

DEPARTMENT OF THE ARMY PERMIT

Permittee: Terrebonne Levee and Conservation District

Permit No. MVN-2005-1663-CY

Issuing Office: New Orleans District

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: Dredge and deposit fill and aggregate material to construct the Reach H, Segments 2 and 3 of the Morganza to the Gulf Hurricane Protection Levee to include two flood gates, a navigation canal, armored plugs and shoreline protection, in accordance with the drawings attached in twelve sheets, sheets one, eleven and twelve dated September 11, 2008, and sheets two and ten dated May 1, 2008.

Project Location: Near Chauvin, Louisiana, in Terrebonne Parish.

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on **November 30, 2013**. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least 1 month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.
5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.
6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions: Pages 4-5.

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

- Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).
- Section 404 of the Clean Water Act (33 U.S.C. 1344).
- Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

- a. This permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.
- b. This permit does not grant any property rights or exclusive privileges.
- c. This permit does not authorize any injury to the property or rights of others.
- d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

- a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
- b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.
- c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
- d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

X [Signature]
(PERMITTEE)

X 11/11/08
(DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

Martin S. Mayer

13 November 2008
(DATE)

Martin S. Mayer, Chief Central Evaluation Section
for Alvin B. Lee, District Commander

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE)

(DATE)

SPECIAL CONDITIONS: MVN-2005-1663-CY

7. This authorization is wholly unconnected and unconcerned with the ownership of, or rights in, the underlying soil and creates no property rights.
8. The permitted activity must not interfere with the public's right to free navigation on all navigable waters of the United States.
9. The permittee must install and maintain, at the permittee's expense, any safety lights, signs, and signals prescribed by the US Coast Guard, through regulations or otherwise, on the permittee's authorized facilities.
10. The Chitimacha Tribe of Louisiana has stated that the project area is part of the aboriginal Chitimacha homelands. If during the course of work at the site, prehistoric and/or historic aboriginal cultural materials are discovered, the permittee will contact the Chitimacha Tribe of Louisiana at P.O. Box 661, Charenton, LA 70523, and the US Army Corps of Engineers, New Orleans District (CEMVN) Regulatory Branch. CEMVN will initiate the required federal, state, and Tribal coordination to determine the significance of the cultural materials and the need, if applicable, for additional cultural resource investigations.
11. The permittee shall limit dredge and fill activities and/or other types of filling activities to areas essential to the project. The remainder of the property shall be left in its natural state. If the proposed project requires any additional work not expressly permitted herein, or impacts any wetlands other than the areas indicated on the attached drawings, the permittee must apply for an amendment to this authorization prior to commencement of work.
12. Where practicable, appropriate erosion and siltation controls should be utilized and maintained in effective operating condition during construction, to avoid sediment runoff into adjacent wetlands and waterways. In addition, the permittee shall seed the levee immediately upon completion. The levee shall be seeded with bahia grass if the work is performed during the period of January through July or with rye grass if the work is performed during the period of August through December. Bahia grass shall be seeded at a rate of 5 lbs per acre and rye grass at 25 lbs per acre.
13. Upon immediate completion of the proposed navigation canal, the permittee shall install and maintain an adequate amount of rock armor (rip-rap) on the proposed plugs, along both sides of the canal for erosion protection and bankline stabilization, and in the proposed drainage swales to prevent scouring.

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14. As compensatory mitigation, the permittee shall perform 369 acres of marsh creation and plantings as prescribed in the June 4, 2008, approved mitigation plan, attached hereto. This plan shall be implemented concurrently with construction of the proposed levee. Construction for Levee Reach H, Segments 2 and 3 will be conducted at different times beginning with the construction of Segment 2, which is expected to result in approximately 174 acres of marsh impact. As such, compensatory mitigation will be conducted for Segment 2 first and will include a minimum of 261 acres of marsh creation and plantings. Likewise, Segment 3 construction will result in approximately 72 acres of marsh impact. Compensatory mitigation for Segment 3 will begin concurrently with construction of this segment and will include a minimum of 108 acres of marsh creation and plantings. When complete, both Segments combined will result in 369 acres of marsh creation to include plantings.

15. The compensatory mitigation identified above has been determined to be a necessary part of this permit approval. Failure by the permittee to perform the compensatory mitigation, in accordance with these permit conditions, is considered grounds for permit suspension, permit revocation, and/or restoration of the project site.

16. The permittee shall provide written monitoring reports to CEMVN-OD-SC and National Marine Fisheries Service (NMFS) and any other interested natural resource agencies by December 31 of the calendar year in which monitoring is conducted. The mitigation project shall be monitored at the end of years one (1), three (3), five (5), and ten (10). Monitoring reports shall contain, but should not be limited to, pre- and post- site construction surveys and photographic documentation (i.e., onsite and aerial photographs), description of planting unit growth and survival rates including expansion in area coverage. The report should also provide a brief description of the condition of the armored shoreline along the navigation canal including adjacent wetlands, condition of armored plugs in the borrow canal, condition of drainage swales along Bayou Little Caillou, and any other potential secondary impact and/or benefit realized as a result of project implementation.

17. The permittee shall ensure that no more than 15% percent of the mitigation area is below +1.25 feet NAVD or higher than +2.0 feet NAVD no later than one (1) year after fill placement.

18. The permittee is made aware that if the mitigation plan does not result in the projected level of marsh creation, the permittee shall implement remedial measures necessary, as directed by CEMVN, to ensure full compensation, or may be required to provide additional or alternative mitigation to compensate for any deficiency.

19. The permit is authorized for 10 years from the date of permit issuance to facilitate multiple levee lifts and levee maintenance. This authorization is specific to the work described in the attached plans. The structures and work shall not exceed specifications shown on the permit drawings, unless otherwise approved by CEMVN.

CEMVN-OD-SC

Department of the Army Permit Evaluation
and Decision Document

Applicant: Terrebonne Levee and Conservation District

Application No: MVN 2005-1663-CY

This document constitutes my Environmental Assessment, Statement of Findings and review and compliance determination according to the 404(b)(1) guidelines for the proposed work (applicant's preferred alternative) described in the attached public notice.

Background

The proposed project consists of a storm protection levee that lies in the same location as what could be a portion of the federal Morganza to the Gulf (MtoG) Hurricane Protection System. In the MtoG project this levee would involve Reach H, Segments 2 and 3 of the Highway 57 alternative. The applicant is proposing to construct this levee in advance and separate from any federal MtoG construction in the area. When complete, the MtoG project could extend approximately 72 miles and encompass a vast area stretching from Falgout Canal southeasterly to Highway 56 and 27 junction then northerly to the Montegut area then southwesterly to Pointe Au Chein area then northeasterly toward Larose, Louisiana.

Origins of the MtoG project can be traced back to the early 1990's to the Terrebonne Levee and Conservation District (TLCD - formerly South Terrebonne Tidewater Management and Conservation District). The Corps of Engineers New Orleans District (CEMVN) had issued various permits to the TLCD for construction of forced drainage projects, levees, and floodgates in the study area. In 1992, the House of Representatives authorized a reconnaissance study in southern Louisiana in Terrebonne and Lafourche Parishes from the East Atchafalaya Basin protection levee to the western Mississippi River guide levee and from Morganza, Louisiana to the Gulf of Mexico, encompassing approximately 4,000 square miles of southern Louisiana. In 1993, the TLCD filed a permit application, SW (Terrebonne Parish Wetlands) 1013, with the Corps for a comprehensive hurricane protection system in Terrebonne Parish. The system was based on a plan outlined in a 1992 report prepared for TLCD, entitled "Basin Delineation of Terrebonne Parish Flood Protection System." That plan became Alternative 1 for the MtoG study.

A Notice of Intent to prepare a draft Environmental Impact Statement (DEIS) for the TLCD plan appeared in the Federal Register on April 7, 1993. Following completion of reconnaissance report, in 1994, Congress authorized a Feasibility Study in the Energy and Water Development Appropriations Act (E&WDA) of 1995 (Public Law 103-316).

As the Feasibility Study progressed, it became apparent based on the scope and magnitude of the proposed project that a programmatic EIS would be necessary. The Corps issued a Notice of Intent concerning the change to a programmatic DEIS in the Federal Register on October 22, 1999.

