SECTION 2

CLEAN WATER ACT
SECTION 404 EVALUATIONS

SECTION 2

SECTION 404(b)(1) EVALUATION
BAYOU SORREL LOCK REPLACEMENT
IBERVILLE PARISH, LOUISIANA

I. PROJECT DESCRIPTION

a. Location: The project site is located in southern Iberville Parish, Louisiana, near the community of Bayou Sorrel. The city of Plaquemine, the parish seat, is located about 12 miles northeast of the project site. The Bayou Sorrel Lock is on the Morgan City to Port Allen Alternate Route of the Gulf Intracoastal Waterway (GIWW - Alternate Route). It allows navigation traffic to pass through the East Atchafalaya Basin Protection Levee (EABPL).

b. General Description: The Bayou Sorrel Lock was opened for traffic in 1952. It has usable dimensions of 56 feet wide by 797 feet long by 14 feet deep. The lock requires replacement for two reasons. First, navigation delays at the lock are significant due to the lock's relatively small size. Second, the Atchafalaya Basin Floodway flow line for a project flood has been raised since the lock was built due to siltation in the basin. This makes the Bayou Sorrel Lock inadequate to pass a project flood on the Mississippi River and Tributaries project.

The Tentatively Selected Plan is to replace the Bayou Sorrel Lock with a new, concrete-chambered lock, located immediately west and slightly north of the existing lock. The existing lock will be abandoned in place and its approach channels and chamber will be filled with dredged material. The proposed plan consists of a larger replacement lock, 75 feet wide by 1,200 feet long by 15 feet deep to be located adjacent to the existing lock at Bayou Sorrel within government owned land and land currently used as perpetual maintenance dredging disposal areas. The plan provides for a U-shaped concrete chamber with timber guide walls. The positioning of the replacement lock would allow for the existing lock to remain operating until construction of the new lock is complete. The lock gates will be two, 70-degree steel sector gate leaves, electronically operated. Emptying and filling will be accomplished by opening the gates and allowing the chamber to empty or fill. The Atchafalaya Basin Floodway East Access Channel, which joins the south approach channel of the existing lock immediately south of the lock, will be rerouted and extended to the south. During high water, cross currents from the East Access Channel cause significant problems to tows approaching the south guide wall. Relocating the channel west and extending its junction with the new lock's south approach channel will allow barge traffic ample time to negotiate the cross currents before entering the new lock. Discharges regulated by 404(b)(1) guidelines would occur at the following sites, indicated on Plate 1, and are described as follows:

Discharge sites X, Y, and Z are existing borrow pits that would be associated with the discharge of approximately 490,000 cubic yards of material removed from construction of the new lock tailbay channel.

Discharge sites 1, 2, 3, and 5 are existing channel sites. Approximately 1,080,000 cubic yards of material removed from the maintenance dredging disposal area for construction of the new Atchafalaya Basin Access Channel will be discharged into these sites.

Discharge sites I1, I2, K1, N1, and N2 are existing disposal areas of mixed wetland and non-wetland sites that would be associated with the discharge of approximately 750,000 cubic yards of material removed for construction of the new lock forebay channel.

c. Authority and Purpose: The feasibility study for the lock was authorized by resolutions of the U.S. Senate and House of Representatives in 1972 requesting the Board of Engineers for Rivers and Harbors to review the Louisiana-Texas portion of the GIWW with a view to determining the advisability of modifying the existing project.

d. General Description of Dredged or Fill Material

(1) General Characteristics of Material. The material to be dredged is alluvial clay, silt, and fine sand, mixed with varying amounts of organic material.

(2) Quantity of Material. Approximately 490,000 cubic yards (cy) of soil would be removed to construct the new lock's tailbay channel. Approximately 750,000 cy would be excavated to construct the new lock's forebay channel. Approximately 1,080,000 cy would be excavated to construct a new alignment for the Atchafalaya Basin East Access Channel. Approximately 440,000 cy of material from the new lock chamber area, and tailbay and/or forebay channels would be used to realign the East Atchafalaya Basin Protection Levee to tie-in with the new lock and construct the closure of the existing lock. Approximately 110,000 cy of channel bottom would be excavated to construct closures across the existing lock tailbay and forebay channels and at two locations in the existing East Access Channel. These closures are necessary to contain the dredged material from realignment of the East Access Channel and maintenance dredging. Approximately 70,000 cy of graded rock would be used for bank protection along the new channels. Approximately 85,000 cy of concrete would be used to construct the new lock.

During annual maintenance dredging of the channel, approximately 250,000 cy of material would be dredged. The estimated annual maintenance dredging quantity is the same as the amount of material currently dredged from the channel on an annual basis. This material would be placed in Areas 2, 5, 1, and 3 (in that order), until each site is filled to capacity. Sites 2 and 5 would be filled in about five years after project construction, using a total of about 1,250,000 cy of material. Site 1 would be filled in about 10 years using about 1,250,000 cy of material. Site 3 would be filled in about 35 years using about 6,250,000 cy of material.

(3) Source of Material. All soils and channel sediments to be excavated are currently in-place. The rock used for bank protection would come from quarries located out-of-state. Concrete used for lock construction would either be hauled-in pre-mixed or mixed of hauled-in basic materials on site.

e. Description of the Proposed Discharge Sites

(1) Location: All dredged material discharge would occur in the vicinity of the Bayou Sorrel Lock. The disposal sites are shown on Plate 1.

(2) Size: The sizes of the discharge sites are as follows:

Area I1	24.5 acres	Area 1	14.9 acres	Area X	14.1 acres
Area K1	4.1 acres	Area 2	10.1 acres	Area Y	26.8 acres
Area N1	17.2 acres	Area 3	47.4 acres	Area Z	11.4 acres
Area I2	24.9 acres	Area 5	8.1 acres		
Area N2	42.7 acres				

During project construction, all of the above areas may be used for disposal. During project maintenance, only Areas 1-5 would be used.

