conditions and is not considered to be of major concern. Once dredging and disposal operations are completed, benthic populations would likely re-inhabit the remaining water areas similar to existing conditions.

(3) Effects on Nekton. Nekton populations in the mitigation site, and nearby tidal waters, are expected to be adversely impacted by turbidity plumes which would cause a decrease in primary productivity, plankton concentrations, and oxygen levels. Once the deposited material consolidates and becomes vegetated, and the site is reconnected to the tidal system, populations of nekton and other aquatic organisms are expected to be higher than existing conditions due to the primary production of the created wetlands.

Nekton populations are not significant at the MRGO site due to the intermittent nature of surface water.

Nekton populations at are not expected to be affected due to the paucity of nekton in the main channel of the river and the very localized area of disturbance expected from dredged material disposal. Nekton populations at the IHNC disposal site are also likely low. Whatever species are present would be displaced during dredging and disposal activities.

(4) Effects on the Aquatic Food Web. The aquatic food web would be affected at the mitigation site for a period of months after deposition of dredged material. Populations of organisms at all levels of the food web would be decreased or eliminated from a combination of effects including turbidity, decreased dissolved oxygen, and physical burying and displacement. A viable food web is expected to re-establish after cessation of dredging, consolidation of sediments, and re-connection of the site to tidal influence.

The aquatic food web of the MRGO site is not a significant resource.

The aquatic food web at the river disposal site is not expected to be adversely affected due to the localized effect of the disposal. The aquatic food web in the vicinity of the IHNC disposal site is probably stressed, at best, due to poor water quality and pollutants. Harmful effects to aquatic organisms would be restricted to the IHNC between the river and the junction with the GIWW/MRGO.

(5) Effects on Special Aquatic Sites.

(a) Sanctuaries and Refuges. No sanctuaries or refuges are located at or near any of the four disposal sites.

(b) Wetlands. Deposition of dredged material at the MRGO site may occur in scrub/shrub wetland and freshwater marsh. The disposal site would be situated so that impacts on the wetland areas would be minimized.

(c) Mud Flats. No mud flats would be impacted directly by the deposition of dredged material. Around the perimeter of the mitigation site and nearby water bodies, small mud flats occur between the marsh fringe and areas which are always inundated. These mud flats would not be altered by the disposal of dredged material. New mud flats would be created around the perimeter of the newly created islands. No mud flats occur at or near the other disposal sites.

(d) Vegetated Shallows. The only site which may contain vegetated shallows is the MRGO site. Disposal areas would be situated to minimize impacts to this habitat.

(e) Coral Reefs. No such areas would be affected.

(f) Riffle and Pool Complexes. No such areas would be affected.

(6) Threatened and Endangered Species. Consultation with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service has revealed that no threatened or endangered species, nor their critical habitats, would be impacted by the disposal activity.

(7) Other Wildlife. Wildlife species that are known to occur in the mitigation site are avian species which feed in the shallow open water. Some species observed in the area are lesser scaup, red-breasted mergansers, double-crested cormorants, great egrets, and several species of gulls and terns. Some of these species would be displaced during disposal operations, while others would likely continue to forage in nearby open waters and marshes. The created wetlands would, after vegetation establishes, provide habitat suitable for marsh wrens, clapper rails, mottled ducks, and other species commonly found in brackish marshes. The species now utilizing the area would also be able to forage in the shallow waters around the dredged material islands.

At the MRGO site, nutria, swamp rabbit, muskrat, and otters, which are semi-aquatic mammals, are found. These animals would be displaced during dredging operations, but would recolonize the area afterwards.

(8) Actions to Minimize Impacts. Confinement of dredged material at the mitigation site and MRGO site until the material consolidates and becomes vegetated would minimize impacts to the aquatic organisms and ecosystem outside of the site. No actions are proposed to reduce impacts within the site. Impacts at the river and IHNC disposal sites are expected to be minimal, and no actions to reduce impacts are proposed.

f. Proposed Disposal Site Determinations

(1) Mixing Zone Determination. A mixing zone is defined as a region where the concentrations of constituents in a discharge are different from those of the receiving water and are in transition, decreasing steadily in concentration from the source to the receiving system. Mixing zones are those portions of waterbodies where effluent waters are dispersed into receiving waters. Mixing must be accomplished as quickly as possible to ensure that the waste is mixed in the smallest practicable area.

Whenever contaminant concentrations at the point of discharge are above receiving water quality standards, there will be some limited "initial" mixing zone (or zone of initial dilution) in the vicinity of the discharge point where receiving water quality standards may be exceeded. The size of this zone of initial dilution depends on a number of factors including the contaminant concentrations in the effluent, the applicable water quality standards, effluent density and flow rate, receiving water flow rate and turbulence, and the geometry of the discharge structure and the receiving water boundaries. Generally, the zone of initial dilution is restricted to the immediate point of discharge and is substantially smaller than the designated mixing zone (usually not exceeding 10 percent of the size of the mixing zone). Numeric acute aquatic life criteria apply, beginning at the edge of the zone of initial dilution. Numeric mixing zones and other water quality criteria, including both aquatic life acute and chronic water quality criteria, will not apply inside these zones of initial dilution.

The mixing zone is a larger area outside of the zone of dilution where the applicable criteria transitions from acute to chronic aquatic life. The chronic aquatic life criteria apply outside the mixing zone, beginning at the edge of the zone. This is the criteria which must be met in order to meet mixing zone regulations. For the IHNC lock replacement project, four separate mixing zones will need to be determined, one for each of the disposal sites.

LDEQ Environmental Regulatory Code, Part IX, Water Quality Regulations, states that in cases such as wetlands where the application of a specific mixing zone is not applicable, the LDEQ office may specify geometric limits for mixing zones. Assuming an average depth of 4 feet in the mitigation site, the total volume of open water in the diked area is approximately 884,000 cubic yards. A hydraulic dredge will produce a slurry estimated by 4 parts of water to 1 part of usable soil, so it will take approximately 2,668,000 cubic yards of water to produce the 667,000 cubic yards of sediment material.

The two constituents of concern in the mitigation site from 1993 elutriate testing are copper and zinc. Copper levels increased from an ambient level of <14 ug/L to a maximum of 60 ug/L (the range of elutriates were 18 ug/L to 60 ug/L, with an average of 36.7 ug/L for all elutriates analyzed). The saltwater acute aquatic life criteria for copper is 2.9 ug/L, no chronic criteria exists. Zinc levels increased from an ambient level of <20 ug/L to a maximum of 310 ug/L (the range of elutriates were 69 ug/L to 310 ug/L, with an average of 123 ug/L). The saltwater acute aquatic life criteria for zinc is 95 ug/L, with the chronic criteria at 86 ug/L. The mixing of the existing water with the dredged operation water provides a small reduction in the constituent levels expected. Using the elutriate concentration for the dredged volume of water and taking into consideration the ambient copper levels, it is estimated that copper will be found at levels averaging 29 ug/L within the 137 acre diked disposal site. This calculation is done by combining 2,668,000 cubic yards of water produced by dredging (at the elutriate average of 36.7 ug/L) with the ambient water volume available of 884,000 cubic yards (at the ambient level of 7 ug/L, assumed at half the detection limit) and dividing by the total volume of water. Since ambient levels were measured at <14 ug/L (assumed to be 7 ug/L), no amount of water available at the site would dilute the water to the criteria of 2.9 ug/L, therefore the standard cannot be achieved by dilution. For zinc, the dredged volume of water (8,864,000 cubic yards) will be at an average of 123 ug/L while the ambient water is estimated at 10 ug/L (half of the ambient level of <20 ug/L), yielding zinc levels estimated to average 93 ug/L. Zinc will generally be found at levels acceptable to the 95 ug/L saltwater acute aquatic life criteria and very close to the 86 ug/L chronic criteria.

It should be noted that although mixing is not capable of diluting copper levels to acceptable criteria levels, dredging effects are short term and copper levels will return to background shortly after dredging operations cease. The advantages of creating wetlands from this dredged material rather than discharging directly into the Mississippi River (or to an upland site) should outweigh the effects of short-term increases in copper levels at the mitigation site. Waters of the Mississippi River and the IHNC historically have either violated or possibly violated the applicable criteria for copper.

The constituents of concern in the MRGO site are again copper and zinc. Since there is no water quality data in this direct area, we have assumed that the water in the mitigation site would be similar and therefore has been used in this analysis. The area of confined disposal in the MRGO site is 240 acres. For these mixing zone calculations we have assumed that 2 feet of water is currently in the area. The mixing of the existing water with the dredged operation water provides a small reduction in the constituent levels expected. Using the elutriate concentration for the dredged volume of water and taking into consideration the ambient copper levels, it is estimated that copper will be found at levels averaging 33 ug/L within the 240 acre site. This calculation is done by combining 5,456,000 cubic yards of water produced by dredging (at the elutriate average of 36.7 ug/L) with the ambient water volume available of 871,000 cubic yards (at the ambient level of 7 ug/L) and dividing by the total volume of water. Since ambient levels were measured at <14 ug/L (assumed to be 7 ug/L), no amount of water available at the site would dilute the water to the criteria of 2.9 ug/L, therefore the standard cannot be achieved by dilution. For zinc, the dredged volume of water (5,456,000 cubic yards) will be at an average of 123 ug/L while the ambient water is estimated to be 10 ug/L, yielding zinc levels estimated to average 107 ug/L. Therefore, it is estimated that zinc will generally be found at levels just above the 95 ug/L saltwater acute aquatic life criteria.

It should be noted that although mixing is not capable of diluting copper and zinc levels to acceptable criteria levels, dredging effects are short term and copper levels will return to background shortly after dredging operations cease. The advantages of creating wetlands from this dredged material rather than discharging directly into the Mississippi River (or to an upland site) should outweigh the effects of short-term increases in copper and zinc levels at the MRGO site.

The river disposal site falls into LDEQ's category 1, streams with 7Q10 flow greater than 100 cfs. This categorization is for determination of appropriate dilution and mixing zone application for aquatic life. The 7Q10 for the Mississippi River is approximately 142,000 cfs. The designated mixing zone for category 1 streams is 1/3 of the 7Q10 flow or 47,333 cfs. To determine the dilution factor for application of the freshwater aquatic life chronic criteria, one must divide 47,333 cfs by the point discharge flow (dredge flow). For a 18" hydraulic dredge, the flow is estimated to be 26.5 cfs. The calculated 473,333 cfs/26.5 cfs equals a dilution factor of 1:1,786. Given the constituents of concern on the Mississippi River (copper, chromium, and zinc), levels will be diluted below the chronic criteria in all instances where ambient conditions are below the criteria. Copper levels increased from <14 ug/L for ambient conditions (7 ug/L used for calculations) to 190 ug/L for the elutriate. The freshwater acute aquatic life criteria for copper is 22 ug/L, the chronic criteria is 17 ug/L. The 1 part elutriate to 1,786 parts ambient Mississippi River water will dilute copper to 7.1 ug/L. This level of dilution is acceptable to both the acute and chronic freshwater aquatic life criteria. Total chromium levels increased from 4 ug/L for ambient water conditions to 17 ug/L for the elutriate. The freshwater acute aquatic life criteria for chromium (VI) is 16 ug/L, the chronic is 11 ug/L. The dilution factor for the Mississippi River will dilute total chromium to 4.0 ug/L, acceptable to both the acute and chronic freshwater aquatic life criteria for chromium (VI). Note that the criteria is for chromium (VI) and not total chromium but is conservative in light that only a fraction of total chromium is of the hexavalent form. Zinc levels increased from ambient conditions of 100 ug/L to 190 ug/L for the elutriate. The freshwater acute aquatic life criteria for zinc is 165 ug/L, the chronic is 149 ug/L. Zinc will be diluted to approximately 100.1 ug/L, acceptable to both the acute and chronic aquatic life criteria. Therefore, in all instances the mixing zone is acceptable to decrease constituents to levels which meet the freshwater chronic aquatic life criteria for material disposal at the river disposal site.

The amount of material to be placed at the IHNC disposal site is approximated at 640,000 cubic yards. This area is located at the new lock construction area, north of the Claiborne Avenue crossing and south of the Florida Avenue crossing. Tidal flows from the Gulf of Mexico into Lake Pontchartrain via the MRGO generally flow through the portion of the IHNC channel which links the MRGO with Lake Pontchartrain. The section of the IHNC from the existing lock north to the MRGO intersection is essentially isolated from flows along the MRGO and has little mixing and dispersion associated with it, with the exception of slight flows from the locking of vessels through the existing IHNC lock. Since flow is basically nonexistent in this portion of the IHNC channel, a mixing analysis similar to what was constructed for the mitigation site was used. Utilizing cross sectional data from the existing IHNC channel, it was determined that the volume of the IHNC channel from the existing lock to the intersection with the MRGO is roughly 3,800,000 cubic yards. Assuming a worst case scenario, the assumption is made that all of the dredging will be accomplished by a hydraulic dredge and none will be done by mechanical dredge. The hydraulic dredge will produce a slurry of approximately 640,000 cubic yards of soil material mixed with 2,560,000 cubic yards of water.

The two constituents of concern in the IHNC from 1993 elutriate testing are copper and zinc. Copper levels increased from an ambient level of <14 ug/L to a maximum of 200 ug/L (the range of elutriates were 81 ug/L to 200 ug/L, with an average copper level of 130 ug/L for all elutriates analyzed). The saltwater acute aquatic life criteria for copper is 2.9 ug/L, no chronic criteria exists. Zinc levels increased from an ambient level of <20 ug/L to a maximum of 220 ug/L (the range of elutriates were 82 ug/L to 220 ug/L, with an average zinc level of 141 ug/L). The saltwater acute aquatic life criteria for zinc is 95 ug/L, with the chronic criteria at 86 ug/L. The mixing of the existing water with the dredged operation water provides a reduction in the constituent levels as follows. Using the average elutriate level for the amount of dredged water available and taking into consideration the ambient copper levels, it is estimated that copper will be found at levels averaging 57 ug/L. This calculation is done by combining 2,560,000 cubic yards of water produced by dredging (at the elutriate average of 130 ug/L) with the ambient water volume available of 3,800,000 cubic yards (at the ambient level of 7 ug/L, assumed at half the detection limit) and dividing by the total volume of water. Since ambient levels were measured at <14 ug/L (assumed to be 7 ug/L), no amount of water available at the site would dilute the water to the criteria of 2.9 ug/L, therefore the standard cannot be achieved by dilution. For zinc, the dredged volume of water (2,560,000 cubic yards) will be at an average of 141 ug/L while the ambient water is at 10 ug/L (half the ambient of <20 ug/L), yielding zinc levels estimated to average 63 ug/L. Zinc will generally be found at levels acceptable to the 95 ug/L saltwater acute and the 86 ug/L chronic criteria.

It should be noted that although mixing is not capable of diluting copper levels to acceptable criteria levels, dredging effects are short term and copper levels will return to background shortly after dredging operations cease. Disposal of material is confined with ring levees and the effluent over the levees is expected to be lower than the estimations given above due to settling of the solids in the confined disposal area. The advantages of using this existing dredged material rather than purchasing and transporting fill material should outweigh the short-term effects of elevated copper levels at this backfill site.

(2) Determination of Compliance with Applicable Water Quality Standards. The 1989 LDEQ Numerical Criteria for Specific Toxic Substances, 1989 LDEQ Numerical Standards Applicable to Surface Waters in the Study Area, 1986 EPA Freshwater Aquatic Life Criteria, 1986 EPA Saltwater Aquatic Life Criteria, and the 1986 EPA Human Health Criteria are contained in the Engineering Appendix, Water Quality Section. Acute and chronic criteria are

included. The chronic criteria are intended to protect aquatic organisms from long-term exposure to contaminants while the acute criteria are intended to protect them from short-term exposure to contaminants. Since dredging and disposal activities will not produce a continuous discharge, the acute criteria would apply. The freshwater criteria would apply to the river disposal site, while the saltwater criteria would apply to the other disposal sites.

The purpose of the elutriate test is to provide information on the potential effects of a disposal operation on water quality. The results can be compared to appropriate water quality criteria. A comparison of elutriate test concentrations with criteria is conservative. Water quality criteria have an implied exposure time ranging from 96 hours to many months, while dredged material perturbations persist for 30 minutes to two hours. Because of the nature of the comparisons, an elutriate test result showing a pollutant level less than established criteria would indicate that adverse water quality impacts would not be expected. However, an elutriate test result exceeding established criteria would not necessarily imply that adverse water quality impacts would occur.

The acute criteria were employed due to the localized, short-term water quality effects which dredging/disposal operations typically produce. Only criteria violations of the applicable acute aquatic life criteria are noted in the following paragraphs. Existing conditions show that maximum values for ambient chromium, copper, and toxaphene in the Mississippi River from the period 1970-1988 exceeded the applicable freshwater acute aquatic life criteria. Chromium is noted as a possible exceedance because the maximum value is <20 ug/L and the criteria for chromium VI (not total chromium) is 16 ug/L. The maximum copper level during this time frame was 26 ug/L, exceeding the acute freshwater aquatic life criteria of 2.9 ug/L. A maximum toxaphene level of <1.0 ug/L also possibly exceeds the acute aquatic life criteria of 0.73 ug/L.

The IHNC under existing ambient conditions has been shown to violate the acute saltwater aquatic life criteria of 2.9 ug/L for copper in historic sampling (maximum values of 11 ug/L as well as the mean value of 3.42 ug/L are in exceedance). The IHNC has also violated the dissolved oxygen minimum of 4.0 mg/L in the past with a minimum value of 0.1 mg/L. pH levels ranging from a minimum of 3.4 su to 9.8 su violated both ends of the 6.5-9.0 su acceptable range.

Lake Pontchartrain under existing ambient conditions experiences frequent violations of aquatic life criteria as well. The maximum copper concentration of 9 ug/L exceeds the saltwater acute criteria of 2.9 ug/L. Cyanide maximum historic levels were at 30 ug/L, exceeding the acute criteria level of 1 ug/L. The maximum concentration of chlordane (<0.1 ug/L) possibly exceeds the acute criteria level of 0.09 ug/L. Dissolved oxygen levels have historically been measured in Lake Pontchartrain near the IHNC entrance as low as 1.1 mg/L, in violation of the 4.0 mg/L minimum state criteria. pH levels ranged from 4.1 su to 9.7 su, violating both ends of the acceptable stated range of 6.5-9.0 su.

As noted in previous sections, no historic sampling of the mitigation site exists. From the 1993 water sample, it is seen that copper possibly exceeds the EPA saltwater aquatic life criteria of 2.9 ug/L, at <14 ug/L. Since only one sample was analyzed, a generalization cannot be made as to the existing water quality in the area. However, the water quality appears to be similar to the quality of water in the IHNC, although fluctuations do occur.

Fecal coliform violations are not discussed in this section, but are addressed in Section 2(d) Pathogens. Other parameters which violated (or possibly violated) the applicable chronic criteria of the Mississippi River are as follows: lead, mercury, cyanide, chlordane, mirex, PCBs, heptachlor, DDT, dieldrin, and endrin. The chronic criteria violators for the IHNC are lead, mercury, and nickel. The chronic criteria violators for Lake Pontchartrain are lead, mercury, cyanide, chlordane, mirex, PCBs, and toxaphene.

The only constituents which showed the potential to violate water quality criteria during construction, dredging, and disposal activities were determined through the 1993 elutriate testing. For the Mississippi River (shown by Sampling Site A results) it was shown that possible increases in the levels of chromium, copper, and zinc may occur during dredging and disposal activities. However, mixing zone determinations show no acute aquatic life criteria violations outside of the zone.

The 1993 elutriate samples analyzed for Sampling Site C show that two constituent levels increase at the IHNC disposal site to possibly exceed the saltwater acute aquatic life criteria. These constituents are copper and zinc. The maximum elutriate level experienced for copper was 200 ug/L, exceeding the acute saltwater criteria of 2.9 ug/L. The maximum elutriate level experienced for zinc was 220 ug/L, exceeding the acute saltwater criteria of 95 ug/L. Mixing calculations show that copper is the main parameter of concern and levels cannot be diluted to meet the criteria as ambient copper levels themselves are above the saltwater acute aquatic life criteria.

The 1993 elutriate samples analyzed for Sampling Sites G and E show that two constituent levels increase in the mitigation site and MRGO site to possibly exceed the saltwater acute criteria. These constituents are again copper and zinc. The maximum elutriate level experienced for copper was 60 ug/L, exceeding the acute saltwater criteria of 2.9 ug/L. The maximum elutriate level experienced for zinc was 310 ug/L, exceeding the acute saltwater criteria of 95 ug/L. Again, mixing calculations show that copper is the main parameter of concern and levels cannot be diluted to meet the criteria as the ambient copper levels themselves are above the saltwater aquatic life criteria.

(3) Potential Effects on Human Use Characteristics.

(a) Municipal and private water supply. The nearest downstream water intake on the Mississippi River is 4.7 miles from the IHNC lock, and no impact to this public water supply is expected for the following reasons. A study of the disposal of hydraulic dredged material in the New Orleans Harbor indicated constituents settled out of the water within 100 yards downstream of the dredge. The constituents would be discharged in a highly sediment-laden mixture into the river which contains a large amount of sediment, providing an excellent environment for adsorption of the constituents. It should be noted that water in the Mississippi River presently contains levels of copper which exceeds the freshwater aquatic life criteria, and also chromium which possibly exceeds the freshwater aquatic life criteria.

Since the 1993 elutriate tests for the river disposal site do not include elutriate levels for the 97 organics analyzed for this effort (due to breakage of the sample jars), the effects of these organics cannot be analyzed through the elutriates. Only the 27 metals for which elutriate levels were analyzed are presented. Considering the drinking water supply human health criteria reveals the following: only arsenic possibly violates the human health criteria for drinking water supplies of 50 ug/L. Arsenic increases from an ambient level of <3 ug/L to <60 ug/L. No other metals are shown to increase to levels which may violate the drinking water system. The mixing zone is adequate to reduce levels of arsenic below the human health criteria for the Mississippi River.

(b) Recreational and commercial fisheries. The mitigation site and nearby water bodies are used recreational and commercial fishermen. Crab traps are common throughout the area and in typical years thousands of pounds of shrimp are harvested in Bayou Bienvenue, which is the only tidal channel connecting the mitigation site and adjacent waters with the tidal system. Some recreational angling also occurs, mainly for spotted seatrout, red drum, and Atlantic croaker. Commercial gill nets have also been observed in the area. Likely target species for these nets are gar fish, sheepshead, black drum, and southern flounder. Disposal operations could adversely impact fisheries occurring in the site and nearby waters. Fisheries in the area west of Paris Road (Louisiana Highway 47) between Bayou Bienvenue and the Back Protection Levee would be most seriously impacted. Impacts detailed in other sections of this evaluation, including turbidity, reduced dissolved oxygen levels, physical disturbance, and release of contaminants, would reduce populations of harvested species.

Disposal operations at the MRGO site would also affect Bayou Bienvenue and adjacent waters. The highly turbid runoff from the site would cause the same type of impacts as those described for the mitigation site.

No impacts to fisheries at the river and IHNC disposal sites are expected. Virtually no fishing occurs in the main channel of the river near the IHNC. Bank fishing along the river should not be affected by disposal activities. The IHNC is closed to all types of fishing activities, by regulations of the Port of New Orleans, because of the danger associated with navigation traffic.

(c) Water-related recreation. The only types of recreational activity known to occur in the mitigation site is fishing. Some hunting for rabbits and wild hogs may occur in the MRGO site, although the site is in Orleans Parish and is technically off-limits to this activity. These areas are not especially scenic, being flanked by development and landfills. When the landfills were still open, bird watching was a common activity. The landfills attracted tremendous numbers of birds, especially during winter months, to feed on the discarded refuse. Effects to fishing activities are described in the preceding paragraph. No effects to hunting activities would be expected.

No effects to water-related recreation would be expected from disposal of dredged material at the river and IHNC disposal sites.

(d) Aesthetics. Dredging and deposition of dredged material are not aesthetically pleasing sights. The mitigation site and MRGO site are isolated from the view of all but those who venture into the area. These people would likely be much more concerned about the effects on resources that they intend to harvest than on the diminished aesthetic qualities of the area. The wetlands created with dredged material would likely become vegetated with wetland plant species and would be considered aesthetically pleasing to those who enjoy viewing marsh landscapes.

During disposal activities at the river and IHNC disposal sites, these areas would not be visually pleasing; however, such activities are not uncommon in the New Orleans Harbor.

(e) Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar preserves. The Galvez Street Wharf and the St. Claude Avenue Bridge, both located on the IHNC are eligible for the Federal Register. Both structures would be demolished as part of the lock replacement plan, regardless of the dredging and disposal plan. Mitigation has been coordinated with the State Historic Preservation Officer and would consist of recordation to accepted standards. Additional coordination with the State Historic Preservation Officer and the Advisory Council on Historic Preservation will be accomplished prior to project construction. Two Historic Neighborhoods, the Bywater Historic Neighborhood and the Holy Cross Historic Neighborhood, lie on either side of the IHNC. Both of these neighborhoods would be adversely impacted by the lock replacement plan, but not specifically by dredging and disposal operations.

g. Determination of Cumulative Effects on the Aquatic Ecosystem

All four proposed disposal sites have had a history of being manipulated by humans. The mitigation site was leveed, drained, and used for agricultural purposes up until early in this century. After levee systems failed and were abandoned, the area was again subjected to tidal flows. Since the soils had subsided and compacted while the area was drained, the elevation was no longer sufficient to sustain most plant species; only the existing cypress trees were able to survive. The MRGO, completed in the 1960's provided a straight channel to the Gulf of Mexico and caused an increase in salinity levels, killing the remaining cypress trees. Nearby marshes converted from fresh and intermediate marshes to brackish marshes. Adjacent areas were used as landfills and the area received urban stormwater runoff with associated pollutants. Dredged material disposal for mitigation restoration is an attempt to increase the existing value of the area for terrestrial and aquatic fish and wildlife resources. As stated in other sections, the disposal area would be disturbed for a period of time during disposal and afterwards, but the long-term effect is expected to be positive.

The MRGO site has been previously subjected to disposal of dredged material.

The cumulative effect of disposal at the river disposal site is insignificant. The average amount of sediment dredged from the New Orleans Harbor is approximately 2,400,000 cubic yards/year (15-year average). The amount of material to be deposited in the river is 172,000 cubic yards or about 7 percent of the total dredged in the harbor annually. Because of the existing sediment load, rapid movement of material by the river, and normal scouring, the cumulative effect of the added sediment would be minimal.

The IHNC disposal site is almost completely developed for industrial and urban uses. The proposed dredging and disposal activities would cause a rearrangement of the canal banks and lock site but not add to the effects that humans have had on the area.

h. Determination of Secondary Effects on the Aquatic Ecosystem

No secondary effects, other than the effects discussed in previous sections, some of which may be considered secondary, are expected.

III. FINDINGS OF COMPLIANCE OR NON-COMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE

a. Adaptation of the Section 404(b)(1) Guidelines to this Evaluation

No significant adaptations of the guidelines were made relative to this evaluation.

b. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site Which Would Have Less Adverse Impacts on the Aquatic Ecosystem

Disposal sites other than those proposed are potentially available. Also the disposal plan could be changed to alter the percentages of the total amount of dredged material which would be deposited into each of the proposed sites.

c. Compliance with Applicable State Water Quality Standards

The proposed disposal plan would violate several Louisiana Department of Environmental Quality numerical standards. Concentrations of copper and zinc at the four proposed disposal sites would violate acute criteria levels during dredging operations. The concentration of chromium VI may exceed the acute criteria level at the river disposal site. Copper levels in the vicinity of the disposal sites frequently exceed applicable acute criteria levels under ambient conditions. Therefore, standards for copper may not be achievable through dilution.

d. Compliance with Applicable Toxic Effluent Standard or Prohibition Under Section 307 of the Clean Water Act

The 65 pollutants designated as toxic under Section 307(a)(1) of the Clean Water Act as revised under EPA Water Quality Criteria, Federal Register dated 28 November 1980, have not been adopted by the State of Louisiana as regulatory. They are used in a comparative context only.

e. Compliance with the Endangered Species Act of 1973

Disposal of the excavated material is not anticipated to have adverse impacts on any threatened or endangered species.

f. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972

All disposal sites and effects of disposal are in inland waters. No effects would occur beyond the shoreline of the Gulf of Mexico.

g. Evaluation of Extent of Degradation of the Waters of the United States

(1) Significant Adverse Effects on Human Health and Welfare

(a) Municipal and Private Water Supplies. No effect on water supplies is expected.

(b) Recreational and Commercial Fisheries. Disposal into the mitigation site and MRGO site would have an adverse effect on the recreational and commercial fisheries for a period of up to about 2 years after the conclusion of disposal activities. Once dredged material island become vegetated with wetland species and turbidity levels return to pre-project conditions, fisheries catches would likely return to conditions approximating those now occurring or improve somewhat over these conditions due to the positive effects of restored marshes. No effects are expected at the other two sites.

(c) Plankton. Plankton populations at the mitigation site would likely be reduced for up to about 2 years following the conclusion of disposal activities due to elevated turbidity levels. No adverse effects are expected at the other sites.

(d) Fish. Fish trapped in the mitigation site by confinement dikes would be forced out of the area or killed by the discharge of hydraulically dredged material. After the wetlands become vegetated and the area is reconnected to tidal influence, fish populations should improve to levels higher than existing conditions from the positive effects of the created wetlands. No significant adverse effects are expected at the other disposal sites.

(e) Shellfish. Shrimp and crabs are the primary shellfish inhabiting the area. Effects on these species would be the same as those described under the previous section.

(f) Wildlife. Wildlife species would be forced to leave the MRGO site during disposal operation. Wildlife would benefit from the creation of wetland habitat at the mitigation site. Species normally found in coastal brackish marshes are expected to rapidly colonize the marsh islands at the site once vegetation becomes established.

(g) Special Aquatic Sites. No special aquatic sites would be impacted.

(2) Significant Adverse Effects on Life Stages of Aquatic Life and Other Wildlife Dependent on Aquatic Ecosystems. The mitigation site is used as a nursery area by the juveniles and sub-adults of a variety of migratory estuarine species of fish and shellfish. Migratory, in this sense, means species whose adults spawn in the Gulf of Mexico (or estuarine areas closer to the gulf) and their larval offspring are carried into the shallow, marsh-fringed estuaries by tides and currents. The juveniles and sub-adults of such species would be prevented from utilizing the disposal site for a period of time afterward. A reduction in the populations of these species from the general area due to the exclusion of organisms from the disposal site would be expected until the site is reconnected to tidal waters. No significant adverse effects are expected at the other disposal sites.

(3) Significant Adverse Effects on Aquatic Ecosystem Diversity, Productivity and Stability. The diversity of the aquatic ecosystem at the mitigation site is probably limited due to the proximity of the site to urban areas, landfills, urban storm water runoff, and restrictions to free interchange with the tidal system. The ecosystem of the disposal site would be significantly altered until the area is reconnected to the tidal system. No long-term adverse impacts to ecosystem diversity are expected. The site would likely become more diverse after the emergent vegetation is established. No significant long-term, adverse effects are anticipated at the other disposal sites.

(4) Significant Adverse Effects on Recreational, Aesthetic, and Economic Resources. Recreational catches of shrimp, crabs, and finfish would probably be reduced in waters near the mitigation

site and MRGO site during dredged material disposal and for a period of time afterwards, but no adverse long-term effects are expected. Aesthetic and economic resources would not be significantly affected by disposal of dredged material at any of the four sites from disposal activities.

h. <u>Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem</u>

The confinement of dredged material at the mitigation site and MRGO site would minimize adverse impacts to the aquatic ecosystem outside of these areas. The area of the MRGO disposal site to be used for disposal of dredged material would be minimized. The MRGO disposal site selected has been chosen to minimize impacts to the aquatic ecosystem and to restrict dredged material disposal to low-quality wetlands. The Corps will abide by any restrictions placed on the project by the Louisiana Department of Environmental Quality to prevent the degradation of coastal waters.

i. <u>On the basis of the guidelines, the discharge of dredged material into the four proposed sites is specified as complying with the requirements of these guidelines, with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects on the aquatic ecosystem</u>.