The Feasibility Study was completed in March 2002. A Final Programmatic Environmental Impact Statement (FPEIS) entitled "Mississippi River & Tributaries-Morganza, Louisiana to the Gulf of Mexico Hurricane Protection" went to the public in March 2002. A Record of Decision (ROD) was not signed at that time. The Report of the Chief of Engineers was completed and forwarded to the Secretary of the Army in August 2002. This Chief's report was supplemented in July 2003.

The Government and the Non-Federal Sponsor entered into an Agreement for design of the Houma Navigation Canal Lock Feature of the MtoG Project on January 13, 2000. An Agreement for design of the remaining features of the MtoG Project was entered on May 22, 2002. The Design Agreement was amended in 2005 to reflect accurate cost sharing of the design and to allow the sponsor to accelerate the provision of its funds to the Government.

In October 2003, TLCD submitted a permit application to the New Orleans District, Regulatory Branch, for the construction of Reach J1 of the MtoG project. The Energy and Water Development Appropriations Act of 2004, Section 158, (Public Law 108-137) authorized the Secretary of the Army to carry out the Reach J, Segment 1, element of the MtoG project, in accordance with the report of the Chief of Engineers, dated August 23, 2002, and supplemental report dated July 22, 2003, at a total cost of \$ 4,000,000. In 2004, the Corps undertook environmental compliance and TLCD withdrew its permit application. The Environmental Assessment for this levee reach went out for public review in April of 2005 and a Finding of No Significant Impact was signed July 29, 2005. TLCD contracted the construction of this reach and work began in 2006.

TLCD subsequently submitted another permit application requesting a permit to construct this levee on April 21, 2005 (Reach H, Segments 2 & 3). The applicant would provide funding through local tax increases previously approved by citizens of Terrebonne Parish.

The MtoG project was authorized in Section 1001(24) of the Water Resources Development Act of 2007 at a total cost of \$886,700,000, with an estimated Federal cost of \$576,355,000 and an estimated non-Federal cost of \$310,345,000. In order to incorporate new storm modeling data and design criteria developed since hurricanes Katrina and Rita, modifications to the project will be required. It is recognized that these modifications will likely result in a total project cost that exceeds the allowable cost under Section 902 of WRDA 86. A letter report is being prepared to assess cost estimate and benefits of the authorized plan and a comparison with the next best alternative to reaffirm that the authorized plan is still the best plan. Geotechnical investigations, hydraulic modeling, economic and environmental analysis to support completion of a reevaluation report are being accomplished.

The New Orleans District is preparing a revised Programmatic Project Cost Estimate (PCE) for MtoG using the post-Katrina criteria and the new 100-year surge elevations. The PCE will determine if the project is still economically justified and if the authorized plan is still the NED (National Economics Development) plan.

A Revised Programmatic Environmental Impact Statement (RPEIS) will be prepared to document the environmental impacts resulting from the MtoG as designed to meet the new 100-yr elevations and the post-Katrina design criteria. This will be a revision rather than a supplement due to the fact the original ROD was not signed. The RPEIS will be based on the new project footprint developed as part of the PCE. The RPEIS could include constructible features (i.e. HNC Lock complex) so that no further environmental clearances will be needed upon signing of the ROD for those features. The tentative date for completion of the RPEIS is summer 2009.

A Post Authorization Change (PAC) report for the entire MtoG must be submitted to Congress for reauthorization. The PAC report will include updated project cost estimates (based on the PCE), updated economic benefits, and detailed environmental impacts. The PAC report should be completed and submitted for approval along with the PEIS in summer of 2009.

I Proposed Project: The location and description of work are described in the attached public notice. (Any modifications since the public notice are listed below).

Since issuance of the public notice on March 20, 2005 (March 24, 2005 for CMD), there has been a change in the proposed project. The change proposes to keep the proposed borrow canal in section I of the levee open for navigation. Specifically, the borrow canal stretching from Lapeyrouse Canal south to the levee terminus. Presently, Lapeyrouse Canal provides access from Bayou Little Caillou to Bayou Terrebonne. The proposed levee alignment will traverse this canal thereby preventing access and causing local boat traffic to proceed further north to either Placid or Bush Canals to access Bayou Terrebonne. These options will add a substantial amount of time and distance to navigational interest. The proposal will maintain current navigation through Lapeyrouse Canal but through a more southerly entrance.

II Environmental and Public Interest Factors Considered:

A. Purpose(s) and need(s): The proposed project would involve the construction of approximately a 5.6 mile long protection levee beginning approximately 4,400 feet south of Lapeyrouse Canal and extending northward along the Bayou Little Caillou ridge for approximately 3.9 miles and then heading northeasterly for approximately 1.7 miles to the junction of Bush Canal and Bayou Terrebonne where it will tie-in to the Bush Canal navigational flood gate. Another navigational flood gate will be placed at the junction of Bayou Little Caillou and Placid Canal. The proposed project will also have drainage swales placed along Bayou Little Caillou ridge at every 1000 feet or as needed to prevent impoundments of wetlands between the ridge and levee and to allow for tidal exchange. The borrow canal from Lapeyrouse Canal northward to project ending will have armored plugs every 2000 feet or as needed. The borrow canal from Lapeyrouse Canal south to Bayou Little Caillou will be maintained for navigation. Both sides of the navigation canal from Bayou Little Caillou to Lapeyrouse Canal will be armored for bank stabilization. Both navigational flood gates will remain open at all times except during an anticipated flood event such as a tropical storm, including hurricane or other extreme tidal events. Tide gauges will be installed on each gate and will be monitored closely. The gates will be closed when water elevations approach +2.5 feet NAVD at which the gates would be closed until the water recedes. In the event of a "named" storm in the Gulf of Mexico and a sudden rise in water elevation due to storm surge is expected, the gates may be closed at +2.0 feet.

The purpose of the proposed project is to provide residents living in the communities of Chauvin and Dulac, Louisiana with moderate flood protection from tidal surges associated with strong southerly flows, abnormally high tides and modest tropical storm events. These communities are increasingly vulnerable to flooding as subsidence and land loss continue to influence the region by the disappearance of natural storm barriers which help buffer and protect low-lying areas. In recent decades, areas in and around these communities have experienced significant property damage as a result of flooding associated with these events. The proposed project is intended to minimize reoccurring flooding by offering moderate flood protection to local residents in the area. On a much larger scale, the proposed project could become a part of a larger protection plan known as Morganza to the Gulf (MtoG) Hurricane Protection Levee Project. When complete, the MtoG levee may extend approximately 72 miles and encompass a vast area stretching from Falgout Canal southeasterly to Highway 56 and 27 junction then northerly to the Montegut area then southwesterly to Pointe Au Chein area then northeasterly toward Larose, Louisiana. Regardless of any future MtoG project construction, the proposed action provides independent flood risk reduction from extreme tidal events and less intense tropical storms to the communities of Chauvin and Dulac.

In recent times, several significant storm events have resulted in widespread destruction and flooding resulting in billions of dollars in damages. Hurricane Katrina in August 2005 resulted in significant adverse impacts to the region but more so in southeast Louisiana and coastal Mississippi. This storm is considered the most severe and costly natural disaster ever to affect the United States. Just over three years later, recovery efforts in coastal Mississippi and the greater Now Orleans area are still underway. The proposed project area was spared massive destruction but did experience localized flooding in the lower-lying areas. If Hurricane Katrina would have made landfall approximately 50 miles further westward, the proposed project area, especially in the communities of Dulac and Chauvin, would have suffered catastrophic results. Nearly a month later in September 2005, Hurricane Rita made landfall in southwest Louisiana resulting in massive widespread flooding and destruction. This event led to increased flooding in the project area due to the storm's intensity, size, and track which put it on the more severe side of the storm. This storm too could have resulted in greater catastrophic damages if it had taken a more easterly route toward south central Louisiana. In September 2008, Hurricane Gustav made landfall at Terrebonne Parish resulting in significant storm damage to the region. Nearly two weeks later, Hurricane Ike made landfall in Galveston, Texas which caused severe damage in south Louisiana. The storm surge led to major widespread flooding and the breaching of several levees. The proposed project area communities of Dulac and Chauvin were impacted due to their lower elevation and proximity to the Gulf of Mexico. Although final damage assessments have not been tallied, preliminary reports suggest that approximately 2,500 homes were flooded during this event and tens of thousands were without power, and many areas are still without power weeks later. The proposed project area where the levee is to be constructed remains unchanged since much of it lies within marsh and open-water. If the proposed levee had been in place prior to Hurricane Ike, it is believed that the severity of the impact would have been lessened through the reduction of storm surge and associated wave energy.