(3) Type of Site: Disposal sites include upland habitats within existing dredged material disposal areas; wetland sites within existing dredged material disposal areas; existing borrow pits that were excavated for fill material used in levee construction; and open water areas that currently serve as navigation channels. Existing dredged material disposal sites with mixed wetland and non-wetland habitats are Area I1, Area K1, Area N1, Area I2, and Area N2. Areas of existing channel to be used for discharge of dredged material are Area 1, Area 2, Area 3, and Area 5. Existing borrow pits to be used for dredged material discharge are Area X, Area Y, and Area Z. The area where the new lock site and levee tie-ins would be built is currently a mixed habitat of mowed lock grounds, bottomland hardwoods, disturbed land used for dredged material disposal and borrow, and young black willow woodlands.

(4) Type of Habitat: Material would be discharged into upland, wetland, and open water sites. The upland discharge sites include existing, confined, dredged material disposal areas that have been created with material excavated during annual maintenance dredging of the GIWW - Alternate Route. Some of these disposal areas have been elevated to the point where parts of them do not hold any surface water and are therefore not considered wetland. The disposal sites are vegetated with mainly light-seeded species such as black willow, sycamore, and cottonwood. The existing borrow pits to be used for discharge are connected to Lower Grand River and are normally very turbid. The channel discharge sites are existing navigation channels that would no longer be necessary once the new lock becomes operational.

(5) Timing and Duration of Discharge: The current schedule has project construction beginning in 2005. Discharge would occur during the 3-year construction period for the new lock. Maintenance dredging of the GIWW south of the new lock would be necessary annually. Dredging now occurs annually in the same area for maintenance of the existing waterway. No change in the dredging quantity for annual maintenance is expected.

f. Description of Disposal Method: All soils and sediments dredged for construction of the new lock's forebay and tailbay channels and for re-alignment of the East Access Channel would be dredged and deposited with a hydraulic cutterhead dredge. Closures constructed in the existing channels to confine the hydraulically discharged material would be constructed with barge-mounted draglines and/or clamshell bucket cranes. Rock used for bank protection would be deposited with a barge-mounted crane. Concrete used for lock construction would be poured

in place from conventional concrete handling equipment. Fill used for levee construction would be deposited with earth moving equipment that may include dump trucks, bulldozers, graders, and heavy off-road earthmoving machines.

II. FACTUAL DETERMINATIONS

a. Physical Substrate Determinations

(1) Substrate Elevation and Slope. The existing dredged material disposal areas to be used for disposal are currently between +3 and +20 feet. The elevation generally decreases with increasing distance from the East Access Channel. These areas would be raised in elevation to as much as +20 throughout.

The existing channels where dredged material would be placed during construction and maintenance range in depth to about 15 feet deep. These areas would be filled to create terrestrial habitats, but not all areas would be filled to capacity during project construction. The final elevation of these areas would be about +3 to +12 feet.

The borrow pit discharge sites would be converted from aquatic to terrestrial habitats. The pits are currently about 6 to 8 feet deep. Their elevation after discharge would be in the range of +3 to +10 feet.

(2) Sediment Type. The sediments to be deposited are similar in grain size to the sediments of the disposal sites. The entire project area is composed of alluvial sediments ranging from clays to fine sands, with varying amounts of organic matter. The hydraulically dredged material would be very fluid and soft upon disposal, but would de-water and consolidate over time.

(3) Dredged Material Movement. All discharge sites for hydraulically-dredged material would be confined. Spillboxes or overflow weirs would allow effluent to exit the sites. No significant movement of material out of the discharge sites is expected.

(4) Physical Effects on Benthos. Benthos in the borrow pits and channels used for disposal would be smothered with dredged material. Soil organisms in the existing disposal areas would also be lost, but the same species of organisms would re-colonize the sites once the dredged material consolidates.

(5) Other Effects. The realigned East Access Channel is expected to provide similar aquatic habitat to the existing East Access Channel.

(6) Actions Taken to Minimize Impacts. Hydraulically-dredged material would be confined with dikes. Spillboxes or overflow weirs would be used to allow effluent runoff. All effluent would be returned to major channels.

b. Water Circulation, Fluctuation, and Salinity Determinations

(1) Water.

(a) Salinity. The project site is a freshwater environment and the salinity in the vicinity of the project is not expected to change due to the project construction.

(b) Water Chemistry. Ambient pH values in the Intracoastal Waterway from Bayou Sorrel Lock to Morgan City range typically from 6.5 su to 8.5 su. Ambient pH values in the Intracoastal Waterway from Bayou Sorrel Lock to Port Allen Lock range typically from 6.0 su to 8.5 su. From Louisiana Department of Environmental Quality (LDEQ) Station 51010080 Intracoastal Waterway Port Allen to Morgan City Alternate Route @ Bayou Sorrel Lock during the time period January 1977 through December 1996, the pH ranged from 6.30 su to a maximum of 8.99 su with an average of 7.7 su. Factors typically associated with dredging activities may cause pH in receiving area waters to shift toward less alkaline 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. These pH variations would be minor and short - lived. pH levels would return to background shortly after construction.

The clearing of land for access and construction of a new lock will increase the erosion of the banks and possibly increase the pH in the waterway. However, environmental practices to reduce erosion can be performed. pH levels would return to background shortly after construction.

For all discharge sites evaluated, minor and temporary alteration of local water chemistry is anticipated during dredge material discharge. This material will be held in confined disposal areas and only the effluent will flow back into the surrounding waters. Typical changes in local water chemistry include the elevation of: oxygen demand, dissolved solids, nitrogen, iron, and manganese concentrations. Normally, the affected surface waters have sufficient buffer capacity to prevent radical changes in pH. Dilution tends to limit the degree of modifications in water chemistry.

(c) Clarity. Construction in the cofferdam area will affect clarity. The placement of material for the earthen dam would cause short-term impacts by increasing turbidity in the immediate construction area. Turbidity affects the water quality in several ways. 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. Overall, water clarity will return to background conditions after project construction is completed.