18 March 1997
Date

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TABLE B-26
ELUTRIATE ANALYSIS
SITE AR1-1C, mixed with Mississippi River water

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediments (ug/kg)	Mississippi Water	Elutriate	Applicable Acute Criteria
Antimony	<12,000	<3	<60	
Arsenic (total)	7,700	<3	15	360
Arsenic (III)				360
Beryllium	920	<0.6	0.67	
Cadmium	<1,000	0.3	0.3	6.2
Chromium (total)	19,000	4	17	
Chromium (VI)				16
Chromium (III)				1700
Copper	23,000	<14	190	22
Lead	27,000	6.3	11	137
Mercury	<100		<0.20	2.4
Nickel	25,000	<23	<23	1999
Selenium	<600	<3	<3	
Silver	<1,800	<0.4	<0.4	8.2
Thallium	<400	<2	<2	
Zinc	95,000	100	190	120
Aluminum	13,000,000	4,200	12,000	
Barium	160,000	94	150	
Boron	20,400	<100	140	
Calcium	7,600,000	44,000	31,000	
Cobalt	12,000	<11	<11	
Iron	23,000,000	3,900	12,000	
Magnesium	5,900,000	14,000	34,000	
Manganese	1,200,000	160	2,400	
Molubdenum	<20,400	<1	<100	
Potassium	2,200,000	4,000	14,000	
Vanadium	29,000	<13	27	
TRP Hydrocarbons	14,000	<1,000	broken	
Aldrin	<3.5		broken	3.0
A-BHC	<3.5	<0.05	broken	
B-BHC	<3.5	<0.05	broken	
G-BHC	<3.5	<0.05	broken	2.0
D-BHC	<3.5	<0.05	broken	
PPDDD	<6.9	<0.01	broken	0.03
PPDDE	<6.9	<0.1	broken	52.5
PPDDT	<6.9	<0.1	broken	1.1
Heptachlor	<3.5	<0.05	broken	0.52
Dieldrin	<6.9	<0.1	broken	2.5
A-Endosulfan	<3.5	<0.05	broken	
B-Endosulfan	<6.9	<0.1	broken	
Endosulfan				0.22
Endosulfan sulfate	<6.9	<0.1	broken	
Endrin	<6.9	<0.1	broken	0.18
Endrin Aldehyde	<6.9	<0.1	broken	
Heptachlor Epoxide	<3.5	<0.05	broken	
Methoxychlor	<3.5	<0.5	broken	
Chlordane	<3.5	<0.05	broken	2.4
Toxaphene	<350	<5	broken	0.73
PCB-1016	<67	<1	broken	2.0
PCB-1221	<135	<2	broken	2.0
PCB-1232	<67	<1	broken	2.0
PCB-1242	<67	<1	broken	2.0
PCB-1248	<67	<1	broken	2.0
PCB-1254	<67	<1	broken	2.0
PCB-1260	<67	<1	broken	2.0
Phenol	<670	<10	broken	700
2-Chlorophenol	<670	<10	broken	258
2-Nitrophenol	<670	<10	broken	
2,4-Dimethylphenol	<670	<10	broken	
2,4-Dichlorophenol	<670	<10	broken	202
4-Chloro-3-Methylphenol	<670	<10	broken	
2,4,6-Trichlorophenol	<670	<10	broken	

Sampling Site A (between existing lock and river)
Composite of sediments from various depths

TABLE B-26 (continued)

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediments (ug/kg)	Mississippi Water	Elutriate	Applicable Acute Criteria
2,4-Dinitrophenol	<3,300	<50	broken	
4-Nitrophenol	<3,300	<50	broken	
2-Methyl-4,6-Dinotrophenol	<3,300	<50	broken	
Pentachlorophenol	<3,300	<50	broken	20
Benzoic Acid	<3,300	<50	broken	
2-Methylphenol	<670	<10	broken	
4-Methylphenol	<670	<10	broken	
2,4,5-Trichlorophenol	<3,300	<50	broken	
Benzyl Alcohol	<670	<10	broken	
N-Nitrosodimethylamine			broken	
Bis(2-Chloroisopropyl)Ether	<670	<10	broken	
N-Nitroso-Di-N-Propylamine	<670	<10	broken	
Nitrobenzene	<670	<10	broken	
Isophorone	<670	<10	broken	
Bis(2-Chloroethoxy)Methane	<670	<10	broken	
2,6-Dinitrotoluene	<670	<10	broken	
2,4-Dinitrotoluene	<670	<10	broken	
1,2-Diphenylhydrazine			broken	
Benzidine			broken	250
3,3'Dichlorobenzidine	<1,300	<20	broken	
Bis(2-Chloroethyl)Ether	<670	<10	broken	
1,3-Dichlorobenzene	<670	<10	broken	
1,4-Dichlorobenzene	<670	<10	broken	
1,2-Dichlorobenzene	<670	<10	broken	
Hexachloroethane	<670	<10	broken	
1,2,4-Trichlorobenzene	<670	<10	broken	
Naphthalene	<670	<10	broken	
Hexachlorobutadiene	<670	<10	broken	5.1
Hexachlorocyclopentadiene	<670	<10	broken	
2-Chloronaphthalene	<670	<10	broken	
Acenaphthylene	<670	<10	broken	
Dimehtyl Phthalate	<670	<10	broken	
Acenaphthene	<670	<10	broken	
Fluorene	<670	<10	broken	
Diethyl Phthalate	<670	<10	broken	
4-Chlorophenyl Phenyl Ether	<670	<10	broken	
N-Nitrosodiphenyl Amine	<670	<10	broken	
4-Bromophenyl Ether	<670	<10	broken	
Hexachlorobenzene	<670	<10	broken	
Phenathrene	140	<10	broken	
Anthracene	<670	<10	broken	
Dibutylphthalate	160	<10	broken	
Fluoranathene	<670	<10	broken	
Pyrene	380	<10	broken	
Butylbenzylphthalate	<670	<10	broken	
Chrysene	200	<10	broken	
Benzo(a)Antharacene	130	<10	broken	
Bis(2-Ethylexyl)Phthalate	100	1	broken	
Di-N-Octyphthalate	<670	<10	broken	
Benxo(a)Fluoranthene	290	<10	broken	
Benzo(k)Fluoranthene	<670	<10	broken	
Benzo(a)Pyrene	86	<10	broken	
Indeno(1,2,3-C,D)Pyrene	69	<10	broken	
Dibenzo(A,H)Anthracene	<670	<10	broken	
Benzo(G,H,I)Perylene	<670	<10	broken	
Aniline			broken	
4-Chloroaniline	<670	<10	broken	
Dibenzofuran	<670	<10	broken	
2-Methylnaphthalene	<670	<10	broken	
2-Nitroaniline	<3,300	<50	broken	
3-Nitroaniline	<3,300	<50	broken	
4-Nitroaniline	<3,300	<50	broken	

< Actual value is less than value shown

TABLE B-27
ELUTRIATE ANALYSIS
SITE CR1-AT, mixed with IHNC water

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediments (ug/kg)	IHNC Water	Elutriate	Applicable Acute Criteria
Antimony	<17,700	<3	<3	
Arsenic (total)	9,000	<3	3.8	69
Arsenic (III)				69
Beryllium	1,160	<0.6	<0.6	
Cadmium	<1,500	<3	<0.3	43
Chromium (total)	29,000	<2	3.3	
Chromium (III)				515
Chromium (VI)				1,100
Copper	59,000	<14	110	2.9
Lead	49,000	3.3	3.4	140
Mercury	<100		0.2	2.1
Nickel	32,000	<23	<23	75
Selenium	<900	<3	<6	
Silver	<2,700	<0.4	<0.4	2.3
Thallium	<600	<2	<2	
Zinc	180,000	<20	82	95
Aluminum	18,000,000	900	84	
Barium	530,000	66	140	
Boron	30,400	900	890	
Calcium	4,300,000	100,000	97,000	
Cobalt	13,000	<11	<11	
Iron	31,000,000	860	130	
Magnesium	7,700,000	250,000	290,000	
Manganese	760,000	180	2,300	
Molubdenum	<29,500	<1	<100	
Potassium	4,200,000	91,000	89,000	
Vanadium	40,000	<13	<13	
TRP Hydrocarbons	26,000	<1,000	<1,000	
Aldrin	<5	<0.05	<0.05	1.3
A-BHC	<5	<0.05	<0.05	
B-BHC	<5	<0.05	<0.05	
G-BHC	<5	<0.05	<0.05	0.160
D-BHC	<5	<0.05	<0.05	
PPDDD	<10	<0.01	<0.1	1.25
PPDDE	<10	<0.1	<0.1	0.7
PPDDT	<10	<0.1	<0.1	0.13
Heptachlor	<5	<0.05	<0.05	0.053
Dieldrin	<10	<0.1	<0.1	0.71
A-Endosulfan	<5	<0.05	<0.05	
B-Endosulfan	<10	<0.1	<0.1	
Endosulfan				0.034
Endosulfan sulfate	<10	<0.1	<0.1	
Endrin	<10	<0.1	<0.1	0.037
Endrin Aldehyde	<10	<0.1	<0.1	
Heptachlor Epoxide	<5	<0.05	<0.5	
Methoxychlor	<50	<0.5	<0.5	2.1
Chlordane	<5	<0.05	<0.05	0.09
Toxaphene	<500	<5	<5	0.21
PCB-1016	<97	<1	<1	10
PCB-1221	<190	<2	<2	10
PCB-1232	<97	<1	<1	10
PCB-1242	<97	<1	<1	10
PCB-1248	<97	<1	<1	10
PCB-1254	<97	<1	<1	10
PCB-1260	<97	<1	<1	10
Phenol	<970	<10	<14	580
2-Chlorophenol	<970	<10	<14	
2-Nitrophenol	<970	<10	<14	
2,4-Dimethylphenol	<970	<10	<14	
2,4-Dichlorophenol	<970	<10	<14	
4-Chloro-3-Methylphenol	<970	<10	<14	
2,4,6-Trichlorophenol	<970	<10	<14	

Sampling Site C (between existing lock and Claiborne Ave)
Sediments from 0' to 1' deep

TABLE B-27 (continued)

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediments (ug/kg)	IHNC Water	Elutriate	Applicable Acute Criteria
2,4-Dinitrophenol	<4,700	<50	<68	
4-Nitrophenol	<4,700	<50	<68	
2-Methyl-4,6-Dinotrophenol	<4,700	<50	<68	
Pentachlorophenol	<4,700	<50	<68	13
Benzoic Acid	<4,700	<50	<68	
2-Methylphenol	<970	<10	<14	
4-Methylphenol	<970	<10	<14	
2,4,5-Trichlorophenol	<4,700	<50	<68	
Benzyl Alcohol	<970	<10	<14	
N-Nitrosodimethylamine				
Bis(2-Chloroisopropyl)Ether	<970	<10	<14	
N-Nitroso-Di-N-Propylamine	<970	<10	<14	
Nitrobenzene	<970	<10	<14	
Isophorone	<970	<10	<14	
Bis(2-Chloroethoxy)Methane	<970	<10	<14	
2,6-Dinitrotoluene	<970	<10	<14	
2,4-Dinitrotoluene	<970	<10	<14	
1,2-Diphenylhydrazine				
Benzidine				125
3,3'Dichlorobenzidine	<1,900	<20	<27	
Bis(2-Chloroethyl)Ether	<970	<10	<14	
1,3-Dichlorobenzene	<970	<10	<14	
1,4-Dichlorobenzene	<970	<10	<14	
1,2-Dichlorobenzene	<970	<10	<14	
Hexachloroethane	<970	<10	<14	
1,2,4-Trichlorobenzene	<970	<10	<14	
Naphthalene	<970	<10	<14	
Hexachlorobutadiene	<970	<10	<14	1.6
Hexachlorocyclopentadiene	<970	<10	<14	
2-Chloronaphthalene	<970	<10	<14	
Acenaphthylene	<970	<10	<14	
Dimehtyl Phthalate	<970	<10	<14	
Acenaphthene	<970	<10	<14	
Fluorene	<970	<10	<14	
Diethyl Phthalate	<970	<10	<14	
4-Chlorophenyl Phenyl Ether	<970	<10	<14	
N-Nitrosodiphenyl Amine	<970	<10	<14	
4-Bromophenyl Ether	<970	<10	<14	
Hexachlorobenzene	<970	<10	<14	
Phenathrene	<970	<10	<14	
Anthracene	<970	<10	<14	
Dibutylphthalate	<970	<10	<14	
Fluoranathene	<970	<10	<14	
Pyrene	170	<10	<14	
Butylbenzylphthalate	<970	<10	<14	
Chrysene	<970	<10	<14	
Benzo(a)Antharacene	<970	<10	<14	
Bis(2-Ethylexyl)Phthalate	290	1	2	
Di-N-Octyphthalate	<970	<10	<14	
Benxo(a)Fluoranthene	170	<10	<14	
Benzo(k)Fluoranthene	<970	<10	<14	
Benzo(a)Pyrene	<970	<10	<14	
Indeno(1,2,3-C,D)Pyrene	<970	<10	<14	
Dibenzo(A,H)Anthracene	<970	<10	<14	
Benzo(G,H,I)Perylene	<970	<10	<14	
Aniline				
4-Chloroaniline	<970	<10	<14	
Dibenzofuran	<970	<10	<14	
2-Methylnaphthalene	<970	<10	<14	
2-Nitroaniline	<4,700	<50	<68	
3-Nitroaniline	<4,700	<50	<68	
4-Nitroaniline	<4,700	<50	<68	

< Actual value is less than value shown

TABLE B-28
ELUTRIATE ANALYSIS
SITE CR1-AM, mixed with IHNC water

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediments (ug/kg)	IHNC Water	Elutriate	Applicable Acute Criteria
Antimony	<14,800	<3	<3	
Arsenic (total)	11,000	<3	3.5	69
Arsenic (III)				69
Beryllium	1,120	<0.6	<0.6	
Cadmium	<1,200	<3	<0.3	43
Chromium (total)	26,000	<2	2.8	
Chromium (VI)				1,100
Chromium (III)				515
Copper	38,000	<14	200	2.9
Lead	90,000	3.3	13	140
Mercury	200		<0.2	2.1
Nickel	29,000	<23	<23	75
Selenium	<800	<3	<6	
Silver	<2,200	<0.4	<0.4	2.3
Thallium	<500	<2	<2	
Zinc	230,000	<20	220	95
Aluminum	16,000,000	900	210	
Barium	1,600,000	66	250	
Boron	<24,600	900	870	
Calcium	4,800,000	100,000	88,000	
Cobalt	13,000	<11	<11	
Iron	29,000,000	860	500	
Magnesium	6,600,000	250,000	260,000	
Manganese	650,000	180	310	
Molubdenum	<24,600	<1	<100	
Potassium	3,700,000	91,000	91,000	
Vanadium	38,000	<13	<13	
TRP Hydrocarbons	15,000	<1,000	<1,000	
Aldrin	<4.2	<0.05	<0.05	1.3
A-BHC	<4.2	<0.05	<0.05	
B-BHC	<4.2	<0.05	<0.05	
G-BHC	<4.2	<0.05	<0.05	0.160
D-BHC	<4.2	<0.05	<0.05	
PPDDD	<8.5	<0.01	<0.1	1.25
PPDDE	<8.5	<0.1	<0.1	0.7
PPDDT	<8.5	<0.1	<0.1	0.13
Heptachlor	<4.2	<0.05	<0.05	0.053
Dieldrin	<8.5	<0.1	<0.1	0.71
A-Endosulfan	<4.2	<0.05	<0.05	
B-Endosulfan	<8.5	<0.1	<0.1	
Endosulfan				0.034
Endosulfan sulfate	<8.5	<0.1	<0.1	
Endrin	<8.5	<0.1	<0.1	0.037
Endrin Aldehyde	<8.5	<0.1	<0.1	
Heptachlor Epoxide	<4.2	<0.05	<0.5	
Methoxychlor	<42	<0.5	<0.5	2.1
Chlordane	<4.2	<0.05	<0.05	0.09
Toxaphene	<420	<5	<5	0.21
PCB-1016	<82	<1	<1	10
PCB-1221	<160	<2	<2	10
PCB-1232	<82	<1	<1	10
PCB-1242	<82	<1	<1	10
PCB-1248	<82	<1	<1	10
PCB-1254	<82	<1	<1	10
PCB-1260	<82	<1	<1	10
Phenol	<820	<10	<12	580
2-Chlorophenol	<820	<10	<12	
2-Nitrophenol	<820	<10	<12	
2,4-Dimethylphenol	<820	<10	<12	
2,4-Dichlorophenol	<820	<10	<12	
4-Chloro-3-Methylphenol	<820	<10	<12	
2,4,6-Trichlorophenol	<820	<10	<12	

Sampling Site C (between existing lock and Claiborne Ave)
Sediments from 1' to 5' deep

TABLE B-28 (continued)

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediments (ug/kg)	IHNC Water	Elutriate	Applicable Acute Criteria
2,4-Dinitrophenol	<4,000	<50	<60	
4-Nitrophenol	<4,000	<50	<60	
2-Methyl-4,6-Dinotrophenol	<4,000	<50	<60	
Pentachlorophenol	<4,000	<50	<60	13
Benzoic Acid	<4,000	<50	<60	
2-Methylphenol	<820	<10	<12	
4-Methylphenol	<820	<10	<12	
2,4,5-Trichlorophenol	<4,000	<50	<60	
Benzyl Alcohol	<820	<10	<12	
N-Nitrosodimethylamine				
Bis(2-Chloroisopropyl)Ether	<820	<10	<12	
N-Nitroso-Di-N-Propylamine	<820	<10	<12	
Nitrobenzene	<820	<10	<12	
Isophorone	<820	<10	<12	
Bis(2-Chloroethoxy)Methane	<820	<10	<12	
2,6-Dinitrotoluene	<820	<10	<12	
2,4-Dinitrotoluene	<820	<10	<12	
1,2-Diphenylhydrazine				
Benzidine				125
3,3'Dichlorobenzidine	<1,600	<20	<24	
Bis(2-Chloroethyl)Ether	<820	<10	<12	
1,3-Dichlorobenzene	<820	<10	<12	
1,4-Dichlorobenzene	<820	<10	<12	
1,2-Dichlorobenzene	<820	<10	<12	
Hexachloroethane	<820	<10	<12	
1,2,4-Trichlorobenzene	<820	<10	<12	
Naphthalene	<820	<10	<12	
Hexachlorobutadiene	<820	<10	<12	1.6
Hexachlorocyclopentadiene	<820	<10	<12	
2-Chloronaphthalene	<820	<10	<12	
Acenaphthylene	<820	<10	<12	
Dimehtyl Phthalate	<820	<10	<12	
Acenaphthene	160	<10	<12	
Fluorene	160	<10	<12	
Diethyl Phthalate	110	<10	<12	
4-Chlorophenyl Phenyl Ether	<820	<10	<12	
N-Nitrosodiphenyl Amine	<820	<10	<12	
4-Bromophenyl Ether	<820	<10	<12	
Hexachlorobenzene	<820	<10	<12	
Phenathrene	540	<10	<12	
Anthracene	110	<10	<12	
Dibutylphthalate	84	<10	<12	
Fluoranathene	1,400	<10	<12	
Pyrene	1,100	<10	<12	
Butylbenzylphthalate	<820	<10	<12	
Chrysene	270	<10	<12	
Benzo(a)Antharacene	220	<10	<12	
Bis(2-Ethylexyl)Phthalate	300	1	7	
Di-N-Octyphthalate	<820	<10	<12	
Benxo(a)Fluoranthene	430	<10	<12	
Benzo(k)Fluoranthene	<820	<10	<12	
Benzo(a)Pyrene	150	<10	<12	
Indeno(1,2,3-C,D)Pyrene	140	<10	<12	
Dibenzo(A,H)Anthracene	<820	<10	<12	
Benzo(G,H,I)Perylene	<820	<10	<12	
Aniline				
4-Chloroaniline	<820	<10	<12	
Dibenzofuran	<820	<10	<12	
2-Methylnaphthalene	<820	<10	<12	
2-Nitroaniline	<4,000	<50	<60	
3-Nitroaniline	<4,000	<50	<60	
4-Nitroaniline	<4,000	<50	<60	

Actual value is less than value shown

TABLE B-29
ELUTRIATE ANALYSIS
SITE CR1-AB, mixed with IHNC water

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediments (ug/kg)	IHNC Water	Elutriate	Applicable Acute Criteria
Antimony	<10,300	<3	<3	
Arsenic (total)	9,500	<3	<3.0	69
Arsenic (III)				69
Beryllium	900	<0.6	<0.6	
Cadmium	<900	<3	<0.3	43
Chromium (total)	16,000	<2	<2.0	
Chromium (VI)				1,100
Chromium (III)				515
Copper	20,000	<14	81	2.9
Lead	18,000	3.3	7.9	140
Mercury	100		<0.2	2.1
Nickel	24,000	<23	<23	75
Selenium	<500	<3	<6	
Silver	<1,500	<0.4	<0.4	2.3
Thallium	<300	<2	<2	
Zinc	72,000	<20	120	95
Aluminum	11,000,000	900	120	
Barium	110,000	66	420	
Boron	<17,100	900	900	
Calcium	13,000,000	100,000	96,000	
Cobalt	9,500	<11	<11	
Iron	20,000,000	860	250	
Magnesium	8,100,000	250,000	260,000	
Manganese	620,000	180	81	
Molubdenum	<17,100	<1	<100	
Potassium	3,400,000	91,000	87,000	
Vanadium	25,000	<13	<13	
TRP Hydrocarbons	11,000	<1,000	<1,000	
Aldrin	<2.9	<0.05	<0.05	1.3
A-BHC	<2.9	<0.05	<0.05	
B-BHC	<2.9	<0.05	<0.05	
G-BHC	<2.9	<0.05	<0.05	0.160
D-BHC	<2.9	<0.05	<0.05	
PPDDD	<5.9	<0.01	<0.1	1.25
PPDDE	<5.9	<0.1	<0.1	0.7
PPDDT	<5.9	<0.1	<0.1	0.13
Heptachlor	<2.9	<0.05	<0.05	0.053
Dieldrin	<5.9	<0.1	<0.1	0.71
A-Endosulfan	<2.9	<0.05	<0.05	
B-Endosulfan	<5.9	<0.1	<0.1	
Endosulfan				0.034
Endosulfan sulfate	<5.9	<0.1	<0.1	
Endrin	5.9	<0.1	<0.1	0.037
Endrin Aldehyde	<5.9	<0.1	<0.1	
Heptachlor Epoxide	<2.9	<0.05	<0.5	
Methoxychlor	<29	<0.5	<0.5	2.1
Chlordane	<2.9	<0.05	<0.05	0.09
Toxaphene	<290	<5	<5	0.21
PCB-1016	<57	<1	<1	10
PCB-1221	<110	<2	<2	10
PCB-1232	<57	<1	<1	10
PCB-1242	<57	<1	<1	10
PCB-1248	<57	<1	<1	10
PCB-1254	<57	<1	<1	10
PCB-1260	<57	<1		10
Phenol	<570	<10	<12	580
2-Chlorophenol	<570	<10	<12	
2-Nitrophenol	<570	<10	<12	
2,4-Dimethylphenol	<570	<10	<12	
2,4-Dichlorophenol	<570	<10	<12	
4-Chloro-3-Methylphenol	<570	<10	<12	
2,4,6-Trichlorophenol	<570	<10	<12	

Sampling Site C (between existing lock and Claiborne Ave)
Sediments from 4′ to 9′ deep

TABLE B-29 (continued)

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediments (ug/kg)	IHNC Water	Elutriate	Applicable Acute Criteria
2,4-Dinitrophenol	<2,800	<50	<60	
4-Nitrophenol	<2,800	<50	<60	
2-Methyl-4,6-Dinotrophenol	<2,800	<50	<60	
Pentachlorophenol	<2,800	<50	<60	13
Benzoic Acid	<2,800	<50	<60	
2-Methylphenol	<570	<10	<12	
4-Methylphenol	<570	<10	<12	
2,4,5-Trichlorophenol	<2,800	<50	<60	
Benzyl Alcohol	<570	<10	<12	
N-Nitrosodimethylamine				
Bis(2-Chloroisopropyl)Ether	<570	<10	<12	
N-Nitroso-Di-N-Propylamine	<570	<10	<12	
Nitrobenzene	<570	<10	<12	
Isophorone	<570	<10	<12	
Bis(2-Chloroethoxy)Methane	<570	<10	<12	
2,6-Dinitrotoluene	<570	<10	<12	
2,4-Dinitrotoluene	<570	<10	<12	
1,2-Diphenylhydrazine				
Benzidine				125
3,3'Dichlorobenzidine	<1,100	<20	<24	
Bis(2-Chloroethyl)Ether	<570	<10	<12	
1,3-Dichlorobenzene	<570	<10	<12	
1,4-Dichlorobenzene	<570	<10	<12	
1,2-Dichlorobenzene	<570	<10	<12	
Hexachloroethane	<570	<11	<12	
1,2,4-Trichlorobenzene	<570	<10	<12	
Naphthalene	<570	<10	<12	
Hexachlorobutadiene	<570	<10	<12	1.6
Hexachlorocyclopentadiene	<570	<10	<12	
2-Chloronaphthalene	<570	<10	<12	
Acenaphthylene	<570	<10	<12	
Dimehtyl Phthalate	<570	<10	<12	
Acenaphthene	<570	<10	<12	
Fluorene	<570	<10	<12	
Diethyl Phthalate	<570	<10	0.3	
4-Chlorophenyl Phenyl Ether	<570	<10	<12	
N-Nitrosodiphenyl Amine	<570	<10	<12	
4-Bromophenyl Ether	<570	<10	<12	
Hexachlorobenzene	<570	<10	<12	
Phenathrene	<570	<10	<12	
Anthracene	<570	<10	<12	
Dibutylphthalate	84	<10	<12	
Fluoranathene	<570	<10	<12	
Pyrene	<570	<10	<12	
Butylbenzylphthalate	<570	<10	<12	
Chrysene	<570	<10	<12	
Benzo(a)Antharacene	<570	<10	<12	
Bis(2-Ethylexyl)Phthalate	190	1	1	
Di-N-Octyphthalate	<570	<10	<12	
Benxo(a)Fluoranthene	<570	<10	<12	
Benzo(k)Fluoranthene	<570	<10	<12	
Benzo(a)Pyrene	<570	<10	<12	
Indeno(1,2,3-C,D)Pyrene	<570	<10	<12	
Dibenzo(A,H)Anthracene	<570	<10	<12	
Benzo(G,H,I)Perylene	<570	<10	<12	
Aniline				
4-Chloroaniline	<570	<10	<12	
Dibenzofuran	<570	<10	<12	
2-Methylnaphthalene	<570	<10	<12	
2-Nitroaniline	<2,800	<50	<60	
3-Nitroaniline	<2,800	<50	<60	
4-Nitroaniline	<2,800	<50	<60	

< Actual value is less than value shown

TABLE B-30
ELUTRIATE ANALYSIS
SITE GR1-AT, mixed with disposal area water

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediment (ug/kg)	Disposal Water	Elutriate	Applicable Acute Criteria
Antimony	<16,200	<3	<60	
Arsenic (total)	11,000	3	<3	69
Arsenic (III)				69
Beryllium	1,130	<0.6	<0.6	
Cadmium	<1,400	<3	<0.3	43
Chromium (total)	31,000	<2	2.2	
Chromium (VI)				1,100
Chromium (III)				515
Copper	45,000	<14	28	2.9
Lead	100,000	8.7	3.2	140
Mercury	300		<0.2	2.1
Nickel	29,000	<23	<23	75
Selenium	<800	<3	<6	
Silver	<2,400	<0.4	<0.4	2.3
Thallium	<500	<2	<2	
Zinc	270,000	<20	81	95
Aluminum	16,000,000	340	73	
Barium	1,700,000	120	190	
Boron	<27,100	980	1,100	
Calcium	5,100,000	100,000	100,000	
Cobalt	12,000	<11	<11	
Iron	28,000,000	530	680	
Magnesium	6,800,000	280,000	290,000	
Manganese	500,000	250	1,300	
Molubdenum	<27,100	<1	<100	
Potassium	4,000,000	96,000	100,000	
Vanadium	36,000	<13	<13	
TRP Hydrocarbons	30,000	<1,000	<1,000	
Aldrin	<4	<0.05	<0.05	1.3
A-BHC	<4	<0.05	<0.05	
B-BHC	<4	<0.05	<0.05	
G-BHC	<4	<0.05	<0.05	0.160
D-BHC	<4	<0.05	<0.05	
PPDDD	<9	<0.01	<0.1	1.25
PPDDE	<9	<0.1	<0.1	0.7
PPDDT	<9	<0.1	<0.1	0.13
Heptachlor	<4	<0.05	<0.05	0.053
Dieldrin	<9	<0.1	<0.1	0.71
A-Endosulfan	<4	<0.05	<0.05	
B-Endosulfan	<9	<0.1	<0.1	
Endosulfan				0.034
Endosulfan sulfate	<9	<0.1	<0.1	
Endrin	<9	<0.1	<0.1	0.037
Endrin Aldehyde	<9	<0.1	<0.1	
Heptachlor Epoxide	<4	<0.05	<0.05	
Methoxychlor	<47	<0.5	<0.5	2.1
Chlordane	<4	<0.05	<0.05	0.09
Toxaphene	<470	<5	<5	0.21
~~PCB-1016~~	<92	<1	<1	10
PCB-1221	<180	<2	<2	10
PCB-1232	<92	<1	<1	10
PCB-1242	<92	<1	<1	10
PCB-1248	<92	<1	<1	10
PCB-1254	<92	<1	<1	10
PCB-1260	<92	<1	<1	10
Phenol	<920	<10	<14	580
2-Chlorophenol	<920	<10	<14	
2-Nitrophenol	<920	<10	<14	
2,4-Dimethylphenol	<920	<10	<14	
2,4-Dichlorophenol	<920	<10	<14	
4-Chloro-3-Methylphenol	<920	<10	<14	
2,4,6-Trichlorophenol	<920	<10	<14	

Sampling Site G (adjacent to the Galvez Street Wharf)
Sediments from 0' to 1' deep

TABLE B-30(continued)

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediment (ug/kg)	Disposal Water	Elutriate	Applicable Acute Criteria
2,4-Dinitrophenol	<4,400	<50	<14	
4-Nitrophenol	<4,400	<50	<68	
2-Methyl-4,6-Dinotrophenol	<4,000	<50	<68	
Pentachlorophenol	<4,000	<50	<68	13
Benzoic Acid	<4,000	<50	<68	
2-Methylphenol	<920	<10	<14	
4-Methylphenol	<920	<10	<14	
2,4,5-Trichlorophenol	<920	<50	<68	
Benzyl Alcohol	<920	<10	<14	
N-Nitrosodimethylamine				
Bis(2-Chloroisopropyl)Ether	<920	<10	<14	
N-Nitroso-Di-N-Propylamine	<920	<10	<14	
Nitrobenzene	<920	<10	<14	
Isophorone	<920	<10	<14	
Bis(2-Chloroethoxy)Methane	<920	<10	<14	
2,6-Dinitrotoluene	<920	<10	<14	
2,4-Dinitrotoluene	<920	<10	<14	
1,2-Diphenylhydrazine				
Benzidine				125
3,3'Dichlorobenzidine	<1,800	<20	<27	
Bis(2-Chloroethyl)Ether	<920	<10	<14	
1,3-Dichlorobenzene	<920	<10	<14	
1,4-Dichlorobenzene	<920	<10	<14	
1,2-Dichlorobenzene	<920	<10	<14	
Hexachloroethane	<920	<10	<14	
1,2,4-Trichlorobenzene	<920	<10	<14	
Naphthalene	<920	<10	<14	
Hexachlorobutadiene	<920	<10	<14	1.6
Hexachlorocyclopentadiene	<920	<10	<14	
2-Chloronaphthalene	<920	<10	<14	
Acenaphthylene	<920	<10	<14	
Dimehtyl Phthalate	<920	<10	<14	
Acenaphthene	150	<10	<14	
Fluorene	110	<10	<14	
Diethyl Phthalate	<920	<10	<14	
4-Chlorophenyl Phenyl Ether	<920	<10	<14	
N-Nitrosodiphenyl Amine	<920	<10	<14	
4-Bromophenyl Ether	<920	<10	<14	
Hexachlorobenzene	<920	<10	<14	
Phenathrene	480	<10	<14	
Anthracene	120	<10	<14	
Dibutylphthalate	120	<10	<14	
Fluoranathene	<920	<10	<14	
Pyrene	1,300	<10	<14	
Butylbenzylphthalate	<920	<10	<14	
Chrysene	600	<10	<14	
Benzo(a)Antharacene	390	<10	<14	
Bis(2-Ethylexyl)Phthalate	610	1	1	
Di-N-Octyphthalate	<920	<10	<14	
Benxo(a)Fluoranthene	990	<10	<14	
~~Benzo(k)Fluoranthene~~	~~<920~~	~~<10~~	~~<14~~	
Benzo(a)Pyrene	480	<10	<14	
Indeno(1,2,3-C,D)Pyrene	280	<10	<14	
Dibenzo(A,H)Anthracene	<920	<10	<14	
Benzo(G,H,I)Perylene	<920	<10	<14	
Aniline				
4-Chloroaniline	<920	<10	<14	
Dibenzofuran	<920	<10	<14	
2-Methylnaphthalene	<920	<10	<14	
2-Nitroaniline	<4,400	<50	<68	
3-Nitroaniline	<4,400	<50	<68	
4-Nitroaniline	<4,400	<50	<68	

< Actual value is less than value shown

TABLE B-31
ELUTRIATE ANALYSIS
SITE GR1-AM, mixed with disposal area water

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediments (ug/kg)	Disposal Water	Elutriate	Applicable Acute Criteria
Antimony	<10,600	<3	<60	
Arsenic (total)	6,700	3	<3	69
Arsenic (III)				69
Beryllium	1,070	<0.6	<0.6	
Cadmium	<900	<3	<0.3	43
Chromium (total)	20,000	<2	<2.0	
Chromium (VI)				1,100
Chromium (III)				515
Copper	26,000	<14	38	2.9
Lead	36,000	8.7	3.6	140
Mercury	200		<0.2	2.1
Nickel	27,000	<23	<23	75
Selenium	<500	<3	<6	
Silver	<1,600	<0.4	<0.4	2.3
Thallium	<400	<2	<2	
Zinc	110,000	<20	86	95
Aluminum	14,000,000	340	120	
Barium	170,000	120	740	
Boron	17,100	980	940	
Calcium	9,600,000	100,000	110,000	
Cobalt	11,000	<11	<11	
Iron	22,000,000	530	1,600	
Magnesium	7,600,000	280,000	270,000	
Manganese	510,000	250	400	
Molubdenum	<17,000	<1	<100	
Potassium	3,300,000	96,000	78,000	
Vanadium	31,000	<13	<13	
TRP Hydrocarbons	53,000	<1,000	<1,000	
Aldrin	<3.1	<0.05	<0.05	1.3
A-BHC	<3.1	<0.05	<0.05	
B-BHC	<3.1	<0.05	<0.05	
G-BHC	<3.1	<0.05	<0.05	0.160
D-BHC	<3.1	<0.05	<0.05	
PPDDD	<6.1	<0.01	<0.1	1.25
PPDDE	<6.1	<0.1	<0.1	0.7
PPDDT	<6.1	<0.1	<0.1	0.13
Heptachlor	<3.1	<0.05	<0.05	0.053
Dieldrin	<6.1	<0.1	<0.1	0.71
A-Endosulfan	<3.1	<0.05	<0.05	
B-Endosulfan	<6.1	<0.1	<0.1	
Endosulfan				0.034
Endosulfan sulfate	<6.1	<0.1	<0.1	
Endrin	<6.1	<0.1	<0.1	0.037
Endrin Aldehyde	<6.1	<0.1	<0.1	
Heptachlor Epoxide	<3.1	<0.05	<0.05	
Methoxychlor	<31	<0.5	<0.5	2.1
Chlordane	<3.1	<0.05	<0.05	0.09
Toxaphene	<310	<5	<5	0.21
PCB-1016	<61	<1	<1	10
PCB-1221	<120	<2	<2	10
PCB-1232	<61	<1	<1	10
PCB-1242	<61	<1	<1	10
PCB-1248	<61	<1	<1	10
PCB-1254	<61	<1	<1	10
PCB-1260	<61	<1	<1	10
Phenol	<610	<10	<13	580
2-Chlorophenol	<610	<10	<13	
2-Nitrophenol	<610	<10	<13	
2,4-Dimethylphenol	<610	<10	<13	
2,4-Dichlorophenol	<610	<10	<13	
4-Chloro-3-Methylphenol	<610	<10	<13	
2,4,6-Trichlorophenol	<610	<10	<13	

Sampling Site G (adjacent to the Galvez Street Wharf)
Sediments from 1′ to 4′ deep

TABLE B-31 (continued)

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediments (ug/kg)	Disposal Water	Elutriate	Applicable Acute Criteria
2,4-Dinitrophenol	<3,000	<50	<13	
4-Nitrophenol	<3,000	<50	<66	
2-Methyl-4,6-Dinotrophenol	<3,000	<50	<66	
Pentachlorophenol	<3,000	<50	<66	13
Benzoic Acid	<3,000	<50	<66	
2-Methylphenol	<610	<10	<13	
4-Methylphenol	<610	<10	<13	
2,4,5-Trichlorophenol	<610	<50	<66	
Benzyl Alcohol	<610	<10	<13	
N-Nitrosodimethylamine				
Bis(2-Chloroisopropyl)Ether	<610	<10	<13	
N-Nitroso-Di-N-Propylamine	<610	<10	<13	
Nitrobenzene	<610	<10	<13	
Isophorone	<610	<10	<13	
Bis(2-Chloroethoxy)Methane	<610	<10	<13	
2,6-Dinitrotoluene	<610	<10	<13	
2,4-Dinitrotoluene	<610	<10	<13	
1,2-Diphenylhydrazine				
Benzidine				125
3,3'Dichlorobenzidine	<1,200	<20	<27	
Bis(2-Chloroethyl)Ether	<610	<10	<13	
1,3-Dichlorobenzene	<610	<10	<13	
1,4-Dichlorobenzene	<610	<10	<13	
1,2-Dichlorobenzene	<610	<10	<13	
Hexachloroethane	<920	<10	<13	
1,2,4-Trichlorobenzene	<920	<10	<13	
Naphthalene	<920	<10	<13	
Hexachlorobutadiene	<920	<10	<13	1.6
Hexachlorocyclopentadiene	<61	<10	<13	
2-Chloronaphthalene	<61	<10	<13	
Acenaphthylene	<61	<10	<13	
Dimehtyl Phthalate	<61	<10	<13	
Acenaphthene	<61	<10	<13	
Fluorene	<6.1	<10	<13	
Diethyl Phthalate	<61	<10	<13	
4-Chlorophenyl Phenyl Ether	<61	<10	<13	
N-Nitrosodiphenyl Amine	<610	<10	<13	
4-Bromophenyl Ether	<610	<10	<13	
Hexachlorobenzene	<610	<10	<13	
Phenathrene	650	<10	<13	
Anthracene	<610	<10	<13	
Dibutylphthalate	<610	<10	<13	
Fluoranathene	<610	<10	<13	
Pyrene	150	<10	<13	
Butylbenzylphthalate	<610	<10	<13	
Chrysene	65	<10	<13	
Benzo(a)Antharacene	<610	<10	<13	
Bis(2-Ethylexyl)Phthalate	<610	1	75	
Di-N-Octyphthalate	<610	<10	<13	
Benxo(a)Fluoranthene	81	<10	<13	
Benzo(k)Fluoranthene	<610	<10	<13	
Benzo(a)Pyrene	460	<10	<13	
Indeno(1,2,3-C,D)Pyrene	<610	<10	<13	
Dibenzo(A,H)Anthracene	<610	<10	<13	
Benzo(G,H,I)Perylene	<610	<10	<13	
Aniline				
4-Chloroaniline	<610	<10	<13	
Dibenzofuran	<610	<10	<13	
2-Methylnaphthalene	<610	<10	<13	
2-Nitroaniline	<3,000	<50	<66	
3-Nitroaniline	<3,000	<50	<66	
4-Nitroaniline	<3,000	<50	<66	

< Actual value is less than value shown

TABLE B-32
ELUTRIATE ANALYSIS
SITE GR1-AB, mixed with disposal area water

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediments (ug/kg)	Disposal Water	Elutriate	Applicable Acute Criteria
Antimony	<10,800	<3	<60	
Arsenic (total)	11,000	3	<3	69
Arsenic (III)				69
Beryllium	920	<0.6	<0.6	
Cadmium	<900	<3	<0.4	43
Chromium (total)	16,000	<2	<2.0	
Chromium (VI)				1,100
Chromium (III)				515
Copper	17,000	<14	<100	2.9
Lead	18,000	8.7	29	140
Mercury	<100		0.2	2.1
Nickel	21,000	<23	<23	75
Selenium	<600	<3	<6	
Silver	<1,600	<0.4	<0.4	2.3
Thallium	<400	<2	<2	
Zinc	66,000	<20	310	95
Aluminum	11,000,000	340	93	
Barium	85,000	120	810	
Boron	<18,100	980	890	
Calcium	9,000,000	100,000	110,000	
Cobalt	9,200	<11	<11	
Iron	19,000,000	530	170	
Magnesium	7,400,000	280,000	260,000	
Manganese	380,000	250	260	
Molubdenum	<18,100	<1	<100	
Potassium	3,600,000	96,000	87,000	
Vanadium	26,000	<13	<13	
TRP Hydrocarbons	10,000	<1,000	<1,000	
Aldrin	<3.2	<0.05	<0.05	1.3
A-BHC	<3.2	<0.05	<0.05	
B-BHC	<3.2	<0.05	<0.05	
G-BHC	<3.2	<0.05	<0.05	0.160
D-BHC	<3.2	<0.05	<0.05	
PPDDD	<6.2	<0.01	<0.1	1.25
PPDDE	<6.2	<0.1	<0.1	0.7
PPDDT	<6.2	<0.1	<0.1	0.13
Heptachlor	<3.2	<0.05	<0.05	0.053
Dieldrin	<6.2	<0.1	<0.1	0.71
A-Endosulfan	<3.2	<0.05	<0.05	
B-Endosulfan	<6.2	<0.1	<0.1	
Endosulfan				0.034
Endosulfan sulfate	<6.2	<0.1	<0.1	
Endrin	<6.2	<0.1	<0.1	0.037
Endrin Aldehyde	<6.2	<0.1	<0.1	
Heptachlor Epoxide	<3.2	<0.05	<0.05	
Methoxychlor	<32	<0.5	<0.5	2.1
Chlordane	<3.2	<0.05	<0.05	0.09
Toxaphene	<320	<5	<5	0.21
PCB-1016	<62	<1	<1	10
PCB-1221	<130	<2	<2	10
PCB-1232	<62	<1	<1	10
PCB-1242	<62	<1	<1	10
PCB-1248	<62	<1	<1	10
PCB-1254	<62	<1	<1	10
PCB-1260	<62	<1	<1	10
Phenol	<620	<10	<13	580
2-Chlorophenol	<620	<10	<13	
2-Nitrophenol	<620	<10	<13	
2,4-Dimethylphenol	<620	<10	<13	
2,4-Dichlorophenol	<620	<10	<13	
4-Chloro-3-Methylphenol	<620	<10	<13	
2,4,6-Trichlorophenol	<620	<10	<13	