B. Alternatives (33 CFR 320.4(a)(2), 40 CFR 230.10)

(1) **No Action.** If no action is taken to prevent flooding in the project area, the communities of Dulac and Chauvin would remain susceptible to flooding from strong southerly flows,

abnormally high tides and modest tropical storm events. Property loss and damage, displacement of residents, damage to roads and other infrastructure, interruption of public services and transportation and loss of income would continue to occur. In addition, residents would continue to experience the difficulties and stresses associated with repetitive flooding.

The frequency of flooding and associated problems will inevitably worsen over time as ground elevations in the project area continue to subside with respect to sea level. Possible economic growth in the area would be curtailed due to a lack of available developable land, and it is expected that living conditions on much of the ridge could deteriorate severely due to the increased frequency of flooding. In addition, degradation of marsh and bottomland hardwood habitat within the project area would be expected to occur as a result of prolonged inundation, erosion and saltwater intrusion.

Public health and safety concerns would heighten as storm related losses and damages would increase. Increases in relative sea-level would cause tide levels to increase in the frequency and duration of standing water in or in close proximity to inhabited areas. Prolonged inundation would reduce the efficiency of the individual sewage disposal systems used throughout the area and provide breeding areas for bacteria and disease-transmitting insects.

(2) Other Project Designs (smaller, larger, different etc.) An alternative analysis consisting of sixteen (16) alignments was provided to the agencies for review. All of these alternatives required the same levee footprint since the ultimate goal was to provide for future hurricane protection, and all were generally in the same location but deviated slightly based on availability of suitable borrow material and method of construction. On January 27, 2005, a meeting was conducted between the applicant, state and federal agencies to discuss the preferred alignment and other alternatives. After considering wetland impacts, logistical concerns and overall cost, it was determined by the agencies that Alternative 5 (proposed alignment) was the most practicable alternative.

Another design modification which could potentially reduce wetland impacts involves a reduction of the levee dimensions. However, current levee design is based on minimum specifications necessary to establish future hurricane protection and, thus, any reduction in levee dimension would be considered incompatible. It should be noted that if the MtoG Hurricane Protection Project is not realized as a single and complete project, the current levee proposal would still offer moderate flood protection to the area, including the communities of Dulac and Chauvin.

(3) Other Sites Available To The Applicant (40 CFR 230.10). The purpose of the proposed project is to provide moderate flood protection from tidal surges associated with strong southerly flows, abnormally high tides and modest tropical storm events for residents located in the communities of Chauvin and Dulac, Louisiana. It is possible that other offsite alternatives were investigated during the initial phase of MtoG feasibility study but this document focuses on the current proposal. Also, consideration was not given to the feasibility of relocating the entire project since doing so would not fulfill the objective of providing moderate flood protection for these communities. As discussed above, other onsite alternatives were considered but these options were contingent upon the use and availability of near and offsite borrow areas, which ultimately determined costs.

(4) Other Sites Not Available To The Applicant. Alternative sites which are not available to the TLCD could not be utilized since the TLCD would be unable to accomplish its project objective of providing moderate flood protection for the communities of Dulac and Chauvin.

C. Physical/chemical characteristics and anticipated changes (check applicable blocks and provide concise description of impacts).

(X) Substrate. Soil types within the proposed project area consist of Mhoon silty clay loam, low phase (Mg), Sharkey clay (Se), Brackish marsh, clays and mucky clays (Bb), and Brackish marsh, peat (Bd) (SCS 1960). The Mhoon silty clay loam soils are located on the highest portions of the Bayou Little Caillou ridge and grades down into Sharkey clay soils at the base of the ridge. Both the Brackish marsh clay and peat soils are located in the interdistributary basin (marsh) between Bayou Terrebonne and Bayou Little Caillou ridges, with the Brackish marsh clay soils being closer to the ridge.

Approximately two-thirds of levee and borrow construction will occur primarily within the Sharkey clay and Brackish marsh, clay and mucky clay soils near the ridge. The northern remaining third where the levee crosses over to the Bayou Terrebonne ridge will impact all soil types. Approximately 3.5 million cubic yards of material would be dredged to construct over five miles of levee and borrow area. Project construction would require a construction rights-of-way width ranging from 550-600 feet approximately. Excavation would result in those marsh area substrates located within the borrow area and with an average width of 250 feet to be converted to open water and would expose the clay substratum to a depth of -25 feet NAVD. Dredging would affect gaseous and water movement in the substrata but would not significantly alter physical or chemical characteristics of the soil. The excavated material would be deposited to construct a levee with an average base width of 200 feet and a final elevation of +18 feet NAVD. Wetland substrate areas within the levee basal area would be filled and would be reclassified as nonwetland. In addition to the obvious changes in substrate elevation caused by placing material on the marsh, substrate underneath the proposed levee would be compressed, altering both gaseous and water movement. The use of geotextile fabric underneath the levee would minimize but not eliminate settling. Compaction caused by the weight of the dredged material and consolidation of the dredged material would result in gradual subsidence of the levee which would persist throughout the life of the project but which would occur at a slower rate over time. It is also anticipated that similar impacts to the substrate would occur in the proposed mitigation area through dredge and fill activities associated with marsh creation, but is expected to be minor.

(X) Currents, circulation or drainage patterns. The hydrology of the project area is influenced primarily by tidal action from the Gulf of Mexico as well as by precipitation. Tides are principally diurnal, exhibiting one high and one low within a 24 hour period; however, this cycle is often modified by winds. The estimated mean water level is approximately +1.5 ft NGVD. The project area generally receives an abundance of rainfall, with an annual average of 65.72 inches at Houma, Louisiana. Rainfall is well-distributed throughout the year, with the maximum occurring in July and the minimum in October (SCS 1960).

Currently, most excess precipitation introduced to the project area drains from the ridge west to Bayou Little Caillou and east to the broad interdistributary basin (marsh). Drainage occurs overland

as sheet flow. The rate at which this water drains is influenced to a large extent by the prevailing tide elevation. High tides reduce the hydrologic gradient, thereby hindering runoff from the ridge. Drainage patterns from the ridge west are not expected to occur since the natural ridge will not be directly affected by levee construction. Drainage patterns from the ridge east would be already impacted due to the location of the levee. However, in an effort to avoid isolation of marsh and reduce the ponding of water between the levee and the ridge, numerous gaps will be cut into the ridge to allow for drainage and tidal exchange to the west along the bayou.

The proposed levee would also adversely affect existing current and circulation patterns, especially in the area where the levee crosses over to Bayou Terrebonne. Presently, current and drainage patterns stretching from Bush Canal to the north and Lapeyrouse Canal to the south and between Bayou Little Caillou to the west and Bayou Terrebonne to the east is unimpeded. The cross-over levee will remove these current patterns. However, the area north of the cross over would still have exchange between Bush Canal and Bayou Little Caillou. The area south of the cross-over will still have exchange with Placid and Lapeyrouse Canals and all the natural sloughs and drainages in between. Therefore, impacts to current and circulation patterns as a result of levee construction would result in permanent, long-term changes but the project area is expected to adjust over time. In addition, the areas to be dredged from Madison Bay and Bayou Terrebonne to create shallow marsh platforms that will serve as compensatory mitigation would not experience any appreciable changes in existing current and circulation patterns, and overtime these area bottoms would return to preproject elevations as siltation occurs.

(X) Suspended particulates; turbidity. Dredging and filling associated with the construction of levee and borrow area and the borrow area in Madison Bay and Bayou Terrebonne would result in substantial localized increases in suspended particulate levels in the proposed borrow canal and in the immediately adjacent marsh and waterbodies. Particulates, comprised primarily of fine silt and clay material, would remain suspended in the borrow canal and adjacent waterbodies for some time after dredging ceases. Particulates released in the marsh and waterbodies would be expected to fall out of suspension within a relatively short period of time; however, the actual duration of impact would depend on tidal movement, winds, rainfall and salinity. After the project is completed, slight increases in turbidity may occur during rainfall events due to erosion of the unconsolidated levee material. This would decline within a few months of construction as the levee revegetates.

(X) Water quality (temperature, salinity patterns, and other parameters). Construction of the proposed project would result in temporary degradation of water quality at and in the immediate vicinity of the project site due to increased turbidity, elevated biochemical oxygen demand, depressed dissolved oxygen levels and the potential release of some contaminants currently entrapped within the soil. These water quality conditions are expected to return to normal ambient conditions once dredging activities cease. Any potential releases of contaminants are expected to be relatively minor and short-term in duration.