Dewatering the cofferdam construction area by pump prior to construction will have little adverse impact on clarity, as there is periodic flow from the lock chamber to the GIWW - Alternate Route at the present time.

For all discharge sites evaluated, elevated turbidity and suspended solids levels would reduce surface water clarity during placement of dredged material within the disposal area, particularly in the area of the channel closure. This would be a temporary and localized condition. Clarity would soon return to normal, especially after placement of the erosion

protection on the closures and establishment of grass on the levees. Turbidity of the effluent is typically very low and is not expected to have significant effects on the surrounding waters.

(d) Color. No significant long-term changes in water color would occur. During construction, temporary changes in color may occur in the GIWW - Alternate Route. These temporary color changes would be associated with the release of organic soils as a result of dredging, excavation, and disposal as well as other construction activities. Water color would return to background conditions after completion of the project.

(e) Odor. Since the soils to be excavated are not considered highly organic in nature, no odor is expected from excavation and dredging of the materials.

(f) Taste. No potable water intakes are known to exist in the area. Therefore, any alteration of taste caused by construction activities would be temporary and of little consequence.

(g) Dissolved Gas Levels. The only dissolved gas of concern affected by construction, dredging, and disposal would be dissolved oxygen. Short-term decreases in dissolved oxygen could occur due to the release of nutrients from organic soils and increased turbidity.

For all discharge sites evaluated, short term decreases in dissolved oxygen levels could occur in the areas of dredged material placement, due to the oxygen demands associated with dredge sediments.

Dissolved oxygen would return to background levels after project construction is completed.

(h) Nutrients. For all discharge sites evaluated, some nutrient concentrations could temporarily increase as a result of dredging and disposal operations. Some nutrient concentrations could also temporarily increase as a result of organic soils placed in waters as an earthen closure of the existing GIWW - Alternate Route. Nutrient levels would return to background concentrations shortly after construction is completed.

(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.

(a) Current Patterns and Flow. Discharge sites (X, Y, and Z): The excavation of the new lock tailbay channel and placement of this material in borrow pit located 1 mile east of the new lock site along the Lower Grand River, would make no change to existing current patterns in the Lower Grand River.

Discharge sites (I_1, N_1, I_2, and N_2): The excavation of the new lock forebay channel would be placed on portions of land currently used for the deposit of maintenance dredging material and would make no changes to existing current patterns or flow in the GIWW - Alternate Route.

Discharge sites (1, 2, 3 and 5): The excavation of the new Atchafalaya Basin East Access Channel and placement of this material into these discharge sites would make no significant changes to existing current patterns or flow in the GIWW - Alternate Route.

The proposed Bayou Sorrel lock would be located further north and west in the GIWW - Alternate Route than the existing lock. This is not expected to significantly change current patterns or flows as opposed to currents passing through the existing lock.

(b) Velocity. For all discharge sites evaluated, the Proposed Plan would have no appreciable effect on velocities.

The Bayou Sorrel lock's proposed location would not significantly effect velocities. The proposed tailbay, forebay, and connecting east access channels dimensions are primarily the same as the existing channels and therefore no appreciable effects on velocities are expected.

No effect is expected on velocity in the GIWW - Alternate Route as a result of dredged disposal activities in the waterway.

(c) Stratification. For all discharge and construction sites evaluated, the Proposed Plan would have no appreciable effect on water column stratification from current conditions.

(d) Hydrologic Regime. For all discharge, disposal and construction sites evaluated, the normal hydrologic regime would not be altered by the Tentatively Selected Plan.

(3) Normal Water Level Fluctuations. For all discharge, disposal and construction sites, normal water level fluctuations would not be altered by the plan.

(4) Salinity Gradients. For all discharge, disposal and construction sites, normal salinity gradients would not be altered.

(5) Actions That Would Be Taken to Minimize Impacts. None.

c. Suspended Particulate/Turbidity Determinations

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site. For all discharge sites evaluated, turbidity and suspended particulates would temporarily increase for the duration of disposal operations. Turbidity of the effluent is typically very low and is not expected to have significant effects on the surrounding waters.

At the location of dredging the action of the mechanical and hydraulic dredging equipment would cause a small amount of material to become suspended in the surrounding

water. This turbidity and suspended particulate increase would be localized and short-lived. The use of silt curtains would minimize re-suspension of particulates.

The placement of material to be used for the earthen cofferdam would increase turbidity and suspended particulates in the immediate construction area. This turbidity and suspended particulates would return to background levels shortly after construction.

Dike clearing and construction and levee construction activities will result in large denuded areas from which soils would erode. These denuded areas are then exposed to rain which lead to surface runoff and erosion. This runoff and erosion of the denuded areas add soil to the streams in the form of turbidity and suspended particulates. The use of silt screens and/or hay bales would minimize overland flow and aide in erosion control. These adverse effects are temporary and will diminish soon after the completion of the project.

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

(a) Light penetration. For all discharge sites, decreased light penetration would be associated primarily with water column turbidity and suspended material generated during dredging, disposal, and construction operations. This condition would be localized and short lived. Once the dike and levees are completed and covered with grass and the channel closures are faced with riprap, the fill material will not erode. Turbidity and suspended material levels would decrease, and light penetration would return to background levels.

(b) Dissolved oxygen. For all discharge sites, there would be localized short term decreases in dissolved oxygen levels resulting from the release of nutrients from the organic soils. The increase in turbidity and suspended particulates during construction would have little effect on the dissolved oxygen levels. Dissolved oxygen levels would return to background levels shortly after construction.

(c) Toxic metals and organics. To evaluate the potential effects on toxic metals and organics relating to dredging and disposal activities, elutriate tests were conducted. The elutriate test is a simplified simulation of the dredging and 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 dredging/filling operations. Samples were collected by the New Orleans District in June 1996. The locations of these samples are shown on Plate 2.