Sampling Site G (adjacent to the Galvez Street Wharf)
Sediments from 4' to 9' deep

TABLE B-32 (continued)

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediments (ug/kg)	Disposal Water	Elutriate	Applicable Acute Criteria
2,4-Dinitrophenol	<3,000	<50	<13	
4-Nitrophenol	<3,000	<50	<66	
2-Methyl-4,6-Dinotrophenol	<3,000	<50	<66	
Pentachlorophenol	<3,000	<50	<66	13
Benzoic Acid	<3,000	<50	<66	
2-Methylphenol	<620	<10	<13	
4-Methylphenol	<620	<10	<13	
2,4,5-Trichlorophenol	<3,000	<50	<66	
Benzyl Alcohol	<620	<10	<13	
N-Nitrosodimethylamine				
Bis(2-Chloroisopropyl)Ether	<620	<10	<13	
N-Nitroso-Di-N-Propylamine	<620	<10	<13	
Nitrobenzene	<620	<10	<13	
Isophorone	<620	<10	<13	
Bis(2-Chloroethoxy)Methane	<620	<10	<13	
2,6-Dinitrotoluene	<620	<10	<13	
2,4-Dinitrotoluene	<620	<10	<13	
1,2-Diphenylhydrazine				
Benzidine				125
3,3'Dichlorobenzidine	<1,200	<20	<27	
Bis(2-Chloroethyl)Ether	<620	<10	<13	
1,3-Dichlorobenzene	<620	<10	<13	
1,4-Dichlorobenzene	<620	<10	<13	
1,2-Dichlorobenzene	<620	<10	<13	
Hexachloroethane	<620	<10	<13	
1,2,4-Trichlorobenzene	<620	<10	<13	
Naphthalene	<620	<10	<13	
Hexachlorobutadiene	<620	<10	<13	1.6
Hexachlorocyclopentadiene	<620	<10	<13	
2-Chloronaphthalene	<620	<10	<13	
Acenaphthylene	<620	<10	<13	
Dimehtyl Phthalate	<620	<10	<13	
Acenaphthene	<620	<10	<13	
Fluorene	<620	<10	<13	
Diethyl Phthalate	1,000	<10	9	
4-Chlorophenyl Phenyl Ether	<620	<10	<13	
N-Nitrosodiphenyl Amine	<620	<10	<13	
4-Bromophenyl Ether	<620	<10	<13	
Hexachlorobenzene	<620	<10	<13	
Phenathrene	<620	<10	<13	
Anthracene	<620	<10	<13	
Dibutylphthalate	<620	<10	<13	
Fluoranathene	<620	<10	<13	
Pyrene	<62	<10	<13	
Butylbenzylphthalate	<620	<10	<13	
Chrysene	<620	<10	<13	
Benzo(a)Antharacene	<620	<10	<13	
Bis(2-Ethylexyl)Phthalate	150	1	<13	
Di-N-Octyphthalate	<620	<10	<13	
Benxo(a)Fluoranthene	<620	<10	<13	
Benzo(k)Fluoranthene	<620	<10	<13	
Benzo(a)Pyrene	<620	<10	<13	
Indeno(1,2,3-C,D)Pyrene	<620	<10	<13	
Dibenzo(A,H)Anthracene	<620	<10	<13	
Benzo(G,H,I)Perylene	<620	<10	<13	
Aniline				
4-Chloroaniline	<620	<10	<13	
Dibenzofuran	<620	<10	<13	
2-Methylnaphthalene	<620	<10	<13	
2-Nitroaniline	<3,000	<50	<66	
3-Nitroaniline	<3,000	<50	<66	
4-Nitroaniline	<3,000	<50	<66	

< Actual value is less than value shown

TABLE B-33
ELUTRIATE ANALYSIS
SITE ER1-AT, mixed with disposal area water

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediments (ug/kg)	Disposal Water	Elutriate	Applicable Acute Criteria
Antimony	<13,400	<3	<60	
Arsenic (total)	8,400	3	<3	69
Arsenic (III)				69
Beryllium	800	<0.6	<0.6	
Cadmium	<1,100	<3	<0.3	43
Chromium (total)	26,000	<2	<2.0	
Chromium (VI)				1,100
Chromium (III)				515
Copper	40,000	<14	34	2.9
Lead	150,000	8.7	2.4	140
Mercury	500		<0.2	2.1
Nickel	22,000	<23	<23	75
Selenium	<700	<3	<6	
Silver	<2,000	<0.4	<0.4	2.3
Thallium	<500	<2	<2	
Zinc	190,000	<20	100	95
Aluminum	10,000,000	340	47	
Barium	410,000	120	890	
Boron	<22,400	980	940	
Calcium	22,000,000	100,000	170,000	
Cobalt	8,400	<11	<11	
Iron	27,000,000	530	86	
Magnesium	9,300,000	280,000	230,000	
Manganese	540,000	250	180	
Molubdenum	<22,400	<1	<100	
Potassium	2,900,000	96,000	89,000	
Vanadium	28,000	<13	<13	
TRP Hydrocarbons	31,000	<1,000	<1,000	
Aldrin	<4.0	<0.05	<0.05	1.3
A-BHC	<4.0	<0.05	<0.05	
B-BHC	<4.0	<0.05	<0.05	
G-BHC	<4.0	<0.05	<0.05	0.160
D-BHC	<4.0	<0.05	<0.05	
PPDDD	<7.7	<0.01	<0.1	1.25
PPDDE	<7.7	<0.1	<0.1	0.7
PPDDT	<7.7	<0.1	<0.1	0.13
Heptachlor	<4.0	<0.05	<0.05	0.053
Dieldrin	<7.7	<0.1	<0.1	0.71
A-Endosulfan	<4.0	<0.05	<0.05	
B-Endosulfan	<7.7	<0.1	<0.1	
Endosulfan				0.034
Endosulfan sulfate	<7.7	<0.1	<0.1	
Endrin	<7.7	<0.1	<0.1	0.037
Endrin Aldehyde	<7.7	<0.1	<0.1	
Heptachlor Epoxide	<4.0	<0.05	<0.05	
Methoxychlor	<40	<0.5	<0.5	2.1
Chlordane	<4.0	<0.05	<0.05	0.09
Toxaphene	<400	<5	<5	0.21
PCB-1016	<77	<1	<1	10
PCB-1221	<150	<2	<2	10
PCB-1232	<77	<1	<1	10
PCB-1242	<77	<1	<1	10
PCB-1248	<77	<1	<1	10
PCB-1254	700	<1	<1	10
PCB-1260	<77	<1	<1	10
Phenol	<770	<10	<11	580
2-Chlorophenol	<770	<10	<11	
2-Nitrophenol	<770	<10	<11	
2,4-Dimethylphenol	<770	<10	<11	
2,4-Dichlorophenol	<770	<10	<11	
4-Chloro-3-Methylphenol	<770	<10	<11	
2,4,6-Trichlorophenol	<770	<10	<11	

Sampling Site E (at turn basin just south of Florida Ave)
Vibracore #1. Sediments from 1' to 1.5' deep

TABLE B-33 (continued)

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediments (ug/kg)	Disposal Water	Elutriate	Applicable Acute Criteria
2,4-Dinitrophenol	<3,700	<50	<11	
4-Nitrophenol	<3,700	<50	<57	
2-Methyl-4,6-Dinotrophenol	<3,700	<50	<57	
Pentachlorophenol	<3,700	<50	<57	13
Benzoic Acid	<3,700	<50	<57	
2-Methylphenol	<770	<10	<11	
4-Methylphenol	<770	<10	<11	
2,4,5-Trichlorophenol	<3,700	<50	<57	
Benzyl Alcohol	<770	<10	<11	
N-Nitrosodimethylamine				
Bis(2-Chloroisopropyl)Ether	<770	<10	<11	
N-Nitroso-Di-N-Propylamine	<770	<10	<11	
Nitrobenzene	<770	<10	<11	
Isophorone	<770	<10	<11	
Bis(2-Chloroethoxy)Methane	<770	<10	<11	
2,6-Dinitrotoluene	<770	<10	<11	
2,4-Dinitrotoluene	<770	<10	<11	
1,2-Diphenylhydrazine				
Benzidine				125
3,3'Dichlorobenzidine	<1,500	<20	<23	
Bis(2-Chloroethyl)Ether	<770	<10	<11	
1,3-Dichlorobenzene	<770	<10	<11	
1,4-Dichlorobenzene	<770	<10	<11	
1,2-Dichlorobenzene	<770	<10	<11	
Hexachloroethane	<770	<10	<11	
1,2,4-Trichlorobenzene	<770	<10	<11	
Naphthalene	750	<10	<11	
Hexachlorobutadiene	<770	<10	<11	1.6
Hexachlorocyclopentadiene	<770	<10	<11	
2-Chloronaphthalene	<770	<10	<11	
Acenaphthylene	<770	<10	<11	
Dimehtyl Phthalate	<770	<10	<11	
Acenaphthene	1,100	<10	7	
Fluorene	1,200	<10	3	
Diethyl Phthalate	<770	<10	<11	
4-Chlorophenyl Phenyl Ether	<770	<10	<11	
N-Nitrosodiphenyl Amine	<770	<10	<11	
4-Bromophenyl Ether	<770	<10	<11	
Hexachlorobenzene	<770	<10	<11	
Phenathrene	3,900	<10	3	
Anthracene	230	<10	<11	
Dibutylphthalate	130	<10	<11	
Fluoranathene	<770	<10	1	
Pyrene	3,300	<10	1	
Butylbenzylphthalate	<770	<10	<11	
Chrysene	1,700	<10	<11	
Benzo(a)Antharacene	930	<10	<11	
Bis(2-Ethylexyl)Phthalate	240	1	1	
Di-N-Octyphthalate		<10	<11	
~~Benxo(a)Fluoranthene~~	25,000	<10	<11	
Benzo(k)Fluoranthene	<770		<11	
Benzo(a)Pyrene	12,000	<10	<11	
Indeno(1,2,3-C,D)Pyrene	8,300	<10	<11	
Dibenzo(A,H)Anthracene	1,800	<10	<11	
Benzo(G,H,I)Perylene	770	<10	<11	
Aniline				
4-Chloroaniline	<770	<10	<11	
Dibenzofuran	620	<10	1	
2-Methylnaphthalene	250	<10	3	
2-Nitroaniline	<3,700	<50	<57	
3-Nitroaniline	<3,700	<50	<57	
4-Nitroaniline	<3,700	<50	<57	

< Actual value is less than value shown

TABLE B-34
ELUTRIATE ANALYSIS
SITE ER1-AB, mixed with disposal area water

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediments (ug/kg)	Disposal Water	Elutriate	Applicable Acute Criteria
Antimony	<20,300	<3	<60	
Arsenic (total)	10,000	3	<3	69
Arsenic (III)				69
Beryllium	1,290	<0.6	<0.6	
Cadmium	<1,700	<3	<0.3	43
Chromium (total)	22,000	<2	<2.0	
Chromium (VI)				1,100
Chromium (III)				515
Copper	24,000	<14	29	2.9
Lead	79,000	8.7	5.1	140
Mercury	400		0.2	2.1
Nickel	23,000	<23	<23	75
Selenium	<1,000	<3	<6	
Silver	<3,000	<0.4	<0.4	2.3
Thallium	<700	<2	<2	
Zinc	110,000	<20	95	95
Aluminum	17,000,000	340	360	
Barium	190,000	120	810	
Boron	<33,800	980	500	
Calcium	72,000,000	100,000	300,000	
Cobalt	7,900	<11	<11	
Iron	20,000,000	530	440	
Magnesium	31,000,000	280,000	180,000	
Manganese	620,000	250	25	
Molubdenum	<33,800	<1	<100	
Potassium	2,900,000	96,000	72,000	
Vanadium	37,000	<13	<13	
TRP Hydrocarbons	30,000	<1,000	<1,000	
Aldrin	<5.9	<0.05	<0.05	1.3
A-BHC	<5.9	<0.05	<0.05	
B-BHC	<5.9	<0.05	<0.05	
G-BHC	<5.9	<0.05	<0.05	0.160
D-BHC	<5.9	<0.05	<0.05	
PPDDD	<11	<0.01	<0.1	1.25
PPDDE	<11	<0.1	<0.1	0.7
PPDDT	<11	<0.1	<0.1	0.13
Heptachlor	<5.9	<0.05	<0.05	0.053
Dieldrin	<11	<0.1	<0.1	0.71
A-Endosulfan	<5.9	<0.05	<0.05	
B-Endosulfan	<11	<0.1	<0.1	
Endosulfan				0.034
Endosulfan sulfate	<11	<0.1	<0.1	
Endrin	<11	<0.1	<0.1	0.037
Endrin Aldehyde	<11	<0.1	<0.1	
Heptachlor Epoxide	<5.9	<0.05	<0.05	
Methoxychlor	<59	<0.5	<0.5	2.1
Chlordane	<5.9	<0.05	<0.05	0.09
Toxaphene	<590	<5	<5	0.21
PCB-1016	<110	<1	<1	10
PCB-1221	<230	<2	<2	10
PCB-1232	<110	<1	<1	10
PCB-1242	<110	<1	<1	10
PCB-1248	<110	<1	<1	10
PCB-1254	<110	<1	<1	10
PCB-1260	<110	<1	<1	10
Phenol	<1,100	<10	<11	580
2-Chlorophenol	<1,100	<10	<11	
2-Nitrophenol	<1,100	<10	<11	
2,4-Dimethylphenol	<1,100	<10	<11	
2,4-Dichlorophenol	<1,100	<10	<11	
4-Chloro-3-Methylphenol	<1,100	<10	<11	
2,4,6-Trichlorophenol	<1,100	<10	<11	

Sampling Site E (at turn basin just south of Florida Ave)
Vibracore #1. Sediments from 0' to 8' deep

TABLE B-34 (continued)

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediments (ug/kg)	Disposal Water	Elutriate	Applicable Acute Criteria
2,4-Dinitrophenol	<5,500	<50	<11	
4-Nitrophenol	<5,500	<50	<57	
2-Methyl-4,6-Dinotrophenol	<5,500	<50	<57	
Pentachlorophenol	<5,500	<50	<57	13
Benzoic Acid	<5,500	<50	<57	
2-Methylphenol	<1,100	<10	<11	
4-Methylphenol	<1,100	<10	<11	
2,4,5-Trichlorophenol	<5,500	<50	<57	
Benzyl Alcohol	<1,100	<10	<11	
N-Nitrosodimethylamine				
Bis(2-Chloroisopropyl)Ether	<1,100	<10	<11	
N-Nitroso-Di-N-Propylamine	<1,100	<10	<11	
Nitrobenzene	<1,100	<10	<11	
Isophorone	<1,100	<10	<11	
Bis(2-Chloroethoxy)Methane	<1,100	<10	<11	
2,6-Dinitrotoluene	<1,100	<10	<11	
2,4-Dinitrotoluene	<1,100	<10	<11	
1,2-Diphenylhydrazine				
Benzidine				125
3,3'Dichlorobenzidine	<2,300	<20	<23	
Bis(2-Chloroethyl)Ether	<1,100	<10	<11	
1,3-Dichlorobenzene	<1,100	<10	<11	
1,4-Dichlorobenzene	<1,100	<10	<11	
1,2-Dichlorobenzene	<1,100	<10	<11	
Hexachloroethane	<1,100	<10	<11	
1,2,4-Trichlorobenzene	<1,100	<10	<11	
Naphthalene	210	<10	6	
Hexachlorobutadiene	<1,100	<10	<11	1.6
Hexachlorocyclopentadiene	<1,100	<10	<11	
2-Chloronaphthalene	<1,100	<10	<11	
Acenaphthylene	<1,100	<10	<11	
Dimehtyl Phthalate	<1,100	<10	<11	
Acenaphthene	650	<10	15	
Fluorene	480	<10	6	
Diethyl Phthalate	<1,100	<10	4	
4-Chlorophenyl Phenyl Ether	<1,100	<10	<11	
N-Nitrosodiphenyl Amine	<1,100	<10	<11	
4-Bromophenyl Ether	<1,100	<10	<11	
Hexachlorobenzene	<1,100	<10	<11	
Phenathrene	1,900	<10	8	
Anthracene	140	<10	1	
Dibutylphthalate	160	<10	<11	
Fluoranathene	<1,100	<10	1	
Pyrene	1,200	<10	1	
Butylbenzylphthalate	<1,100	<10	<11	
Chrysene	390	<10	<11	
Benzo(a)Antharacene	310	<10	<11	
Bis(2-Ethylexyl)Phthalate	230	1	<11	
Di-N-Octyphthalate	<1,100	<10	<11	
Benxo(a)Fluoranthene	740	<10	<11	
Benzo(k)Fluoranthene	<1,100	<10	<11	
Benzo(a)Pyrene	130	<10	<11	
Indeno(1,2,3-C,D)Pyrene	<1,100	<10	<11	
Dibenzo(A,H)Anthracene	<1,100	<10	<11	
Benzo(G,H,I)Perylene	<1,100	<10	<11	
Aniline				
4-Chloroaniline	<1,100	<10	<11	
Dibenzofuran	<1,100	<10	<11	
2-Methylnaphthalene	180	<10	2	
2-Nitroaniline	<5,500	<50	<57	
3-Nitroaniline	<5,500	<50	<57	
4-Nitroaniline	<5,500	<50	<57	

< Actual value is less than value shown

TABLE B-35
ELUTRIATE ANALYSIS
SITE ER2-BT, mixed with disposal area water

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediments (ug/kg)	Disposal Water	Elutriate	Applicable Acute Criteria
Antimony	<11,800	<3	18	
Arsenic (total)	9,400	3	<3	69
Arsenic (III)				69
Beryllium	1,580	<0.6	<0.6	
Cadmium	<1,000	<3	<0.3	43
Chromium (total)	24,000	<2	<2.0	
Chromium (VI)				1,100
Chromium (III)				515
Copper	64,000	<14	18	2.9
Lead	200,000	8.7	2.0	140
Mercury	900		<0.2	2.1
Nickel	31,000	<23	<23	75
Selenium	<600	<3	<6	
Silver	<1,800	<0.4	<0.4	2.3
Thallium	<400	<2	<2	
Zinc	330,000	<20	69	95
Aluminum	14,000,000	340	120	
Barium	270,000	120	730	
Boron	<19,600	980	840	
Calcium	10,000,000	100,000	150,000	
Cobalt	11,000	<11	<11	
Iron	25,000,000	530	210	
Magnesium	7,400,000	280,000	250,000	
Manganese	500,000	250	1,300	
Molubdenum	<19,600	<1	<100	
Potassium	2,700,000	96,000	73,000	
Vanadium	34,000	<13	<13	
TRP Hydrocarbons	480,000	<1,000	<1,000	
Aldrin	<3.4	<0.05	<0.05	
A-BHC	<3.4	<0.05	<0.05	
B-BHC	<3.4	<0.05	<0.05	
G-BHC	<3.4	<0.05	<0.05	0.160
D-BHC	<3.4	<0.05	<0.05	
PPDDD	<6.8	<0.01	<0.1	1.25
PPDDE	<6.8	<0.1	<0.1	0.7
PPDDT	<6.8	<0.1	<0.1	0.13
Heptachlor	<3.4	<0.05	<0.05	0.053
Dieldrin	<6.8	<0.1	<0.1	0.71
A-Endosulfan	<3.4	<0.05	<0.05	
B-Endosulfan	<6.8	<0.1	<0.1	
Endosulfan				0.034
Endosulfan sulfate	<6.8	<0.1	<0.1	
Endrin	<6.8	<0.1	<0.1	0.037
Endrin Aldehyde	<6.8	<0.1	<0.1	
Heptachlor Epoxide	<3.4	<0.05	<0.05	
Methoxychlor	<34	<0.5	<0.5	2.1
Chlordane	<3.4	<0.05	<0.05	0.09
Toxaphene	<340	<5	<5	0.21
PCB-1016	<68	<1	<1	10
PCB-1221	<130	<2	<2	10
PCB-1232	<68	<1	<1	10
PCB-1242	<68	<1	<1	10
PCB-1248	<68	<1	<1	10
PCB-1254	<68	<1	<1	10
PCB-1260	<68	<1	<1	10
Phenol	<3,300	<10	<16	580
2-Chlorophenol	<3,300	<10	<16	
2-Nitrophenol	<3,300	<10	<16	
2,4-Dimethylphenol	<3,300	<10	<16	
2,4-Dichlorophenol	<3,300	<10	<16	
4-Chloro-3-Methylphenol	<3,300	<10	<16	
2,4,6-Trichlorophenol	<3,300	<10	<16	

Sampling Site E (at turn basin just south of Florida Ave)
Vibracore #2. Sediments from 0' to 8' deep

TABLE B-35 (continued

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediments (ug/kg)	Disposal Water	Elutriate	Applicable Acute Criteria
2,4-Dinitrophenol	<16,000	<50	<16	
4-Nitrophenol	<16,000	<50	<78	
2-Methyl-4,6-Dinotrophenol	<16,000	<50	<78	
Pentachlorophenol	<16,000	<50	<78	13
Benzoic Acid	<16,000	<50	<78	
2-Methylphenol	<3,300	<10	<16	
4-Methylphenol	<3,300	<10	<16	
2,4,5-Trichlorophenol	<16,000	<50	<78	
Benzyl Alcohol	<3,300	<10	<16	
N-Nitrosodimethylamine				
Bis(2-Chloroisopropyl)Ether	<3,300	<10	<16	
N-Nitroso-Di-N-Propylamine	<3,300	<10	<16	
Nitrobenzene	<3,300	<10	<16	
Isophorone	<3,300	<10	<16	
Bis(2-Chloroethoxy)Methane	<3,300	<10	<16	
2,6-Dinitrotoluene	<3,300	<10	<16	
2,4-Dinitrotoluene	<3,300	<10	<16	
1,2-Diphenylhydrazine				
Benzidine				125
3,3'Dichlorobenzidine	<6,600	<20	<31	
Bis(2-Chloroethyl)Ether	<3,300	<10	<16	
1,3-Dichlorobenzene	<3,300	<10	<16	
1,4-Dichlorobenzene	<3,300	<10	<16	
1,2-Dichlorobenzene	<3,300	<10	<16	
Hexachloroethane	<3,300	<10	<16	
1,2,4-Trichlorobenzene	<3,300	<10	<16	
Naphthalene	<3,300	<10	<16	
Hexachlorobutadiene	<3,300	<10	<16	1.6
Hexachlorocyclopentadiene	<3,300	<10	<16	
2-Chloronaphthalene	<3,300	<10	<16	
Acenaphthylene	<3,300	<10	2	
Dimehtyl Phthalate	<3,300	<10	<16	
Acenaphthene	17,000	<10	70	
Fluorene	13,000	<10	12	
Diethyl Phthalate	<3,300	<10	<16	
4-Chlorophenyl Phenyl Ether	<3,300	<10	<16	
N-Nitrosodiphenyl Amine	<3,300	<10	<16	
4-Bromophenyl Ether	<3,300	<10	<16	
Hexachlorobenzene	<3,300	<10	<16	
Phenathrene	50,000	<10	4	
Anthracene	7,700	<10	10	
Dibutylphthalate	<3,300	<10	<16	
Fluoranathene	<3,300	<10	14	
Pyrene	30,000	<10	15	
Butylbenzylphthalate	<3,300	<10	<16	
Chrysene	7,300	<10	3	
Benzo(a)Antharacene	9,100	<10	3	
Bis(2-Ethylexyl)Phthalate	<3,300	1	2	
Di-N-Octyphthalate	<3,300	<10	<16	
Benxo(a)Fluoranthene	13,000	<10	3	
Benzo(k)Fluoranthene	<3,300	<10	<16	
Benzo(a)Pyrene	5,800	<10	2	
Indeno(1,2,3-C,D)Pyrene	1,600	<10	<16	
Dibenzo(A,H)Anthracene	<3,300	<10	<16	
Benzo(G,H,I)Perylene	2,300	<10	<16	
Aniline				
4-Chloroaniline	<3,300	<10	<16	
Dibenzofuran	<3,300	<10	<16	
2-Methylnaphthalene	7,600	<10	30	
2-Nitroaniline	<5,500	<50	<78	
3-Nitroaniline	<5,500	<50	<78	
4-Nitroaniline	<5,500	<50	<78	

< Actual value is less than value shown

TABLE B-36
ELUTRIATE ANALYSIS
SITE ER2-BB, mixed with disposal area water

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediments (ug/kg)	Disposal Water	Elutriate	Applicable Acute Criteria
Antimony	<11,300	<3	<60	
Arsenic (total)	8,000	3	<3	69
Arsenic (III)				69
Beryllium	1,020	<0.6	<0.6	
Cadmium	<900	<3	<0.3	43
Chromium (total)	17,000	<2	<2.0	
Chromium (VI)				1,100
Chromium (III)				515
Copper	25,000	<14	60	2.9
Lead	22,000	8.7	7.2	140
Mercury	<100		<0.2	2.1
Nickel	24,000	<23	<23	75
Selenium	<500	<3	<6	
Silver	<1,700	<0.4	0.4	2.3
Thallium	<400	<2	<2	
Zinc	82,000	<20	120	95
Aluminum	11,000,000	340	1,600	
Barium	140,000	120	820	
Boron	<18,800	980	760	
Calcium	12,000,000	100,000	140,000	
Cobalt	9,300	<11	<11	
Iron	20,000,000	530	1,500	
Magnesium	7,800,000	280,000	240,000	
Manganese	630,000	250	480	
Molubdenum	<18,800	<1	<100	
Potassium	3,200,000	96,000	79,000	
Vanadium	27,000	<13	<13	
TRP Hydrocarbons	20,000	<1,000	<1,000	
Aldrin	<3.2	<0.05	<0.05	1.3
A-BHC	<3.2	<0.05	<0.05	
B-BHC	<3.2	<0.05	<0.05	
G-BHC	<3.2	<0.05	<0.05	0.160
D-BHC	<3.2	<0.05	<0.05	
PPDDD	<6.2	<0.01	<0.1	1.25
PPDDE	<6.2	<0.1	<0.1	0.7
PPDDT	<6.2	<0.1	<0.1	0.13
Heptachlor	<3.2	<0.05	<0.05	0.053
Dieldrin	<6.2	<0.1	<0.1	0.71
A-Endosulfan	<3.2	<0.05	<0.05	
B-Endosulfan	<6.2	<0.1	<0.1	
Endosulfan				0.034
Endosulfan sulfate	<6.2	<0.1	<0.1	
Endrin	<6.2	<0.1	<0.1	0.037
Endrin Aldehyde	<6.2	<0.1	<0.1	
Heptachlor Epoxide	<3.2	<0.05	<0.05	
Methoxychlor	<32	<0.5	<0.5	2.1
Chlordane	<3.2	<0.05	<0.05	0.09
Toxaphene	<320	<5	<5	0.21
PCB-1016	<62	<1	<1	10
PCB-1221	<130	<2	<2	10
PCB-1232	<62	<1	<1	10
PCB-1242	<62	<1	<1	10
PCB-1248	<62	<1	<1	10
PCB-1254	<62	<1	<1	10
PCB-1260	<62	<1	<1	10
Phenol	<620	<10	<13	580
2-Chlorophenol	<620	<10	<13	
2-Nitrophenol	<620	<10	<13	
2,4-Dimethylphenol	<620	<10	<13	
2,4-Dichlorophenol	<620	<10	<13	
4-Chloro-3-Methylphenol	<620	<10	<13	
2,4,6-Trichlorophenol	<62	<10	<13	

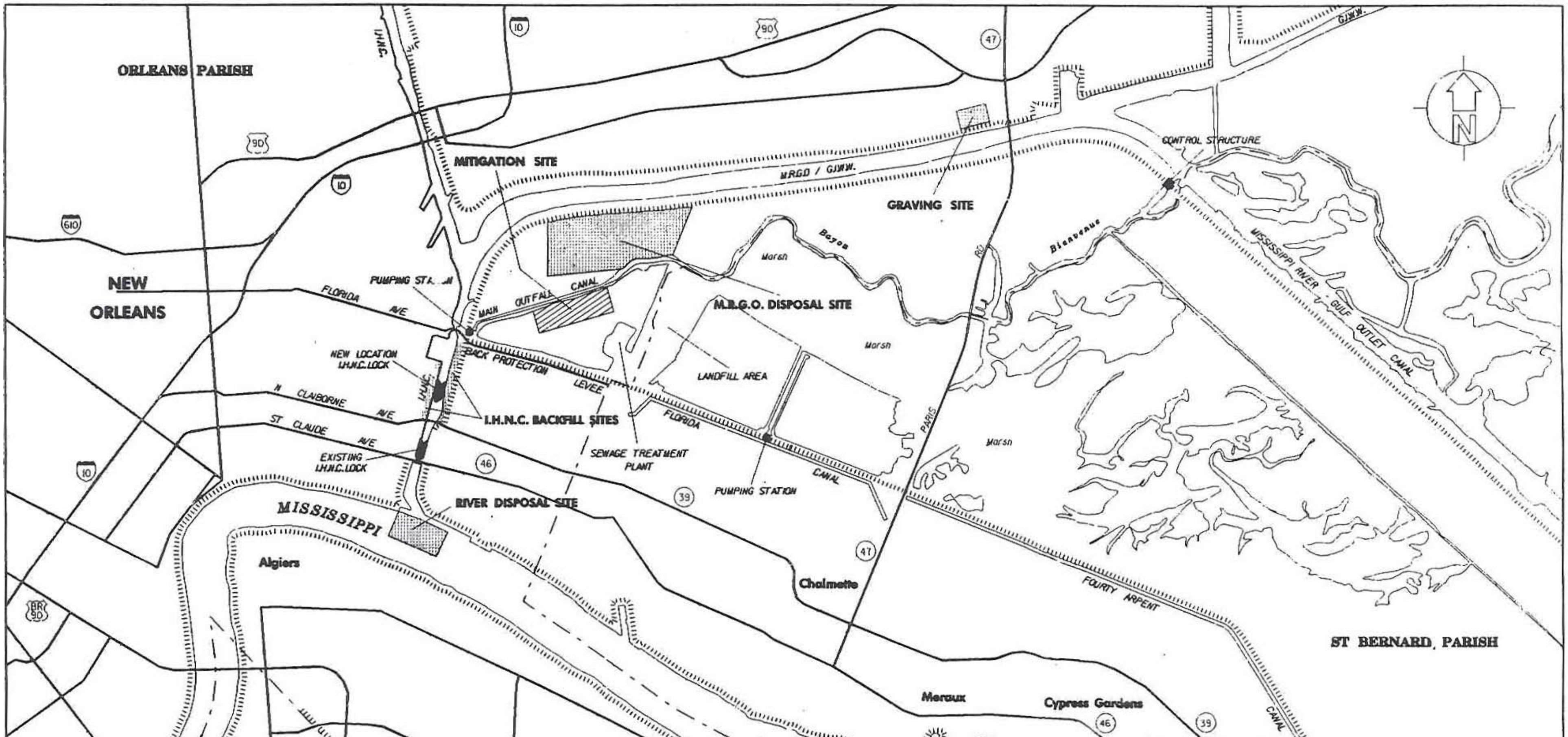
Sampling Site E (at turn basin just south of Florida Ave)
Vibracore #2. Sediments from 8' to 12' deep

TABLE B-36 (continued)

(Units are ug/L unless otherwise specified.)

Constituent	Bulk Sediments (ug/kg)	Disposal Water	Elutriate	Applicable Acute Criteria
2,4-Dinitrophenol	<3,000	<50	<13	
4-Nitrophenol	<3,000	<50	<65	
2-Methyl-4,6-Dinotrophenol	<3,000	<50	<65	
Pentachlorophenol	<3,000	<50	<65	13
Benzoic Acid	<3,000	<50	<65	
2-Methylphenol	<620	<10	<13	
4-Methylphenol	<620	<10	<13	
2,4,5-Trichlorophenol	<3,000	<50	<65	
Benzyl Alcohol	<620	<10	<13	
N-Nitrosodimethylamine				
Bis(2-Chloroisopropyl)Ether	<620	<10	<13	
N-Nitroso-Di-N-Propylamine	<620	<10	<13	
Nitrobenzene	<620	<10	<13	
Isophorone	<620	<10	<13	
Bis(2-Chloroethoxy)Methane	<620	<10	<13	
2,6-Dinitrotoluene	<620	<10	<13	
2,4-Dinitrotoluene	<620	<10	<13	
1,2-Diphenylhydrazine				
Benzidine				125
3,3'Dichlorobenzidine	<1,200	<20	<26	
Bis(2-Chloroethyl)Ether	<620	<10	<13	
1,3-Dichlorobenzene	<620	<10	<13	
1,4-Dichlorobenzene	<620	<10	<13	
1,2-Dichlorobenzene	<620	<10	<13	
Hexachloroethane	<620	<10	<13	
1,2,4-Trichlorobenzene	<620	<10	<13	
Naphthalene	<620	<10	<13	
Hexachlorobutadiene	<620	<10	<13	1.6
Hexachlorocyclopentadiene	<620	<10	<13	
2-Chloronaphthalene	<620	<10	<13	
Acenaphthylene	<620	<10	<13	
Dimehtyl Phthalate	<620	<10	<13	
Acenaphthene	<620	<10	<13	
Fluorene	<620	<10	<13	
Diethyl Phthalate	<620	<10	<13	
4-Chlorophenyl Phenyl Ether	<620	<10	<13	
N-Nitrosodiphenyl Amine	<620	<10	<13	
4-Bromophenyl Ether	<620	<10	<13	
Hexachlorobenzene	<620	<10	<13	
Phenathrene	<620	<10	<13	
Anthracene	<620	<10	<13	
Dibutylphthalate	290	<10	<13	
Fluoranathene	<620	<10	<13	
Pyrene	<620	<10	<13	
Butylbenzylphthalate	<620	<10	<13	
Chrysene	75	<10	<13	
Benzo(a)Antharacene	6.4	<10	<13	
Bis(2-Ethylexyl)Phthalate	700	1	1	
Di-N-Octyphthalate	<620	<10	<13	
Benxo(a)Fluoranthene	140	<10	<13	
Benzo(k)Fluoranthene	<620	<10	<13	
Benzo(a)Pyrene	370	<10	<13	
Indeno(1,2,3-C,D)Pyrene	<620	<10	<13	
Dibenzo(A,H)Anthracene	<620	<10	<13	
Benzo(G,H,I)Perylene	<620	<10	<13	
Aniline				
4-Chloroaniline	<620	<10	<13	
Dibenzofuran	<620	<10	<13	
2-Methylnaphthalene	<620	<10	<13	
2-Nitroaniline	<3,000	<50	<65	
3-Nitroaniline	<3,000	<50	<65	
4-Nitroaniline	<3,000	<50	<130	

< Actual value is less than value shown



MISSISSIPPI RIVER - GULF OUTLET
NEW LOCK AND CONNECTING CHANNELS
(INDUSTRIAL CANAL LOCK REPLACEMENT)
EVALUATION REPORT

DISPOSAL AND MITIGATION SITES

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS

DATE: OCTOBER 1996

PLATE I

GRAVING SITE

SECTION 404(b)(1)

This section contains an evaluation of the effects of dredged material disposal. This 404(b)(1) evaluation is prepared to fulfill the requirements of the Clean Water Act. The following short form 404(b)(1) evaluation follows the format designed by the Office of the Chief of Engineers, (OCE). As a measure to avoid unnecessary paperwork and to streamline regulation procedures while fulfilling the spirit and intent of environmental statutes, New Orleans District is using this format for all proposed project elements requiring 404 evaluation, but involving no significant impact.

PROJECT TITLE. Mississippi River-Gulf Outlet New Lock and Connecting Channels, Industrial Canal Lock Replacement Graving Site, Orleans Parish, Louisiana

PROJECT DESCRIPTION

The U.S. Army Corps of Engineers, New Orleans District, proposes construction of a graving site located northwest of the Paris Road Bridge in eastern New Orleans, Orleans Parish, Louisiana. Approximately 32 acres of waters (and wetlands) of the United States regulated by Section 404 guidelines would be impacted by the proposed project. **The proposed graving site would be** used to construct 4 precast ship locks for a new canal lock and associated Mississippi River-Gulf Outlet (MRGO) levee protection. Completion of all phases of the proposed project would take approximately 5 years (construction of the proposed graving site is expected to take about 1 year, construction of the 4 precast ship locks would take approximately 4 years). Following construction of the ship locks, the site would then be turned over to the local sponsor (Orleans Parish Levee Board).

Flood protection along the MRGO would follow the present line of levee protection and tie into the graving site hurricane protection levees (see Plate 1). Excavation of the graving site would be done in a dry condition to approximate elevation of -27.5 NGVD. Material excavated would be used to construct the hurricane levee protection surrounding the graving site and the tie-in dikes between the channel closure and the main levees. The excavation would require a well and/or wellpoint dewatering system to keep the slopes and base dry. Piezometric levels would be lowered a minimum of 5 feet below the slopes of the bottom of the excavation. Piezometers would be required for monitoring water levels below slopes and the excavation base.

Concrete grade beams spaced on 6-foot intervals supported by 74-foot long 12-inch by 12-inch precast prestressed concrete (PPC) piles would provide a working foundation. Between the grade beams a 1-foot sand base would be placed over the bottom of the excavation and overlain by a 4-inch reinforced concrete stabilization slab to facilitate the fabrication of the lock modules. Flood side protection of the site would consist of a tie-in dike to elevation 7.0, a 45-foot diameter cofferdam cell, and a sand or crushed stone closure at elevation 0.0 NGVD with sheetpile protection to elevation 8.0 NGVD to protect against high tides. The closure would be removed after a lock module is completed and ready for transfer to another site; the closure would be reinstalled to facilitate the construction of other lock modules. A total of 4 lock modules would be constructed.