A Water Quality Certification from the Louisiana Department of Environmental Quality, Office of Environmental Services, was issued for the proposed project on July 5, 2005.

(X) Flood control functions. Terrebonne Parish lies within the Mississippi Deltaic Plain which is characterized by low elevations and little relief. Although developed areas in the southern

portions of the parish are situated primarily on relic distributary ridges, portions of the ridges are often less than 5 feet NGVD in elevation and are prone to flooding during extreme tidal events or strong southerly flows and are most vulnerable during tropical storm events. Although most people in southern Terrebonne have learned to cope with and have adapted to the minor flooding, it is the tropical storm events that are of most concern due to the magnitude and intensity of storm surge and destruction associated with these storm events. As seen in the last few decades, tropical storms, most notably hurricanes, have resulted in the loss of lives and property with damages in the billions of dollars. Although the proposed project will not eliminate or reduce flooding associated with severe tropical storm events such as hurricanes, it will help to minimize flooding associated with extreme tidal events and less intense tropical storms. Accordingly, regardless of any future MtoG project construction, the proposed action provides independent flood risk reduction from extreme tidal events and less intense tropical storms to the communities of Chauvin and Dulac. Without any level of protection from tidal surges, flooding and loss of property would continue and will increase in severity over time due to regional subsidence and projected rise in sea level.

(X) Storm, wave and erosion buffers. As indicated earlier, the proposed project would provide moderate protection from strong southerly flows, extreme tidal and modest tropical storm events. The proposed project would also serve as a buffer against storm, wave and tidal induced erosional processes in the area behind the levee and further inland as these processes are reduced. The proposed project would also reduce daily wave and tidal action to the natural ridge and those areas behind the levee. These project benefits would be achieved independently of any proposed MtoG project construction.

(X) Erosion and accretion patterns. Areas located adjacent to the natural ridge and behind the levee are likely to experience reduced erosion due to a reduction in wave fetch and severe tidal action associated with strong southerly flows and modest tropical storm events. Erosion and deterioration of marsh areas located outside the protection of the levee are expected to continue. Some minor erosion of the proposed levee is likely to occur over time due to wave action and weathering. Some accretion of sediments would be likely to occur in the borrow canal and adjacent wetlands and waterbodies due to normal erosional processes.

() Aquifer recharge.

() Baseflow.

() Other.

Additionally, for projects involving the discharge of dredged material;

(X) Mixing zone, in light of the depth of water at the disposal site; current velocity, direction and variability at the disposal site; degree of turbulence; water column stratification; discharge vessel speed and direction; rate of discharge; dredged material characteristics; number of discharges per unit of time; and any other relevant factors affecting rates and patterns of mixing. Disposal of dredged material will occur in open water and in tidal marsh. Water levels in the marsh area are typically less than 1.5 feet and approximately 3 feet or so in the open water areas. Because of the shallow depth and daily flushing, the water

column would exhibit little to no stratification. Water movement would be negligible and would be dependent upon tides and winds. However, for those existing man-made canals and natural tidal sloughs that offer more depth, there could be some minor stratification but is anticipated to be minimal due to mechanical agitation of the water column from routine boat traffic.

The deposition of the dredged clays and mucky clays by bucket dredge would increase the level of suspended particulates in the immediate vicinity of the project site. Turbulence caused by the dredging activity would promote thorough mixing; however, dispersal of the resuspended materials would likely occur slowly except during outgoing tides or during heavy rainfall. Suspended particulates and absorbed contaminants would gradually fall out of suspension and would be redeposited over a period of several hours. Redeposition would be facilitated by the presence of emergent vegetation immediately surrounding the project site.

D. Biological characteristics and anticipated changes (check applicable blocks and provide concise description of impacts).

(X) Special aquatic sites (wetlands, mudflats, coral reefs, pool and riffle areas, vegetated shallows, sanctuaries and refuges, as defined in 40 CFR 230.40-45). The proposed project would result in the direct and permanent loss of 246 acres of intertidal brackish marsh due to levee and borrow construction. Adjacent wetlands would be minimally impacted initially but over time could benefit as the levee would reduce wind driven fetch and other erosional processes acting upon the marsh.

The 246 acres of intertidal marsh to be impacted is unavoidable. To offset this loss, the applicant proposes to construct shallow water platforms in open water areas near the levee and plant these areas to create approximately 369 acres of marsh, as indicated in the June 4, 2008 approved mitigation plan.

(X) Habitat for fish and other aquatic organisms. Dredging and filling associated with the construction of levee and borrow area and the borrow area in Madison Bay and Bayou Terrebonne would result in the temporary displacement of motile aquatic organisms at and near the construction site and the destruction of benthic communities in the dredge and disposal site substrate. Additionally, turbidity increases and depressed dissolved oxygen levels in the marsh and adjacent waterbodies during construction would adversely impact those less-mobile organisms near the site. After construction, marine organisms would return; however, poor habitat and water quality would limit productivity until suspended sediments have resettled and dissolved oxygen levels increase.

Brackish marshes within the project area are tidally influenced and are utilized by estuarine and estuarine-dependent marine species of fish and shellfish as feeding and nursery areas. In addition, these wetlands produce and export nutrients and detrital material which support the complex estuarine food web. The construction and implementation of the proposed project would result in the permanent loss of approximately 246 acres of brackish marsh habitat and subsequent loss of all actual or potential estuarine and marine fisheries values associated with these wetlands. The loss of these wetlands would not, by itself, perceptibly impact the aquatic ecosystem; however, it would, along with other natural and man-induced marsh losses, contribute to increased competition for

remaining estuarine habitat. The creation of 369 acres of brackish marsh in the vicinity of the levee is expected to adequately mitigate project impacts to affected fisheries resources.

(X) Wildlife habitat (breeding, cover, food, travel, general). Wildlife utilizing those areas to be directly impacted by dredge and fill activities would be displaced during construction due to noise, human activity and habitat disturbance. Organisms would likely flee to adjacent undisturbed habitat and would suffer a permanent and immediate loss of 246 acres of brackish marsh. However, once the levee and mitigation area is complete, marsh habitat is expected to return and exceed preproject levels. A secondary benefit of the completed project would be the potential preservation of remaining marsh habitat behind the levee that could be lost to wave action and tidal scour. Other nearby areas may benefit as well with a reduction the rate of marsh loss.

(X) Endangered or threatened species. No threatened or endangered species are known to occur in the immediate project area, and no state or Federally-listed species would be impacted by the proposed project.

(X) Biological availability of possible contaminants in dredged or fill material, considering hydrography in relation to known or anticipated sources of contaminants; results of previous testing of material from the vicinity of the project; known significant sources of persistent pesticides from land runoff or percolation; spill records for petroleum products or designated (Section 311 of the CWA) hazardous substances; other public records of significant introduction of contaminants from industries, municipalities or other sources. All dredged material for levee construction would be obtained from marsh and open water areas adjacent to the levee. Material would also be dredged from Madison Bay and Bayou Terrebonne to construct the shallow platform areas for marsh creation. There are no known contaminants in the local substrate. However, because of the project's location near Bayou Little Caillou, it is possible that the underlying substrate may contain some contaminants introduced from residential runoff and the local shrimping fleet, etc. If present, these levels are expected to be minimum and the dredged material would be substantially similar to the disposal site substrate; therefore, no new contaminants would be introduced as a result of the project.

E. Human use characteristics and impacts (check applicable blocks and provide concise description of impacts):

(X) Existing and potential water supplies; water conservation. Waters within and contiguous with the proposed project area are subject to tidal influence and are not utilized as drinking water or for agriculture due to high salinities. The proposed project would, therefore, not result in the contamination or depletion of existing or potential water supplies.

(X) Recreational or commercial fisheries. The proposed project would result in the loss of marsh habitat which may be utilized by recreationally or commercially important species of fish. However, this loss would have no perceptible impact upon overall populations or harvests of these species. Vast areas of higher quality habitat would remain within the adjacent estuarine basin. With the implementation of 369 acres of marsh creation (mitigation), marsh habitat is expected to return and exceed preproject conditions.

(X) Other water related recreation. Wetlands which would be impacted by the proposed levee project may offer recreational opportunities in the form of fishing and hunting. The proposed project would temporarily prevent hunting and fishing on properties within the project area but only during the construction period.