The results of the elutriate tests are discussed in the following paragraphs. Elutriate data were compared to the applicable freshwater acute and chronic aquatic life criteria. It should be noted that a value preceded by a less than symbol (<) indicates that the concentration of the constituent is known to be less than the value reported. This value is known as the detection limit of the analysis. If the detection limit of the method used to analyze the sample was greater than the numerical criteria for that specific substance, then that indicates the constituent could have, or "possibly", exceeded the criteria.

Elutriate 1BS96 was prepared with bottom surface sediment from Site 1BS96 and water collected from Site 2BS96. For the metals tested, the mercury concentration, <0.20 ug/L, possibly exceeded the chronic criterion of 0.1210 ug/L, but was below the acute criterion of 2.4 ug/L. The level of copper increased from an ambient water concentration of 14 ug/L to an elutriate concentration of 22 ug/L. However, the elutriate concentration is below the applicable LDEQ criteria. For the pesticides tested, the PPDDD concentration of <0.4 ug/L possibly exceeded both the chronic criterion of 0.006 ug/L and the acute criterion of 0.03 ug/L. The concentration of endrin, <0.4 ug/L, possibly exceeded both the chronic criterion of 0.023 ug/L and the acute criterion of 0.18 ug/L. The concentration of PPDDT, <0.4 ug/L, possibly exceeded the chronic criterion of 0.001 ug/L, but was less than the acute criterion of 1.10 ug/L. The concentration of heptachlor, <0.2 ug/L, possibly exceeded the chronic criterion of 0.0038 ug/L, but was less than the acute criterion of 0.52 ug/L. The concentration of dieldrin, <0.4 ug/L, possibly exceeded the chronic criterion of 0.0019 ug/L, but was less than the acute criterion of 2.5 ug/L. The concentration of chlordane, <0.1 ug/L, possibly exceeded the chronic criterion of 0.0043 ug/L, but was less than the acute criterion of 2.4 ug/L. The concentration of PCB's in the elutriate sample, <0.4 ug/L, possibly exceeded the chronic criterion of 0.014 ug/L, but was less than the acute criterion of 2.0 ug/L. Hexachlorobutadiene, a base/neutral extractable organic chemical, with a sample concentration of <22 ug/L possibly exceeded both the chronic criterion of 1.02 ug/L and the acute criterion of 5.1 ug/L. Data for all of the constituents tested, with the exception of metals, indicate possible increases from ambient concentrations. However, these increases in concentrations do not necessarily indicate that the constituents would be released in the water column during dredging operations.

Elutriate 2BS96 was prepared with bottom surface sediment and water collected from Site 2BS96. For the metals tested, the mercury concentration of <0.20 ug/L possibly exceeded the chronic criterion of 0.1210 ug/L, but was well below the acute criterion of 2.4 ug/L. For the pesticides tested, the concentration of PPDDD, <0.21, ug/L, possibly exceeded both the chronic criterion of 0.006 ug/L and the acute criterion of 0.03 ug/L. The concentration of endrin, <0.21 ug/L, possibly exceeded both the chronic criterion of 0.0023 ug/L and the acute criterion of 0.18 ug/L. The concentration of PPDDT, <0.21 ug/L, possibly exceeded the chronic criterion of 0.001 ug/L, but was less than the acute criterion of 1.10 ug/L. The concentration of heptachlor, <0.10 ug/L, possibly exceeded the chronic criterion of 0.0038 ug/L, but was less than the acute criterion of 0.52 ug/L. The concentration of dieldrin, <0.21 ug/L, possibly exceeded the chronic criterion of 0.0019 ug/L, but was less than the acute criterion of 2.5 ug/L. The concentration of A and B endosulfan, <0.10 ug/L, possibly exceeded the chronic criterion of 0.056 ug/L, but was less than the acute criterion of 0.22 ug/L. The concentration of chlordane, < 0.052 ug/L, possibly exceeded the chronic criterion of 0.0043 ug/L, but was less than the acute criterion of 0.21 ug/L. The concentration of PCB's in the elutriate sample, <0.21 ug/L, possibly exceeded the chronic criterion of 0.014 ug/L, but was less than the acute criterion of 2.0 ug/L. A base/neutral extractable organic chemical, hexachlorobutadiene, with a concentration of < 10 ug/L possibly exceeded the acute criterion of 5.1 ug/L and the chronic criterion of 1.02 ug/L. The following constituents increased from ambient water concentration to the elutriate concentration, respectively: B-BHC increased from <0.076 ug/L to 0.083 ug/L; dibutylphthalate increased from 3.7 ug/L to 5.7 ug/L; butylbenzlphthalate increased from <10 ug/L to 18 ug/L.

Elutriate 3BS96 was prepared with bottom surface sediment and water collected from Site 3BS96. For the metals tested, the mercury concentration of <0.20 ug/L possibly exceeded the chronic criterion of 0.1210 ug/L, but was below the acute criterion of 2.4 ug/L. For the pesticides tested, the PPDDD concentration of <0.20 ug/L possibly exceeded both the chronic criterion of 0.006 ug/L and the acute criterion of 0.03 ug/L. The PPDDT concentration of <0.20 ug/L possibly exceeded the chronic criterion of 0.001 ug/L, but was less than the acute criterion of 1.10 ug/L. The heptachlor concentration of <0.10 ug/L possibly exceeded the chronic criterion of 0.0038 ug/L, but was less than the acute criterion of 0.52 ug/L. The dieldrin concentration of 0.20 ug/L possibly exceed the chronic criterion of 0.0019 ug/L, but was less than the acute criterion of 2.5 ug/L. The endosulfan concentration of <0.10 ug/L possibly exceeded the chronic criterion of 0.056 ug/L, but was less than the acute criterion of 0.22 ug/L. The endrin concentration of <0.20 ug/L possibly exceeded the chronic criterion of 0.0023 ug/L and the acute criterion of 0.18 ug/L. The chlordane concentration of <0.050 ug/L possibly exceeded the chronic criterion of 0.0043 ug/L, but was less than the acute criterion of 2.4 ug/L. The toxaphene concentration of <0.50 ug/L possibly exceeded the chronic criterion of 0.0002 ug/L, but was less than the acute criterion of 0.73 ug/L. The concentration of PCB's in the elutriate sample, <0.20 ug/L, possibly exceeded the chronic criterion of 0.014 ug/L, but was less than the acute criterion of 2.0 ug/L. A base/neutral extractable organic chemical, hexachlorobutadiene, with a concentration of <10 ug/L possibly exceeded both the acute criterion of 5.1 ug/L and the chronic criterion of 1.02 ug/L.