The new hurricane levees surrounding the graving site would experience some consolidation during and after construction. It will therefore be necessary to retain an elevation close to 15.0 NGVD as settlement occurs.

A sheetpile seepage cutoff will extend into the pleistocene along the length of the channel closure. The tip of the sheetpile would be driven to approximate elevation -55 NGVD to substantially slow down seepage from the channel.

The following total quantities of dredged or fill material would be placed into approximately 32 acres of waters (and wetlands) of the United States regulated by Section 404 guidelines. Approximately 270,500 cubic yards (cy) of earthen material would be excavated from the proposed graving site. Approximately 90,200 cy of this excavated material would be used for levee construction; the remaining excavated material would be stockpiled for future levee lifts. Approximately 63,800 square feet (sf) of steel sheet piling would be used in the levee/I-wall construction. Approximately 2,400 cy of light weight aggregate would be used as fill in the cofferdam cells. Approximately 80,000 cy of stone would be used for closure of the cofferdams. Construction of the work slab would require approximately 174,500 linear feet of 12 inch by 12 inch precast prestressed concrete (PPC) pipe piles; 3,200 cy of reinforced concrete grade beams; 1,000 cy of concrete for slab construction; 2,100 cy of sand; and 8,200 cy of gravel for road construction.

1. Review of Compliance (§230.10 (a)-(d)).

Preliminary[1]

A review of this project indicates that:

	Preliminary			
a. The discharge represents the least environmentally damaging practicable alternative and if in a special aquatic site, the activity associated with the discharge must have direct access or proximity to, or be located in the aquatic ecosystem to fulfill its basic purpose (if no, see section 2 and information gathered for environmental assessment alternative);	YES	NO*	YES	NO
b. The activity does not appear to: (1) violate applicable state water quality standards or effluent standards prohibited under Section 307 of the Clean Water Act; (2) jeopardize the existence of Federally listed endangered or threatened species or their habitat; and (3) violate requirements of any Federally designated marine sanctuary (if no, see section 2b for (1) and check responses from resource and water quality certifying agencies);	YES	NO*	YES	NO
c. The activity will not cause or contribute to significant degradation of waters of the United States including adverse effects on human health, life stages of organisms dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, esthetic, and economic values (if no, see section 2);	YES	NO*	YES	NO
d. Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem (if no, see section 5).	YES	NO*	YES	NO

2. Technical Evaluation Factors (Subparts C-F).

	N/A	Not Significant	Significant*
a. Physical and Chemical Characteristics of the Aquatic Ecosystem (Subpart C).			
(1) Substrate impacts.		X	
(2) Suspended particulates/turbidity impacts.		X	
(3) Water column impacts.		X	
(4) Alteration of current patterns and water circulation.		X	
(5) Alteration of normal water fluctuations/hydro period.		X	
(6) Alteration of salinity gradients.		X	
b. Biological Characteristics of the Aquatic Ecosystem (Subpart D).			
(1) Effect on threatened/endangered species and their habitat.		X	
(2) Effect on the aquatic food web.		X	
(3) Effect on other wildlife (mammals, birds, reptiles, and amphibians).		X	

c. Special Aquatic Sites (Subpart E)

	N/A	Not Significant	Significant*
(1) Sanctuaries and refuges.		X	
(2) Wetlands.		X	
(3) Mud flats.	X		
(4) Vegetated shallows.		X	
(5) Coral reefs.	X		
(6) Riffle and pool complexes.	X		

d. Human Use Characteristics (Subpart F).

	N/A	Not Significant	Significant*
(1) Effects on municipal and private water supplies.	X		
(2) Recreational and commercial fisheries impacts		X	
(3) Effects on water-related recreation.		X	
(4) Esthetic impacts.		X	
(5) Effects on parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves.	X		

Remarks. Where a check is placed under the significant category, preparer has attached an explanation below.

3. Evaluation of Dredged or Fill Material (Subpart G).[3]

a. The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material.

(1)	Physical characteristics	X
(2)	Hydrography in relation to known or anticipated sources of contaminants	X
(3)	Results from previous testing of the material or similar material in the vicinity of the project	X
(4)	Known, significant sources of persistent pesticides from land runoff or percolation	
(5)	Spill records for petroleum products or designated (Section 311 of CWA) hazardous substances	
(6)	Other public records of significant introduction of contaminants from industries, municipalities, or other sources	X
(7)	Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities	
(8)	Other sources (specify)	

Appropriate references:

(1) Draft Report, Environmental Data for Hazardous, Toxic, and Radioactive Waste (HTRW) Investigations Inter Harbor Navigation Channel - Graving Site. Prepared by Gulf Engineers & Contractors, Inc., Baton Rouge, Louisiana, for the U.S. Army Corps of Engineers, New Orleans District, New Orleans, Louisiana. September, 1996

(2) Initial site assessment for Inter Harbor Navigation Channel - Graving Site, HTRW# 109, October 1996.

(3) Water Quality input for the MRGO New Locks and Connecting Channels Reevaluation Study Long Form 404(b)(1), New Orleans District, 1995.

(4) Water, Sediment, and elutriate testing for Chalmette Area Protection, New Orleans District, 1981.

(5) Louisiana Department of Environmental Quality, State of Louisiana Water Quality Management Plan, Volume 5 Part B Water Quality Inventory, 1994.

b. An evaluation of the appropriate information in 3a above indicates that there is reason to believe the proposed dredge or fill material is not a carrier of contaminants, or the material meets the testing exclusion criteria. . . . . YES NO*

4. Disposal Site Delineation (§230.11(f)).

a. The following factors, as appropriate, have been considered in evaluating the disposal site.

(1)	Depth of water at disposal site	X
(2)	Current velocity, direction, and variability at disposal site	X
(3)	Degree of turbulence	
(4)	Water column stratification	
(5)	Discharge vessel speed and direction	
(6)	Rate of discharge	
(7)	Dredged material characteristics (constituents, amount, and type of material, settling velocities)	X
(8)	Number of discharges per unit of time	
(9)	Other factors affecting rates and patterns of mixing (specify)	

Appropriate references:

(1) Louisiana Coast High Altitude Photographs, NASA, Vol.16, 1985

(2) Little Woods, Louisiana Quadrangle Map. Scale 1:24,000, 1979.

(3) 1995 Infra-red aerial photograph ACC#04866 FR 1374

(4) Soil Survey of Orleans Parish, Louisiana. U.S. Department of Agriculture, Soil Conservation Service with Louisiana Agricultural Experiment Station. 1989.

(5) Same as 3.(a)

b. An evaluation of the appropriate factors in 4a above indicates that the disposal site and/or size of mixing zone are acceptable . . . . YES NO*

5. Actions to Minimize Adverse Effects (Subpart H).

All appropriate and practicable steps have been taken, through application of the recommendations of §230.70-230.77 to ensure minimal adverse effects of the proposed discharge . . . . YES NO*

Actions taken:

(1) Excavation of the proposed graving site would be done in a dry condition, Material would be excavated in the dry (via cofferdams). Piezometers would be required for monitoring water levels below slopes and the excavation base. A sheetpile seepage cutoff would extend to the pliestocene along the length of the channel closure. The tip of the sheetpile would be driven to approximate elevation of -55 NGVD to slow down seepage from the channel.

6. Factual Determination (§230.11).

A review of appropriate information as identified in items 2-5 above indicates that there is minimal potential for short- or long-term environmental effects of the proposed discharge as related to:

a. Physical substrate at the disposal site (review sections 2a, 3, 4, and 5 above) . . . . YES NO*

b. Water circulation, fluctuation and salinity (review sections 2a, 3, 4, and 5) . . . . YES NO*

c. Suspended particulates/turbidity (review sections 2a, 3, 4, and 5) . . . . YES NO

d. Contaminant availability (review sections 2a, 3, and 4) . YES NO

e. Aquatic ecosystem structure and function (review sections 2b, and c, 3, and 5) . . . . YES NO*

f. Disposal site (review sections 2, 4, and 5) . . . . YES NO*

g. Cumulative impact on the aquatic ecosystem . . . . YES NO

h. Secondary impacts on the aquatic ecosystem . . . . YES NO

* A negative, significant, or unknown response indicates that the project may not be in compliance with the Section 404(b)(1) Guidelines.

[1] Negative responses to three or more of the compliance criteria at this stage indicates that the proposed projects may not be evaluated using this short form procedure.

If the dredged or fill material cannot be excluded from individual testing, the "short form" evaluation process is inappropriate.

If the dredged or fill material cannot be excluded from individual testing, the "short form" evaluation process is inappropriate.

7. Evaluation Responsibility.

a. Water Quality input was prepared by: Julie Z. LeBlanc, P.E.

Position: Hydraulic Engineer GS-11

Date: 30 Sep 1996

b. Biological input was prepared by: William P. Klein, Jr.

Position: Wildlife Biologist GS-11

Date: 3 Oct 96

c. This evaluation was reviewed by: R. H. Schroeder Jr.

Position: Chief, Planning Division

Date: ____________

8. Findings.

a. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines X

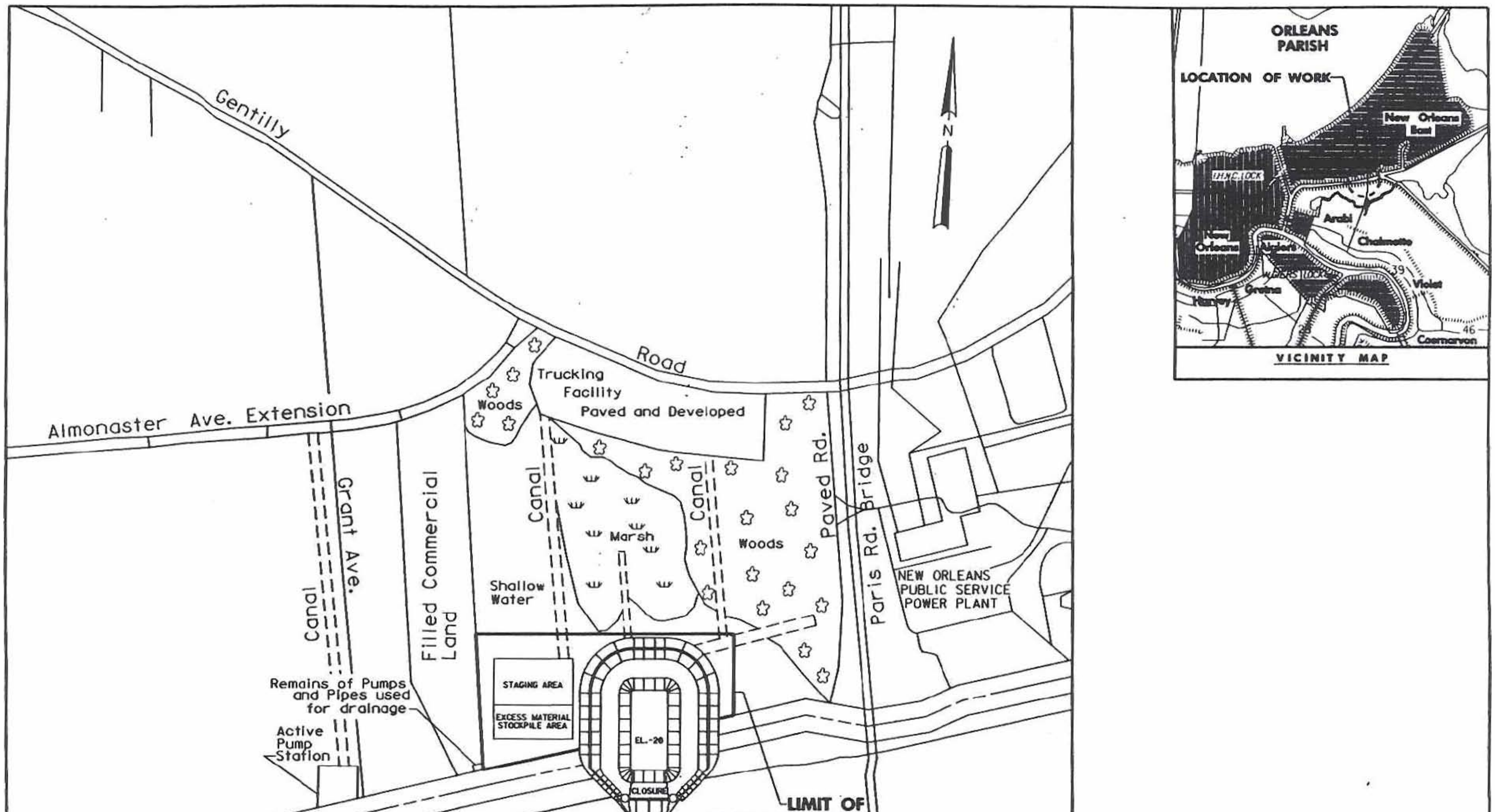
b. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) guidelines with the inclusion of the following conditions . ________

c. The proposed disposal site for discharge of dredged or fill material does not comply with the Section 404(b)(1) guidelines for the following reason(s):

(1) There is a less damaging practicable alternative . . . . ______
(2) The proposed discharge will result in significant degradation of the aquatic ecosystem . . . . ______
(3) The proposed discharge does not include all practicable and appropriate measures to minimize potential harm to the aquatic ecosystem . . . . . ______

18 Mar 97
Date

William L. Conner
William L. Conner
Colonel, U.S. Army
District Engineer



MISSISSIPPI RIVER - GULF OUTLET
NEW LOCK AND CONNECTING CHANNELS
(INDUSTRIAL CANAL LOCK REPLACEMENT)
EVALUATION AND MITIGATION REPORT

GRAVING SITE
HABITATS AND IMPACT AREA

U.S ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS

DATE: SEPTEMBER 1996

Section 4

COASTAL ZONE CONSISTENCY DETERMINATION

SECTION 4
LOUISIANA COASTAL ZONE MANAGEMENT PROGRAM
CONSISTENCY DETERMINATION

INTRODUCTION

Section 307 of the Coastal Zone Management Act of 1972, 16 U.S.C. 1451 et. seq., requires that "each Federal agency conducting or supporting activities directly affecting the coastal zone shall conduct or support those activities in a manner which is, to the maximum extent practicable, consistent with state approved management programs." In compliance with Section 307, a consistency determination has been prepared for the Mississippi River-Gulf Outlet, New Lock and Connecting Channels Study. Coastal Use Guidelines addressed in this document were written to implement the policies and goals of the Louisiana Coastal Resources Program and to serve as a set of performance standards for evaluating projects. Compliance with the Louisiana Coastal Resources Program and, therefore, Section 307, requires compliance with applicable Coastal Use Guidelines.

PROJECT DESCRIPTION

The main component of the tentatively selected plan is a new 1200-foot long by 110-foot wide by 36-foot deep lock connecting the Mississippi River with the Mississippi River-Gulf Outlet (MRGO) and Gulf Intracoastal Waterway (GIWW) via the Inner Harbor Navigation Canal (IHNC). The new lock would be constructed in the IHNC, north of the existing lock, between the Claiborne Avenue and Florida Avenue Bridges.

The construction schedule for lock replacement is complex and most tasks must be accomplished in very ridged chronological order to maintain existing flood control systems, utilities, and navigation and also to minimize socioeconomic impacts on local residents and commuters. The following narrative description is written in the approximate chronological order in which construction events would take place.

A temporary construction site (graving site) would be prepared for off-site construction of lock modules. The graving site is located along the north bank of the MRGO/GIWW, immediately west of the Paris Road (Louisiana Highway 47 or I-310) bridge. The existing hurricane protection levee, running parallel to the waterway, would be reconfigured to form a slip. The lock modules would be constructed within the slip.

Meanwhile, the Galvez Street Wharf would be demolished and the U.S. Coast Guard facility and businesses along the east side of the IHNC between the Mississippi River and Florida Avenue would be removed. Utilities crossing the IHNC would be relocated to three corridors - one corridor to be located adjacent to each bridge that crosses the IHNC between the river and the GIWW. A temporary bypass channel (north bypass channel) would be excavated on the east side of the site designated for the new lock. Bank protection, either rip-rap or sheet piling, would be used to stabilize the east side of the bypass channel. Protection cells would be provided at each end of the bypass channel to prevent vessels from striking bridges. Levees and floodwalls would be upgraded between the old lock site and the vicinity of the new lock in order to provide for Mississippi River flood protection. After site preparation, a new concrete-shell lock, constructed off-site in four pieces, would be floated into place and ballasted. A detour road through an undeveloped area (the Meraux Tract in St. Bernard Parish) would be built to connect St. Bernard Highway, Judge Perez Boulevard, and Florida Avenue to reduce traffic congestion during the time that modifications are being made to the Claiborne Avenue Bridge and while the St. Claude Avenue Bridge is being replaced. The Claiborne Avenue bridge lift-span and superstructure would be raised to allow sufficient clearance for varying river stages but no relocations would be necessary. The north bypass channel would be back-filled mainly with material taken from a south bypass channel that would be excavated around the east side of the old lock. New levees and floodwalls would be constructed as necessary to provide uninterrupted storm and river flood protection. The St. Claude Avenue Bridge would be demolished and a new low-level bridge would be constructed while the old lock is being demolished. Upon completion of the St. Claude Avenue Bridge, final dredging would be required in the vicinity of the old lock site, the old lock fore-bay, the new lock fore-bay. This material would be used for random back-fill as needed, with the excess pumped into the Mississippi River. The new lock guidewalls would be installed and permanent mooring facilities would be constructed. The entire construction phase is expected to take about 12-13 years.

The majority of the soil and sediment excavated for lock site preparation and for the north bypass channel would be hydraulically pumped to the northeast of the new lock site into previously-used, MRGO disposal areas. The material has been determined to be too contaminated for aquatic disposal or for wetland restoration. The soil from the east bank of the IHNC, below 5 feet in depth, is essentially uncontaminated. It would be used to develop wetlands as mitigation for impacts of the graving site. The material would be deposited into an area of shallow, brackish water. Low level dikes would be used to contain the material until settlement occurs. Afterwards, the dikes would be breached to allow tidal exchange.

GUIDELINES

1. Guidelines Applicable to All Uses

Guideline 1.1: The guidelines must be read in their entirety. Any proposed use may be subject to the requirements of more than one guideline or section of guidelines and all applicable guidelines must be complied with.

Response: Acknowledged.

Guideline 1.2: Conformance with applicable water and air quality laws, standards, and regulations, and with those other laws, standards and regulations which have been incorporated into the coastal resources program shall be deemed in conformance with the program except to the extent that these guidelines would impose additional requirements.

Response: Acknowledged.

Guideline 1.3: The guidelines include both general provisions applicable to all uses and specific provisions applicable only to certain types of uses. The general guidelines apply in all situations. The specific guidelines apply only to situations they address. Specific and general guidelines should be interpreted to be consistent with each other. In the event there is an inconsistency, the specific should prevail.

Response: Acknowledged.

Guideline 1.4: These guidelines are not intended to nor shall they be interpreted so as to result in an involuntary acquisition or taking of property.

Response: Acknowledged.

Guideline 1.5: No use or activity shall be carried out or conducted in such a manner as to constitute a violation of the terms of a grant or donation of any lands or waterbottoms to the State or any subdivision thereof. Revocations of such grants and donations shall be avoided.

Response: The tentatively selected plan would not cause violations or revocations of such grants or donations.

Guideline 1.6: Information regarding the following general factors shall be utilized by the permitting authority in evaluating whether the proposed use is in compliance with the guidelines.

a) type, nature, and location of use.

b) elevation, soil, and water conditions and flood and storm hazard characteristics of site.

c) techniques and materials used in construction, operation, and maintenance of use.

d) existing drainage patterns and water regimes of surrounding area including flow, circulation, quality, quantity, and salinity; and impacts on them.

e) availability of feasible alternative sites or methods for implementing the use.

f) designation of the area for certain uses as part of a local program.

g) economic need for use and extent of impacts of use on economy of locality.

h) extent of resulting public and private benefits.

i) extent of coastal water dependency of the use.

j) existence of necessary infrastructure to support the use and public costs resulting from the use.

k) extent of impacts on existing and traditional uses of the area and on future uses for which the area is suited.

l) proximity to and extent of impacts on important natural features such as beaches, barrier islands, tidal passes, wildlife and aquatic habitats, and forest lands.

m) the extent to which regional, state, and national interests are served including the national interest in resources and the siting of facilities in the coastal zones as identified in the coastal resources program.

n) proximity to, and extent of impacts on, special areas, particular areas, or other areas of particular concern of the state program or local programs.

o) likelihood of, and extent of impacts of, resulting secondary impacts and cumulative impacts.

p) proximity to and extent of impacts on public lands or works, or historic, recreational or cultural resources.

q) extent of impacts on navigation, fishing, public access, and recreational opportunities.

r) extent of compatibility with natural and cultural setting.

s) extent of long-term benefits or adverse impacts.

Response: Acknowledged

Guideline 1.7: It is the policy of the coastal resources program to avoid the following adverse impacts. To this end, all users and activities shall be planned, sited, designed, and constructed, operated, and maintained to avoid to the maximum extent practicable significant:

a) reductions in the natural supply of sediment and nutrients to the coastal system by alterations of freshwater flow.

Response: The proposed new lock would increase the amount of Mississippi River water and suspended sediments entering the IHNC and subsequently, the GIWW, the MRGO, and Lake Pontchartrain due to more frequent lockages and larger volumes of water during each lockage. The effect of this increased freshwater discharge is expected to be minimal because of rapid dilution in receiving water bodies.

b) adverse economic impacts on the locality of the use and affected governmental bodies.

Response: Nearly all of the property required for project construction is owned by the Port of New Orleans. The socioeconomic mitigation plan contains a provision for the Port of New Orleans to offer incentives for the industrial tenants that would be dislocated to relocate their businesses in Orleans Parish. In that way, negative impacts to the tax revenues collected by the City of New Orleans are minimized. Some local businesses in the vicinity of St. Claude Avenue would likely experience reduced sales during periods of bridge closure because of difficulties associated with access to the businesses. However, the lost sales would be displaced to other businesses. Construction of the proposed project would generate substantial employment, income, and tax revenues. The socioeconomic mitigation package contains a commitment to require contractors to employ local residents.

Long-term economic benefits to the region and nation are anticipated as a result of project implementation. Improved navigation and vehicular traffic flow would result upon project completion.

Please refer to the Socioeconomic Mitigation Plan (Appendix A of the Evaluation Report) for a complete description of the socioeconomic impacts and mitigation plan.

c) detrimental discharges of inorganic nutrient compounds into coastal waters.

Response: No detrimental discharges of such compounds are expected.

d) alterations in the natural concentration of oxygen in coastal waters.

Response: Oxygen concentrations in the waters at the IHNC dredging site, the graving site, and the mitigation site would have a tendency to be reduced during dredging operations. The IHNC dredging site is considered to be poor habitat for aquatic organisms and no adverse impacts to the aquatic ecosystem would occur. Any negative impacts would be limited to the IHNC between the GIWW and the Mississippi River. Due to the high volume and dilution rates of the Mississippi River, no measurable decrease in dissolved oxygen concentrations are expected in the Mississippi River from the discharge of dredged material. There would be a decrease in dissolved oxygen concentrations at the graving site and the mitigation site from the turbidity caused by the discharge of dredged material. However, impacts would be temporary. Normal oxygen concentrations would return once dredging operations were completed.

e) destruction or adverse alterations of streams, wetland, tidal passes, inshore waters and waterbottoms, beaches, dunes, barrier islands, and other natural biologically valuable areas or protective coastal features.

Response: No adverse effects to the Mississippi River are expected. No tidal passes, beaches, dunes, barrier islands, or protective coastal features would be affected. About 25 acres of freshwater wetlands at the graving site within a fastland area would be destroyed and replaced with a navigation slip.

f) adverse disruption of existing social patterns.

Response: Adverse social impacts would occur primarily from the rerouting of vehicular traffic, increased noise levels, relocation of businesses, and other construction-related items. All of the potential impacts to the social environment of the study area are identified in the EIS and the Socioeconomic Mitigation Plan (Appendix A). The potential for adverse impacts to the social patterns of the IHNC area have been minimized by elimination of more intrusive alternatives and the commitment to implement a comprehensive Socioeconomic Mitigation Plan.

g) alterations of the natural temperature regime of coastal waters.

Response: Project construction and operation would not cause a measurable change in the natural temperature regime of coastal waters.

h) detrimental changes in existing salinity regimes.

Response: No measurable change in existing salinity regimes would occur. Larger volumes of water discharged through the new lock would slightly increase the amount of fresh water entering tidal waterways. The high volume of flow in the IHNC between Lake Pontchartrain and the GIWW would prevent any measurable change from occurring.

i) detrimental changes in littoral and sediment transport processes.

Response: This plan would not affect littoral or sediment transport processes.

j) adverse effects of cumulative impacts.

Response: The proposed project would rearrange the developed corridor adjacent to the IHNC near the Mississippi River. Since the IHNC corridor is already totally developed, there is minimal potential to add to the cumulative impact of development in this area.

k) detrimental discharges of suspended solids into coastal waters, including turbidity resulting from dredging.

Response: This plan would cause a minor, temporary increase in the sediment load of the Mississippi River. The bulk of the material would rapidly settle to the bottom of the river and become part of the river's bedload. Increased turbidity would be detectable for only a short distance downstream.

There would also be increased turbidity from discharge of dredged material at the graving site and the mitigation site. Turbid flow would extend to adjacent water bodies, including the MRGO, GIWW, Bayou Bienvenue, and the shallow open water around the mitigation site. No long-term, detrimental effects are expected.

l) reductions or blockage of water flow or natural circulation patterns within or into an estuarine system or wetland forest.

Response: Circulation patterns would not be altered at the IHNC. The graving site would radically alter the character of the impounded freshwater wetland currently existing there. The wetland would be converted to a construction site. Associated material stockpile and staging areas would also impact this wetland. The wetland is located within a designated industrial corridor (New Orleans Business and Industrial District), within a forced drainage area, behind a hurricane protection levee. After construction of lock modules is complete, the slip would be open to tidal flow. The landowner could then use the site as a docking or vessel repair facility.

The mitigation site would be confined with low-level earthen dikes to prevent the loss of dredged material and to minimize turbidity levels in nearby tidal waters. The mitigation site would be reconnected to tidal waters after the dredged material becomes consolidated and vegetated. Therefore, no long-term reduction or blockage of tidal flow would occur.

m) discharges of pathogens or toxic substances into coastal waters.

Response: No pathogens would be discharged. Bottom sediments in the IHNC and the top layer of soils (upper 5 feet) on the canal banks have been found to contain a variety of toxic substances. The most contaminated material, portions of the top 5 feet of soil on the east bank of the IHNC, would be disposed in an industrial landfill. The lesser contaminated sediment and soil would be disposed in previously-used MRGO disposal areas. The uncontaminated soil (below 5 feet) from the east bank of the IHNC, would be used restore wetlands as mitigation for impacts of the graving site. No toxic substances would be deposited directly into coastal waters.

n) adverse alteration or destruction of archaeological, historical, or other cultural resources.

Response: This alternative would require demolition of the Inner Harbor Navigation Canal Lock, the St. Claude Avenue Bridge, and the Galvez Street Wharf. All of these properties have been determined eligible for the National Register of Historic Places. The loss of these three structures would be mitigated by recordation to Historic American Engineering Record standards prior to demolition. In addition, the Galvez Street would be documented to Historic American Building Survey standards before demolition. Additional consultation with the State Historic Preservation Officer and the Advisory Council on Historic Preservation would be necessary in order to reach agreement on the details of the mitigation plan for each of these structures. Pieces of the demolished structures may be preserved for display at the new lock site.

There would be no impact to any historic or prehistoric archeological properties in the project area. No structures in either the Bywater or Holy Cross Historic Districts would be moved or destroyed.

o) fostering of detrimental secondary impacts in undisturbed or biologically highly productive wetland areas.

Response: No detrimental secondary impacts are expected in undisturbed or biologically highly productive wetlands. The graving site and mitigation site are considered neither undisturbed, nor biologically highly productive.

p) adverse alteration or destruction of unique or valuable habitats, critical habitat for endangered species, important wildlife or fishery breeding or nursery areas, designated wildlife management or sanctuary areas, or forest lands.

Response: No critical habitat for endangered species, nor any wildlife management or sanctuary areas would be affected by the proposed project. The graving site, mitigation site, and MRGO disposal site have been heavily impacted by human activities and are not particularly valuable or unique.

Another feature of the proposed project, a detour road, would negatively affect a tract of forested land which is within the drained area of St. Bernard Parish. This forested tract is not within the boundaries of the Coastal Zone as defined for purposes of the Louisiana Coastal Resources Program and work within this forested tract would not affect areas outside of the levee system. A very small portion of the detour road, including a bridge crossing, would be located outside of the Back Protection Levee, and within the Coastal Zone.

q) adverse alteration or destruction of public parks, shoreline access points, public works, designated recreation areas, scenic rivers, or other areas of public use and concern.

Response: No such areas would be adversely impacted.

r) adverse disruptions of coastal wildlife and fishery migratory patterns.

Response: No adverse disruptions of wildlife and fisheries migratory patterns would occur. There could be some displacement of wildlife and fisheries organisms away from dredging and disposal sites due to turbidity and physical disturbance by construction equipment. The dredging and disposal sites do not provide migratory pathways for coastal wildlife and fisheries resources. These sites are already heavily impacted and not significant habitats.

s) land loss, erosion, and subsidence.

Response: The graving site would cause the loss of about 3.5 acres of levee, levee berm, and wetland. The wetland is located behind a hurricane protection levee. Mitigation for the graving site would directly restore 41 acres of brackish marsh. The net effect would be a gain in exposed land.

t) increases in the potential for flood, hurricane, or other storm damage, or increases in the likelihood that damage will occur from such hazards.

Response: The proposed project would not increase flooding potential. Adequate flood protection would be provided throughout the construction period. Realigned levees and floodwalls would be built to applicable design standards for hurricane and Mississippi River flood protection.

u) reductions in the long-term biological productivity of the coastal ecosystem.

Response: Mitigation for impacts of the graving site would fully compensate for loss of biological productivity.

Guideline 1.8: In those in which the modifier "maximum extent practicable" is used, the proposed use is in compliance with the guideline if the standard modified by the term is complied with. If the modified standard is not complied with, the use will be in compliance with the guideline if the permitting authority finds, after a systematic consideration of all pertinent information regarding the use, the site, and the impacts of the use as set forth in Guideline 1.6, and a balancing of their relative significance, that the benefits resulting from the proposed use would clearly outweigh the adverse impacts resulting from noncompliance with the modified standard and there are no feasible and practical alternative locations, methods, and practices for the use that are in compliance with the modified standard and:

a) significant public benefits will result from the use, or;

b) the use would serve important regional, state, or national interests, including the national interest in resources and the siting of facilities in the coastal zone identified in the coastal resources program, or;

c) the use is coastal water dependent.

The systematic consideration process shall also result in a determination of those conditions necessary for the use to be in compliance with the guideline. Those conditions shall assure that the use is carried out utilizing those locations, methods, and practices which maximize conformance to the modified standard; are technically, economically, environmentally, socially, and legally feasible and practical and minimize or offset those adverse impacts listed in guideline 1.7 and in the guideline at issue.

Response: Acknowledged.

Guideline 1.9: Uses shall, to the maximum extent practicable, be designed and carried out to permit multiple concurrent uses which are appropriate for the location and to avoid unnecessary conflicts with other uses of the vicinity.

Response: The purpose and use of the proposed project would be for improved navigation. The area immediately adjacent to the IHNC is heavily industrialized. Other uses of the proposed lock and channels would be inappropriate. After construction, the project site and the area around the existing lock would be landscaped and recreational pursuits would be encouraged to the maximum extent practicable.

Guideline 1.10: These guidelines are not intended to be, nor shall they be, interpreted to allow expansion of governmental authority beyond that established by La. R.S. 49:213.1 through 213.21, as amended; nor shall these guidelines be interpreted so as to require permits for specific uses legally commenced or established prior to the effective date of the coastal use permit program nor to normal maintenance or repair of such uses.

Response: Acknowledged.

2. Guidelines for Levees

Guideline 2.1: The leveeing of unmodified or biologically productive wetlands shall be avoided to the maximum extent practicable.

Response: The graving site is already within a forced drainage area within the hurricane protection system and is therefore, considered "fast land" under the State's Coastal Resources Program. Nevertheless, the graving site would adversely impact productive wetlands.

The low-level earthen dikes or levees to be constructed in the mitigation area would be placed in shallow water for the purpose of containing dredged material. These dikes would be breached after the dredged material consolidates and the area becomes vegetated. Confinement levees would be upgraded or constructed as necessary in the MRGO disposal area to confine the dredged material.

Guideline 2.2: Levees shall be planned and sited to avoid segmentation of wetland areas and systems to the maximum extent practicable.

Response: The footprint of the graving site has been located so that impacts to wetlands are minimized. No other wetland area or system would be segmented.

Guideline 2.3: Levees constructed for the purpose of developing or otherwise changing the use of a wetland area shall be avoided to the maximum extent practicable.

Response: The wetland to be developed at the graving site is within a drained area behind a hurricane protection levee. It is therefore not technically within the jurisdiction of the State Coastal Resources Program. No other levees would encourage or cause development or change the use of wetlands.

Guideline 2.4: Hurricane and flood protection levees shall be located at the wetland/non-wetland interface or landward to the maximum extent practicable.

Response: The hurricane protection levee would be realigned landward to form a construction site along the MRGO/GIWW. All other realigned levees and floodwalls would be located in the heavily industrialized IHNC corridor, either on non-wet sites or within the IHNC.

Guideline 2.5: Impoundment levees shall only be constructed in wetland areas as part of approved water or marsh management projects or to prevent release of pollutants.

Response: The levees to be constructed at the mitigation site and the MRGO disposal site would be for the sole purpose of retaining dredged material until it becomes consolidated. The MRGO disposal areas area already impounded and would remain that way. Levees around the mitigation area would be breached in several locations after consolidation of dredged material.

Guideline 2.6: Hurricane or flood protection levee systems shall be designed, built, and thereafter operated and maintained utilizing best practical techniques to minimize disruptions of existing hydrologic patterns, and the interchange of water, beneficial nutrients and aquatic organisms between enclosed wetlands and those outside the levee system.

Response: Existing hydrologic patterns would not be altered. The levees and floodwalls in the IHNC vicinity that would be realigned would be built in a developed corridor and therefore would not affect hydrologic patterns or wetlands.

3. Guidelines for Linear Facilities

Note: The detour road proposed as a socioeconomic mitigation item is considered, for purposes of this evaluation, as a linear facility. Only a very small portion of the detour road would be located in the area defined as the Coastal Zone. The detour road is shown on Plate 18 of the Main Report.

Guideline 3.1: Linear use alignments shall be planned to avoid adverse impacts on areas of high biological productivity or irreplaceable resource areas.

Response: The route of the detour road has been chosen to avoid developed areas and to minimize adverse impacts to biologically productive areas. The only place where the road would be located within the Coastal Zone is at the extreme southwest corner of an open water area, next to an existing landfill.

The graving site levee is a realignment of the existing levee. The wetland to be impacted at the graving site is behind hurricane protection levee and not within the Coastal Zone.

Guideline 3.2: Linear facilities involving the use of dredging or filling shall be avoided in wetland and estuarine areas to the maximum extent practicable.

Response: The proposed detour road has been aligned to avoid wetlands and estuarine areas as much as possible.

The graving site would affect wetlands not included in the Coastal Zone.

Guideline 3.3: Linear facilities involving dredging shall be of the minimum size and length.

No dredging or filling in the Coastal Zone is planned for construction of the detour road. A bridge would be built across the wetland portion of the route.

The hurricane protection levee to be realigned at the graving site would be built to design standards for the rest of the levee reach.

Guideline 3.4: To the maximum extent practicable, pipelines shall be installed through the "push ditch" method and the ditch backfilled.

Response: Not applicable.

Guideline 3.5: Existing corridors, right-of-way, canals, and streams shall be utilized to the maximum extent practicable for linear facilities.

Response: The detour road would follow along the inside of the Back Protection Levee and floodwall, actually being built on the levee berm. It is only where the levee makes almost a 90-degree turn near the Orleans-St. Bernard Parish line that the road would continue straight across the crest of the levee and cross a dead end finger of tidal water with a wetland fringe.

The levee must be realigned landward at the graving site to provide enough space for construction of lock modules.

Guideline 3.6: Linear facilities and alignments shall be, to the maximum extent practicable, designed and constructed to permit multiple uses consistent with the nature of the facility.

Response: The detour road would be used by personnel and commercial vehicles. Other uses of the road right-of-way such as fiber-optic cables or utilities would be allowed as long as they don't conflict with the roadway.

The realigned levee at the graving site would be appropriate only for industrial purposes.

Guideline 3.7: Linear facilities involving dredging shall not traverse or adversely affect any barrier island.

Response: No barrier islands would be affected

Guideline 3.8: Linear facilities involving dredging shall not traverse beaches, tidal passes, protective reefs or other natural gulf shoreline unless no other alternative exists. If a beach, tidal pass, reef or other natural gulf shoreline must be traversed for a non-navigation canal, they shall be restored at least to their natural condition immediately upon completion of construction. Tidal passes shall not be permanently widened or deepened except when necessary to conduct the use. The best available restoration techniques which improve the traversed area's ability to serve as a shoreline shall be used.

Response: No such areas would be affected.