(X) Aesthetics of the aquatic ecosystem. Construction of the proposed levee and borrow would result in localized aesthetic impacts due to construction-related loss of marsh and the deposition of barren spoil in these areas. Additional aesthetic impacts would occur due to increased turbidity levels in the marsh and adjacent waterbodies during dredging and filling operations. The newly constructed levee would be revegetated within a relatively short period of time, lessening both the visual impact of the spoil and the turbidity associated with erosion.

The completed levee with navigational floodgates would be permanent and considered not as aesthetically pleasing as the natural landscape. However, other levee projects such as those that serve as forced drainage have been in existence in the parish for several decades and residents have accepted them as a part of their surroundings.

(X) Parks, national and historic monuments, national seashores, wild and scenic rivers, wilderness areas, research sites, etc. The proposed project is located within the boundaries of the Barataria-Terrebonne National Estuary Program (BTNEP). BTNEP was established in 1991 and is administered by the Louisiana Universities Marine Consortium (LUMCON). Its mission is to preserve and restore the Barataria-Terrebonne estuary system in an approximately 4.2 million acre region between the Atchafalaya and Mississippi Rivers. Some of the goals of the program is to preserve and restore wetlands and to develop and achieve water quality standards that adequately protect estuarine resources and human health. In light of this, the project's mitigation plan would help to achieve these goals by creating 369 acres of brackish marsh that would provide additional estuarine habitat, preserve existing habitat by serving as a buffer, promote water quality, and help to protect the human environment.

(X) Traffic/transportation patterns. Louisiana Highway 56 is located along Bayou Little Caillou just west of the proposed levee and is the only major transportation route in the area. This highway also serves as a hurricane evacuation route for communities to the south such as Cocodrie. In the event that the proposed navigational floodgate structures within the levee are closed, the levee would reduce most floodwaters coming from the east and southeast from inundating low portions of the road, thereby helping to maintain or prolong existing traffic patterns and prevent road closures during periods of high tides. Because the road is immediately adjacent to Bayou Little Caillou, road flooding will continue but at a reduced threat. These project benefits would be achieved independently of any proposed MtoG project construction.

(X) Energy consumption or generation. Equipment such as draglines, bulldozers and heavy trucks would consume diesel and gasoline during the construction and maintenance of the proposed project. These energy requirements would be inconsequential due to the widespread availability of these fuels.

(X) Navigation. The proposed project contains two navigational floodgates located at Placid Canal and Bayou Petit Caillou confluence and Bush Canal and Bayou Terrebonne confluence that

are to remain open at all times and will only be closed during times of strong southerly flows, extreme tidal events or an approaching tropical storm. Both gates will have tidal gauges installed and will be monitored closely. The gates will be closed when water levels approach +2.5 NAVD feet and will reopen when the water level recedes. In the event of a "named" storm in the Gulf of Mexico and a sudden rise in water elevation due to storm surge is expected, the gates may be closed at +2.0 NAVD feet. Also, the proposed levee would cut off direct connection between Lapeyrouse Canal and Bayou Little Caillou. However, an alternative by-pass route has been provided for local navigation and it includes the borrow canal beginning at Lapeyrouse Canal and extending south to levee terminus where it will tie-back into Bayou Little Caillou, thereby, maintaining access to Bayou Terrebonne.

(X) Safety. The proposed project would provide a moderate level of protection from flooding associated with strong southerly flows, extreme tidal events and modest tropical storms but would not provide protection against severe flood events such as those typically associated with hurricanes.

(X) Air quality. Short-term localized degradation of air quality would be expected to occur during construction as a result of emissions of carbon monoxide, nitrogen oxides, hydrocarbons and particulates by dredging and earth-moving equipment. These pollutants would be quickly dispersed by prevailing winds, and concentrations should approach ambient conditions within a short distance of the project site. The proposed project has been analyzed for conformity applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act. It has been determined that the activities proposed under this project will not exceed *de minimis* levels of direct emissions of a criteria pollutant as its precursors and are exempted by 40 CFR Part 93.153. Any later indirect emissions are generally not within the Corps continuing program responsibility and generally cannot be practicably controlled by the Corps. For these reasons a conformity determination is not required for this project.

(X) Noise. The construction of the proposed project features would necessitate the use of dredges and various other heavy equipment which would temporarily increase noise levels near the construction site. Most construction would occur at least several hundred feet away from residences, and noise levels in developed areas are not expected to be excessively high. Construction would occur over a period of several months but would be restricted, for the most part, to normal daytime working hours.

(X) Cultural resources. A draft Reconnaissance Level survey was conducted at the project site in July 2008 by Earth Search, Inc. (ESI), which resulted in no discovery of cultural resources at the project site. ESI submitted their findings to this office in a report dated August 2008. The report stated that there was no evidence of prehistoric or historic archaeological deposits within the project area. In addition, the report pointed out the possibility of previously unrecorded sites being located in the high probability areas, but beyond the proposed levee alignment and, therefore recommended that a Phase I survey would not be necessary. ESI opined that levee construction within the proposed alignment would have no affect on historic resources.

In a letter dated September 10, 2008, this office forwarded the above draft report to the State Historic Preservation Officer (SHPO) for review and comment. In a letter dated October 3, 2008, the SHPO has concurred with the findings of the report and, therefore offer no objection.

(X) Land use classification. The proposed project is located in predominantly intertidal marsh and open water habitats. These areas provide for fish and wildlife habitat and are used for hunting and fishing. Project construction would have minimal impact on these activities.

(X) Economics. The purchase of materials used during construction would produce income for local businesses and generate sales tax revenue which would contribute to the economy. Contracts for the final design and construction of the project would provide work and income for local engineering and construction firms.

Long-term, localized economic benefits would be realized as a result of the moderate flood protection afforded by the proposed project. Family homes/camps and other structures within the communities of Dulac and Chauvin would benefit from the project. Economic benefits would be realized by the quantified savings in cost that would have gone to repair these structures from flooding associated with tidal surge and, in turn, may likely increase the local tax base.

(X) Prime and unique farmland (7 CF R Part 658). Soils within the proposed levee consist primarily of Mhoon silty clay loam (Mg), Sharkey clay (Se), Brackish marsh, clays and mucky clays (Bb), and Brackish marsh, peat (Bd) (SCS 1960). These soils are not considered to be optimal for agriculture.

() Food and fiber production.

(X) General water quality. Water quality would be impacted as described in Section II-C. For the most part, impacts would consist of temporary, localized increases in turbidity, lowered dissolved oxygen and potential minor releases of contaminants found in the dredged material. No appreciable long-term impacts are anticipated. The Louisiana Department of Environmental Quality Office of Environmental Services has certified that the proposed project would not violate water quality standards for the State of Louisiana, as stated in their WQC (WW 050513-01) dated July 5, 2005.

() Mineral needs.

(X) Consideration of private property. The proposed project would provide moderate flood protection for privately owned property within the communities of Dulac and Chauvin, Louisiana. The project would provide all landowners within the area with moderate protection for their homes and property. Properties within the project area may, therefore, increase in value.

() Other.

F. Summary of secondary and cumulative effects: In the late 1980's the Terrebonne Levee and Conservation District, formerly known as the South Terrebonne Tidewater Management and Conservation District, revealed plans to eventually construct a comprehensive hurricane protection system to protect much of south Terrebonne Parish from floodwaters equivalent to the F.E.M.A. 100-yr. base flood elevation. The plan proposed a system of levees, floodgates and water control structures spanning the coastal marshes and ridges. The system was designed primarily to provide hurricane related tidal flood protection for the majority of the developed areas on and adjacent to the

distributary ridges but would also enclose and presumably protect interdistributary wetlands from loss and degradation caused by hurricane surges and saltwater intrusion. This plan eventually evolved into what is referred today as the Morganza to the Gulf (MtoG) Hurricane Protection Levee Project, as mentioned at the beginning of this document. If implemented in its entirety, the MtoG levee will extend approximately 72 miles and encompass a vast area stretching from GIWW southwest of Houma, then southerly to Falgout Canal area, then south of Lake Boudreaux near the Highway 56 and 27 junction, then northeasterly to the Montegut area, then southeasterly to Pointe Au Chien area, and then northeasterly toward Larose, Louisiana. Despite the long-term benefits which could be realized by constructing the hurricane protection system, a project of this magnitude could directly or indirectly impact a substantial area of wetlands and wetland-dependent resources, impact commercial and recreational navigation and greatly modify existing hydrologic patterns. As such, a Programmatic Environmental Impact Statement was prepared by the Corps to address alternatives and potential impacts associated with this proposal.