Elutriate 4BS96 was prepared with bottom surface sediment from Site 4BS96 and water collected from Site 3BS96. For the metals tested, the mercury concentration of <0.20 ug/L possibly exceeded the chronic criterion of 0.1210 ug/L, but was below the acute criterion of 2.4 ug/L. For the pesticides tested, the PPDDD concentration of <0.20 ug/L possibly exceeded both the chronic criterion of 0.006 ug/L and the acute criterion of 0.03 ug/L. The endrin concentration of <0.20 ug/L possibly exceeded both the chronic criterion of 0.0023 ug/L and the acute criterion of 0.18 ug/L. The PPDDT concentration of <0.20 ug/L possibly exceeded the chronic criterion of 0.001 ug/L, but was less than the acute criterion of 1.10 ug/L. The heptachlor concentration of <0.10 ug/L possibly exceeded the chronic criterion of 0.0038 ug/L, but was less than the acute criterion of 0.52 ug/L. The concentration of dieldrin, <0.20 ug/L, possibly exceeded the chronic criterion of 0.0019 ug/L, but was less than the acute criterion of 2.5 ug/L. The endosulfan concentration of <0.10 ug/L possibly exceeded the chronic criterion of 0.056 ug/L, but was less than the acute criterion of 0.22 ug/L. The concentration of chlordane, <0.050 ug/L, possibly exceeded the chronic criterion of 0.0043 ug/L, but was less than the acute criterion of 2.4 ug/L. The toxaphene concentration of <0.50 ug/L possibly exceeded the chronic criterion of 0.0002 ug/L, but was less than the acute criterion of 0.73 ug/L. The concentration of PCB's in the elutriate sample, <0.20 ug/L, possibly exceeded the chronic criterion of 0.014 ug/L, but was less than the acute criterion of 2.0 ug/L. A base/neutral extractable organic chemical, hexachlorobutadiene, with a concentration of <10 ug/L possibly exceeded the acute criterion of 5.1 ug/L and the chronic criterion of 1.02 ug/L. The concentration of dibutylphthalate increased from an ambient water concentration of 4.5 ug/L to an elutriate concentration of 10 ug/L.

In summary:

Discharge into sites X, Y, & Z resulting from tailbay construction could cause a temporary increase in metals and organics. The release would be minimal and limited to the confined discharge area. Levels would return to background upon completion of the project.

Discharge into sites 1, 2, 3, & 5 resulting from construction of the new alignment of the Atchafalaya Basin East Access Channel would not likely cause an increase in metal and organic levels because the material to be discharged into these areas would be removed from the same areas as during maintenance dredging operations.

Discharge into sites I_1, I_2, K_1, N_1 & N_2 resulting from construction of the forebay channel could cause a temporary increase in metal and organic levels. The release would be minimal and limited to the construction and discharge areas. Levels would return to background upon completion of construction.

(d) Pathogens. The water body in the vicinity of the project area is the GIWW - Alternate Route, which falls under the fecal coliform criteria cited for primary contact recreation by LDEQ. 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.

The mean fecal coliform levels in the GIWW - Alternate Route for the period of record of January 1977 through December 1996 averaged 732/100 mL. This value could be the result of urban runoff, septic tanks, and animal management areas located in the vicinity of the project area. Although existing conditions in the GIWW - Alternate Route 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. The water in the project area is normally quite turbid due to the very high suspended sediment load. The turbidity of the dredged material effluent is not expected to cause a significant change in the appearance of area waters. The physical presence of the dredging equipment and other equipment associated with construction of the new lock would conflict with the generally rural nature of the project area.

(f) Others as Appropriate. None

(3) Effects on Biota.

(a) Primary production. Primary production in the borrow pit discharge sites and channel discharge sites would change from phytoplankton to terrestrial plants. There would be a loss of 52 acres of aquatic habitat. However, the borrow pits are man-made anomalies. No such habitat occurs naturally in the area.

Primary production in the waterways of the area, aside from the borrow pits, is expected to return to normal upon project completion. Annual maintenance dredging would produce impacts similar to the maintenance dredging that now occurs. Impacts include temporary increases in turbidity levels, disturbance of bottom sediments, and loss of benthic organisms in the dredging areas.

(b) Suspension/filter feeders. Fish species occurring in the waterways of the project area are adapted to the very turbid waters that are common in this area. Mobile filter feeding organisms would avoid the dredging sites and effluent from discharge sites. Non-mobile filter feeders, such as bivalve mollusks, in the immediate areas of discharge would likely be killed.

(c) Sight feeders. Sight feeders in the area include largemouth bass and sunfish. These species would be adversely affected in the immediate area of discharge. Also, the organisms trapped inside of the borrow pits and channel discharge sites when confining dikes are constructed, would be either flushed from the area when discharge begins or killed.

(4) Actions Taken To Minimize Impacts. None.

d. Contaminant Determinations

The elutriate data analyzed in 1996 indicate, with the exception of Copper, PPDDD, endrin, and hexachlorobutadiene which "possibly" exceeded the acute criteria, contaminants would not be introduced into the water columns in concentrations that would exceed applicable criteria. This is based upon samples of sediment taken in the GIWW - Alternate Route in the vicinity of the project.

e. Aquatic Ecosystem and Organism Determinations

(1) Effects on Plankton. Plankton concentrations would be adversely affected in the immediate areas of dredging and discharge during dredging operations. Due to the high volume of water flow in the waterways of the project area, no long term adverse effect on plankton concentrations is expected. The long term effect on plankton is the loss aquatic habitat through the conversion of borrow pits to terrestrial habitat.