Guideline 3.9: Linear facilities shall be planned, designed, located, and built using the best practical techniques to minimize disruption of natural hydrologic and sediment transport patterns, sheet flow, and water quality, and to minimize adverse impacts on wetlands.

Response: No disruption of natural hydrologic and sediment transport patterns, sheet flow, or water quality would occur from the detour road. Adverse impacts on wetlands are minimized by routing the road through non-wet areas to the maximum practicable degree.

Impacts on wetlands have been minimized at the graving site by restricting drainage to the minimum necessary for construction activities.

Guideline 3.10: Linear facilities shall be planned, designed, and built using the best practical techniques to prevent bank slumping and erosion, saltwater intrusion, and to minimize the potential for inland movement of storm-generated surges. Consideration shall be given to the use of locks in navigation canals and channels which connect more saline areas with fresher areas.

Response: The proposed detour road would have no effect on bank slumping, saltwater intrusion, or storm surge.

The graving site levee would be designed according to the same design standards as typical hurricane protection levees in the New Orleans area.

4. Guidelines for Dredged Spoil Deposition

Guideline 4.1: Spoil shall be deposited utilizing the best practical techniques to avoid disruption of water movement, flow, circulation, and quality.

Response: Water flow in the Mississippi River would not be affected by the disposal of dredged material. Tidal currents would be blocked from the mitigation site so that dredged material is not transported out of the site. The dikes would be breached following consolidation and colonization of dredged material, thereby reestablishing tidal flows. Deposition of material in the MRGO disposal site would not affect water flow.

Guideline 4.2: Spoil shall be used beneficially to the maximum extent practicable to improve productivity or create new habitat, reduce or compensate for environmental damage done by dredging activities, or prevent environmental damage. Otherwise, existing spoil disposal areas or upland disposal shall be utilized to the maximum extent practicable rather than creating new disposal areas.

Response: Much of the material dredged for project construction has been determined too contaminated for wetland restoration or aquatic disposal. That is the reason for deposition in the MRGO disposal site. The uncontaminated soil would be used for to compensate for impacts of the graving site, and would fully mitigate for those adverse impacts. Dredging in the IHNC would not cause environmental damage since the entire IHNC corridor is developed. The portion of the IHNC to be dredged is slack water and poor aquatic habitat. The relatively small amount of material to be disposed in the Mississippi River would be dredged between the old lock site and the river. This location is a considerable distance from the material to be dredged for MRGO disposal and mitigation - approximately 3,000 feet on the other side of the existing IHNC lock. The incremental cost of pumping the material to the wetland development site instead of to the river would be significant.

Guideline 4.3: Spoil shall not be disposed of in a manner which could result in the impounding or draining of wetlands or the creation of development sites unless spoil deposition is part of an approved levee or land surface alteration project.

Response: No dredged material would be deposited in a manner which would impound or drain tidal wetlands or encourage development of wetlands.

Guideline 4.4: Spoil shall not be disposed of on marsh, known oyster or clam reefs, or in areas of submerged vegetation to the maximum extent practicable.

Response: No spoil would be deposited in such areas.

Guideline 4.5: Spoil shall not be disposed of in such a manner as to create a hindrance to navigation or fishing, or hinder timber growth.

Response: No hindrance to navigation, fishing, and timber growth would occur.

Guideline 4.6: Spoil disposal areas shall be designed and constructed and maintained using the best practicable techniques to retain the spoil at the site, reduce turbidity, and reduce shoreline erosion when appropriate.

Response: This guideline is not applicable to the Mississippi River disposal site. All other dredged material would be deposited within confined areas to retain material at the discharge sites.

Guideline 4.7: The alienation of state-owned property shall not result from spoil deposition activities without the consent of the Department of Natural Resources.

Response: No state-owned properties would be alienated by deposition of dredged material.

5. Guidelines for Shoreline Modification

Not applicable.

6. Guidelines for Surface Alterations

Guideline 6.1: Industrial, commercial, urban, residential, and recreational uses are necessary to provide adequate economic growth and development. To this end, such uses will be encouraged in those areas of the coastal zone that are suitable for development. Those uses shall be consistent with the other guidelines and shall, to the maximum extent practicable, take place only:

a) on lands five feet or more above sea level or within fast lands; or

b) on lands which have foundation conditions sufficiently stable to support the use, and where flood and storm hazards are minimal or where protection from these hazards can be reasonably well achieved, and where the public safety would not be unreasonably endangered; and

1) the land is already in high intensity of development use, or
2) there is adequate supporting infrastructure, or
3) the vicinity has a tradition of use for similar habitation or development.

Response: The project site is within a highly industrialized corridor along the IHNC. Most of the land is more than five feet above sea level and the soil conditions are suitable for development. The graving site is within the New Orleans Business and Industrial District.

Guideline 6.2: Public and private works projects such as levees, drainage improvements, roads, airports, ports, and public utilities are necessary to protect and support needed development and shall be encouraged. Such projects shall, to the maximum extent practicable, take place only when:

a) they protect or serve those areas suitable for development pursuant to Guideline 6.1; and

b) they are consistent with other guidelines; and

c) they are consistent with all relevant adopted state, local, and regional plans.

Response: The project would protect and support existing development and is within an industrial area.

Guideline 6.3: Blank (Deleted).

Guideline 6.4: To the maximum extent practicable, wetland areas shall not be drained or filled. Any approved drain or fill project shall be designed and constructed using best practical techniques to minimize present and future property damage and adverse environmental impacts.

Response: The graving site would impact wetlands that are not within the Coastal Zone. No other wetland areas would be drained or filled.

Guideline 6.5: Coastal water-dependent uses shall be given special consideration in permitting because of their reduced choice of alternatives.

Response: The IHNC lock replacement is definitely water-dependent.

Guideline 6.6: Areas modified by surface alteration activities shall, to the maximum extent practicable, be revegetated, refilled, cleaned, and restored to their pre-development condition upon termination of the use.

Response: After construction, the lock area would be landscaped. The mitigation site would be allowed to vegetate naturally. The graving site levee would probably be seeded to prevent erosion.

Guideline 6.7: Site clearing shall, to the maximum extent practicable, be limited to those areas immediately required for physical development.

Response: The footprint of the graving site and associated material stockpile and staging areas have been minimized. Because of the developed nature of the lock replacement site, only lands necessary for project construction would be included within the project right-of-way.

Guideline 6.8: Surface alterations shall, to the maximum extent practicable, be located away from critical wildlife areas and vegetation areas. Alterations in wildlife preserves and management areas shall be conducted in strict accord with the requirements of the wildlife management body.

Response: No critical wildlife or vegetation areas would be impacted by the proposed project. No alterations of wildlife preserves or management areas would occur.

Guideline 6.9: Surface alterations which have high adverse impacts on natural functions shall not occur, to the maximum extent practicable, on barrier islands and beaches, isolated cheniers, isolated natural ridges or levees, or in wildlife and aquatic species breeding or spawning areas, or in important migratory routes.

Response: None of these areas would be affected.

Guideline 6.10: The creation of low dissolved oxygen conditions in the water or traps for heavy metals shall be avoided to the maximum extent practicable.

Response: Low dissolved oxygen conditions may occur during dredging operations. However, low oxygen occasionally occurs at the IHNC and mitigation site under ambient conditions. No heavy metal traps would occur. Contaminants would be contained within existing MRGO disposal areas.

Guideline 6.11: Surface mining and shell dredging shall be carried out utilizing the best practical techniques to minimize adverse environmental impacts.

Response: Not applicable

Guideline 6.12: The creation of underwater obstructions which adversely affect fishing or navigation shall be avoided to the maximum extent practicable.

Response: No underwater obstructions would be created.

Guideline 6.13: Surface alteration sites and facilities shall be designed, constructed, and operated using the best practical techniques to prevent the release of pollutants or toxic substances into the environment and minimize other adverse impacts.

Response: All heavily contaminated soils would be removed from within the project right-of-way before it is disturbed by construction activities and disposed in an industrial landfill. Other contaminated soil and sediment would be deposited in an existing MRGO disposal area. The contaminants would therefore be contained. No pollutants or toxic substances would be released during normal operations of the new lock.

Guideline 6.14: To the maximum extent practicable, only material that is free of contaminants and compatible with the environmental setting shall be used as fill.

Response: The material to be used for mitigation is alluvial material which is uncontaminated. Heavily contaminated material would be deposited in an industrial landfill and less contaminated material would be placed in an MRGO disposal area. The MRGO disposal area would likely not be developed.

7. Guidelines for Hydrologic and Sediment Transport Modifications

Not applicable.

8. Guidelines for the Disposal of Wastes

Not applicable.

9. Guidelines for Uses That Result in the Alteration of Waters Draining into Coastal Waters

Not applicable.

10. Guidelines for Oil, Gas, and Other Mineral Activities

Not applicable.

CONSISTENCY DETERMINATION

Based on this evaluation, the New Orleans District, U.S. Army Corps of Engineers, has determined that implementation of the Tentatively Selected Plan (lock replacement, North of Claiborne Avenue), would be consistent, to the maximum extent practicable, with the State of Louisiana's approved Coastal Resources Program.

State of Louisiana

M.J. "MIKE" FOSTER, JR.
GOVERNOR

JACK C. CALDWELL
SECRETARY

DEPARTMENT OF NATURAL RESOURCES

March 3, 1997

Mr. R. N. Schroeder, Jr.
U.S. Army Corps of Engineers
New Orleans District
P. O. Box 60267
New Orleans, LA 70160-0267

RE: C970090, Coastal Zone Consistency
New Orleans District, Corps of Engineers
Direct Federal Action
Proposed new lock on the Inner Harbor-Navigation Canal, connecting the Mississippi River with the Mississippi River-Gulf Outlet (MRGO) and the Inner Harbor-Harbor Navigation Canal (IHNC), **Orleans and St. Bernard Parishes, Louisiana**

Dear Mr. Schroeder:

The above referenced project has been reviewed for consistency with the approved Louisiana Coastal Resource Program (LCRP) as required by Section 307 of the Coastal Zone Management Act of 1972, as amended. The project, as proposed in the application, is consistent with the LCRP. If you have any questions concerning this determination please contact Brian Marcks of the Consistency Section at (504)342-7939 or 1 (504) 267-4019.

Sincerely,

Terry W. Howey, /for
Administrator

TWH/JDH/bgm

cc: Richard Boe, NOD-COE
Fred Dunham, LDWF
Tim Killee, CMD/FC
Harvey Stern, Orleans Parish
Mike Hunnicutt, St. Bernard Parish

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO ATTENTION OF:

February 25, 1997

Planning Division
Environmental Analysis Branch

Mr. Gregory J. Ducote
Program Manager, Interagency Affairs
Coastal Management Division
Office of Coastal Restoration and Management
P.O. Box 44487
Baton Rouge, Louisiana 70804-4487

Dear Mr. Ducote:

By letter of February 5, 1997, your office informed us that our tentatively selected plan for replacing the navigation lock on the Inner Harbor Navigation Canal (C960539) was not consistent with the Louisiana Coastal Resources Program. We have met with Mr. Brian Marcks of your office, as well as representatives of the U.S. Fish and Wildlife Service (USFWS) and the Louisiana Department of Environmental Quality (LDEQ), concerning this matter. We have refined our dredged material disposal plan in response to your concerns. The following information revises and supplements the Consistency Determination contained in Appendix D of the Mississippi River-Gulf Outlet, New Lock and Connecting Channels, feasibility report/Environmental Impact Statement, previously submitted to your office.

The disposal area for the 1,364,000 cubic yards of material from the top 5 feet of the north bypass channel and the canal bottom sediments would be a tract of about 240 acres between Bayou Bienvenue and the hurricane protection levee as shown on the enclosed photo. This site, previously used for disposal of material from the Mississippi River-Gulf Outlet, is bounded by old retention dikes on the east and west sides. Rainwater runoff from this area enters Bayou Bienvenue directly through a break in the bank of Bayou Bienvenue and indirectly through a break in the retention dike along the east side of the site. The elevation of ~~the site, and its location within a hurricane~~ protection system, prevents tidal inundation during high tidal conditions. Therefore, the site does not provide habitat for estuarine fish or shellfish.

The site contains jurisdictional wetlands. However, the vegetation occurring there limits its value for wildlife resources. The dominant species are Chinese tallow and black willow, with sparse ground cover over most of the site. The USFWS considers this habitat type to be of low value for most wildlife species found in the area.

We believe that the proposed site is the most logical location for disposal of the dredged material, and we propose to use the 240-acre site for confined disposal of the dredged material. The retention dikes would be upgraded as necessary to retain the material within the site. Effluent from the dredging operation would pass through spill boxes constructed in the dikes. All runoff would flow either directly or indirectly into the upper reach of Bayou Bienvenue, also known as the Main Outfall Canal.

Your letter also contains concerns about the contaminants in the dredged material. We have applied for State Water Quality Certification with the LDEQ, and they are currently reviewing our report. We will abide by any conditions and constraints which the LDEQ requires for State Water Quality Certification to ensure that coastal waters are not degraded.

We submit that our Inner Harbor Navigation Canal lock replacement plan, as revised in this letter, is consistent, to the maximum extent practicable, with the State of Louisiana's approved Coastal Resources Program. We request an expedited reply to this consistency concurrence request. We intend to finalize our report by the middle of March 1997, and we want to include your response. Any questions may be addressed to Mr. Richard Boe at (504) 862-1505.

Sincerely,

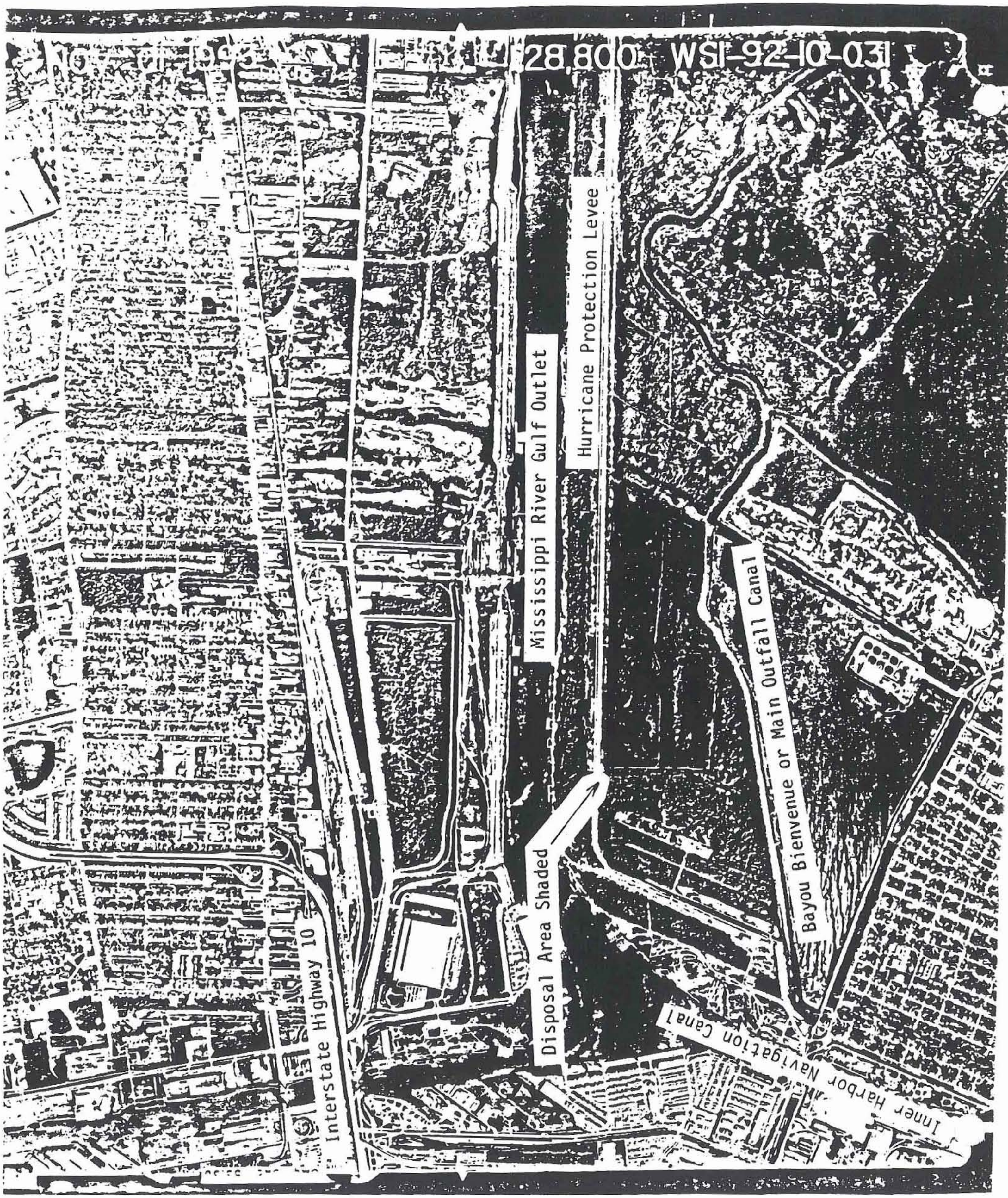
R. H. Schroeder, Jr.
Chief, Planning Division

Enclosure

~~Copies Furnished w/enclosure:~~

Mr. Fred Dunham, LDWF
Ms. Jane Ledwin, USFWS
Mr. James Little, LDEQ

N



28,800 WSI-92-10-031
Hurricane Protection Levee
Mississippi River Gulf Outlet
Bayou Bienvenue or Main Outfall Canal
Disposal Area Shaded
Interstate Highway 10
Inner Harbor Navigation Canal

ENCLOSURE

State of Louisiana

M.J. "MIKE" FOSTER, JR.
GOVERNOR

JACK C. CALDWELL
SECRETARY

DEPARTMENT OF NATURAL RESOURCES

February 5, 1997

Mr. R. H. Schroeder, Jr.
Department of the Army
New Orleans District, Corps of Engineers
New Orleans, Louisiana 70160-0267

RE: **C960539**, Coastal Zone Consistency
New Orleans District, Corps of Engineers
Direct Federal Action
Proposed new lock on the Inner Harbor Navigation Canal, connecting the Mississippi River with the Mississippi River-Gulf Outlet (MRGO) and the Inner Harbor Navigation Canal (IHNC), Orleans and St. Bernard Parish,
Louisiana

Dear Mr. Schroeder:

This office has received the above referenced federal application for consistency review with the approved Louisiana Coastal Resources Program in accordance with Section 307(c) of the Federal Coastal Zone Management Act of 1972, as amended.

A field trip to the project site on February 4, 1997, indicates that the containment levee for the proposed spoil disposal area between the MRGO and Bayou Bienvenue is breached at several points along Bayou Bienvenue and is thus tidally connected with coastal wetlands. Also, there are numerous shallow ponded wetlands in this proposed disposal site. In order to be consistent with the LCRP, if this site is to be used as a spoil area for contaminated spoil from the Inner Harbor Navigation Canal as proposed in the project, suitable mitigation must be proposed.

Further, we are concerned that contaminated spoil that is to be deposited in this area does not leach into coastal wetlands, and that the contaminated spoil does not exceed State water quality standards or degrade the water quality of coastal waters as required by Coastal Use Guidelines 1.7 m, 4.1, and 6.13. In light of the non-compliance with State mitigation policy and the above referenced Coastal use Guidelines, we find the above referenced project is not consistent, to the maximum extent practicable, with the LCRP.

By copy of this letter, this division will notify the Assistant Administrator of the National Oceanic and Atmospheric Administration (NOAA) that your project, as proposed, is not consistent with the Louisiana Coastal Resources Program (LCRP). Please note that in accordance with the regulations set forth at 15 CFR Subpart C, Section 930.42 and Subpart H, Section 930.125, you have the right to appeal this decision within 30 days of its receipt to the Secretary of the U.S. Department of Commerce. We look forward to the opportunity to assist in resolving this issue.

If you have any further questions please call Brian Marcks of the Consistency Section at (504) 342-7591 or 1-800-267-4019.

Sincerely,

Terry W. Howey
Administrator

TWH/JDH/bgm

cc: Fred Dunham, LDWF
Tim Killeen, CMD/FC
Harvey Stern, Orleans Parish
Chris Andry, St. Bernard Parish
Richard Boe, NOD-COE
Assistant Administrator, NOAA

Section 5

EIS MAILING LIST

SECTION 5
EIS MAILING LIST

All U.S. Senators and Congressmen representing Louisiana, Federal and state agencies, state officials, local government agencies, interested groups, libraries, and individuals listed below received copies of the DEIS or a notice of its availability.

CONGRESSIONAL DELEGATION
Senator John Breaux
Senator Mary Landrieu
Representative Richard Baker
Representative John Cooksey
Representative William Jefferson
Representative Chris John
Representative Bob Livingston
Representative Jim McCrery
Representative Billy Tauzin

STATE OFFICIALS
Mike Foster, Governor
Kathleen Babineaux Blanco, Lieutenant Governor
W. Fox McKeithen, Secretary of State
Bob Odum, Commissioner of Agriculture and Forestry
Richard Ieyoub, Attorney General

STATE SENATORS
Dennis R. Bagneris Sr., New Orleans, LA
Diana E. Bajoie, New Orleans, LA
Lynn Dean, Braitwaite, LA
John J. Hainkel Jr., New Orleans, LA
Francis C. Heitmeier, New Orleans, LA
Ken Hollis, Metairie, LA
Jon D. Johnson, New Orleans, LA
Ron Landry, Laplace, LA
Art Lentini, Kenner, LA
Tom Schedler, Slidell, LA
J. Chris Ullo, Harvey, LA

STATE REPRESENTATIVES
John A. Alario, Jr., Westwego, LA
Glenn Ansardi, Kenner, LA
Shirley Bowler, Harahan, LA
Emile Bruneau, Jr., New Orleans, LA
Sherman N. Copelin, Jr., New Orleans, LA
Naomi Warren Farve, New Orleans, LA
Garey Forster, New Orleans, LA
Kyle Mark Green, Marrero, LA
Troy Hebert, Jeanerette, LA
Charles D. Lancaster, Jr., Metairie, LA
Mitch Landrieu, New Orleans, LA
Danny Martini, Metairie, LA

Arthur A. Morrell, New Orleans, LA
Edwin R. Murray, New Orleans, LA
Kenneth L. Odinet, Arabi, LA
Renee Gill Pratt, New Orleans, LA
Benny Rousselle, Belle Chasse, LA
Steve Scalise, Jefferson, LA
Joseph F. Toomy, Gretna, LA
David Vitter, Metairie, LA
Tommy Warner, Chalmette, LA
Steve Windhorst, Terrytown, LA

LOCALLY ELECTED OFFICIALS

Orleans Parish

Marc Morial, Mayor of New Orleans
Troy Carter, New Orleans City Council
Ellen Hazeur-Distance, New Orleans City Council
Roy Glapion, New Orleans City Council
James M. Singleton, New Orleans City Council
Suzanne Haik Terrel, New Orleans City Council
Oliver Thomas, New Orleans City Council
Peggy Wilson, New Orleans City Council
Errol Williams, Assessor, 3rd Municipal District, New Orleans, LA

St. Bernard Parish

Charles Ponstein, St. Bernard Parish President, Chalmette, LA
Daniel L. Dysart, Councilman at Large, Chalmette, LA
Calvin E. Callais, St. Bernard Parish Council, Chalmette, LA
Clay Cosse, St. Bernard Parish Council, Chalmette, LA
James Licciardi, Jr., St. Bernard Parish Council, Chalmette, LA
Henry Rodriguez, Jr., St. Bernard Parish Council, Chalmette, LA
Scott Wolfe, St. Bernard Parish Council, Chalmette, LA

Plaquemines Parish

Clyde Giordano, Plaquemines Parish President, Belle Chasse, LA

Jefferson Parish

Tim Coulon, Parish President, Harahan, LA
Aaron Broussard, Parish Council President, Gretna, LA
Nick Giambelluca, Jefferson Parish Council, Metairie, LA
Lloyd Giardina, Jefferson Parish Council, Gretna, LA
Donald R. Jones, Jefferson Parish Council, Gretna, LA
Ed Muniz, Jefferson Parish Council, Harahan, LA
Anne Marie Vandenweghe, Jefferson Parish Council, Harahan, LA
T.J. Ward, Jefferson Parish Council, Gretna, LA

Cities and Towns

Carlo R. Ferrara, Mayor, Harahan, LA
Ronnie C. Harris, Mayor, Gretna, LA

FEDERAL AGENCIES

Advisory Council on Historic Preservation, Washington, DC and Golden, CO
Department of Agriculture,
- Forest Service, Planning & Budget Staff Unit, Atlanta, GA
- Natural Resources Conservation Service, Washington, DC and Boutte, LA

Natural Resources Conservation Service, State Conservationist, Alexandria, LA
Southern Regional Research Center, New Orleans, LA

Department of Commerce,
- National Marine Fisheries Service, Habitat Conservation Division, Field Office, Baton Rouge, LA
- National Marine Fisheries Service, Southeast Regional Office, St. Petersburg, FL
- National Marine Fisheries Service, Silver Spring, MD

Department of Energy, Office of Environmental Compliance, Washington, DC

Department of Health and Human Services, Centers for Disease Control, Atlanta, GA

Department of Housing and Urban Development, New Orleans, LA

Department of Interior,
- Fish and Wildlife Service, Field Supervisor, Lafayette, LA
- Fish and Wildlife Service, National Wetlands Research Center, Lafayette, LA
- Geological Survey, Reston, VA
- Minerals Management Service, New Orleans, LA
- National Park Service, Jean Lafitte Historical Park, New Orleans, LA
- Office of Environmental Policy and Compliance, Washington, DC
- Southeast Louisiana Refuges, Slidell, LA

Department of Transportation
- Coast Guard, New Orleans, LA and Washington, DC
- Maritime Administration, New Orleans, LA

Environmental Protection Agency,
- Office of Federal Activities, Washington, DC
- Region VI, Federal Activities Branch, Dallas, TX

Federal Emergency Management Administration, Washington, DC and Denton, TX

Federal Highway Administration, Baton Rouge, LA

STATE AGENCIES

Department of Agriculture & Forestry,
- Office of Agriculture and Environmental Sciences
- Office of Forestry

Department of Culture, Recreation and Tourism,
- Division of Outdoor Recreation
- State Historic Preservation Officer

Department of Economic Development, Office of Policy and Research

Department of Environmental Quality,
- Secretary
- Inactive and Abandoned Sites
- Solid and Hazardous Waste
- Office of Water Resources

Department of Health and Hospitals, Office of Health Services and Environmental Quality

Department of Natural Resources,
- Coastal Restoration Division
- Coastal Management Division, Consistency Coordinator
- Louisiana Geological Survey

Department of Transportation and Development,
    Chief Engineer
    Division of Environmental Engineering
    Federal Projects Coordinator
Department of Wildlife and Fisheries,
    Secretary
    Habitat Conservation Division, Natural Heritage Program
    New Orleans Office
    Slidell Office
Lake Borgne Basin Levee District, Violet, LA
Louisiana Division of Administration
    State Land Office
    State Planning Office
Louisiana Attorney General's Office, Assistant Attorney General
Louisiana Board of Commerce and Industry, Research Division
Louisiana Mosquito Control Board
Louisiana Sea Grant Legal Program
Louisiana State University,
    Center for Coastal, Energy, and Environmental Resources
    Center for Wetland Resources, Ports and Waterways Institute
    Coastal Studies Institute Library
    Department of Geography and Anthropology
Louisiana Tech University, Department of Economics and Finance,
        Ruston, LA
Office of the Governor, Dr. Len Bahr, Technical Coordinator for
        Coastal Activities
Orleans Levee District, New Orleans, LA

CITY and PARISH GOVERNMENTS
City of New Orleans Office of International Relations/Trade
    Development, New Orleans, LA
City of New Orleans Office of Economic Development, New Orleans,
    La
Jefferson Parish Environmental and Development Control Office,
    Harahan, LA
Jefferson Parish Council, Clerk, Gretna, LA
Jefferson Parish Department of Environmental Quality, Harahan, LA
New Orleans City Planning Council, Ms. Patricia Thompson, New
    Orleans, LA
New Orleans, Deputy Chief Admin Officer, New Orleans, LA
Plaquemine Parish Government, Secretary, Belle Chasse, LA
~~Regional Planning Commission, Federal Programs Review~~
    ~~Coordinator, New Orleans, LA~~
St. Bernard Parish Planning Commission, Mr. Chris Andry,
    Chalmette, LA
Terrebonne Parish Council, Waterways and Permits Committee,
    Houma, LA

AREA CLEARINGHOUSE & PLANNING COMMISSIONS
Regional Planning Commisssion, Federal Programs Review
    Coordinator, New Orleans, LA
New Orleans City Planning Comm, New Orleans, LA
St. Bernard Parish Plan Comm, Chalmette, LA

LIBRARIES

Delgado Junior College, Moss Memorial Library, New Orleans, LA
Dillard University, Will W. Alexander Library, New Orleans, LA
Huey P. Long Memorial Law Library, Attorney General's Office, Baton Rouge, LA
LA Office Comm. & Indus. Research, Baton Rouge, LA
LA State University, Wetland Resources Building, Baton Rouge, LA
Louisiana Dept. of Commerce and Industry Library, Baton Rouge, LA
Loyola University Library, New Orleans, LA
LSU, College of Design Library, Baton Rouge, LA
LSU Library, Government Documents Division
New Orleans Public Library, Mian Branch, New Orleans, LA
New Orleans Public Library, Martin Luther King Branch, New Orleans, LA
New Orleans Public Library, Louisiana Division
New Orleans Public Library, Alvar Street Branch, New Orleans, LA
Southern University, Baton Rouge, LA
Southern University in New Orleans Library, New Orleans, LA
St. Bernard Parish Library, Chalmette, LA
State Library of Louisiana, Louisiana Section, Baton Rouge, LA
Tulane University Library, Louisiana Collection
University of New Orleans Library, Louisiana Collection
Xavier University Library, New Orleans, LA

ENVIRONMENTAL GROUPS

The Audubon Institute, New Orleans, LA
Bonnet Carré Rod and Gun Club, Environmental Committee, Norco, LA
Cactus Clyde Productions, Baton Rouge, LA
Clio Sportsman's League, Harahan, LA
Coalition to Restore Coastal Louisiana, Baton Rouge, LA
Ducks Unlimited, Inc., Jackson, MS
Environmental Defense Fund, New York, NY
Friends of the Earth, Seattle, WA
Gulf Coast Conservation Association, Baton Rouge, LA
Gulf of Mexico Fisheries Management Council, Tampa, FL
Gulf Restoration Network, New Orleans, LA
Gulf States Marine Fisheries Commission, Ocean Springs, MS
Lake Pontchartrain Basin Foundation, Metairie, LA
Louisiana Wildlife Federation, Baton Rouge, LA
Orleans Audubon Society, New Orleans, LA
National Audubon Society, Austin, TX and Tavernier, FL
National Wildlife Federation, Washington, DC
Natural Resources Defense Council, New York, NY
Sierra Club Legal Defense, New Orleans, LA
Sierra Club, Delta Chapter, New Orleans, LA
Sierra Club, Mr. Tyrone Foreman, New Orleans, LA
South Louisiana Environmental Council, Houma, LA

UNIVERSITY AFFILIATED PERSONS

College of Urban and Regional Plng, University of New Orleans, New Orleans, LA
College of Design, Louisiana State University, Baton Rouge, LA
Delgado Comm. College, President, New Orleans, LA

LA State University, Ports & Institute, Baton Rouge, LA
LA State University, Department of Geography & Anthropology, Baton Rouge, LA
LA Tech University, Dept of Economics & Finance, College of Admin & Business, Ruston, LA
LA State University, Sea Grant Legal Program, Baton Rouge, LA
LBJ School of Public Affairs, University of Texas, Austin, Tx
LSU/CCEER/ISD, Baton Rouge, LA
Tulane Environmental Law Clinic, New Orleans, LA
Tulane University, Tulane Law School, New Orleans, LA

NEWS MEDIA
Associated Press, New Orleans, LA
Associated Press, Baton Rouge, LA
City Business, Metairie, LA
Cox Cable New Orleans, New Orleans, LA
Gambit, New Orleans, LA
Journal of Commerce, New Orleans, LA
Louisiana Weekly, New Orleans, LA
Morning Advocate, Baton Rouge, LA
Plaquemine Watchmen Gazette, Belle Chasse, LA
Southern States Network, Baton Rouge, LA
St. Bernard Voice, Arabi, LA
St. Bernard News, Metairie, LA
State-Times, Baton Rouge, LA
TCI of Louisiana, Violet, LA
The Daily Sentry News, Slidell, LA
The Louisiana Network, Baton Rouge, LA
Times Picayune, New Orleans, LA
Times Picayune, St Bernard Bureau, Chalmette, LA
WDSU TV, New Orleans, LA
WEZB, New Orleans, LA
WGNO TV, New Orleans, LA
WLAE TV, New Orleans, LA
WNOE, New Orleans, LA
WNOL TV, New Orleans, LA
WSMB, New Orleans, LA
WVUE TV, New Orleans, LA
WWL, New Orleans, LA
WWOZ, New Orleans, LA
WYES TV, New Orleans, LA
WYLD, New Orleans, LA

LOCAL INTERESTS
Abe Mcfarland, Inc., New Orleans, LA
Brother Stephen Walsh, Holy Cross School, New Orleans, LA
Dixon Machine, Welding & Metalworks, Inc, New Orleans,LA
Eva Benoit, United Medical Center, New Orleans, LA
Historic Districts Landmarks Commission, New Orleans, LA
Jesty Billot, Abita Springs, LA
John Andrews, New Orleans, LA
John Koeferl, New Orleans, LA
Larry Spenser, District 99 Enhancement Corp., New Orleans, LA

Leontine G. Luke, New Orleans, LA
Lloyd Brown, New Orleans, LA
Marc Cooper, Mew Orleans, LA
Mark's Muffler Shop, New Orleans, LA
Middle South Services Inc., Env. Affairs Section, New Orleans, LA
Mrs. Marietta Williams, New Orleans, LA
Mrs. George-Ethyl Warren, New Orleans, LA
Nilima Mwendo, New Orleans, LA
Pam Dashielle, New Orleans, LA
Ruby Sumler, New Orleans, LA
Sal Doucette, New Orleans, LA
Samuel Ramsey, New Orleans, LA
South Central Plng. & Development, Thibodaux, LA
Walter Brooks, RPC, New Orleans, LA
Willie Calhoun, New Orleans, LA

PORT AUTHORITIES
Caddo-Bossier Parishes Port Commission, Shreveport, LA
Camden Port Authority, East Camden, AR
Greater Lafourche Port Commission, Galliano, LA
Helena-Phillips County Port, West Helena, AR
Kaskaskia Regional Port, Red Bud, IL
Lake Charles Harbor and Terminal District, Lake Charles, LA
Lake Providence Port Commission, Lake Providence, LA
Loop Inc., New Orleans, LA
Misa County Mission Port, Charleston, MO
Morgan City Harbor & Terminal District, Morgan City, LA
Natchez-Adams County Port, Natchez, MS
Natchitoches Parish Port Commission, Natchitoches, LA
New Madrid County Port, New Madrid, MO
Orange County Nav & Port District, Orange, TX
Pinebluff-Jefferson County Port, Pine Bluff, AR
Plaquemines Port Harbor & Terminal District, Braithwaite, LA
Port of Chicago, Chicago, IL
Port of Muskogee, Muskogee, OK
Port of Galveston, Galveston, TX
Port of Memphis, Memphis, TN
Port Commission of South Louisiana, Laplace, LA
Port Commission of Greater Baton Rouge, Port Allen, LA
Red River Parish Port Commission, Coushatta, LA
Rosedale-Bolivar County Port, Rosedale, MS
South Tangipohoa Port Commission, Pontchatoula, LA
Southeast Missouri Regional Port, Scott City, MO
St. Bernard Port, Harbor, and Terminal District, Chalmette, LA
Tulsa Port of Catoosa, Catoosa, OK

INLAND WATERWAYS USERS BOARD & RELATED INTERESTS
American Commercial Barge Lines Co., Jeffersonville, IN
American Waterways Operators, Inc., Arlington, VA
Association for the Dinamo, Pittsburgh, PA
Cargo Carriers, Inc., Wayzata, MN
Chairman - Inland Ww Users Board, St Louis, MO
Colusa Elevator Company, Ferris, IL

Foss Maritime, Inc., Portland, OR
Guthrie Corporation, Guthrie, OK
Ingram Industries, Nashville, TN
Institute for Water Resources, Alexandria, VA
Kirby Corporation, Houston, TX
Midland Enterprises, Inc., Cincinnati, OH
Midwest Area River Coalition 2000, St Louis, MO
National Waterways Conference, Inc., Washington, DC
National Mining Association, Washington, DC
Twomey Company, Smithshire, IL