The proposed action could eventually be part of, if implemented, this larger more comprehensive levee protection effort. As such, potential secondary and cumulative impacts would be the collective impacts to the environment resulting from the proposed action in combination with ongoing actions (such as TLCD's recent construction of Reach J), and actions being considered within the reasonably foreseeable future. These activities, along with numerous permits issued for forced drainage projects, have cumulatively impacted extensive areas of Terrebonne Parish and will continue to do so in the future as the effort to facilitate habitation and resource utilization takes place in this region. In addition, numerous permits have been issued to federal, state and local governments, and private groups for programs such as CWPPRA, etc., many of which are designed to either create, protect, restore and enhance coastal wetlands. Many of these endeavors also result in substantial impacts to wetland resources, thereby, adding to secondary and cumulative impacts. However, it is widely recognized that these projects will result in far greater benefit to wetlands in coastal Louisiana. Without these projects, land loss rates will continue to rise and the severity of property damage and/or loss will increase. Aside from the loss of wetlands and associated wildlife and fisheries habitat values, these projects also result in secondary and cumulative impacts to water quality, air quality, noise and aesthetics.

Although the proposed project would result in the direct loss of 246 acres of intertidal brackish marsh habitat, 26 acres of ridge habitat, and 118 acres of shallow water habitat, other benefits would be realized as well. Land suited to human habitation and use is a rare and extremely valuable resource in southern Terrebonne Parish. Unfortunately, ongoing sea level rise and subsidence are increasing the susceptibility of coastal areas to increasingly frequent and prolonged flooding. The loss of these lands would result in the displacement of an undetermined number of residents and hinder growth in the Parish. The proposed levee project would offer some immediate protection to existing development from flooding associated with strong southerly flows, extreme tidal and moderate tropical storm events. However, should the entire MtoG hurricane protection system be realized, the level of protection will also increase, ensuring the sustainability of aquatic and human environments. From an overall perspective, these acreage losses are considered relatively small but still would contribute to the cumulative loss of these wetland habitats in Terrebonne Parish.

III. Findings:

A. Other authorizations:

1. Water quality certification. The Louisiana Department of Environmental Quality, Office of Environmental Services, in a letter dated July 5, 2005, issued their Water Quality Certification (WQC WW 050513-01). The July 5th letter stated that the placement of fill material would not violate the water quality standards of Louisiana and, therefore, offered no objection toward permit issuance.

2. Coastal zone management consistency determination. The Louisiana Department of Natural Resources, Coastal Management Division, issued their coastal use permit dated June 3, 2008.

3. State and/or local authorizations (if issued): N/A

B. A complete application was received on April 21, 2005. A public notice describing the project was issued on May 20, 2005, and sent to all interested parties (mailing list) including appropriate state and federal agencies. All comments received on this action have been reviewed and are summarized below.

1. Summary of comments received.

a. Federal agencies:

i) **U. S. Fish and Wildlife Service (USFWS).** By letter dated May 31, 2005, the USFWS submitted comments in accordance with provisions of the Fish and Wildlife Coordination Act. They indicated that they are satisfied with the avoidance of bottomland hardwoods and marsh along the upper third of the original alignment by utilizing an alternate levee alignment that crosses over to Bayou Terrebonne. Moreover, they point out that impacts to these wetlands would still be substantial and believe that mitigation features for project related impacts be constructed concurrently with those features. They suggest that the permit not be issued until alternative mitigation projects that would provide full compensation be evaluated and approved by the habitat evaluation team (HET). Therefore, they would not oppose permit issuance for the levee itself since it would likely not cause any adverse indirect hydrologic effects but rather provide indirect hydrologic benefits by eliminating increased tidal exchange through formally plugged oil/gas access canals. However, they are concerned about the unknown effects of the water control structures and their interactions with other MtoG features that were not included in the public notice and recommend that permit issuance for those features be deferred until an assessment of project related indirect effects on enclosed wetlands can be approved by the HET, and a adequate mitigation plan developed.

ii) **National Marine Fisheries Service (NMFS).** By letter dated June 16, 2005, the NMFS, in accordance with those provisions established in Sections 404(q) of the Clean Water Act and 305(b)(4)(A) of the Magnuson-Stevens Act, has identified the project area as Essential Fish

Habitat (EFH) and other aquatic resources of national importance and recommended the following to ensure the conservation of EFH and associated marine fishery resources:

- 1) A permit for the project should be held in abeyance until the ongoing system-wide hydrologic modeling and structure design/operation efforts are complete and potential secondary project impacts can be estimated. The operation plan for the floodgates should be developed in coordination with NMFS.
- 2) Rock armoring should be required to be placed along both banks of the navigation channel between Bayou Petit Caillou and Lapeyrouse Canal. Dedicated funding should be made available to ensure that the armoring would be maintained for the life of the project.
- 3) Earthen plugs should be constructed in the borrow canal north of Placid Canal. The plugs should be a minimum of 50 feet wide (at marsh elevation) and placed a minimum of every 1,000 feet. Each location should be armored with rock or other suitable material to prevent erosion and breaching of the plugs and provide armoring for the life of the project.
- 4) The applicant should be required to fully compensate for the direct and secondary impacts to marsh and marine fishery support functions. At least 369 acres of intertidal saline marsh should be created to compensate for direct wetland impacts. The development of an appropriate design, minimum success criteria, and a monitoring plan for the created marsh should be coordinated with NMFS and other interested natural resource agencies. The mitigation should be implemented concurrently with the initiation of the levee construction.
- 5) The applicant should be required to monitor the project area for potential secondary impacts or benefits. At a minimum, monitoring should include the navigation canal bankline armoring, borrow channel plugs and armoring, and wetlands within the Lake Boudreaux basin. The development of the monitoring plan should be coordinated with the NMFS and other interested natural resource agencies.

In a subsequent letter dated July 13, 2005 and pursuant to the 404(q), Part IV.3(b) of the Memorandum of Agreement (MOA), the Southeast Regional Office of the National Marine Fisheries Service has reiterated the above concerns from the Baton Rouge, LA field office and recommend that we fully consider the views and recommendations of NMFS.

In a letter dated July 17, 2008, the Southeast Regional Administrator for NMFS in accordance with Part IV.(3)(d) of the MOA, stated that they would not request higher level review for the proposed project.

iii) U. S. Environmental Protection Agency (EPA). The EPA in a letter dated June 23, 2005, recognizes the need for the proposed project and recommended the following:

- 1) The applicant should assess the practicability of further minimizing marsh impacts by using near- or off-site borrow material for some portion of the levee.
- 2) The applicant should provide information to substantiate the assumed unit cost of near- and off-site borrow and should review the unit cost of using pipeline transport to near- and off-site borrow material.
- 3) The applicant should clarify whether extending Reach H, Segments 2 and 3, further south than is shown in the PEIS could decrease marsh impacts by necessitating the bisecting of marsh areas west of Highway 56 and below the eastern end of Highway 57 in order to connect with Reach G.
- 4) The Corps should consider whether it is necessary to hold this permit in abeyance until hydrologic modeling is complete and there is better information on the potential indirect effects of the proposal.
- 5) For the purposes of calculating compensatory mitigation needs, the Corps should not assume that the project results in positive indirect effects unless such assumptions are substantiated with an acceptable hydrologic model.
- 6) For the purposes of calculating the amount of compensatory mitigation provided by the proposed terracing, the Corps should not assume any indirect benefits to marsh unless such assumptions can be substantiated.
- 7) The Corps should consider using a mitigation ratio of between 1.25:1 and 1.5:1 (mitigation to impacts).