(2) Effects on Benthos. Benthos would be eliminated from the borrow pits and channel discharge sites since these areas would be converted to terrestrial habitats. The realigned East Access Channel would provide benthic habitat similar to the habitat that now exists in the East Access Channel.

(3) Effects on Nekton. Nekton would be trapped in the borrow pits and channel discharge sites when confinement dikes are constructed. These organisms would need to escape from the areas through spillboxes or overflow weirs when discharge begins or they would be killed in the discharge sites. The long term effect on nekton is the loss aquatic habitat through the conversion of borrow pits to terrestrial habitat.

(4) Effects on the Aquatic Food Web. The aquatic food web would be impacted by the conversion of borrow pits to terrestrial habitat. There would be a net loss of aquatic habitat of about 60 acres. However, 52 acres of this amount are man-made borrow pits.

(5) Effects on Special Aquatic Sites.

(a) Sanctuaries and Refuges. No such sites would be affected.

(b) Wetlands. The wetlands that occur in the alignment of the new lock would be converted to channels, the new lock site, and mowed lock grounds.

(c) Mud Flats. No such sites would be affected.

(d) Vegetated Shallows. No such sites would be affected.

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

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

(6) Threatened and Endangered Species. Consultation with the U.S. Fish and Wildlife Service has revealed that the proposed action is not likely to adversely affect threatened and endangered species or their critical habitats. No listed species under the purview of the National Marine Fisheries Service are found in the area.

(7) Other Wildlife. Terrestrial and forest-dwelling animals would benefit from the net increase in habitat from project construction. The filling of borrow pits, the existing lock chamber, and existing forebay and tailbay channels would add a net 60 acres of terrestrial habitat. Semi-aquatic animals, such as river otter, mink, and beavers, would be adversely impacted due to the loss of water area and water/land interface.

(8) Actions to Minimize Impacts. Dredged material disposal has been designated for disturbed areas, consisting of borrow pits and existing dredged material disposal areas.

f. Proposed Disposal Site Determinations

(1) Mixing Zone Determination. The elutriate data analyzed in 1996 only revealed possible exceedances of the acute criteria because detection limits of the method used to analysis the samples were higher than the numerical criteria. Therefore, no mixing zone determination was developed.

(2) Determination of Compliance with Applicable Water Quality Standards. The 1997 LDEQ Numerical Criteria for Specific Toxic Substance, 1997 LDEQ Numerical Standards Applicable to Surface Waters in the Study Area, 1986 EPA Freshwater Aquatic Life Criteria, and the 1986 EPA Human Health Criteria are contained in the Engineering Appendix, Water Quality Section of the INTRACOASTAL WATERWAYS LOCKS, LOUISIANA BAYOU SORREL LOCK REPLACEMENT FEASIBILITY STUDY. 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 all the stated discharge sites.

Elutriate tests are performed to determined potential effects of disposal operations on water quality. The results are then compared to appropriate water quality criteria. It should be noted however; that 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 exceedances of the applicable acute aquatic life criteria are noted in the following paragraphs. Existing conditions on the GIWW - Alternate Route indicate that only two pesticides, Endrin and PPDDD and one base/neutral extractable organic, Hexachlorobutadiene exceeded the LDEQ criteria but the majority of the constituents levels were below the chronic criteria.

Constituents which show the possibility to exceed water quality criteria during construction, dredging, and disposal activities were determined through the 1996 elutriate testing. Results of elutriate testing indicate "possible" increases above the criteria in PPDDD, PPDDT, Endrin, Hexachlorobutadiene, and toxaphene may occur during dredging and disposal activities.

The mean concentration of 732/100 mL of fecal coliform exceeded the maximum LDEQ criteria of 200/100 mL. This level could be a result of urban runoff, septic tanks, and animal management areas located in the project area. Minimum DO levels were below the minimum LDEQ criteria of 5 mg/L which may be attributed to the combination of high BOD industrial wastes, stormwater discharges from stormwater pumping stations, and local domestic wastes being discharged into the GIWW - Alternate Route.

(3) Potential Effects on Human Use Characteristics.

(a) Municipal and private water supply. There are no intakes in the vicinity of project and therefore, the Tentatively Selected Plan and construction activity would have no effect on any municipal or private water supply intakes.

(b) Recreational and commercial fisheries. Two public boat launches are located near the project area. The launch located along the East Access Channel is very heavily used by both recreational and commercial fishermen. The launch located along Lower Grand River is used to a significantly less degree, but it also is used by both recreational and commercial fishermen. The East Access Channel launch would not be affected. The Lower

Grand River launch may be affected by the new lock tailbay channel. If the launch were adversely affected, project funds would be used to restore any lost function of the launch.

The borrow pits to be filled with dredged material are privately owned and posted to exclude the public. The lessors of the property for hunting and fishing rights utilize these pits for recreational fishing. Their fishing opportunities in these pits would be eliminated with the project. The area would convert to forested terrestrial land that would provide hunting opportunities.

A relatively small amount of recreational fishing, mainly from the banks, occurs in the areas to be impacted by the dredging and filling. These activities would be disrupted during dredging and filling activities. Once the project is completed, the new channels would support bank fishing opportunities similar to existing conditions.

(c) Water-related recreation. Whatever non-fishing water-related recreation occurs in the project vicinity is minimal. There may be some very low levels of boating, water-skiing, and nature appreciation occurring. People engaged in these activities would not likely be doing so in the areas where dredging and filling would take place, but would venture into the more natural areas of the Atchafalaya Basin Floodway.

(d) Aesthetics. The project area is not particularly aesthetic. As stated in (c) above, people looking for aesthetically pleasing areas would venture into the more natural parts of the Atchafalaya Basin Floodway.