NAVIGATION INTERESTS
A.P. Champagne Co., Inc., New Orleans, LA
A.R. Pradillo/Division of Gulf States Forwarding Inc., New Orleans, LA
Abbeville Harbor & Terminal Dist., Abbeville , LA
ABC Container Line, New Orleans, LA
Abl-trans, Harvey, LA
Aerotyme Inc., New Orleans, LA
Agway Systems Inc., Baton Rouge, LA
Air Express International, New Orleans, LA
Alexander International, Metairie, LA
Alexandria Regional Port Authority, Alexandria, LA
Algiers Iron Works & Dry Docks Co., New Orleans, LA
Alianza Enterprises Inc., Kenner, LA
Allcargo Inc., New Orleans, LA
Allships Supply Co., Inc., New Orleans, LA
Alter Barge Line Inc., Bettendorf, IA
American Ocean Freight Services Inc., New Orleans, LA
American Waterways Operators, New Orleans, LA
American Commercial Barge Line Co., Harahan, LA
American Gulf Shipping Inc., Metairie, LA
American President Lines Inc., Metairie, LA,
American Ocean Freight Services Inc., New Orleans, LA
American Machinery Movers Inc., Jefferson, LA
American Diesel & Ship Repairs Inc., New Orleans, LA
American Eagle Marine Inc., Harvey, LA
American Marine Corp, New Orleans , LA
American Gulf Shipping Inc., Metairie, LA
Anchor Stevedoring Co., New Orleans, LA
Anvil, Metairie, LA
Apollo Marine Specialities, New Orleans, LA
Arrow International Export Packers, Marrero, LA
Arrow Terminals, Sewickly, PA
Associated International Consultants Inc., Kenner, LA
Associated Federal Coast Pilots of LA, Arabi, LA
Associated Branch Pilots, Metairie, LA
Astral International Shipping Services Inc., New Orleans, LA
Atlantic Steamers Supply Co., Inc., New Orleans, LA
Atlantic Technical Services, New Orleans, LA
Atlantic Container Line, New Orleans, LA
Atlantic Container Line Inc., New Orleans, LA
Avoca Inc., New Orleans, LA

Avondale Shipyards Div, Algiers Drydock, New Orleans, LA
Avondale Container Yard West, Bridge City, LA
Avondale Industries Inc., New Orleans, LA
Avondale Container Yard East, New Orleans, LA
Avondale Boat Division, New Orleans, LA
B&G Crane Service Inc., Jefferson, LA
Barber Ship Management Ltd., New Orleans, LA
Bay-Houston Towing Co., Galveston, TX
Bayou Pipe Coating Company, New Iberia, LA
Bayou Distribution Services, Metairie, LA
Bergeron Marine Service Inc., New Orleans, LA
Bertel Shipping Co., Inc., New Orleans, LA
Bisso Towboat Co., Inc., New Orleans, LA
Bisso Marine Co. Inc., New Orleans, LA
Blue Water Shipping, Metairie, LA
BMI Inc., New Orleans, LA
Boh Bros Construction Co. Inc., New Orleans, LA
Boland Marine & Manufacturing Co., New Orleans, LA
Bollinger Quick Repair Inc., Harvey, LA
Bollinger Machine Shop & Shipyard, Lockport, LA
Bominflot Inc., Harvey, LA
Bosco Brothers Inc., Norco, LA
Brady Diesel, Inc., Houma, LA
Bridge Terminal Services, New Orleans, LA
Bridon Elm Inc., Harahan, LA
Broussard Brothers, Inc., Abbeville, LA
Buchholz & Kuttruff Inc., New Orleans, LA
Buck Kreihs Co. Inc., New Orleans, LA
Bulk Material Transfer Inc., Arabi, LA
Burnside Terminal, Burnside, LA
Calabresi International Inc., New Orleans, LA
Canal Barge Co., Inc., New Orleans, LA
Capital Fleet, Inc/acadiana Marine, Baton Rouge, LA
Caro Produce & Institutional Foods, Harahan, LA
Celtic Marine Corp., Baton Rouge, LA
Cenac Towing, Inc., Houma, LA
Central Gulf Lines Inc., New Orleans, LA
Central Dispatch Custom Brokers & International Freight Central, New Orleans, La
Charles E. Broussard, Kaplan, LA
Chris S. Larsen Jr., Central Gulf Lines Inc., New Orleans, LA
Circle International Inc., St. Rose, LA
City of Abbeville, Abbeville, LA
Coastal Cargo Co. Inc., New Orleans, LA
Commodity Forwarders Inc., New Orleans, LA
Concorde Shipping Inc., Metairie, LA
Conrad Industries, Inc., Morgan City, LA
Consolidated Grain & Barge Co., Jeffersonville, IN
Container Enterprise, Chalmette, LA
Container Freight Station Inc., New Orleans, LA
Container-Care International Inc., New Orleans, LA
Continental Lands & Fur Co., New Orleans , LA
Cooper/T. Smith Corporation, New Orleans, LA

Copeland's Reprographics, New Orleans, LA
Cordell H. Haymon, Petroleum Service Corp., Baton Rouge, LA
Crescent River Port Pilots Assoc., Belle Chasse, LA
Crescent Towing Co., Inc., New Orleans, LA
Crescent Lock Co., Metairie, LA
Cross Offshore Corp, Belle Chasse, LA
CSX Transportation, Jacksonville, FL
Custom Fuel Services, Belle Chasse, LA
Dan-Gulf Shipping Inc., Metairie, LA
Daniel F. Young Inc., New Orleans, LA
Daniel Edgar, St. Mary Seafood, Franklin, LA,
Danzas Corp, St. Rose, LA
Darrow Fleeting & Switching, Darrow, LA
Dave Streiffer & Co., Inc., New Orleans, LA
De La Torre Forwarding Inc., New Orleans, LA
Delaware Marine Operators Inc., Port Allen, LA
Delta Petroleum Co., St. Rose, LA
Dependable International Services & Transport Inc., Metairie, LA
Devall Towing & Boat Service, Hackberry, LA
Dispatch Custom Brokers & International Freight Ceres Gulf Inc., New Orleans, LA
District 4 NMU/NEBA, New Orleans, LA
Diversified Foods Inc., New Orleans, LA
Dixie Carriers Inc., Harvey, LA
Dixie Machine Welding & Metal Works, New Orleans, LA
Dock Loaders & Unloaders of Freight Cars & Barges Local 854 ILA, New Orleans, La
Dow Chemical Company, Plaquemines, LA
Dray Clerks, Weighers, Samplers ILA Local 1655, New Orleans, LA
Duplantis Forwarding Co. Inc., Metairie, LA
Dynamic Ocean Services International Inc., New Orleans, LA
E.N. Bisso & Son Inc., New Orleans, LA
Eckstein Marine Service, Inc., Harahan, LA
Economy Iron Works Inc., New Orleans, LA
Electro Coal Transfer Corp, Davant, LA
Elmwood Drydock & Repair, Harvey, LA
Emery Customs Brokers, Kenner, LA
Emery Worldwide, a CF Co., Kenner, LA
Emmett I. Sindik, New Orleans, LA
Equipment Source, Mandeville, LA
Equitable Shipyard, New Orleans, LA
~~Ethel Bowman, Jennings, LA~~
Evans Industries Co., Inc., Harvey, LA
Foreign Relations Association, New Orleans, LA
Forrest Lines Inc., New Orleans, LA
Forwarders, Gretna, LA
Fritz Companies Inc., New Orleans, LA
Fryoux Tankerman Service, Destrehan, LA
Full Service Forwarders Inc., New Orleans, LA
G.A. Lotz Co., Ltd., New Orleans, LA
Gallagher Transfer & Storage Co., New Orleans, LA
GCI Forwarding Company Inc., Metairie, LA
General Longshore Workers, New Orleans, LA

Genesis Towing Corp, Harvey, LA
Geo. Wm. Rueff Inc., New Orleans, LA
George William Rueff Inc., New Orleans, LA
Gerald R. Boudreaux Freight Forwarders, Metairie, LA
Gilscot Forwarding Co., Inc., Metairie, LA
Global Ship Services, New Orleans, LA
Globalplex Bulk Handling, Reserve, LA
Greater Lafourche Port Commission, Galliano, LA
Greater New Orleans Barge Fleeting Association, Destrehan, LA
Greater Baton Rouge Port Comm, Port Allen, LA
Greater Krotz Springs, Krotz Springs, LA
Green Coffee Association of New Orleans, New Orleans, LA
Gretna Machine & Iron Works, Harvey, LA
Guardian Container Services Inc., New Orleans, LA
Guidry Brothers Towing Co., Inc., Galliano, LA
Gulf Marine & Industrial Supplies, New Orleans, LA
Gulf Transport & Forwarding, Gretna, LA
Gulf South Marine Transportation, New Orleans, LA
Gulf Continental Forwarding Co., New Orleans, LA
Gulf States Forwarding Inc., New Orleans, LA
Gulf Coast Dockside, Inc., New Orleans, LA
Gulf States Marine Terminal Inc., New Orleans and Arabi, LA
Gulf Intracoastal Canal Assoc., Lafayette, LA
Gulfcoast Transit Co., Tampa Fl
H.A. Gogarty Inc., New Orleans, LA
H.E. Schurig & Co. of Louisiana, Metairie, LA
H.S. Renshaw Inc., Metairie, LA
Hall-Buck Marine Inc., Burnside, LA
Hapag-Lloyd, New Orleans, LA
Harbor Towing & Fleeting, Inc., New Orleans, LA
Harvey Gulf International Marine, Harvey, LA
Higgins International Services Inc., New Orleans, LA
Hollywood Marine, Inc., Houston, TX
Hub City Terminals of New Orleans, Kenner, LA
I.T.O. Corp, New Orleans, LA
Illinois Central Railroad, New Orleans, LA
Ingram Barge Co., Nashville, TN
Ingram Towing Company, Inc., Belle Chase, LA
Insulations Inc., Harahan, LA
Intermare Agency Services Inc., Destrehan, LA
International Marine Carriers Inc., New Orleans, LA
International Marine Terminals, Port Sulphur, LA
International Export Packers of Louisiana, Kenner, LA
International Longshoreman's Association Local 2036, Chalmette, LA
International Freight Forwarders & Customs Brokers Assoc. of New Orleans, New Orleans, LA
International Specialists, New Orleans, LA
Intertrans Corp, New Orleans, LA
Intlcobal Inc., Gretna, LA
J.M. Duvic, Duvic's Pumps, Harvey, LA
J. Merrick Jones Jr., Canal Barge Company Inc., New Orleans, LA
J.H. Menge & Co., New Orleans, LA

J.M. Ortego Inc., Metairie, LA
J.S. Sareussen Marine Supplies Inc., New Orleans, LA
J.W. Allen & Co., Inc., New Orleans, LA
James Flanagan Shipping Corp, New Orleans, LA
Joe Stanfield, Osca, Geismar, LA
John W. Holt, Jr., Shreveport, LA
John W. Stone Oil Distributors, Gretna, LA
Joseph C. Domino Inc., Marrero, LA
Kansas Packing Co., New Orleans, LA
Kansas City Southern Railway, Metairie, LA
Karl Senner, Inc., Kenner, LA
Kelley & Abide Co., Inc., New Orleans, LA
KMA Enterprises Inc., Jefferson, LA
Korea House Inc., New Orleans, LA
Krennerich Shipping Co., Metairie, LA
L&L Oil Co., Inc., River Ridge, LA
Louisiana Intracoastal Seway Assoc., Lafayette, LA
Lacassagne's Inc., New Orleans, LA
Lafarge Corp, New Orleans, LA
Lamarco Inc., New Orleans, LA
Lanier & Associates, New Orleans, LA
Lebeouf Bros Towing Co., Houma, LA
Louisiana Dock Co., Harahan, LA
Louisiana Carriers, Cut off, LA
Louisiana Hispanic Chamber of Commerce Inc., Metairie, LA
Louisiana Shipbuilding & Repair Association, New Orleans, LA
Louisiana Dock Co., Harahan, LA
Lusk Shipping Co. Inc., New Orleans, LA
Lykes Bros Steamship Co. Inc., New Orleans, LA
M/G-T Services, Metairie, LA
M.G. Maher & Co., Inc., New Orleans, LA
Magnolia Forwarding Co. Inc., Kenner, LA
Main Iron Works, Inc., Houma, LA
Marine Engineers' Beneficial Association, New Orleans, LA
Marine Equipment Corp, Belle Chasse, LA
Marine Bunker Service Inc., Westwego, LA
Marine Inland Transportation Co., Marrero, LA
Marine Surveyors Guild, Metairie, LA
Marine Sales Inc., New Orleans, LA
Maritrend Inc., New Orleans, LA
McCandless Inc., New Orleans, LA
McCurnin Nautical Charts Co., Metairie, LA
McDonough Marine Service, New Orleans, LA
McKinney Towing, Inc., Baton Rouge, LA
Metropolitan Area Committee, New Orleans, LA
Metrovision Economic Development Partnership/The Chamber, New Orleans, LA
Miami Corporation, Lafayette, LA
Midland Enterprises, Ohio River, CO
Mike Hooks, Inc., Lake Charles, LA
Miss. Valley Coal Exporters Council, New Orleans, LA
Missionary Expediters, New Orleans, LA

Mississippi Valley Coal Trade and Transport Council, New Orleans, LA
Mittercon International Inc., New Orleans, LA
Morgan City Harbor & Terminal Dist, Morgan City, LA
Morton Salt Company, New Iberia, LA
National Marine Inc., New Orleans, LA
National Marine Inc., New Orleans, LA
Navios Ship Agencies, Inc., St Rose, LA
Neeb-Kearney & Co. Inc., New Orleans, LA
Neptune Supplies Inc., New Orleans, LA
New Orleans Steamship Assoc., New Orleans, LA
New Orleans-Baton Rouge, Steamship Pilots Association, Jefferson, LA
New Orleans Clerks & Checkers Union, ILA Local 1497, New Orleans, LA
New Orleans Public Belt Railroad, New Orleans, LA
New Orleans Board of Trade Inc., New Orleans, LA
New Orleans Marine Contractors, New Orleans, LA
Nicky's Container Yard Inc., New Orleans, LA
Norfolk Southern Corp, Houston, TX
Nunez Forwarding Co. of, LA, New Orleans, LA
Ocean Technical Services Inc., Harvey, LA
Oceanfreight Agencies Inc., Kenner, LA
Oceanmar Marine Supply Inc., New Orleans, LA
Old Time Enterprises, New Orleans, LA
Operators Intrnational Inc., Kenner, LA
Orgulf Transport, Cincinnati, OH
Otto Candies Inc., Des Allemands, LA
P.A. Menard, New Orleans, LA
PPG Industries, Chemical Division, Lake Charles, LA
Page & Jones Inc., Kenner, LA
Panalpina Inc., St. Rose, LA
Paul Gunther (USA) Inc., Glenview, IL
Pelican Marine Supply, Belle Chasse, LA
Philbin, Cazalas & St. John Inc., New Orleans, LA
Pike Shipping Co. Inc., Metairie, LA
Planning/Zoning Dir., Terrebonne Par, Houma, LA
Plaquemine Towing Corp, Sunshine, LA
Plimsoll Marine Inc., Darrow, LA
Point Landing Fuel Service, Avondale, LA
Port of New Orleans, New Orleans, LA
Port of West St Mary, Franklin, LA
Port of Iberia, New Iberia, LA
Port Partners Inc., New Orleans, LA
Port of Greater Baton Rouge, Port Allen, LA
Port Cargo Service Inc., New Orleans, LA
Ports & Waterways Institute, Louisiana State University, Baton Rouge, LA
Progressive Barge Line Inc., Westwego, LA
Propeller Club, Port of New Orleans, New Orleans, LA
Puerto Rico Marine Mgt. Inc., New Orleans, LA
Quast & Co. Inc., Metairie, LA
R.H. Keen & Co. Inc., Metairie, LA

R.W. Auerbach, The Cypremort Point Community, Franklin, LA
R.W. Smith & Co. Inc., New Orleans, LA
River Parishes Co. Inc., Lutcher, LA
River Rentals Stevedoring Inc., Metairie, LA
Riverland Resources Inc., Slidell, LA
Riverworks, New Orleans, LA
Robert W. Cisco, New Orleans, LA
Roy Supply Co. Inc., Harvey, LA
RV River Charters, New Orleans, LA
Ryan-Walsh Inc., New Orleans, LA
S. Jackson & Son Inc., New Orleans, LA
Sack-sewers, Sweepers, Waterboys & Coopers ILA Local 1802, New Orleans, LA
Salinas Forwarding Co. Inc., New Orleans, LA
Schenker International Inc., Kenner, LA
Schwartz Forwarding Co. Inc., New Orleans, LA
Scott Terminal & Stevedores Inc., New Orleans, LA
Sea-land Service Inc., New Orleans, LA,
Seafarer's International Union of North America, New Orleans, LA
Seariver Maritime, Inc., Baton Rouge, LA
Shinteaux Environmental Services Inc., Baton Rouge, LA
South Tangipahoa Parish Port Comm, Ponchatoula, LA
Southern U.s. Trade Association, New Orleans, LA
Southern Cargo Logistics Inc., Metairie, LA
Southern Pacific Transportation, Avondale, LA
Southern Forest Products Assoc., Kenner, LA
ST Services, Westwego, LA
St. John Brothers Inc., Kenner, LA
St. Mary Land & Exploration Co., Denver, CO
Stapp Towing Co. Inc., Dickson, TX
T. Baker Smith & Son, Houma, LA
T.L. James & Company, Inc., New Orleans, LA
T.T. Coatings Inc., Harahan, LA
Teamsters Local Union 270, New Orleans, LA
The Irwin Brown Co., New Orleans, LA
The Russell Marine Group, Belle Chasse, LA
The NOCS Group (New Orleans Cold Storage), New Orleans, LA
The Adherence Group, Chalmette, LA
The Irwin Brown Co., New Orleans, LA
The Cortney Co., Inc., New Orleans, LA
Thomas Trading & Transortation Co., New Orleans, LA
Tidewater Marine Inc., Harvey, LA
Traffic & Transportation Club of Greater New Orleans, New Orleans, LA
Trans Gulf Inc., New Orleans, LA
Transoceanic Shipping Co. Inc., Kenner, LA
Tri-world Marine & Environmental, New Orleans, LA
Trinity Marine Group - Equitable/Halter Division, New Orleans, LA
Trinity Marine Group, Gulfport, MS
Twin Brothers Marine Corporation, Morgan City, LA
Twinstar Leasing Ltd., Metairie, LA
Union Pacific Railroad, Avondale, LA
United Tugs Inc., Harvey, LA

Unitor Ship Service Inc., Harahan, LA
Vermillion Parish Police Jury, Abbeville, LA
W.R. Alger Co., Jefferson, LA
W.R. Zanes & Co., Inc., New Orleans, LA
W&O Supply Inc., Harahan, LA
Waldemar S. Nelson & Co., New Orleans, LA
Warrior & Gulf Navigation Co., Chickasaw, AL
Washing Well Laundryteria, New Orleans, LA
Waterfront Container Chasis Terminal Inc., New Orleans, LA
Waterman Steamship Lines, New Orleans, LA
Weber Marine Inc., Burnside, LA
West Calcasieu District, Sulphur, LA
Westfeldt Bros Forwarders Inc., Kenner, LA
Williams Inc., Patterson, LA
Wilson-Universal Transcontinental Corp, New Orleans, LA
World International Freight Forwarders Inc., New Orleans, LA
World Trade Center of New Orleans, New Orleans, LA
World Trade Club of Greater New Orleans, New Orleans, LA
Worldwide Transportation Services, New Orleans, LA
Worls Ship Supply Inc., New Orleans, LA
Xtra Lease Inc., New Orleans, LA

OTHER GROUPS AND INDIVIDUALS

Association of Louisiana Bass Clubs, Thibodaux, LA
Avoca, Inc., New Orleans, LA
Bicycle Awareness Committee of New Orleans, New Orleans, LA
Mr. H. J. Broussard, Jr., New Iberia, LA
Bywater Neighborhood Association, New Orleans, LA
McChord Carrica, Mandeville, LA
The Chamber, New Orleans and the River Region, New Orleans, LA
Coalition of Coastal Parishes, Mr. Steve Wilson, Thibodaux, LA
Coastal America, Director, Washington, DC
Coastal Environments, Inc., Baton Rouge, LA
Mr. R. W. Collins, Houma, LA
Concerned Citizens of Informed Choices, Slidell, LA
Conoco Inc., Houston, Tx
Continental Land and Fur Co., Inc., New Orleans, LA
Conrad Industries, Morgan City, LA
Entergy, Right-of-Way Div., New Orleans, LA
Fina-Laterre Oil Co., Houma, LA
J. H. Menge and Company, Mr. Buren Jones, New Orleans, LA
Gibbens and Blackwell, Attorneys at Law, New Iberia, LA
Mr. Robert D. Gorman, Thibodaux, LA
Governor's Advisory Council on Bicycling, New Orleans, LA
Gulf Intracoastal Canal Association, Mr. Vernon Behrhorst, Lafayette, LA
Lake Borgne Basin Levee District, Chalmette, LA
Lake Pontchartrain Sanitary District, New Orleans, LA
League of Women Voters, Baton Rouge, LA and Metairie, LA
Louisiana Farm Bureau, Baton Rouge, LA
Louisiana Land and Exploration Co., New Orleans, LA
Louisiana Landowners Assoc., Franklin, LA
Louisiana Nature Conservancy, Baton Rouge, LA

Louisiana Oyster Growers and Dealers Association, Mr. Mike Voisin, Houma, LA
Captain O.T. Melvin, Larose, LA
Midcontinental Oil and Gas Association, Baton Rouge, LA
Middle South Services, Inc., Environmental Affairs Section, New Orleans, LA
Montgomery Watson, St. Rose, LA
Monroe & Lemann, Mandeville, LA
New Orleans Board of Trade, New Orleans, LA
New Orleans Levee Board, New Orleans, LA
New Orleans Steamship Association, Mr. Channing F. Hayden, New Orleans, LA
Ninth Ward Civic Association, New Orleans, LA
Phillips Petroleum Company, Houston, TX
Pivach Agency, Mr. George Pivach, Jr., Belle Chasse, LA
Roy, Kiesel, and Tucker, Mr. Victor L. Roy, III, Baton Rouge, LA
Mr. Kerry Rodriguez, Plaquemine, LA
St. Bernard Sportsmen's League, Charles (Pete) Savoye, President, Chalmette, La
Shinteaux Environmental Services, Baton Rouge, LA
Mr. Stephen Smith, Houma, LA
South Central Planning and Development, Thibodaux, LA
Southern US Trade Association, New Orleans, LA
Swiftships, Inc., Morgan City, LA
T. Baker Smith and Son, Inc, Houma, LA
Tennessee Gas Pipeline, Houston, TX
H.J. Thibodaux, Thibodaux, LA
Thompson Marine Transport, Morgan City, LA
Mr. Freddie Trosclair, Jr., Cut Off, LA
Jay Vincent, Harvey, LA
Waldemar S. Nelson and Co., New Orleans, LA
Walk Haydel Association, New Orleans, LA
Williams, Inc., Patterson, LA
World Trade Center of New Orleans, New Orleans, LA

Section 6

FARMLAND PROTECTION POLICY ACT COORDINATION

SECTION 6
FARMLAND PROTECTION POLICY ACT COORDINATION

This section contains a letter from the U.S. Department of Agriculture, Natural Resources Conservation Service, and a Farmland Conversion Impact Rating form. The letter is in response to a request by the Corps of Engineers, New Orleans District for information about farmlands which may be impacted by alternatives under consideration. This coordination is required by the Farmland Protection Policy Act.

Note 1: Site A on the Farmland Protection Impact Rating form refers to the Violet site which was still under consideration at the time of coordination with the Natural Resources Conservation Service. Site B refers to the Inner Harbor Navigation Canal site.

Note 2: Coordination with the Natural Resources Conservation Service for the Inner Harbor Navigation Canal site did not include the graving site or the mitigation site. These sites are in Orleans Parish, which the Natural Resources Conservation Service has indicated does not contain lands covered under the Farmland Protection Policy Act.

Note 3: The name of the Soil Conservation Service was changed in 1994 to the Natural Resources Conservation Service.

United States Department of Agriculture

Soil Conservation Service

New Orleans Field Office
555 Goodhope Street
Norco, LA 70079

October 27, 1989

Mr. R. H. Schroeder, Jr.
Chief, Planning Division
US Army Corps of Engineer
POB 60267
New Orleans, LA 70160-0267

Dear Mr. Schroeder:

This is in response to your recent inquiry as to the Farmland Protection Policy Act on two sites the US Army Corps of Engineers is evaluating for replacing locks on the New Orleans Inner Harbor Navagation Canal.

Site A, which is located in St. Bernard Parish, is zoned I-2 according to Maurice Knight of the planning department. I-2 is heavy industrial. The soils in the area are prime farmland, but due to the zoning, it is taken out of the prime farmland category.

Site B is in Orleans Parish and Orleans Parish does not have prime farmland due to the urbanization of the parish.

Please find enclosed Form AD 1006 as you requested. If you are in need of any additional help, please feel free to call.

Sincerely,

Faye A. Talbot
District Conservationist

FAT:efs

enclosure

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request October 2, 1989
Name Of Project MRGO, New Lock and Connecting Channels	Federal Agency Involved U. S. Army Corps of Engineers
Proposed Land Use Navigation Lock and Channel	County And State Orleans and St. Bernard Parishes, LA
PART II *(To be completed by SCS)*	Date Request Received By SCS 10/10/89

Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply — do not complete additional parts of this form)*	Yes ☐	No ☑	Acres Irrigated	Average Farm Size
Major Crop(s)	Farmable Land In Govt. Jurisdiction Acres: %		Amount Of Farmland As Defined in FPPA Acres: %	
Name Of Land Evaluation System Used	Name Of Local Site Assessment System		Date Land Evaluation Returned By SCS	

PART III *(To be completed by Federal Agency)*		Alternative Site Rating Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly		1,247	92		
B. Total Acres To Be Converted Indirectly		4	0		
C. Total Acres In Site		1,251	92		
PART IV *(To be completed by SCS)* Land Evaluation Information					
A. Total Acres Prime And Unique Farmland					
B. Total Acres Statewide And Local Important Farmland					
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted					
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value					
PART V *(To be completed by SCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*					
PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points				
1. Area In Nonurban Use					
2. Perimeter In Nonurban Use					
3. Percent Of Site Being Farmed					
4. Protection Provided By State And Local Government					
5. Distance From Urban Builtup Area					
6. Distance To Urban Support Services					
7. Size Of Present Farm Unit Compared To Average					
8. Creation Of Nonfarmable Farmland					
9. Availability Of Farm Support Services					
10. On-Farm Investments					
11. Effects Of Conversion On Farm Support Services					
12. Compatibility With Existing Agricultural Use					
TOTAL SITE ASSESSMENT POINTS	160				
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100				
Total Site Assessment *(From Part VI above or a local site assessment)*	160				
TOTAL POINTS *(Total of above 2 lines)*	260				

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes ☐ No ☐

Reason For Selection:

(See Instructions on reverse side) Form AD-1006 (10-83)

ENCLOSURE 1

Section 7

AIR QUALITY

SECTION 7
AIR QUALITY

This section contains three components: 1.) tables showing the amount of volatile organic compound (VOC) emissions from construction equipment needed to build the proposed project; 2.) tables showing ambient air quality data collected at stations in Orleans and St. Bernard Parishes, Louisiana; and 3.) a table showing the National Ambient Air Quality Standards.

The following information will assist in understanding the tables on VOC emissions:

1. The tables were developed information contained in the cost estimates for the lock construction alternatives.

2. The tables show emissions from equipment that would be used for multiple construction contracts. The totals from the two tables must be added together to obtain the maximum total annual emission from project construction.

3. The first table lists equipment to be used for lock construction, levees, floodwalls, and channels. This work would occur over a 4-year period. To obtain an average annual amount of emissions, the total number of hours each type of equipment would be on site is divided by 4. The total hours on site is the number of work hours, which would be 8 to 10 hours for most types of equipment per work day.

4. The second table lists the equipment required for relocations and bridge work during any typical year of project construction.

5. The two tables are subdivided by equipment horsepower (hp) Diesel powered equipment with <600hp have a different emission factor than those with >600 hp.

6. The multiplying factor for time is necessary to compensate for equipment non-use during worker break and lunch time, equipment maintenance time, and non-use time. The 0.83 time factor is simply the assumption that, on average, equipment would be used about 50 minutes out of each work day hour.

7. The multiplying factor for hp is necessary because the equipment would be used at only a percentage of its rated horsepower. Emissions would be less than for equipment run at their full throttle rating.

8. Annual horsepower hours are obtained by multiplying the hours on site, times the hp, times the time factor, times the hp factor. The annual horsepower hours are multiplied by the emission factors to obtain tons of VOC emissions.

IHNC New Lock / VOC Emissions
Feature: Lock Structure, Levees, Floodwalls, and Channels
Project Year: 4-year period of intensive construction

Units	Equipment Item (**Equipment <600hp**)	Total Hours On Site 4-years	Hours/ Year On Site	Fuel Type Gas	Fuel Type Dsel	hp	Multiplying Factor Time	Multiplying Factor % hp	Annual hp hours
3	Manitowoc 4100	21,600	5,400		D	360	0.83	0.50	806,760
1	Pile Hammer/Compressor 2150cfm	3,600	900		D	456	0.83	0.65	221,411
1	S-90 Hydro Hammer	2,000	500		D	185	0.83	0.65	49,904
3	American 7225	10,800	2,700		D	213	0.83	0.50	238,667
3	Truck Crane, 45 ton	10,800	2,700		D	177	0.83	0.50	198,329
2	Air Compressor, 950cfm	14,400	3,600		D	260	0.83	0.65	504,972
1	Derrick Crane, 700 ton	1,000	250		D	500	0.83	0.50	51,875
3	Concrete Pump Truck	6,000	1,500		D	300	0.83	0.30	112,050
2	Hydraulic Excavator Cat 245	1,000	250		D	360	0.83	0.70	52,290
2	Hydraulic Excavator Cat 235	1,000	250		D	250	0.83	0.70	36,313
2	Dozer, Cat D-6	7,200	1,800		D	165	0.83	0.70	172,557
2	Dozer, Cat D-5	7,200	1,800		D	120	0.83	0.70	125,496
2	Dozer, Cat D-4	7,200	1,800		D	95	0.83	0.70	99,351
1	Motor Grader, Cat 12G	7,200	1,800		D	135	0.83	0.70	141,183
2	Front-end Loader, Cat 950	7,200	1,800		D	160	0.83	0.70	167,328
3	Tractor, JD 2355	5,400	1,350		D	65	0.83	0.70	50,983
12	Trucks, Dump	43,200	10,800		D	250	0.83	0.30	672,300
10	Trucks, Pickup	72,000	18,000	G		150	0.83	0.30	672,300
1	Asphalt Paver	1,000	250		D	120	0.83	0.70	17,430
1	Asphalt Distributor	1,000	250		D	50	0.83	0.70	7,263
1	Asphalt Sweeper	1,000	250		D	76	0.83	0.70	11,039
2	Asphalt Drum Roller	2,000	500		D	80	0.83	0.70	23,240
10	Concrete Trucks	7,000	1,750		D	200	0.83	0.30	87,150
2	Sheepsfoot Roller	1,000	250		D	210	0.83	0.70	30,503
6	Trucks, flatbed trailer	24,000	6,000		D	200	0.83	0.30	298,800
12	Generators, Misc. A	21,600	5,400		D	200	0.83	0.65	582,660
12	Generators, Misc. B	21,600	5,400	G		20	0.83	0.65	58,266
2	Draglines, Northwest 70	3,600	900		D	238	0.83	0.70	124,450
	TOTAL GASOLINE (hp hours)								730,566
	TOTAL DIESEL (hp hours)								4,884,301

Emission Factors	Gas	Diesel
Exhaust	0.015	0.00247
Evaporation	0.00066	0
Crankcase	0.00485	0.0000441
Refueling	0.00108	0
Total	0.02159	0.0025141

Emissions	
Tons (gas)	7.9
Tons (diesel)	6.1
Emissions Subtotal (Tons)	**14.0**

Units	Equipment Item (**Equipment >600hp**)	Total Hours On Site 4-years	Hours/ Year On Site	Fuel Type Gas	Fuel Type Dsel	hp	Multiplying Factor Time	Multiplying Factor % hp	Annual hp hours
3	Tugboats	12,960	3,240		D	2,000	0.83	0.70	3,764,880
2	Tugboats	17,280	4,320		D	1,200	0.83	0.70	3,011,904
4	Manitowoc 4600	14,400	3,600		D	685	0.83	0.50	1,023,390
1	Hydraulic Dredge & Plant	7,200	1,800		D	4,500	0.83	0.70	4,706,100
	TOTAL DIESEL (hp hours)								12,506,274

Emission Factor from Table 3.4-2 0.000728

Emissions Subtotal (Tons) **4.6**

Total (Tons) **18.6**

IHNC New Lock / VOC Emissions
Feature: Relocations and Bridges
Project Year: Any Typical Year

Units	Equipment Item	Total Hours On Site	Fuel Type Gas	Fuel Type Dsel	hp	Multiplying Factor Time	Multiplying Factor % hp	Annual hp hours
1	Manitowoc 4100	3,600		D	360	0.83	0.50	537,840
2	American 7225	7,200		D	213	0.83	0.50	636,444
1	S-90 Hydro Hammer	3,600		D	185	0.83	0.65	359,307
10	Trucks, Misc	36,000		D	200	0.83	0.30	1,792,800
4	Asphalt Equipment	14,400		D	100	0.83	0.70	836,640
4	Hydraulic Excavator Cat 235	14,400		D	250	0.83	0.70	2,091,600
2	Air Compressor	7,200		D	260	0.83	0.65	1,009,944
10	Concrete Trucks	36,000		D	200	0.83	0.30	1,792,800
2	Dozer, Cat D-6	7,200		D	120	0.83	0.70	501,984
2	Dozer, Cat D-4	7,200		D	95	0.83	0.70	397,404
3	Loader/Backhoe JD 710	10,800		D	100	0.83	0.70	627,480
1	Truck Crane, 45 ton	3,600		D	177	0.83	0.50	264,438
2	Sheepsfoot Roller	7,200		D	210	0.83	0.70	878,472
5	Generators, Misc.	18,000	G		20	0.83	0.65	194,220
1	Front-end Loader, Cat 950	3,600		D	160	0.83	0.70	334,656
5	Trucks, Pickup	18,000	G		150	0.83	0.30	672,300
	TOTAL GASOLINE (hp hours)							866,520
	TOTAL DIESEL (hp hours)							12,061,809

Emission Factors	Gas	Diesel		
Exhaust	0.015	0.00247		
Evaporation	0.00066	0	Emissions	
Crankcase	0.00485	0.0000441	Tons (gas)	9.4
Refueling	0.00108	0	Tons (diesel)	15.2
Total	0.02159	0.0025141	**Emission Subtotal (Tons)**	**24.5**

Units	Equipment Item (Equipment >600hp)	Total Hours On Site	Fuel Type Gas	Fuel Type Dsel	hp	Multiplying Factor Time	Multiplying Factor % hp	Annual hp hours
1	Hydraulic Dredge & Plant	3,600		D	4,500	0.83	0.70	9,412,200
4	Manitowoc 4600	7,200		D	685	0.83	0.50	2,046,780
2	Tugboats	14,400		D	1,200	0.83	0.70	10,039,680
	TOTAL DIESEL (hp hours)							21,498,660

Emission Factor from Table 3.4-2 **0.000728**

Emissions Subtotal (Tons) 7.8

Total (Tons) 32.3

AMBIENT AIR QUALITY DATA

Carbon Monoxide

Location: New Orleans City Park

Year	Max. ppm (1 hour)	2nd Max. ppm (1 hour)	Number of Values > Primary Standard	Max. ppm (8 hour)
1986	7.9	7.5	0	6.0
1987	9.1	9.0	0	6.9
1988	10.7	9.6	0	6.5
1989	9.3	8.4	0	6.9
1990	7.0	7.0	0	6.0
1991	6.0	6.0	0	4.3
1992	8.0	7.0	0	6.1
1993	16.0	8.0	0	6.1
1994	6.0	6.0	0	5.0
1995	5.0	4.0	0	3.3

Location: Tulane Medical Center (New Orleans)

Year	Max. ppm (1 hour)	2nd Max. ppm (1 hour)	Number of Values > Primary Standard	Max. ppm (8 hour)
1986	14.8	12.6	0	7.7
1987	14.6	10.7	0	8.1
1988	11.9	11.9	0	7.1
1989	15.8	12.8	0	7.9
1990	10.8	10.3	0	6.2
1991	8.6	8.5	0	4.4
1992	11.0	10.0	0	5.3
1993	11.0	11.0	0	5.1
1994	10.0	9.0	0	6.4
1995	10.0	8.0	0	4.3

Nitrogen Dioxide

Location: New Orleans City Park

Year	Max. ppm (1 hour)	Annual Mean ppm	Number of Times > Primary Standard
1986	0.102	0.025	
1987	0.133	0.026	0
1988	0.097	0.024	0
1989	0.086	0.022	
1990	0.086	0.020	0
1991	0.102	0.019	0
1992	0.088	0.023	0
1993	0.080	0.019	0
1994	0.085	0.020	0
1995	0.074	0.021	0

AMBIENT AIR QUALITY DATA
(Continued)

Ozone

Location: New Orleans City Park

Year	Highest Daily Max. ppm	2nd Highest Daily Max. ppm	Number Days > Standard	Number Hours > Standard
1986	0.117	0.103	0	0
1987	0.110	0.108	0	0
1988	0.110	0.108	0	0
1989	0.116	0.108	0	0
1990	0.101	0.095	0	0
1991	0.108	0.090	0	0
1992	0.104	0.093	0	0
1993	0.095	0.094	0	0
1994	0.124	0.104	0	0
1995	0.101	0.098	0	0
Location:	Arabi, Louisiana (St. Bernard Parish)			
1986	0.109	0.108	0	0
1987	0.109	0.108	0	0
1988	0.110	0.104	0	0
1989	0.095	0.091	0	0
1990	0.118	0.107	0	0
1991	0.109	0.099	0	0
1992	0.115	0.104	0	0
1993	0.124	0.110	0	0
1994	0.120	0.118	0	0
1995	0.095	0.093	0	0

Sulfur Dioxide

Location: Arabi (St. Bernard Parish)

Year	Max. ppm (1 hour)	Max. ppm (24 hour)	Annual Arithmetic Mean	Number of Times > Primary Standard
1986	0.085	0.032	0.004	0
1987	0.066	0.018	0.003	0
1988	0.115	0.021	0.003	0
1989	0.058	0.019	0.003	0
1990	0.092	0.015	0.003	0
1991	0.130	0.045	0.005	0
1992	0.108	0.043	0.005	0
1993	0.126	0.027	0.006	0
1994	0.206	0.036	0.008	0
1995	0.116	0.032	0.007	0

AMBIENT AIR QUALITY DATA
(Continued)

Total Suspended Particulate

Location: Mew Orleans Civil Courts Building

Year	Maximum ug/m^3 24 hrs	2nd Maximum	Annual Geometric Mean
1986	90	82	45
1987	107	100	53
1988	86	80	47
1989	93	78	47
1990	68	66	39
1991	113	106	41
1992	130	89	41
1993	104	82	41
1994	80	76	76
1995	82	81	81
Location:	New Orleans Water Treatment Plant		
1986	176	154	58
1987	214	154	62
1988	105	99	49
1989	107	83	48
1990	112	90	45
1991	110	99	44
1992	137	105	47
1993	114	93	42
1994	94	90	48
1995	192	105	49

Particulate Matter 10 Micron

Location: New Orleans Water Purification Plant

Year	Maximum ug/m^3	2nd Max. ug/m^3	Annual Mean	Annual Mean > Std.
1986	74	66	34	No
1987	76	71	32	No
1988	57	47	37	No
1989	68	58	31	No
1990	75	54	27	No
1991	59	52	26	No
1992	72	52	27	No
1993	85	54	25	No
1994	53	50	25	No
1995	55	50	24	No

AMBIENT AIR QUALITY DATA
(Continued)

<u>Lead</u> Location: New Orleans Water Purification Plant

Year	Qtr. #	Qtr. Max. ug/m	Qtr. Mean	Number of Values > Primary Standard
1986	1	0.10	0.09	0
	2	0.11	0.10	0
	3	0.17	0.13	0
	4	0.12	0.09	0
1987	1	0.10	0.09	0
	2	0.09	0.09	0
	3	0.10	0.09	0
	4	0.09	0.09	0
1988	1	0.09	0.09	0
	2	0.10	0.09	0
	3	0.10	0.10	0
	4	0.14	0.10	0
1989	1	0.10	0.09	0
	2	0.09	0.07	0
	3	0.05	0.03	0
	4	0.08	0.03	0
1990	1	0.04	0.02	0
	2	0.17	0.05	0
	3	0.03	0.02	0
	4	0.08	0.03	0
1991	1	0.04	0.02	0
	2	0.17	0.03	0
	3	0.03	0.02	0
	4	0.04	0.02	0
1992	1	0.20	0.03	0
	2	0.07	0.02	0
	3	0.05	0.03	0
	4	0.06	0.03	0
1993	1	0.03	0.02	0
	2	0.04	0.01	0
	3	0.03	0.02	0
	4	0.04	0.02	0

Location: New Orleans City Park (Established 3rd qtr. 1994)

1994	3	0.02	0.01
	4	0.04	0.02
1995	1	0.02	0.01
	~~2~~	~~0.11~~	~~0.03~~
	3	0.10	0.03
	4	0.04	0.02

LOUISIANA AMBIENT AIR QUALITY STANDARDS

POLLUTANT	PRIMARY STANDARD[1]	SECONDARY STANDARD[2]
CARBON MONOXIDE		
Maximum 8 hr.	9 ppm	9 ppm
Maximum 1 hr.	35 ppm	
NITROGEN DIOXIDE		
Annual arithmetic mean	0.053 ppm or 100 ug/m^3	
OZONE		
Daily maximum 1 hr.	0.12 ppm or 235 ug/m^3	0.12 ppm or 235 ug/m^3
SULFUR DIOXIDE		
Maximum 24 hr.	0.14 ppm or 365 ug/m^3	
Maximum 3 hr.		0.50 ppm or 1300 ug/m^3
Annual arithmetic mean	0.03 ppm or 80 ug/m^3	
PARTICULATE MATTER 10 MICRON		
Maximum 24 hr.	150 ug/m^3	
Annual arithmetic mean	50 ug/m^3	
LEAD		
Maximum quarterly arithmetic mean	1.5 ug/m^3	

ug/m^3 - micrograms per cubic meter
ppm - parts per million

[1] Primary ambient air quality standards define levels of air quality which the Administrator of the Environmental Protection Agency judges to be necessary, with an adequate margin of safety, to protect the public health.