In a subsequent letter dated March 27, 2006, the EPA questioned whether there were no less damaging practicable alternatives to the preferred alternative 5 option and recommended that further evaluation be given to near- or offsite- uses of borrow material instead of relying solely on an adjacent borrow source. They pointed out that the alternative did not provide information that utilizes both near- and offsite- borrow areas in a cost-effective combination with adjacent borrow areas to reduce impacts. In addition, they are satisfied that the applicant has proposed marsh creation to compensate for loss of wetlands. However, EPA questions the applicant's claim that 177 acres will be benefited through marsh nourishment. They feel this claim is based on assumptions that existing adjacent marsh would benefit substantially from sediments exported from created marsh areas and further point out that there has been no information provided to support this claim. EPA does not disagree that there are benefits to be derived from exported sediments but they are skeptical to the extent and level of benefits expected to occur and, thus, recommended that the indirect marsh nourishment acres not considered as compensatory mitigation.

iv) U.S. Army, Corps of Engineers, New Orleans District, Real Estate Division. By memorandum dated May 24, 2005, the Real Estate Division of this District stated that no real estate instrument would be required for this application as no real estate interest under the jurisdiction of the New Orleans District is involved.

v) **U.S. Army, Corps of Engineers, New Orleans District, Operations Division, Operations Manager.** By memorandum dated May 18, 2005, the operations manager for Bayou Terrebonne stated that the impacts are minor and that a engineering review would not be required.

vi) **Other.**

b. **State and local agencies:** By letter dated June 8, 2005, the Louisiana Department of Wildlife and Fisheries (LDWF), offered the following comments:

1) The public notice states that approximately 26 acres of ridge habitat, 246 acres of marsh habitat, 14 acres of spoil bank habitat and 118 acres of open water habitat will be impacted as a result of the project. We are concerned about the omission of a mitigation plan and require a plan be submitted for review. Upon receipt of the mitigation plan, a determination can be made if all direct and indirect impact from the project have been addressed.

2) Applicant shall develop a mitigation plan designed to offset impacts to fish and wildlife resources. The mitigation plan shall be approved by the resource and regulatory agencies. The approved mitigation plan shall be incorporated as part of the conditions of the permit.

3) In addition, the public notice does not include an operational plan for the proposed water control structures. This is a concern because the area on the protected side of the levee has the potential to be impounded by the proposed structures. The plan needs to be designed to allow adequate drainage as well as ingress and egress of all estuarine dependent finfish and shellfishes to the area. An operations plan for the proposed water control structures will need to be provided for approval.

4) The Department continues to be concerned with the Corps' hydrologic model development lagging behind while engineering and design efforts are for new reaches of the Morganza to the Gulf Hurricane Protection Levee. The lack of a functioning hydrologic model limits the ability to adequately determine if all direct and indirect impacts have been avoided, minimized, or mitigated as result of the project and project features.

5) We highly recommend that those impacts from Reach H, Segment 2 and 3 be cumulatively evaluated with those that will result from other reaches of the Morganza to the Gulf Hurricane Protection Levee, including water control structures such as the HNC Lock Complex, Bayou Pointe aux Chenes Floodgate, etc. Future designs and plans should be developed in conjunction with planned and existing coastal restoration projects within Terrebonne Basin.

c. **Organizations.** No comments were received from any organizations.

d. **Individuals.** No comments were submitted by individuals.

2. Evaluation:

I have reviewed and evaluated, in light of the public interest, the documents and factors concerning this permit application as well as the stated views of other interested agencies and the concerned public. In doing so, I have considered the possible consequences of this proposed work in accordance with regulations published in 33 CFR Part 320 to 330 and 40 CFR Part 230. The following paragraphs include my evaluation of comments received and how the project complies with the above cited regulations.

a. Consideration of comments: In regard to comments offered by the USFWS, the proposed project does not contain water control structures but rather two navigational floodgates as described in the beginning of this document. These floodgates are to remain open at all times and would be closed only temporarily during threatening flood events. However, should these structures in the future become part of a larger water management plan for the Lake Boudreaux Basin, then coordination with the agencies would be conducted and adjustments made if necessary. In regard to compensatory mitigation, USFWS requested that any mitigation features be completed concurrently with project construction. In mitigation plan dated June 4, 2008, these concerns have been addressed and the plan approved by USFWS.

In view of the above comments by the NMFS, recommendations 2 and 3 involving the rock armoring along both sides of the navigation channel between Bayou Petit Caillou and Lapeyrouse Canal and armored plugs in the borrow canal every 1,000 feet have been incorporated into the project plans, except that spacing for the armored plugs will be every 2,000 feet. In recommendation 1, NMFS requested that we keep the permit in abeyance until the hydrologic modeling and structure design/operation efforts are completed and potential secondary project impacts estimated. The hydrologic modeling is being conducted by the New Orleans District's Engineering Division and its primary purpose is to determine the necessary sizes for the two navigational floodgates, primarily the Bush Canal navigation floodgate. It is not the intent of this particular hydrologic model to determine how the entire Lake Boudreaux Basin would be managed from a water management perspective. However, there may be some ancillary information as a result of this study that could be utilized in working toward that objective. Recommendations 4 and 5 regarding mitigation and monitoring have been coordinated with the other interested natural resource agencies. In mitigation plan dated June 4, 2008, these concerns have been addressed and the plan approved by NMFS.

In consideration of the above EPA comments, recommendations regarding the use of near or off-site borrow for some portions of the levee to reduce impacts were determined not to be a feasible. The most cost effective material is located onsite as proposed. The prospect of transporting material from an offsite source would result in double or possible triple handling of the material, thus, driving up the cost significantly. Pipeline transport would also result in a higher increase per cubic yard. In the January 2005 alternative alignment analysis, SCI estimated cost at \$4 per cubic yard for onsite (adjacent) borrow as opposed to \$12 per cubic yard for a near site borrow area and \$16 per cubic yard for a offsite borrow area. In addition, EPA suggested that the Corps should consider holding the permit in abeyance until the results of the hydrologic modeling are completed. As indicated earlier, the purpose of the hydrologic modeling is to determine the necessary sizes for the two navigational floodgates and not water control structures. As such, these structures will remain

open at all times and would be closed only temporarily during threatening flood events. However, should these structures in the future become part of a larger water management plan for the Lake Boudreaux Basin, then coordination with the agencies will be conducted and adjustments made if necessary. In regard to compensatory mitigation, the EPA recommended that a mitigation ratio of between 1.25:1 and 1.5:1 be considered. In mitigation plan dated June 4, 2008, these concerns have been addressed and the plan approved by EPA.

In regard to comments offered by the Louisiana Department of Wildlife and Fisheries, recommendations 1 and 2 regarding compensatory mitigation has been satisfied with the submittal of a mitigation plan. Comments 3 and 4 above points out the lack of a operational plan for the water control structures (navigational floodgates) and the lack of a hydrologic model which they feel limits the ability to adequately determine all direct and indirect impacts and to insure that they have avoided and/or minimized. As indicated earlier, the purpose of the hydrologic modeling is not to establish water control structures but rather to determine the size of the two navigational floodgates. As such, these structures will remain open at all times and would be closed only temporarily during threatening flood events. In comment 5, LDWF recommended that all aspects of the MtoG project be cumulatively evaluated to determine all impacts. Although this project could be subsumed by the larger MtoG system, the project by itself represents a stand alone project that will provide moderate flood protection to the communities of Dulac and Chauvin and, as such, has been evaluated as an independent project based on its current purpose. Additionally, the proposed action would provide increased buffer from storm, wave and erosion and would enhance the traffic and transportation stability to the immediate area, regardless of any potential MtoG construction.

b. Evaluation of Compliance with 404(b)(1) guidelines (restrictions on discharge, 40 CFR 230.10). (A check in a block denoted by an asterisk indicates that the project does not comply with the guidelines.)

i. Alternatives test:

1) Based on the discussion in II B, are there available, practicable alternatives having less adverse impact on the aquatic ecosystem and without other significant adverse environmental consequences that do adverse environmental consequences that do not involve discharges into "waters of the United States" or at other locations within these waters?

*** X**
Yes No

2) Based on II B, if the project is in a special aquatic site and is not water-dependent, has the applicant clearly demonstrated that there are no practicable alternative sites available?

X *
Yes No

ii. Special restrictions. Will the discharge:

1) Violate state water quality standards.

*** X**
Yes No

* X
Yes No

2) Violate toxic effluent standards (under Section 307 of the Act).

 * X
Yes No

3) Jeopardize endangered or threatened species or their critical habitat.

 * X
Yes No

4) Violate standards set by the Department of Commerce to protect marine sanctuaries.

 X *
Yes No

5) Evaluation of the information in II C and D above indicates that the proposed discharge material meets testing exclusion criteria for the following reason(s).

() Based on the above information, the material is not a carrier of contaminants.

(X) The levels of contaminants are substantially similar at the extraction and disposal sites and the discharge is not likely to result in degradation of the disposal site and pollutants will not be transported to less contaminated areas.