(e) Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar preserves. No such sites are located in the project area.

g. Determination of Cumulative Effects on the Aquatic Ecosystem

The Atchafalaya River Basin has been heavily influenced by humans, but still contains vast areas of productive fish and wildlife habitats, including cypress swamps, bottomland hardwood forests, and various aquatic habitats. Construction of levees to confine the Atchafalaya River has isolated much of that river's original floodplain from the river. River stages are higher now than they once were in the floodway due to the confining of the river by levees, which can adversely affect wildlife populations. The construction of levees has allowed communities such as Bayou Sorrel to develop along the protected side of the Atchafalaya Basin Floodway levees. Levee construction and associated borrow pits for fill material cover thousands of acres of formerly productive fish and wildlife habitats.

The construction of a new, improved lock at Bayou Sorrel would continue the pattern of development in the Atchafalaya Basin for navigation and flood control. While not significantly changing the existing condition, in terms of levee alignment or navigation channel alignment, the proposed action would further solidify the commitment to navigation and flood control in the area.

h. Determination of Secondary Effects on the Aquatic Ecosystem

Secondary effects of the proposed project include an increase in the number of tows on the GIWW - Alternate Route, since the existing Bayou Sorrel Lock is an impediment to the free flow of commerce. The estimated volume of traffic that would use the route over time, based on economic analyses, is shown below.

Bayou Sorrel Traffic by Year
(1,000 Tons of Cargo)

Condition	1992	2000	2010	2020	2030	2040	2060
Without Project	22,554	25,817	29,170	29,287	29,438	29,927	30,649
1,200 x 75 Concrete	22,890	26,215	30,662	34,285	34,444	34,690	35,195

The table shows that after the new Bayou Sorrel Lock is operating, significant increases in traffic (compared to no action) do not begin to occur until the year 2020. After the year 2020, the Port Allen Lock becomes a constraint on the amount of traffic that would move through the system. Since there is no study under way, nor authorization, to replace the Port Allen Lock, the projections do not exceed the capacity of the existing Port Allen Lock.

Increased vessel traffic on the GIWW - Alternate Route would be expected to exacerbate erosion problems that are occurring along certain reaches of the waterway. Bank erosion is not a problem along the alternate route from Morgan City to the Bayou Sorrel Lock. This reach of the waterway is within the Atchafalaya Basin Floodway. Comparison of aerial photos taken in 1978 and 1995 indicate that no discernable erosion has occurred during this time period on that reach of the waterway. This is likely because the sediment load carried by the waterway during high water events is sufficient to replace material lost through erosion.

Between Bayou Sorrel and Port Allen there are at least two locations where erosion problems are causing problems. Just north of the Bayou Sorrel Bridge, where the waterway begins to turn, landowners have been complaining for years about erosion of their property. Allegedly, prop-wash from pushboats is directed toward the bank in this area as barges are guided through the turn. Another erosion problem area is located near the community of Indian Village, located about 7 miles north of Bayou Sorrel. Erosion along the waterway has eaten into the Highway 3066 roadway and about a 3-mile stretch of the roadway is now closed. While these are not serious environmental problems, residents are losing their property to the waterway and public property is being damaged. Additional vessel traffic in the waterway would only worsen the problem.

These two problem areas are the only ones known to be critical. It should be noted that even these areas are not suffering from the rapid erosion problems occurring in coastal Louisiana where erosion rates along the edges of waterways and lake shorelines of 10 to 20 feet per year are not unusual. Erosion is also likely occurring along other sections of the waterway between

Bayou Sorrel and Port Allen, but comparison of aerial photographs from 1978 and 1995 indicates only a slight difference in appearance of the waterway, and only in a few isolated locations. Most of the waterway appears not to have widened during the 17-year period. However, roadways are located so close to the waterway in some locations, only a small amount of erosion could have adverse impacts. The conclusion is that erosion is not a significant problem along the waterway except in isolated locations where residential properties and roadways are being impacted.

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

The proposed discharge sites are the least adverse, practicable alternative sites available. Other alternatives that were considered include using undisturbed cypress swamp and bottomland hardwood forest, over which the Corps of Engineers already has an easement for dredged material disposal. The undisturbed swamp and forest was not used because of its high habitat value. Another disposal area that was considered was a series of borrow pits located 2-3 miles away from the dredging sites. The high cost of pumping the dredged material that distance, coupled with the fact that the property is owned by the State of Louisiana and is used by the public for recreational fishing, forced a decision not to use those borrow pits for discharge of dredged material.

c. Compliance with Applicable State Water Quality Standards

The proposed action would not violate State Water Quality Standards.

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

The proposed action is compliant with applicable toxic effluent standards and does not violate any prohibitions of Section 307 of the Clean Water Act.

e. Compliance with the Endangered Species Act of 1973

The proposed action, including the discharge of dredged material, is not likely to adversely affect threatened or endangered species or their critical habitats. The US Fish and Wildlife Service has concurred with this conclusion.

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

No marine sanctuaries would be affected by the proposed action.

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. The lessors of the borrow pits proposed for the discharge of dredged material would be deprived of the recreational fishing opportunities provided by the borrow pits. This is an unavoidable consequence of the proposed action. No other significant adverse impacts to commercial or recreational fishing are anticipated.

(c) Plankton. Plankton would be eliminated from the borrow pits proposed for the discharge of dredged material since the area would be converted to terrestrial habitat. No significant effects on plankton populations are expected beyond the borrow pits.

(d) Fish. Fish would be eliminated from the borrow pits proposed for the discharge of dredged material since the area would be converted to terrestrial habitat. No significant effects on fish populations are expected beyond the borrow pits.

(e) Shellfish. Shellfish would be eliminated from the borrow pits proposed for the discharge of dredged material since the area would be converted to terrestrial habitat. No significant effects on shellfish populations are expected beyond the borrow pits.

(f) Wildlife. Wildlife would be displaced from excavated areas of land, but would benefit overall from a net increase in terrestrial habitat.