[2] Secondary ambient air quality standards define levels of air quality which the administrator of the Environmental Protection Agency judges to be necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

Section 8

NOISE IMPACT RATING

SECTION 8
NOISE IMPACT RATING

Introduction

Noise can be defined as unwanted sound which interferes with normal activities such as sleeping, conversation, or recreation, or which causes actual physical harm such as hearing loss, or which adversely impacts mental health (U.S. Department of Housing and Urban Development, 1985). Two types of noise are present in the community, ambient noise and point specific noise. The chief contributors to ambient (or background, or community) noise are the various transportation modes which operate in the community.

The dynamics of noise are based on the source of noise (generator), and the receiver (person or place), and the path noise follows from source to receiver. Sound in general has three primary characteristics. These are amplitude, frequency, and time pattern. Amplitude, which is perceived as loudness, is the measure of the difference between atmospheric pressure with no sound present and the total pressure with sound present. The unit of sound amplitude is the decibel (dB). The decibel scale is logarithmic rather than linear because the range of sound intensities is so great that convenient measurement requires compression of the scale (Environmental Protection Agency, 1978). Sound frequency is the rate at which a sound source vibrates or makes air vibrate. The term Hertz (Hz) is used to designate the number of cycles per second. The human ear appears to respond better to frequencies in the 500Hz to 8,000Hz. Sound has a temporal nature or characteristic which may be described in terms of its pattern of time and level: continuity, fluctuation, impulsiveness, and intermittency.

In the assessment used for this study, sound or noise measurements are expressed in terms of the day-night sound level (DNL) and expressed mathematically (in decibels) as Ldn. Thus, 50 Ldn means a day-night sound level of 50 decibels (dB). The expression DNL is defined as the A-weighted equivalent sound level for a 24-hour period with 10 decibels added for nighttime sounds (10:00 p.m.-7:00 a.m.). The day-night sound level is used to characterize average sound levels in residential areas throughout the day and night. The A-weighted sound level is the momentary magnitude of sound weighted to approximate the human ear's frequency sensitivity, which is better in the 500Hz to 8,000 Hz range. The DNL sound level includes a 10 dB penalty because people are more disturbed by noise at night.

In evaluating noise impacts, the U.S. Department of Housing and Urban Development (HUD) has set down noise standards to be used in evaluating new housing construction assisted or supported by

HUD financing. These standards are as follows:

- 65 Ldn or less is judged acceptable;
- >65 Ldn but not >75 Ldn is judged to be normally unacceptable. HUD participation in the project requires the incorporation of sound attenuation measures in the design of the project; and,
- >75 Ldn is judged unacceptable.

Although HUD participation in this project is not anticipated, noise impacts here are appropriately evaluated utilizing HUD standards.

Pile Driving Equipment Noise Estimate

Sound decibel estimates for pile driving equipment was estimated from data collected by a major New Orleans construction company in March 1989. Utilizing sound dosimeters, noise readings were taken at the following points:

- At the pile driver (ground level);
- At 100 feet from the pile driver;
- At 350 feet from the pile driver (line of sight, but at a closed window in a nearby building).

The recorded sound levels for these locations were 100 dB, 55 dB, and 43 dB, respectively. Each of these noise measurements were converted to the corresponding DNL to measure average 24-hour noise exposure. The conversion equation is as follows:

Ldn = 10log10 1/24 [td X 10(Ld/10) + tn X 10 (Ln + 10)/10], where td = hours of daytime activity and tn = hours of nighttime activity.

In this equation, a 24-hour period is represented by 1/24. Although no pile driving activity would take place at night, the nighttime sound level (Ln) was increased by 10 dB in order to take into consideration the increased annoyance level of sound or noise at night and to build the worst case scenario. The ambient noise level, both day and night, was taken as 60 dB. An 8dB penalty was added to the actual noise reading to compensate for the annoyance created by loud impulsive noise.

Based on these considerations, the derived DNLs for the distances at which readings were taken are 120 Ldn, 69 Ldn, and 68 Ldn, respectively. It is understood that these levels represent a worst case scenario in terms of pile driving activity. Under this scenario, after application of a curve fitting technique to the known data points, the 75 Ldn contour would fall approximately 80 feet from the pile driver and the 65 Ldn contour could be expected to fall approximately 450 feet from the pile driver.

Literature Cited

U.S. Department of Housing and Urban Development. 1985. The Noise Guidebook. Office of Environment and Energy, Environmental Planning Division. Washington, D.C.

U.S. Environmental Protection Agency. 1978. Protective Noise Levels: Condensed Version of EPA Levels Document. Office of Noise Abatement and Control. Washington, D.C.

Section 9

SCOPING DOCUMENT

SECTION 9
SCOPING DOCUMENT

This section contains the scoping document which summaries responses received to the scoping input request. The scoping input request, which was mailed to 595 persons, agencies, and other interested parties, is also included.

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF:

August 1, 1988

Planning Division
Environmental Analysis Branch

To All Scoping Participants

Nineteen letters were received in response to the Scoping Input Request for the Draft Evaluation Report and Environmental Impact Statement for the Mississippi River - Gulf Outlet, New Lock and Connecting Channels. A scoping document is attached which summarizes the comments received. Copies of the letters are available upon request.

When the draft EIS is filed with the Environmental Protection Agency, you will receive either a copy of the EIS or a Notice of Availability informing you how to obtain copies or have access to them. You will also be notified of the comment period and of the date and location of the public hearings on the EIS.

Thank you for taking the time to comment.

R. H. Schroeder, Jr.

R. H. Schroeder, Jr.
Acting Chief, Planning Division

Attachment

SCOPING DOCUMENT

DRAFT EVALUATION REPORT AND ENVIRONMENTAL IMPACT STATEMENT
MISSISSIPPI RIVER - GULF OUTLET
NEW LOCK AND CONNECTING CHANNELS

Introduction

Scoping is a part of the Environmental Impact Statement (EIS) process that provides for early agency and public input and identification of major concerns to be addressed in the document. Over 500 Scoping Input Requests were mailed on June 6, 1988, to federal, state, parish, and local agencies and officials, as well as libraries, radio stations, newspapers, businesses, environmental groups, and private individuals. Following a 30-day comment period, nineteen comment letters were received, and copies of these letters are included.

Summary of Scoping Comments

Comment letters were of three types: those with statements applicable to both proposed alternative sites (Inner Harbor Navigation Canal (IHNC) and Violet site) and those applicable solely to either the IHNC site or the Violet site.

Comments Pertinent To Both Alternative Sites

- City of New Orleans would provide input prior to elimination of any alternative.

- A larger lock (1200 X 150 X 50 ft) needed.

- Consideration of existing and proposed roadways and maintaining traffic at all times (I-10, US 90, at IHNC; LA 46 and LA 39 at Violet site).

- Coordination with State Historic Preservation Officer (SHPO).

- Complete mitigation for negative project impacts (IHNC site - restore neighborhood to better conditions than before project; Violet site - fully offset environmental losses of habitat, fish and wildlife productivity, and recreation).

- Effects of new channel construction and the proposed project on marsh erosion in the area.

- Conformity of project to state and local water quality management programs and standards.

- Discussion of cost/benefit analyses and analyses of unquantifiable environmental impacts, values and amenities.

- Discussion of impacts of project on groundwater, air quality, wetlands, endangered/threatened species or their habitat, historic preservation and recreation.

- Provide habitat maps and descriptions of associated biological communities and their importance to fish, wildlife, and recreation.

- Determine nature of shipping to be accommodated by the proposed lock as well as the single most economical and environmentally sound choice of navigation route (and hence lock site) to the Gulf rather than maintaining 2 major navigation routes.

IHNC Site

- Consider impacts of increased vehicular traffic, noise and air pollution, litter, ground vibration, roadway deterioration, and possible increased transportation of hazardous materials on historic Bywater neighborhood.

Violet Site

- Assess changes in hydrology due to canal dredging and spoil deposition.

- Assess cumulative impacts of habitat loss and degradation of marine resource production as well as project effects on federally managed fisheries such as shrimp and red drum.

- Consider economic impact to local businesses of division of parish by the lock

- Opposition to this site alternative voiced by the Regional Planning Commission; State of Louisiana House of Representatives, District 103 representative, as well as several private citizens.

Responses to the Scoping Input Request were received from the following:

Federal

National Marine Fisheries Service
National Park Service
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

State

Louisiana Department of Transportation and Development

State (cont'd)

Kenneth L. Odinet
State of Louisiana
House of Representatives
District 103

Sherman W. Copelin, Jr.
State of Louisiana
House of Representatives
District 99

Local

Bywater Neighborhood Association
City of New Orleans
Regional Planning Commission of Jefferson, Orleans,
St. Bernard, and St. Tammany Parish

Private

American Commercial Barge Line Company
Val J. Dauterive and Son, Inc.
Mrs. Laurentine Ernst
Oliver A. Houck
Aveta and Junius Louis
New Orleans Steamship Association
Mrs. Val Springer

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO ATTENTION OF:

June 6, 1988

Planning Division
Environmental Analysis Branch

SCOPING INPUT REQUEST

DRAFT EVALUATION REPORT AND ENVIRONMENTAL IMPACT STATEMENT
MISSISSIPPI RIVER - GULF OUTLET
NEW LOCK AND CONNECTING CHANNELS
NEW ORLEANS, LOUISIANA

INTRODUCTION

The U.S. Army Corps of Engineers, New Orleans District, is initiating the preparation of a Draft Evaluation Report/ Environmental Impact Statement (EIS) for the above described project. Your input concerning significant issues, impacts, and alternatives to be examined is requested.

BACKGROUND

The existing lock on the Inner Harbor Navigation Canal (IHNC) also known as the Industrial Canal, was put into operation in 1923 (see Figure 1). Initial concern for the replacement of the lock began in the 1950's. The Mississippi River - Gulf Outlet (MRGO) was authorized by PL 84-455 (the River and Harbor Act of 1956), was put into service in July 1963, and was fully completed in June 1968. PL 84-455 also provided, ". . .that when economically justified by obsolescence of the existing Industrial Canal lock or by increased traffic, replacement of the existing lock or an additional lock with suitable connections is hereby approved to be constructed in the vicinity of Meraux, Louisiana, with type, dimensions, and cost estimates to be approved by the Chief of Engineers . . . ." Section 186 of PL 94-587 (the Water Resources Development Act of 1976) amended PL 84-455, making the construction of bridge relocations a Federal responsibility (not to exceed a cost of $71,500,000).

The initial public meeting regarding the replacement of the existing lock was held on February 1, 1960. Varied opinions were expressed regarding the proposed locations under consideration for the lock. Two public meetings to discuss alternative plans and present the plan tentatively selected were held in late 1972: one in New Orleans on November 29, and the other in Chalmette (St. Bernard Parish) on December 10-11. Both extensive project support and opposition were voiced at these meetings. In 1975, the Chief of Engineers approved a tentative plan to construct a lock in St. Bernard Parish. However, President Carter in April 1977 in his message to Congress concerning the 1978 budget recommended that:

> "The project should be modified to eliminate consideration of the new channel location. Further study should be carried out to determine whether repair or replacement is needed of the existing lock at the existing site. If replacement and expansions are deemed necessary, special care should be taken to minimize dislocation and disruption of residents near the site."

Subsequently, a public meeting soliciting community feedback was held on May 2, 1978, by the Board of Commissioners for the Port of New Orleans. Planning for a new lock was suspended in late 1982. Legislative guidance regarding replacement or expansion of the existing lock was included in PL 99-662 (the Water Resources Development Act of 1986). Section 844 of PL 99-662 modified PL 84-455 "to provide that the replacement and expansion of the existing industrial canal lock and connecting channels or the construction of an additional lock and connecting channel shall be in the area of the existing lock or at the Violet site."

ALTERNATIVES

The alternatives under consideration for the project are those described in PL 99-662 as stated above. These include: (a) replacement or expansion of the existing Industrial Canal lock and connecting channels at the existing lock site, (b) construction of an additional lock and connecting channels in the area of the existing lock and (c) construction of an additional lock and connecting channels near Violet in St. Bernard Parish. Alternative lock sizes at the two locations will be compared to the No-Action alternative. The lock sizes would vary from a small shallow draft lock (75' wide x 640' long x 21' deep) to a large deep draft lock (150' wide x 1200' long x 50' deep) with construction times estimated from 5 years to 10 years.

SIGNIFICANT RESOURCES

Significant resources in the project area include those identified by legislative, institutional, or public concerns. A tentative list of significant resources included in the proposed outline of the EIS is attached.

IMPACTS

Impacts of project alternatives can be grouped under the general categories of economic, social, and ecological. On balance, replacement of the lock at either site is expected to generate positive economic impacts. Specific negative impacts at the IHNC site would probably include industrial and residential relocations, job dislocations, temporary changes in traffic patterns, temporary noise and dust problems, and other similar impacts associated with major construction projects. These impacts would be substantially less at the Violet site. Replacement at either site would be expected to generate considerable construction employment and income. There is potential for impacts to historic and prehistoric properties at both sites. Adverse ecological impacts would be significant at the Violet site but minor at the existing site.

PUBLIC INVOLVEMENT PROGRAM

Responses to this request will provide the basis for a continued public involvement program. Representatives from the Corps of Engineers will coordinate and schedule meetings for the various interests (neighborhood, business, environmental, etc.). Respondents will be invited to attend the meetings or workshops pertaining to their respective interest. These meetings will serve as a forum for organizations and individuals to voice their opinions and concerns. These meetings will also provide additional feedback to be used in reaching a decision on the type and location of lock facility or facilities to be recommended. At the appropriate time in the study process, a formal public meeting will be scheduled to present the tentatively selected plan.

ACTION REQUESTED

Interested individuals, organizations, or representatives of interested agencies are requested to provide specific comments or suggestions regarding alternatives, significant issues (including whether or not an item is significant), and assessment of impacts. Pertinent comments received and issues brought forth will be addressed in the EIS, thereby eliminating the need for excessive reassessment after public review of the draft report and EIS. Interested parties are requested to provide comments postmarked no later than 30 days from the date of this notice so that their concerns can receive full consideration. Please address all correspondence to Chief, Planning Division. If you would like further information regarding preparation of the EIS, please contact Mr. Bill Wilson, CELMN-PD-RE, U.S. Army Engineer District New Orleans, P.O. Box 60267, New Orleans, Louisiana 70160-0267. Mr. Wilson can be contacted at (504) 862-2527.

Cletis R. Wagahoff
Chief, Planning Division

Enclosure

SECTION 10

FISH AND WILDLIFE MITIGATION PLAN

SECTION 10
FISH AND WILDLIFE MITIGATION PLAN

Impact Site

EXISTING CONDITION - IMPACT (GRAVING) SITE

The graving site designated for construction of the lock modules would adversely affect freshwater wetlands which have value as fish and wildlife habitat. The general area within which the graving site would be located consists of wetlands bounded by a developed area and roadways on the north, Paris Road on the east, the MRGO/GIWW on the south, and filled, commercial land on the west (Figure 1). Historic photographs show that the area was once cleared and drained, but has since reverted to a wetland condition. Remains of a pumping facility in the southwestern corner of the area provides further evidence that the area once drained.

The graving site and associated staging, stockpile, and parking areas would be restricted to 25 acres. The graving site and associated work areas would be isolated from adjacent wetlands with low-level dikes or by mandatory no-draining restrictions on the contractor. Although the area needed for lock module construction and associated staging and material stockpile would be much less than the entire graving site, secondary impacts would occur would occur over the entire site. These secondary impacts would include disturbance of wildlife, especially wading birds and waterfowl. Although not documented, some species of wading birds may nest within the graving site.

The overall wetland area containing the graving site is 103 acres. In addition, the graving site would affect about 900 feet of hurricane protection levee and a narrow strip of brackish marsh along the bank of the MRGO approximately 900 feet long. Habitats within the overall area of the graving site include wet forest, freshwater marsh, and shallow fresh water areas with floating aquatic vegetation.

The wooded portion of the area is dominated by trees which have a tolerance for very wet soils. Woods comprise about 37 acres. The most common trees composing the canopy are black willow, Chinese tallow, and red maple. Species scattered throughout the wooded area include swamp bay and cypress. Other species, found mainly along the eastern fringe of the area include water oak, sweetgum, honey locust, sugarberry, white mulberry, and live oak (one). Under-story species include buttonbush, wax myrtle, swamp bay, palmetto, and trumpet creeper.

The freshwater marsh is mostly floating on the remains of dead plants. This is called "flotant marsh" in southern Louisiana. The primary species here are yellow nutsedge, bagscale, camphor weed, and buttonbush. This type of marsh never becomes completely dried-out, nor does it become completely inundated, since the vegetation floats up and down with varying water levels. This habitat type comprises about 16 acres

The open water areas within the graving site are typically about one-half to one-foot deep. A system of shallow, ill-defined canals runs through the graving site. Although probably never very deep, these canals are now only 2 to 3 feet deep. A large amount of tree trunks, stumps, limbs, and branches are scattered throughout the open water area, including the canals. This organic debris is likely the leftover remains of woods which occupied the site during a time when it was drained by pumps. Floating vegetation in the open water is dominated by frogbit, with mosquito fern, greater duckweed, and water meal also present. The floating vegetation covers about 90 percent of the open water during the growing season. The open water area includes about 50 acres.

A variety of wildlife species were observed in the wetland during field investigations in 1996. Wildlife included great blue heron, great egret, green heron, white ibis, black crowned night heron (possibly nesting), alligator, frogs, mosquitofish or least killifish, snowy egret, tri-colored egret, little blue heron, glossy ibis, mottled duck, wood duck, nutria, and swamp rabbit.

The U.S. Fish and Wildlife Service's Habitat Evaluation Procedures (HEP) were used to determine the value of the graving site as wildlife habitat. A brief description of the HEP is contained in the USFWS's Coordination Act Report (Section 11 of this appendix). The graving site provides minimal fisheries habitat due its isolation, shallow depth, and nearly complete coverage of floating aquatic vegetation. However, numerous wildlife species utilize the area as a permanent residence or for foraging. Although many species for which HEP models are available were observed utilizing the graving site, the applicable models for most of these species were not suitable for use for a variety of reasons. Most problems dealt with the relatively small size of the site, its isolation, proximity to disturbances, or permanently flooded nature. Two species were eventually selected for analysis - great egret and mink. Mink are known to inhabit the general area and individuals of this species likely live permanently or forage in the area.

As stated previously, the directs impacts of the graving site on freshwater wetlands would be restricted to 25 acres. The majority of this 25 acres is shallow water with floating aquatic vegetation. Some remnant spoil banks vegetated with tallow and willow run through this area. The Habitat Suitability Index (HSI) for great egret is 0.61, which indicates that the area is moderate to good habitat. The HSI for mink is 0.37, which indicates that the habitat is low to moderate in value for this species.

FUTURE WITHOUT PROJECT CONDITION - IMPACT SITE

The owner of most of the graving site is the local sponsor, the Port of New Orleans. The Port does not have any specific plans for this site which is within the New Orleans Business and Industrial District (NOBID). An Final EIS was prepared for the NOBID (referred to as the Almonaster-Michoud Industrial District at the time) by the U.S. Department of Commerce, Economic Development Administration in 1982. That EIS proposed a system of drainage and other infrastructure improvements to encourage industrial development. The proposal has partially been implemented. Constructed improvements in the vicinity of the graving site include upgrading of the Almonaster Avenue Extension. A pumping station immediately west of the graving site, next to Grant Avenue, has also been upgraded. No additional improvements are known to be planned for the vicinity of the graving site. The graving site would most likely remain an undeveloped wetland. Development of the site in the near future is unlikely because industrial sites with higher elevations and better drainage are available within the AMID.

Without development of the site, suitable habitat would remain for evaluated species. The HSI for great egret would decline slowly because plants would over-crowd shallow, open water areas. The HSI would drop to 0.55 in Target Year (TY) 25, and 0.49 in TY 63. (TY 63 is used to indicate the economic end of the project life. Since the project has a 13-year construction schedule and a 50-year economic life, the total number of years to be evaluated is 63, assuming that the graving site would be developed in the first year of construction.) The site would provide 17.15 average annual habitat units (AAHU's) for great egret under the future without project condition. For mink, the habitat value of the area would improve over time due to an increase in the canopy cover of trees, shrubs, and herbaceous vegetation. The HSI for mink would be 0.44 in TY 25 and 0.51 in TY 63. Under the future without project condition, the site would provide 14.07 AAHU's for mink. Table 1 provides a summary.

TABLE 1
SUMMARY OF FUTURE WITHOUT PROJECT CONDITIONS - IMPACT SITE

Species	HSI Existing	HSI TY1	HSI TY25	HSI TY63	AAHU's
Great egret	0.61	0.61	0.55	0.49	17.15
Mink	0.37	0.37	0.44	0.51	14.07

FUTURE WITH PROJECT CONDITION - IMPACT SITE

Preparation of the graving site would begin during the first year of project construction. The habitat value of the site for evaluated species would drop to zero. Upon completion of construction activities at the graving site, the site would be abandoned. The realigned levee would remain in place. The property owner would be able to utilize the site for commercial or industrial purposes. Table 2 provides a summary.

TABLE 2
SUMMARY OF FUTURE WITH PROJECT CONDITIONS - IMPACT SITE

Species	HSI Existing	HSI TY1	HSI TY25	HSI TY63	AAHU's
Great egret	0.61	0.00	0.00	0.00	0.15
Mink	0.37	0.00	0.00	0.00	0.09

NET IMPACTS - GRAVING SITE

The net impacts of the graving site are a loss of 16.99 AAHU's for great egret and 13.98 AAHU's for mink.

Mitigation Site

EXISTING CONDITION - MITIGATION SITE

The mitigation site is bounded by Bayou Bienvenue (referred to as Main Outfall Canal on some maps) to the north and west, a closed land fill and an operating sewerage treatment plant to the east, and the Back Protection Levee for the Lower Ninth Ward of New Orleans to the south. This triangular shaped area of about 400 acres consists of shallow, brackish water. Hundreds of dead cypress trees are scattered throughout this site, testimony to the cypress swamp that once existed. The trees died after salinity levels in the area increased after completion of the MRGO in the mid 1960's. The area now functions as a low salinity estuary. A large storm water pumping station, which services developed land in Orleans Parish discharges into Bayou Bienvenue which forms the north boundary of this area. The area is thereby subjected to periodic flushing with stormwater runoff from an urban area. As a result, the habitat quality of the area for estuarine aquatic species is greatly reduced. Species which can tolerate a wide salinity range, such as blue crabs, sheepshead minnows, sailfin mollies, mosquitofish, and killifishes are able to populate this area. The vegetated land around the periphery of this area provides habitat for a variety of terrestrial and semi-aquatic animals, and foraging habitat for many species of wading birds. Some species of waterfowl, including scaup, mottled duck, and mergansers, occasionally forage there.

The mitigation site provides low quality habitat for aquatic species. For great egret and mink, the mitigation site provides minimal habitat. The open water is mostly too deep for foraging by great egrets, although numerous stumps and woody debris provide foraging platforms. The open water does not provide habitat for mink, although the wooded periphery of the site does provide necessary food and cover requirements. The mitigation would occur next to the wooded periphery of the triangular area. The area delineated for mitigation was evaluated using the HEP for great egret and mink. The HEP shows the HSI for great egret is 0.10, and the HSI for mink is 0.33.

FUTURE WITHOUT PROJECT CONDITION - MITIGATION SITE

The operator of the sewage treatment facility, located in the southeast corner of the 400-acre triangular area, has been granted a Section 404(b)(1) permit to deposit bio-solids and ash generated at the facility in the open water immediately west and north of the facility. As much as 45 acres of the open water could be used for disposal. Their disposal will serve a dual purpose: to dispose of the waste product and to determine if the material is suitable for wetland development. Test plantings and treatments will be undertaken to determine the best methods for vegetating the material. The proposed mitigation site would be located within the same large triangular shaped area as the sewerage treatment plant and its permitted discharge site. However, the mitigation site would not affect the sewerage treatment plant, nor would the sewerage treatment plant's disposal activities affect the mitigation site. They would be separated by an expanse of open water. No other changes in the large triangular area would be expected. The future without project condition for the mitigation area is shown in Table 3.

TABLE 3
SUMMARY OF FUTURE WITHOUT PROJECT CONDITIONS - MITIGATION SITE

Species	HSI Existing	HSI TY1	HSI TY3	HSI TY12	HSI TY62	AAHU's[1] Shallow-Draft	Deep-Draft
Great egret	0.10	0.10	0.10	N/A	0.10	14.63	16.99
Mink	0.33	0.33	0.33	0.33	0.33	48.29	56.06

[1] The size of the mitigation area is different of the shallow and deep-draft lock plans, hence the AAHU's are different.

FUTURE WITH PROJECT CONDITION - MITIGATION SITE

An area of approximately 137 acres, along the inside border of the triangular area, would be sectioned-off with a low-level dike. Approximately 41 acres of emergent wetland would be created with the uncontaminated material from the east bank of the IHNC for the deep-draft lock alternatives. The shallow-draft lock plans would generate enough material to develop 31 acres of emergent wetland. Surveys taken prior to deposition of dredged material disposal would be used to determine the optimal elevation to which the dredged material is deposited. The goal would be to deposit material so that, within a few months, it would settle to an elevation which would support herbaceous, wetland plant species typical of nearby marsh. The material would be deposited within the diked area at a number of discharge points so as to develop "islands" to be colonized by emergent vegetation. Among the islands, areas of shallow water would provide aquatic habitat for estuarine fish and shellfish and feeding areas for predatory wading birds. After consolidation of sediments, the retaining dike would be breached in several location to allow tidal flow into the mitigation site. The dikes would quickly vegetate with scrub/shrub, and eventually trees would dominate.

The remaining portion of the triangular area is not expected to be impacted by the mitigation site, except that during dredging operations, turbidity levels would be increased.

The wetland would be built adjacent to the periphery of the large triangular area so that it would be contiguous with established travel corridors for terrestrial animals, and so that the created site would be adjacent to a seed source. The habitat value of the mitigation site for the future with project condition is shown in Table 4.

TABLE 4
SUMMARY OF FUTURE WITH PROJECT CONDITIONS - MITIGATION SITE

Species	HSI Existing	HSI TY1	HSI TY3	HSI TY12	HSI TY62	AAHU's Shallow-Draft	AAHU's Deep-Draft
Great egret	0.10	0.14	0.24	N/A	0.33	40.86	47.44
Mink	0.33	0.33	0.63	0.64	0.56	87.33	101.39

NET IMPACTS - MITIGATION SITE

Proposed mitigation would cause a net increase in the value of the mitigation site from both great egret and mink. The net effect of shallow-draft lock plans would be an increase of 26.23 AAHU's for great egret and 39.05 AAHU's for mink. The deep-draft lock plans would produce a net increase of 30.46 AAHU's for great egret and 45.33 AAHU's for mink.

Mitigation Summary

The mitigation plan fully compensates for impacts of the graving site on evaluated species. AAHU's for the graving site and mitigation site are shown in Table 5 on the following page.

TABLE 5
SUMMARY OF PROJECT IMPACTS AND MITIGATION

	Great Egret (AAHU's)	Mink (AAHU's)
Graving Site	-16.99	-13.98
Mitigation Site (Shallow-draft)	+26.23	+39.05
Mitigation Site (Deep-draft)	+30.46	+45.33
Net AAHU's (Shallow-draft)	+9.24	+25.07
Net AAHU's (Deep-draft)	+13.47	+31.35

Section 11

US FISH AND WILDLIFE SERVICE

COORDINATION ACT REPORT

United States Department of the Interior

FISH AND WILDLIFE SERVICE
825 Kaliste Saloom Road
Brandywine Bldg. II, Suite 102
Lafayette, Louisiana 70508

March 14, 1997

Colonel William L. Conner
District Engineer
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Colonel Conner:

Enclosed is the Fish and Wildlife Coordination Act Report for the Mississippi River-Gulf Outlet, New Lock and Connecting Channels, Louisiana, Re-evaluation Study. This report is transmitted pursuant the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), and constitutes the report of the Secretary of the Interior required by Section 2(b) of that Act. The report has been coordinated with the Louisiana Department of Wildlife and Fisheries and the National Marine Fisheries Service; copies of letters received from those agencies are enclosed.

We appreciate the cooperation of your staff on this study. Please have them contact Ms. Jane Ledwin (318/262-6662, extension 230) of this office, if additional information is needed.

Sincerely,

David W. Frugé

David W. Frugé
Field Supervisor

Enclosure

cc: EPA, Dallas, TX
LA Dept. of Natural Resources (CMD), Baton Rouge, LA
Fish and Wildlife Service, Atlanta, GA (AES/HC)
Fish and Wildlife Service, Atlanta, GA (GARD I)

MISSISSIPPI RIVER-GULF OUTLET

NEW LOCK AND CONNECTING CHANNELS,

LOUISIANA, RE-EVALUATION STUDY

FISH AND WILDLIFE COORDINATION ACT REPORT

Submitted to

New Orleans District
U. S Army Corps of Engineers
New Orleans, Louisiana

Prepared by

Jane M. Ledwin
Fish and Wildlife Biologist

U.S. Fish and Wildlife Service
Ecological Services
Lafayette, Louisiana

March 1997

EXECUTIVE SUMMARY

This is a summary of the findings and recommendations of the Fish and Wildlife Service contained in the Fish and Wildlife Coordination Act Report for the U.S. Army Corps of Engineers' (Corps) Mississippi River-Gulf Outlet (MRGO), New Lock and Connecting Channels, Louisiana, Re-evaluation Study. The Corps has identified a Recommended Plan (RP) that involves construction of a new lock north of, and a by-pass channel adjacent to, the existing lock in the Inner Harbor Navigation Canal (INHC) located in Orleans Parish, Louisiana. The RP was recently modified to include a graving site (i.e., an offsite construction area) on the north bank of the MRGO, just west of Paris Road. The Corps also modified their spoil disposal plans. The current plan would place contaminated spoil dredged from the IHNC and the top 5 feet of soils excavated from the east bank into confined disposal facilities (CDFs) along the MRGO. The remaining spoil from the east bank would be used to create marsh in shallow open water northeast of the lock.

With the exception of the proposed disposal site and the graving site, the project area consists of heavily urbanized land and industrialized waterways. While lock replacement will have minimal impacts to fish and wildlife resources, other project features could potentially result in significant habitat losses. Construction of the graving site and associated staging areas will eliminate fish and wildlife habitat value at that site, and could significantly reduce the habitat value of the adjacent marsh and forested wetlands. We encourage the Corps to avoid those impacts by considering alternative graving sites. Disposal of uncontaminated spoil to create an estimated 41 acres of emergent marsh is expected to significantly benefit fish and wildlife resources. Those benefits could potentially offset unavoidable project-related habitat losses at the graving site, should the Corps determine there is no suitable alternative to that site. Impacts from contaminated material dredged from the IHNC and the east bank will be greatly reduced by placing that material only in CDFs that have minimal fish and wildlife habitat. The St. Claude and North Claiborne Avenue detour road should be designed to avoid or minimize impacts on forested and marsh habitats.

While the Service does not oppose replacement of the IHNC lock, we recommend that the Corps include the following fish and wildlife conservation measures in the ~~recommended plan~~ RP to ensure that fish and wildlife receive equal consideration during project design and implementation:

1.) Further investigate alternative locations (e.g., the Barriere Site) for the graving site that have minimal fish and wildlife habitat value. If the Corps determines that the proposed graving site is the only feasible alternative, minimize impacts to fish and wildlife resources by confining the graving and staging areas to the minimum necessary for project completion. The Corps should ensure that site preparation does not adversely affect (i.e., drain or fill) the adjacent emergent marsh and forested wetlands. In that event, the Corps should coordinate with the Service to quantify any such losses and develop appropriate compensation measures.

2.) Minimize potential impacts from contaminated spoil placed in the CDFs by designing those disposal areas to ensure that the material will be remain within those areas. That may include constructing internal dikes to increase effluent retention time in the CDFs. The Service is available to work with the Corps in refining spoil disposal plans for those areas.

3.) Use uncontaminated material dredged from the lower east bank to create emergent marsh in shallow open water northeast of the IHNC. The proposed creation of approximately 41 acres of marsh with that material would fully compensate for currently anticipated habitat losses. The Corps should conduct post-construction surveys of the marsh creation area to ensure that those losses are fully compensated.

4.) Minimize the right-of-way needed (in forested and marsh areas) for the St. Claude and North Claiborne Avenue detour road.

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INTRODUCTION

The Inner Harbor Navigation Canal (IHNC) and Lock, located in metropolitan New Orleans, provides a link between the Mississippi River, the Gulf Intracoastal Waterway (GIWW), and the Mississippi River-Gulf Outlet (MRGO). Constructed in 1923 by the Board of Commissioners of the Port of New Orleans, the antiquated lock is currently operated beyond its design capacity. Public Law 84-455, approved by Congress on March 29, 1956, authorized the construction of a new lock and channel to handle increased vessel traffic. Subsequently, the Corps of Engineers (Corps) conducted several site-selection studies for a new lock, and prepared a Draft Evaluation Report for such a site in November 1982. In concert with that effort, the Fish and Wildlife Service prepared a March 19, 1982, planning-aid report, addressing the six alternatives identified by the Corps. Five of those plans involved construction at the existing IHNC lock, while the sixth plan involved construction of a new channel and lock near Violet in St. Bernard Parish. Because of engineering and environmental constraints, the Corps has eliminated the Violet site from further consideration. The Corps' current IHNC lock re-evaluation report identifies construction of a new lock north of the existing IHNC lock as the Recommended Plan (RP).

This report provides an analysis of the impacts on fish and wildlife resources from implementation of the RP, and also provides recommendations to mitigate adverse impacts on those resources. This report constitutes the report of the Secretary of the Interior as required by Section 2(b) of the Fish and Wildlife Coordination Act, and the discussion by the Secretary of the Interior as required by Section 4 of the Estuary Protection Act; it should accompany the Corps' current IHNC lock re-evaluation report. The Service prepared this report in coordination with the Louisiana Department of Wildlife and Fisheries and the National Marine Fisheries Service.

DESCRIPTION OF STUDY AREA

The study area is located in southeastern Louisiana within St. Bernard and Orleans Parishes (Figure 1). The IHNC lock, one of the busiest locks in the Nation, is located in Orleans Parish. It connects the Mississippi River (fresh water) with the GIWW (salt water at this location). According to the Corps, salinities at the lock can reach 20 parts per thousand (ppt) during low flow. The area surrounding the lock is highly urbanized. Both the IHNC and adjacent residential and industrial lands have negligible value to fish and wildlife.

Northeast of the IHNC, there is a large expanse of deteriorating brackish marsh and open water between the GIWW and the back protection levee. The Corps proposes to place a portion of the spoil from project construction in an open-water area to create marsh (Figure 1). That area is bounded on the south by the back protection levee, on the east by Louisiana Highway 57 and a closed landfill, on the west by a strip of land composed of scrub/shrub vegetation and an operating landfill, and on the north by brackish marsh and

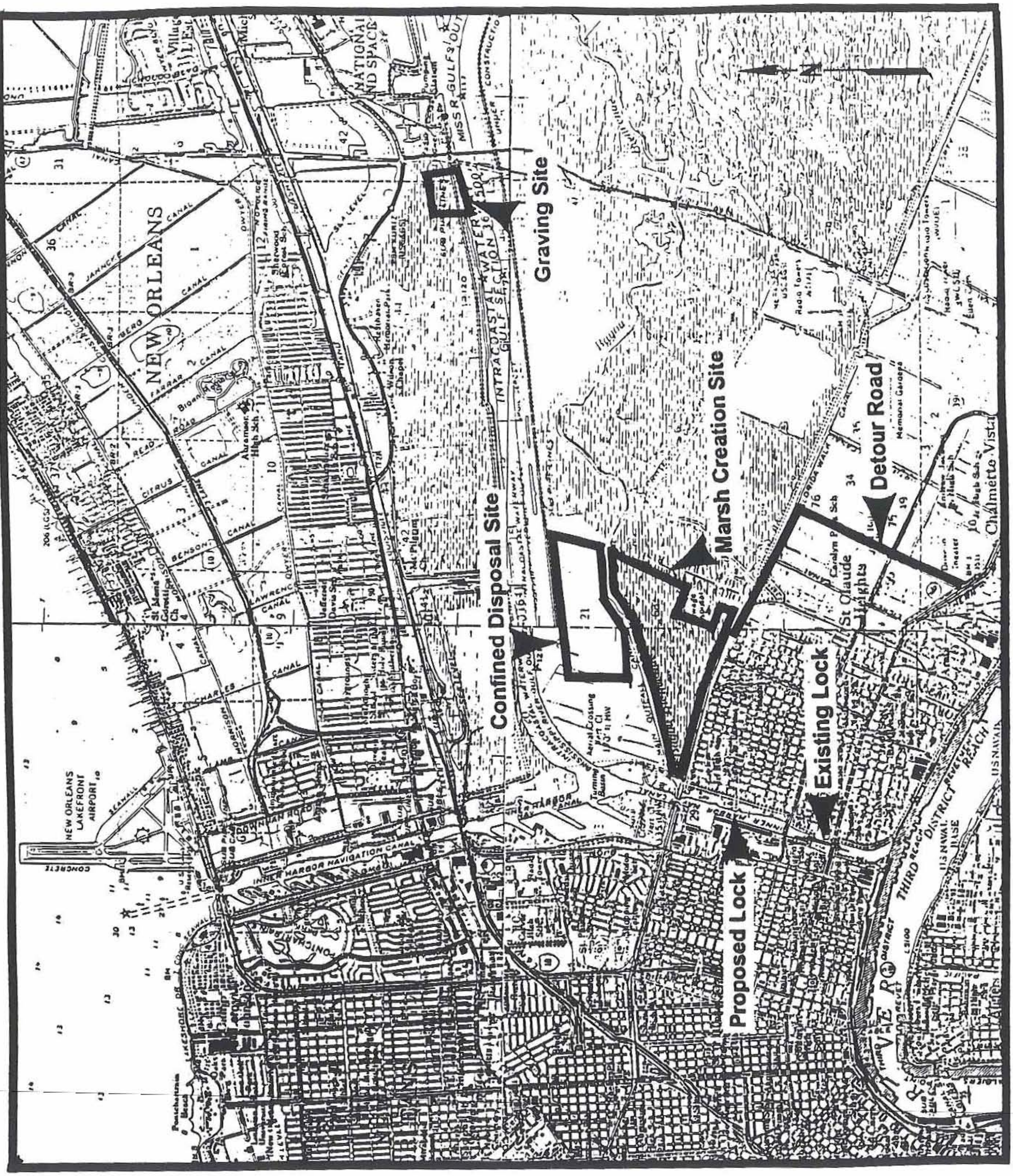

Figure 1. Mississippi River-Gulf Outlet New Lock Study Area

Bayou Bienvenue. The marsh creation site and the surrounding area historically supported forested wetlands and fresh marsh. Developers unsuccessfully attempted to drain part of the area for agriculture. Consequently, the organic soils oxidized and subsided, and have converted to open water averaging 3 feet deep. According to the Corps, the tidal range in the area is approximately 1 foot and average monthly salinities can vary between 3.7 and 18.0 ppt.

FISH AND WILDLIFE RESOURCES

Existing Conditions

Fish and wildlife habitats found in the study area include developed lands, scrub/shrub and forested wetlands, fresh and brackish marsh, and open water. Scrub/shrub communities support woody vegetation less than 20 feet tall and typically occur on disturbed sites (e.g., spoil banks) along the edges of forests, streams, and canals, or on unmaintained levees and vacant lots. Scrub/shrub communities are typically vegetated with black willow, Eastern baccharis, and wax myrtle. Scrub/shrub habitats surround most of the open-water area proposed for marsh creation. There is a remnant stand of forested wetlands behind the back protection levee near the proposed North Claiborne Avenue detour road. Dominant vegetation includes bald cypress, tupelogum, hackberry, red maple, oaks, privet, and greenbriar.

The proposed graving site encompasses a shallow freshwater impoundment surrounded by a mixture of forested and scrub/shrub wetlands, fresh marsh, wooded spoil bank, and maintained levee. Vegetation in the forested areas includes bald cypress, red maple, sweetgum, various oaks, hackberry, Chinese tallow tree, willow, sycamore, and elm. Common scrub/shrub species include wax myrtle, buttonbush, and common privet. Vegetation in the impounded fresh marsh area is dominated by nutsedge, bagscale, rattlebox, morning glory, duckweeds, frogbit, mosquito fern, and water hyacinth.

Historically, the wetlands in and around the proposed disposal area were fresher and consisted of bottomland hardwood forest, cypress-tupelo swamp, and fresh marsh. Many tree stumps and several dead standing trees from the forested wetlands that previously occupied the area remain in the proposed disposal site. Construction of the MRGO and subsequent saltwater intrusion, in addition to drainage and subsidence, has converted those habitats to brackish marsh and open water. Predominant vegetation found in brackish marsh is saltmeadow cordgrass, saltmarsh cordgrass, and leafy threesquare. The open-water area is fairly turbid with highly organic bottom sediments.

Coastal wetlands and associated shallow open waters, such as those found in the study area, are very important to fish and wildlife resources. In addition to providing valuable habitat, wetlands and submerged aquatic vegetation produce vast amounts of organic detritus which are transported to adjacent estuarine waters. Organic detritus is a key component of the estuarine food web which supports a high level of finfish and shellfish productivity. Those habitats also help to improve water quality by acting as a sink for inorganic nutrients and suspended sediments. Because of subsidence, saltwater intrusion, and development, those habitats are becoming increasingly scarce in the study area.

The IHNC has minimal fishery value in the project area. The proposed spoil disposal site, however, has significant value to finfishes and shellfishes. Recreationally and commercially important finfish and shellfish species commonly found in the study-area marshes and open waters include Gulf menhaden, Atlantic croaker, spotted seatrout, sand seatrout, red drum, black drum, spot, sheepshead, southern flounder, white shrimp, brown shrimp, and blue crab.

Historically, wintering waterfowl such as mallard, green-winged teal, and gadwall were common in the study area where fresher wetlands provided excellent habitat. In spite of the conversion from fresher wetlands to brackish marsh and open water, study-area wetlands still provide habitat, albeit of reduced value, for certain waterfowl such as mottled duck and lesser scaup. Other game birds, such as American coots, common snipe, Virginia rails, and sora rails, may occasionally occur in the study area in winter. Clapper rails are year-round residents of coastal Louisiana that also are expected to be found in the study-area marshes.

Numerous species of wading birds, seabirds, shorebirds, and songbirds use the wetlands and scrub/shrub habitats in the study area. Common wading birds include the little blue heron, great blue heron, great egret, snowy egret, cattle egret, white-faced ibis, white ibis, green-backed heron, and yellow-crowned night heron. The graving site is heavily used by several of those species, and may provide nesting habitat for the yellow-crowned night heron. Seabirds using the open-water areas include white pelican, black skimmer, herring gull, laughing gull, and several species of terns. Common shorebirds include killdeer, American avocet, black-necked stilt, and numerous sandpipers. Other nongame birds in the project area include marsh wren, boat-tailed grackle, belted kingfisher, red-winged blackbird, seaside sparrow, yellow-rumped warbler, and several raptors.

Furbearers including muskrat, mink, river otter, nutria, and raccoon occur in the study-area wetlands. Furbearer populations in the area have decreased due to saltwater intrusion and a corresponding decrease in the carrying capacity of brackish marshes. Game mammals that may use the study-area wetlands and scrub/shrub habitats include swamp rabbit, raccoon, and (in forested areas) gray and fox squirrels. Nongame mammals that occur in the study area include Virginia opossum, nine-banded armadillo, and several species of bats, rodents and insectivores.

There have been recent sightings of the endangered West Indian manatee *(Trichechus manatus)* in the outfall slip of the New Orleans Power Plant, approximately one mile east of the proposed graving site. The manatee is a marine mammal that infrequently wanders into coastal waters and streams of southeastern Louisiana during the summer months. Manatees prefer warm water temperatures and feed entirely on aquatic vegetation. The manatee population has declined due to collisions with boats and barges, entrapment in the gates of flood-control structures, poaching, habitat loss, and pollution. We do not expect graving site construction to affect the manatee. In the unlikely event that a manatee is observed in the project area during graving site construction, the Corps should contact

Ms. Deborah Fuller of the Service's Lafayette, Louisiana, office at (318)262-6662, extension 225.

Future Without-Project Conditions

Wetland loss in the study area will continue because of subsidence, saltwater intrusion, erosion, and development. Although increased salinities prevent the re-establishment of cypress swamp, existing forested areas will continue to provide important fish and wildlife habitat. Loss of study-area marshes will reduce primary productivity and finfish and shellfish nursery habitat in those areas. Wetland loss and increased salinity will also decrease habitat values for most dabbling ducks and many wading bird species. Furthermore, those trends will reduce habitat available for swamp rabbit, various furbearers, alligator, other reptiles, and amphibians.

Wetland restoration efforts by State and Federal agencies may help reduce marsh loss in the project area. Restoration activities in the project area include Coastal Wetlands Planning, Protection and Restoration Act projects, and beneficial use of dredged material during Corps maintenance of Federal navigation channels.

FISH AND WILDLIFE CONCERNS AND PLANNING OBJECTIVES

The principal fish and wildlife concern in the study area is the continued conversion of fresh and intermediate marsh to open water and more-saline wetlands. The major human factors contributing to habitat decline are development, flood control and navigation projects, and hydrologic modifications. The latter two factors have resulted in the loss of sediments, nutrients, and freshwater from overbank flooding of the Mississippi River and its distributaries. Construction of the MRGO provided a conduit for saltwater intrusion, which was largely responsible for the conversion of forested wetlands and fresh marshes to brackish and saline marshes and open water. Those habitat alterations have been accompanied by a decline in populations of fish and wildlife that depend on fresher habitats. Because vegetated wetlands provide feeding and nursery habitat for many estuarine finfish and shellfish species, production of those species is reduced when vegetated wetlands are lost.

The Service is also concerned that exposure to contaminants during project construction and maintenance could potentially affect fish and wildlife resources. Contaminants from nearby urban and industrial discharges can adversely affect water quality and fish and wildlife using those waters. The Corps' 1995 Water Quality Report noted that heavy metals, pesticides, and other organic priority pollutants were found in project-area waters and sediments. Because that portion of the IHNC in the project area has minimal fisheries value, the effects of contaminants in bottom sediments are very limited. Dredging of those sediments and spoil disposal activities, however, could increase the exposure of project-area fish and wildlife to contaminants; as exposure increases, so too would the potential for adverse effects to those resources.

The Service's planning objectives for the re-evaluation study are:

1.) Minimize contaminant impacts to fish and wildlife by using only uncontaminated material dredged during project construction to create emergent marsh in open-water areas;

2.) Avoid adverse impacts to fish and wildlife resources by locating project features (i.e., the graving site and contaminated spoil disposal) in areas of minimal value to fish and wildlife;

3) Fully mitigate all adverse impacts to fish and wildlife resources.

Preliminary project plans included an alternative that called for construction of the new lock adjacent to the Mississippi River, near Violet, in St. Bernard Parish. By selecting a site for the new lock just north of the existing lock, the Corps avoided significant adverse impacts to fish and wildlife resources that would have been associated with lock construction, operation, and maintenance at the Violet site. Features of the proposed project (i.e., graving site and the temporary access road), however, may still negatively impact fish and wildlife resources in the study area. Accordingly, the Service's remaining concerns are that adverse project impacts from spoil disposal are minimized, and that unavoidable habitat losses associated with graving site activities are fully offset.

DESCRIPTION OF RECOMMENDED PLAN

The Corps has designated construction of a new lock north of the existing IHNC lock as the RP. The prefabricated lock would be constructed at a graving site (see below) and floated into place in three sections. The proposed lock dimensions would be 110 feet wide, 1,200 feet long, and 36 feet deep. The RP also includes the construction of a by-pass channel east of the existing lock in a heavily industrialized area. Construction of the that channel, the main channel, and utility corridors between the proposed lock and the Mississippi River will require the excavation of 1,028,000 cubic yards of material. Approximately 73,000 cubic yards of that material would be discharged into the Mississippi River. The remaining material would be used to backfill around the new lock and the by-pass channel after construction. Construction of the by-pass channel, main channel, and utility corridors north of the new lock will require excavating 2,216,000 cubic yards of material. Originally, the Corps proposed to pump that material into a shallow, open-water area east of the IHNC to create marsh. Because of contaminants in much of that material, spoil disposal could have resulted in significant adverse fish and wildlife impacts. To reduce those impacts, the Corps has recently modified the RP to include placing contaminated material (i.e., IHNC bottom sediments and the upper 5 feet of East Bank soils) in a CDF along the MRGO. The remaining east banks soils from the by-pass channel would be used to create marsh as originally proposed.

The RP also includes construction of a new bridge over the IHNC at St. Claude Avenue and a modified bridge at Claiborne Avenue. A permanent detour road along the

Guerengeh Canal, from St. Claude Avenue to Florida Boulevard, would accommodate vehicle traffic during bridge construction.

The RP includes construction of a graving site located on the north bank of the MRGO, just west of Paris Road. The graving site will require excavating approximately 270,500 cubic yards of material to create a cofferdam where the new lock components will be constructed. Much of that excavated material will be used to realign the hurricane protection levee around the site, as well as to provide fill for staging areas adjacent to the cofferdam.

EVALUATION METHODOLOGY

Estimation of project-related habitat acreage changes is a fundamental technique used to assess project impacts to fish and wildlife resources. Those estimates also form the basis of other evaluations conducted by the Corps. For this project, habitat changes quantified to date are those associated with the acreage needed for spoil disposal to create marsh, and the acreage required for the graving site and associated staging areas. The Corps provided estimates of the acreage to be affected by the proposed work in both those areas. The Service used those estimates to conduct a Habitat Evaluation Procedures analysis (HEP, see Appendix A). HEP is a method of estimating habitat suitability for evaluation species based on field measurements of parameters that limit the relative population density of those species. Using HEP, habitat quality and quantity can be measured for baseline conditions, and can be predicted for future without-project and future with-project conditions. This standardized, species-based method numerically compares future with-project and future without-project conditions to provide an estimate of project impacts on fish and wildlife resources. Because HEP was not designed to evaluate the effects of contaminants on evaluation species, it was not used to assess impacts to fish and wildlife expected to result from contaminated spoil disposal.

PROJECT IMPACTS

Excavation of the bypass channels, utility corridors and the new lock site would have minimal adverse impacts to fish and wildlife. The proposed detour road would affect less than 3 acres of drained bottomland hardwood forest located directly south of the proposed spoil disposal area, between the Florida Walk Canal and Patricia Street.

Careful placement of the remaining 676,000 cubic yards of uncontaminated material dredged from the east bank should create about 41 acres of brackish marsh in a shallow, open-water area northeast of the new lock. That tidal marsh will benefit numerous resident and migratory birds (e.g., wading birds, waterfowl, rails and songbirds), furbearers, and estuarine-dependent fishes and shellfishes. Using HEP, we predicted that marsh creation would yield an increase of 45.33 average annual habitat units (AAHUs) for mink and 30.46 AAHUs for great egret (Table 1).

Table 1. Project-related Habitat Changes: Marsh Creation Site
(all values in average annual habitat units)

Species	Future Without project	Future With project	Net Change
Mink	56.06	101.39	45.33
Great Egret	16.99	47.44	30.46

Approximately 1,540,000 cubic yards of material dredged from the IHNC and the upper 5 feet of the east bank will be placed in CDFs along the south bank of the MRGO. That material could impact up to 240 acres of upland scrub/shrub and low quality wetland habitat in the CDFs. The Corps' analysis of that material indicates that those sediments and soils are contaminated with heavy metals, polycyclic aromatic hydrocarbons (PAHs), and other organic priority pollutants. As part of the Hazardous, Toxic, and Radioactive Waste (HTRW) investigation and the water quality assessment for this re-evaluation study, the Corps conducted water, sediment, and soil analyses in the IHNC, adjoining channels, and the disposal area. The following discussion relies on data from those analyses.

Several heavy metals were found in IHNC bottom sediments (Table 2). Levels of copper, lead, mercury, and zinc exceeded concentrations shown to cause adverse biological effects. The elutriate analyses of the bottom sediments showed that concentrations of those metals also exceeded EPA's chronic saltwater criteria, and copper and zinc exceeded EPA's acute saltwater criteria.

Bottom sediments from the IHNC contained excessive levels of several PAHs. Acenaphthene, phenanthrene, anthracene, pyrene, and chrysene concentrations were several times higher than levels known to adversely affect biota.

Detection limits of several other semi-volatile and volatile organic compounds also were well above concentrations documented to cause adverse biological effects. Detection limits used in the elutriate analyses of two pesticides (endrin and toxaphene) were higher than both EPA's chronic and acute saltwater criteria. Elutriate analyses of pentachlorophenol had detection limits ten times the chronic saltwater criteria. Dinitrotoluene, dichlorobenzene, hexachlorobutadiene, and dimethyl phthalate sediment analyses also had detection limits exceeding levels known to cause adverse biological effects.

Table 2. Contaminant levels from the Inner Harbor Navigation Canal (Canal Bottom)

Compound	SEDIMENTS Sediment mg/kg	 NOAA ERL/ERM[1] mg/kg	 FDER NOEL/PEL[2] mg/kg	 EPA[3] mg/kg	WATER Elutriate µg/L	 Chronic AWQC** µg/L	 Acute AWQC** µg/L
Arsenic	6.7-11	8.2/70	8/64	33	<3.0-3.8	36	69
Copper	17-64	34/270	28/170	136	18-200	2.9	2.9
Lead	18-200	46.7/218	21/160	132	2-29	0.56	140
Mercury	<0.10-0.90	0.15/0.71	0.1/1.4	0.80	0.2	0.025	2.1
Zinc	72-330	150/410	68/300	760	81-310	86	95
	µg/kg	µg/kg	µg/kg	µg/kg			
Endrin	5.9-<11	0.02/45*			<0.1	0.0023	0.037
Toxaphene	<290-<590				<5	0.0002	0.21
Pentachlorophenol	<2,800-<5,000				<58-<77	7.9	13
2,6-Dinitrotoluene	<570-<3,300			880T	<11		
2,4-Dinitrotoluene	<570-<3,300			880T	<11		
1,3-Dichlorobenzene	<570-<3,300			2,800T	<11		
1,4-Dichlorobenzene	<570-<3,300			2,800T	<11		
1,2-Dichlorobenzene	<570-<3,300			2,800T	<11		
Hexachlorobutadiene	<570-<3,300			1,280	<11		
Dimethyl Phthalate	<570-<3,300			1,960	<11		
Naphthalene	<570-<3,300	160/2,100	130/1,100		<11		1.6
Acenaphthene	<61-17,000	16/500	22/450		<11-70		
Phenanthrene	480-50,000	240/1,500	140/1,200		<11		
Anthracene	120-7,700	85.3/1,100	85/740		<11		
Pyrene	<62-30,000	665/2,600	290/1,900		<11-15		
Chrysene	<65-7,300	348/2,800	200/1,700		<11		

[1]Long et al. 1993 - Effects range low/effects range median, the concentrations (lowest 10 percentile and median values respectively) at which adverse biological effects are observed
[2]MacDonald 1993 - No observable effect level/probable effect level
[3]Bolton et al. 1985
*Long and Morgan 1990
**EPA Ambient (salt)water quality criteria
T - total

Soil analyses from the east bank of the IHNC showed widespread heavy metal contamination in the upper 5 feet (Table 3). Although the Corps did not report results for two common metals, i.e., zinc and copper, levels of arsenic and chromium were moderately elevated. Lead concentrations were many times higher than levels known to cause adverse biological impacts. Mercury concentrations were also quite high, with at least one sample exceeding soil criteria established for compliance with the Resource Conservation and Recovery Act. In addition, levels of silver, although detected in only two samples, also were high enough to cause negative biological effects.

East bank soil analyses also showed elevated levels of PAHs and phthalates in the top 5 feet (excluding fuel tanks, oil-saturated soils, and other areas of concern). Although those compounds were not as widespread as the heavy metals, PAH and phthalate concentrations exceeded levels documented to cause adverse biological effects.

The contaminant levels documented in the IHNC sediments and soils could pose a significant threat to those species using areas affected by contaminated spoil disposal. Exposure through direct contact or ingestion could result injury, and, in some cases, mortality. In addition, the potential for many of the contaminants to bioconcentrate and bioaccumulate poses further long-term risk to trust resources through direct and indirect exposure. Therefore, we are pleased to note that the Corps' revised plan calls for confinement of contaminated dredged material to the CDF; such action will greatly reduce potential exposure of fish and wildlife to those contaminants.

The graving site and staging areas would affect approximately 25 acres of shallow open water, scrub/shrub wetlands, and forested spoil bank habitat. Once the area is cleared, material excavated from the slip would be used to reconstruct the hurricane protection levee around the slip, and to fill staging areas adjacent to the slip. Those activities and post-construction maintenance would essentially eliminate wildlife habitat at that site. The resulting net loss of wildlife habitat value for mink and great egret (i.e., the HEP evaluation species) is shown in Table 4.

The quantified impacts associated with the graving site are directly related to the area needed to excavate the cofferdam, realign the hurricane protection levee, and fill the staging areas. Those activities could potentially affect the emergent marsh and wooded wetlands that surround the graving site. If the proposed work at the graving site reduces water levels in the adjacent wetlands, it could lead to further losses of fish and wildlife habitat value in that area. In that event, the Service would work with the Corps to quantify those losses and develop adequate compensation measures.

Table 3. Contaminant levels from the Inner Harbor Navigation Canal (East Bank)

Compound	Shallow Soils mg/kg	Deep Soils mg/kg	RCRA Soil Criteria mg/kg	NOAA ERL/ERM[1] mg/kg	FDER NOEL/PEL[2] mg/kg
Arsenic	3.4-26.7	2.3-9.6	80	8.2/70	8/64
Chromium	4.7-144	4.7-71.1	400	81/370	33/240
Lead	9.6-4,690	3.2-472		46.7/218	21/160
Mercury	0.046-1.5	0.043-20.8	20	0.15/0.71	0.1/1.4
Silver	2.9-4.4		200	1/3.7	0.5/2.5
	µg/kg	µg/kg		µg/kg	µg/kg
Acenaphthene	170-2200			16/500	22/450
Phenanthrene	210-6,700	180-<830		240/1,500	140/1,200
Anthracene	280-1,100			85.3/1,100	85/740
Flouranthene	270-9900	310-<830		600/5100	380/3,200
Benzo(a)pyrene	770-5400	200-<830		430/1600	230/1,700
Benzo(a)anthracene	250-4900			261/1600	160/1,300
Dibenzo(a,h)anthracene	170-940			63.4/260	31/320
Chrysene	810-5,900	220-<830		348/2,800	200/1,700
Pyrene	220-8,400	330-<830		665/2,600	290/1,900
bis(2-ethylhexyl)phthalate	220-260,000	230-8,200	50		
Diethyl phthalate	<830-2300	26-200	60,000	1,280[3]	

[1]Long et al. 1993
[2]MacDonald 1993
[3]Bolton et al. 1985

Table 4. Project-related Habitat Changes: Graving Site
(all values in average annual habitat units)

Species	Future Without project	Future With project	Net Change
Mink	14.07	0.09	-13.98
Great Egret	17.15	0.15	-16.99

FISH AND WILDLIFE CONSERVATION MEASURES

The President's Council on Environmental Quality defined the term "mitigation" in the National Environmental Policy Act regulations to include:

> a) avoiding the impact altogether by not taking a certain action or parts of an action; (b) minimizing impacts by limiting the degree or magnitude of the action or its implementation; (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and (e) compensating for the impact by replacing or providing substitute resources or environments.

The Service supports and adopts that definition of mitigation and considers its specific elements to represent the desirable sequence in the mitigation planning process.

Placement of contaminated dredged material into CDFs would significantly reduce the potential for adverse fish and wildlife impacts from contaminants in that material. Those impacts, however, could be minimized by designing spoil containment structures to maximize effluent retention and ensure that all contaminated material remains in the CDFs.

Graving site impacts could be avoided altogether by selecting an alternative site that has minimal fish and wildlife habitat value. Although the Corps has apparently considered several other locations, including one much closer to the lock site (i.e., the Barriere Site) on the IHNC, they have not provided a rationale for selecting the preferred graving site. We encourage the Corps to revisit their site selection, and to give equal consideration to fish and wildlife resources in their decision. Fish and wildlife impacts at the graving site could be rectified by returning the area to pre-project conditions once the lock has been built. The Corps, however, has determined that such rehabilitation is economically infeasible.

The Service's Mitigation Policy (*Federal Register*, Vol. 46, pp. 7644-7663, January 23, 1981) defines four resources categories used to ensure that the level of mitigation recommended will be consistent with the fish and wildlife resource values impacted. Activities at the proposed graving site are expected to affect shallow open water, scrub/shrub, and forested spoil bank habitat. The open water and scrub/shrub habitat at that site provide only moderate value to wildlife. Much of the vegetation on the spoil banks consists of opportunistic species (e.g., Chinese tallow tree, black willow, etc.) typical of many disturbed sites in the study area. Such habitat is also of moderate value to wildlife. Therefore, the mitigation goal for those habitats is no net loss of habitat value, while minimizing loss of in-kind habitat value.

As previously noted, the RP includes a spoil disposal plan that would create approximately 41 acres of emergent marsh habitat. Using HEP, we compared the habitat impacts from the graving site to the habitat benefits from the newly created marsh for both mink and great egret. As shown in Table 5, wildlife benefits from the emergent marsh created with dredged material should fully compensate the direct adverse wildlife impacts at the graving site. Therefore, no further compensation would be required.

The final mitigation issue involves the potential, relatively minor, impact of the St. Claude and North Claiborne detour road on remnant forested land and adjacent brackish marsh. Those impacts should be avoided or greatly minimized via careful right-of-way alignment.

Table 5. Net Habitat Changes at the Graving Site and Marsh Creation Site
(All values in average annual habitat units)

	Graving Site	Marsh Creation Site	Net Difference
Mink	-13.98	45.33	31.35
Great Egret	-16.99	30.46	13.47

CONCLUSIONS AND RECOMMENDATIONS

While lock replacement will have minimal impacts to fish and wildlife resources, various project features could potentially result in significant habitat losses. Construction of the graving site and associated staging areas will eliminate moderate-value fish and wildlife habitat at that site, and could reduce the value of adjacent marsh and forested habitats. We encourage the Corps to avoid those impacts by further considering alternative locations for the graving site. Disposal of uncontaminated spoil to create emergent marsh is, however, expected to significantly benefit fish and wildlife resources in the disposal area. Furthermore, those benefits could potentially offset unavoidable project-related habitat losses at the graving site, should the Corps determine there is no suitable alterative to that site. Impacts from contaminated material dredged from the IHNC and the east bank will be greatly reduced by placing that material only in CDFs that have minimal fish and wildlife habitat.

To ensure that fish and wildlife receive equal consideration during further project planning, design, and implementation, the Service recommends that the Corps include the following fish and wildlife conservation measures in the RP:

1.) Further investigate alternative locations (e.g., the Barriere Site) for the graving site that have minimal fish and wildlife habitat value. If the Corps determines that the proposed graving site is the only feasible alternative, minimize impacts to fish and wildlife resources by confining the graving and staging areas to the minimum necessary for project completion. The Corps should ensure that site preparation does not adversely affect (i.e., drain or fill) the adjacent emergent marsh and forested wetlands. In that event, the Corps should coordinate with the Service to quantify any such losses and develop appropriate compensation measures.

2.) Minimize potential impacts from contaminated spoil placed in the CDFs by designing those disposal areas to ensure that the material will be remain within those areas. That may include constructing internal dikes to increase effluent retention time in the CDFs. The Service is available to work with the Corps in refining spoil disposal plans for those areas.

3.) Use uncontaminated material dredged from the lower east bank to create emergent marsh in shallow open water northeast of the IHNC. The proposed creation of approximately 41 acres of marsh with that material would fully compensate for currently anticipated habitat losses. The Corps should conduct post-construction surveys of the marsh creation area to ensure that those losses are fully compensated.

4.) Minimize the rights-of-way needed (in forested and marsh areas) for the St. Claude and North Claiborne Avenue detour road.

FISH AND WILDLIFE SERVICE POSITION

The Service does not oppose replacement of the IHNC lock. Certain project features (i.e., the graving site and spoil disposal on wetlands in CDFs), however, could have potentially significant adverse impacts to fish and wildlife resources. The Service strongly supports using 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 graving site, if the Corps determines that is the only feasible location. The Service believes that project implementation would result in minimal adverse fish and wildlife impacts, provided the Corps implements the Service's aforementioned fish and wildlife conservation measures.

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MISSISSIPPI RIVER-GULF OUTLET

NEW LOCK AND CONNECTING CHANNELS

LOUISIANA, RE-EVALUATION STUDY

APPENDIX A

HABITAT EVALUATION PROCEDURES ANALYSIS AND RESULTS

The Fish and Wildlife Service (Service) developed the Habitat Evaluation Procedures (HEP) to document the quality and quantity of available habitat for fish and wildlife species within a given area. Using HEP, habitat quality and quantity can be measured for baseline conditions, and can be predicted for future without-project and future with-project habitat conditions. This standardized, species-based method numerically compares future with-project and future without-project conditions to provide an estimate of project impacts on fish and wildlife resources. We used the 1980 version of HEP (USFWS 1980), which has become a widely accepted technique for assessing wildlife impacts, to evaluate the impacts of the proposed marsh creation and graving site construction.

For this project, Service biologists collected field measurements in the proposed spoil disposal area in March 1994 and at the graving site in August 1996 to determine baseline conditions. (Details regarding field data are on file in the Service's Lafayette, Louisiana, Field Office.) Using HEP species models, those measurements were mathematically combined to obtain a value between 0.0 and 1.0. This value is termed the habitat suitability index (HSI); 0.0 represents no habitat value for an evaluation species and 1.0 represents optimum habitat value. The HSI is a linear index, with the degree of difference between 0.0 and 0.1 being the same as the degree of difference between 0.9 and 1.0.

Habitat units are the product of the evaluation species' HSI and the acreage of available habitat at a given target year. The habitat unit is the basic unit of HEP to measure project effects on wildlife. Changes in habitat units reflect changes in habitat quality (HSI) and quantity (acres); those changes are predicted for selected target years over the period of analysis, under future without-project and future with-project conditions. These values are then annualized over the project life to determine the average annual habitat units (AAHUs) available for each species. The difference (increase or decrease) in AAHUs under the future with-project condition versus the future without-project condition provides a quantitative measure of expected project impacts. An increase in average annual habitat units indicates that the project will benefit the evaluation species; a decrease in average annual habitat units indicates that the project will harm the evaluation species.

At the marsh creation site, spoil disposal will occur during construction year 2. Therefore, the period of analysis for that site includes 12 years of construction and a 50-year project life. The proposed graving site will be excavated in the first year of project construction. Therefore, the period of analysis at that site will include 13 years of construction and a 50-year project life.

Quantifiable impacts of this project are directly related to the acreage of marsh created using "clean" spoil disposal, and the acreage needed to construct and operate the graving site and associated staging areas. The Corps provided acreage estimates for both. We based future without-project conditions on historic land uses and development patterns in the project area, as well as historic marsh loss rates.

Corps and Service biologists agreed to use great egret and mink to evaluate shallow open water, scrub/shrub wetland, and forested spoil banks habitat at both sites. The great egret model (Chapman and Howard 1984) measures the extent of shallow open water and emergent, submergent or floating vegetation. The mink model (Allen 1986) was used to measure shoreline cover (vegetation and debris), as well as scrub/shrub and forested canopy cover. We calculated habitat conditions in the marsh creation site for TY 0 (baseline), 1, 3, and 62, for the great egret model, and added a TY 12 for the mink model to reflect increasing tree canopy cover. Habitat conditions in the impoundment were calculated for target years (TY) 0 (baseline), 1, 25, and 63.

Under the future-without project scenario, we predicted habitat conditions in the marsh creation area would not change over the period of analysis. Under future-with project conditions, spoil deposition would occur in TY 1, decreasing the depth of the receiving area. By TY 3, spoil above mean low tide would be covered with emergent and scrub/shrub vegetation. The containment levee would show the same pattern. Over the remaining period of analysis, acres of emergent vegetation would slowly decrease because of encroachment by woody vegetation and local subsidence. Comparing habitat values for the marsh creation site under future without-project and future with-project conditions, the HEP analysis predicts an increase of 45.33 AAHUs for the mink, and 30.46 AAHUs for the great egret (Table A-1).

Under the future-without project scenario, we predicted the impoundment at the graving site would undergo further eutrophication. By TY 25, coverage of both floating and emergent vegetation will increase and organic accumulations will slowly decrease the depth of the shallow water areas. Scrub/shrub and forested canopy cover would also increase, although the size of the spoil banks would limit that increase. Under the future-with project scenario, we assumed that the wildlife habitat value of the graving site would be eliminated in year 1, during graving site construction. Although the area immediately surrounding the graving site would retain some habitat value for mink, we discounted the mink HSI to reflect the minimal acreage and prey availability, as well as increased human disturbance (e.g., construction work, truck traffic, etc.). Comparing habitat values for the graving site under future without-project and future with-project conditions, the HEP analysis predicts a decrease of 16.99 AAHUs for the mink, and 13.98 AAHUs for the great egret (Table A-2).

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State of Louisiana

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M.J. "Mike" Foster
Governor

October 31, 1996

Mr. David W. Fruge
Field Supervisor
U. S. Fish and Wildlife Service
825 Kaliste Saloom Road
Brandywine Bldg. II, Suite 102
Lafayette, Louisiana 70508

Re: Mississippi River-Gulf Outlet, New Lock and Connecting Channels, Louisiana, Re-evaluation Study

Dear Mr. Fruge:

The Louisiana Department of Wildlife and Fisheries have reviewed the document for the above referenced project and have found that we concur with the findings of the U.S. Fish and Wildlife Service.

We appreciate the opportunity to review this report.

Sincerely,

James H. Jenkins Jr
Secretary

JHJ:fod

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Habitat Conservation Division
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October 31, 1996 F/SE024/TJ:jk
504/389-0508

Mr. Dave Frugé, Field Supervisor
U.S. Fish & Wildlife Service
825 Kaliste Saloom II, Suite 102
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Dear Mr. Frugé:

The National Marine Fisheries Service has received the revised draft Fish and Wildlife Coordination Report on the Mississippi River-Gulf Outlet, New Lock and Connecting Channels, Louisiana, transmitted by your letter of October 17, 1996. We have reviewed the report and concur with your project analysis and assessment. Furthermore, we strongly support your recommendations that brackish marsh creation be implemented to mitigate adverse project impacts, construction impacts be minimized, and contaminated spoil be isolated from wetlands.

Thank you for this review opportunity.

Sincerely,

Rickey N. Ruebsamen

Rickey N. Ruebsamen
Branch Chief