(g) Special Aquatic Sites. The only special aquatic site to be impacted is wetlands. Wetlands in the path of the new lock's forebay and tailbay channels would be converted to aquatic habitat.

(2) Significant Adverse Effects on Life Stages of Aquatic Life and Other Wildlife Dependent on Aquatic Ecosystems. No significant adverse impact on life stages of aquatic life and other wildlife dependent on aquatic ecosystems would occur.

(3) Significant Adverse Effects on Aquatic Ecosystem Diversity, Productivity and Stability. No significant adverse impact on aquatic ecosystem diversity, productivity, or stability would occur.

(4) Significant Adverse Effects on Recreational, Aesthetic, and Economic Resources. Adverse impacts would occur to the fisheries resources produced in the borrow pits used for dredged material disposal. The impact would be restricted to the borrow pits. No significant adverse impacts would occur to aesthetic or economic resources.

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

Existing ditches and openings along the west bank of the East Access Channel would be left open to provide water flow into the swamp behind the dredged material disposal areas. Additional openings or ditches would be dredged as necessary to maintain adequate water flow into the swamp.

i. On the Basis of the Guidelines, the Proposed Disposal Sites for the Discharge of Dredged Material are:

... 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.

IV. EVALUATION RESPONSIBILITY

a. Project Description and Biological Input Prepared by: Mr. Richard E. Boe, Environmental Planning and Compliance Branch, New Orleans District, US Army Corps of Engineers.

b. Water Quality Input Prepared by: Ms. Donna Keller Bivona, Hydraulics and Hydrology Branch, Engineering Division, New Orleans District, US Army Corps of Engineers.

8/14/02
Date

David F. Carney
Chief, Environmental Planning
and Compliance Branch

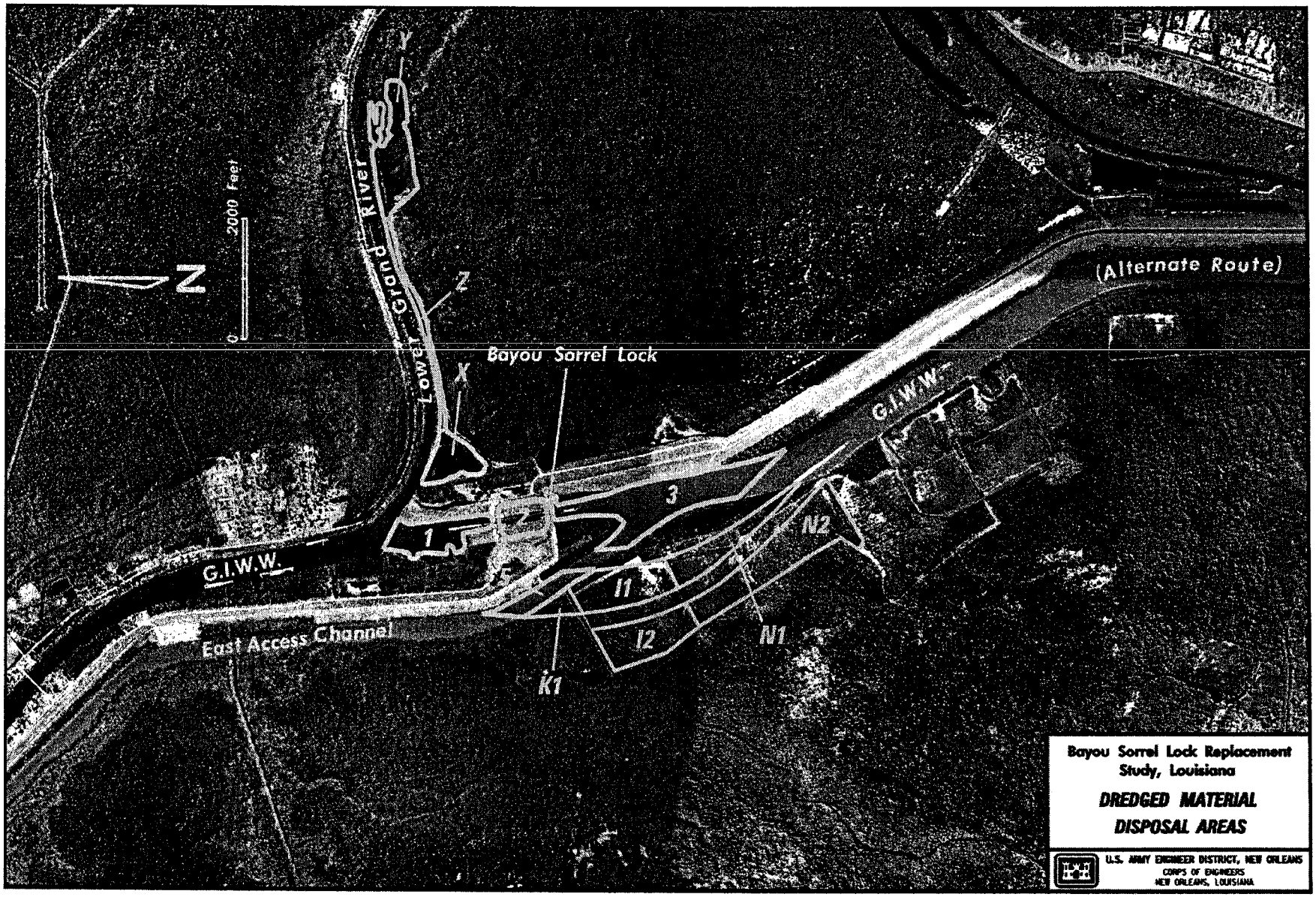
N
0
2000 Feet
Grand River
Lower
Bayou Sorrel Lock
(Alternate Route)
G.I.W.W.
G.I.W.W.
East Access Channel
1
2
3
I1
I2
K1
N1
N2
Bayou Sorrel Lock Replacement Study, Louisiana
DREDGED MATERIAL DISPOSAL AREAS
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

PLATE 2
IWW LOCK SAMPLING LOCATIONS