() Acceptable constraints are available and will be implemented to reduce contamination to acceptable levels within the disposal site and prevent contaminants from being transported beyond the boundaries of the disposal site.

iii. Other restrictions. Will the discharge contribute to significant degradation of "waters of the U.S." through adverse impacts to:

 * X
Yes No

a) Human health or welfare, through pollution of municipal water supplies, fish, shellfish, wildlife, and special aquatic sites?

 * X
Yes No

b) Life stages of aquatic life and other wildlife ?

 * X
Yes No

c) Diversity, productivity, and stability of the aquatic ecosystem, such as loss of fish or wildlife habitat, or loss of the capacity of wetland to assimilate nutrients, purify water or reduce wave energy?

 * X
Yes No

d) Recreational, aesthetic, and economic values?

 X *
Yes No

iv. Actions to minimize potential adverse impacts (mitigation). Will all appropriate and practicable steps (40 CFR 230.70-77) be taken to minimize the potential adverse impacts of the discharge on the aquatic ecosystem? The original levee alignment followed the ridge along Bayou Little Caillou from Lapeyrouse Canal to Bush Canal and consisted of approximately 290 acres of marsh and 65 acres of ridge impacts. The alignment was later revised to cross over from Bayou Little Caillou ridge to Bayou Terrebonne. In doing so, the

most northern third of the alignment crosses more open water resulting in fewer impacts of which approximately 246 acres of marsh and 26 acres of ridge habitat. Moreover, drainage swales were included in the Bayou Little Caillou ridge at 1,000-foot intervals or as needed to prevent marsh impoundment. Installation of armored plugs placed every 2,000 feet or as needed in the borrow canal was also included to prevent tidal scour and shoreline erosion from wave induced boat traffic. Other less damaging alternative were also evaluated but were determined not to be practicable. In addition, the levee dimensions are the minimum needed to fulfill design requirements at this location.

The TLCD proposes to fully compensate these impacts to intertidal brackish marsh by implementing the agency approved mitigation plan dated June 4, 2008. According to the agent, this plan is modeled after the CWPPRA Lake Chapeau Restoration Project and the Bayou Dupont small dredge project. This plan calls for the creation of 369 acres (1.5:1 ratio) of marsh and 120 acres of marsh nourishment. However, the details (i.e., methodology, etc.) for the marsh nourishment has not been established and, therefore, no credit will be given for the 120 acres. The mitigation is to occur in the project area generally along the ridge, which will provide for additional stability and protection. This area is also protected and will allow for wave reduce fetch. Material dredged from Bayou Terrebonne and Madison Bay will be utilized in the marsh creation project. In an effort to minimize direct and indirect impacts, the borrow area (dredging) in Madison Bay will be located at least 1,000 feet from the banks of Bayou Terrebonne. The borrow (dredging) in Bayou Terrebonne will occur at a minimum of 50 feet from the each bank, allow for 1:3 slope, and not to exceed the existing depth of the bayou. As the dredge moves south in the bayou, four (4) 650 foot wide gaps will be left at specified locations to serve as subsurface "plugs" to prevent saltwater intrusion.

Early in the mitigation planning phase, the agent submitted a mitigation plan dated June 9, 2005, for agency review. This proposal involved the creation of terraces but was eventually abandoned because of cost and inadequate environmental benefit.

c. General Evaluation (33 CFR 320.4(a)):

1) The relative extent of the public and private need for the proposed work... The applicant has adequately demonstrated that the proposed project is needed in order to provide local area residents with flood protection associated with strong southerly flows, extreme tidal and modest tropical storm events. In years past, tropical storm events such as Hurricanes Andrew and Lily and Tropical Storm Isadore and Allison have been responsible for inundation of property, damages to permanent and movable structures, damages to existing forced drainage levees, displacement of residents, unhealthy conditions and disruption of community life. In recent events, the destruction associated with Hurricanes Katrina and Rita resulted in billions of dollars in property damages, not to mentioned the loss of life to over thousand people. It is estimated that Hurricane Katrina is the most destructive and costly natural disaster ever to impact the United States. Damage assessments suggest that the economic impact from Gustav/Ike will also be significant. Similar circumstance occurred where millions of people were placed under mandatory evacuation in both the New Orleans and Houston metro areas. Preliminary reports suggest that Hurricanes Gustav/Ike could be ranked as high as the third most destructive and costly event in American history. Without the project, flooding associated with strong southerly flows, extreme tidal and tropical storm events are expected to worsen over time due to continued subsidence and sea level rise. The project is

expected to reduce and perhaps in some cases prevent flood damages associated with these events. For more severe events such as hurricanes, the levee project may offer some protection from flooding but to what extent is dependent on factors associated with the storm such as size, direction of approach, and the amount of vegetated wetlands present to buffer the effects. Until the entire MtoG hurricane protection levee is complete and functioning on-line, the southern communities of Terrebonne and Lafourche Parishes from Bayou Dularge to Larose will continue to be adversely affected by substantial tropical storm events. However, the proposed action will, independent of MtoG, provide an increased level of protection to the communities of Dulac and Chauvin.

2) The practicability of using reasonable alternative locations and methods to accomplish the objective of the proposed structure or work... During the planning phase of the MtoG levee project, several levee alignments were evaluated to determine optimal placement, which resulted in several alignment changes. The practicability of utilizing alternative locations was based on the desire to minimize environmental impacts and to locate a levee that would provide the optimal level of benefit while, at the same time, minimizing overall cost. In doing so, the practicability of utilizing existing natural ridges and/or spoil banks with suitable substrate to support a levee, and the location and availability of suitable material to construct the levee, also had a major role.

If implemented in its entirety, Reach H levee could eventually be part of the larger MtoG levee project and, therefore has been determined to be the most practicable alternative. The use of alternative locations would not fulfill project objectives of providing moderate flood protection for the communities of Dulac and Chauvin. As discussed earlier, however, other onsite alignments and construction methods were examined in the January 2005 alternative sites analysis. The use of near or offsite borrow and pipeline transport were not feasible alternatives/methods because of cost constraints. The most cost-effective material source is located onsite as proposed. Also, a levee alignment utilizing all of the mostly nonwetland ridge would have resulted in less impacts to marsh but was determined not to be a practicable alternative because the ridge had been incorporated into the levee design and would provide protection and structural stability to the levee, especially along Bayou Little Caillou where shoreline erosion due to tidal scouring and boat traffic is prevalent. Although a reduction in marsh impacts would have been realized, this acreage would have been minimal and would have compromised levee design. The levee dimensions are the minimum needed to achieve design criteria and to provide the necessary levee stability at this location. All appropriate and practicable measures to minimize impacts have been incorporated into the project design, including aligning the levee as close to the ridge as practicable.

3) The extent and permanence of the beneficial and/or detrimental effects that the proposed structures or work may have on the public and private uses to which the area is suited... In recent years, south Louisiana has seen an increase in the extent and magnitude of flood events associated with tropical storms and abnormal increases in tides due to strong southerly flows. Since most development in extreme southern Terrebonne Parish has historically occurred on distributary ridges such as the one on which this project is located, this area is especially vulnerable to these events, thus, prompting the need for some type of protection. The disappearance of valuable marshland and a deteriorating ridge, which both serve as an important storm surge buffer, have resulted in continual degradation to this area. If no protection is afforded, the project area will continue to degrade due to subsidence, saltwater intrusion, relative sea-level rise, and man-induced

activities. This need for protection eventually led to the development of the Morganza to the Gulf Hurricane Protection Project. Implementation of the proposed action will result in the permanent loss of 246 acres of marsh and 28 acres of ridge habitat. However, the level of benefit in providing flood protection for local area residents will exceed overall environmental detriments, especially in light of those benefits associated with public and private uses of the land protected and the creation of 369 acres of marsh to offset impacts. Implementation of the approved mitigation plan is expected to provide full functional compensation within the first several years following completion of vegetative plantings.

d. Significant national issues of overriding importance to state or local issues and why. None

3. Determinations:

a. Finding of No Significant Impact (FONSI) (33 CFR Part 325). Having reviewed the information provided by the applicant, all interested parties and the assessment of environmental impacts contained in Part II of this document, I find that this permit action will not have a significant impact on the quality of the human environment. Therefore, an Environmental Impact Statement will not be required.

b. 404(b)(1) Compliance/Non-compliance Review (40 CFR 230.12).

- The discharge complies with the guidelines.
- The discharge complies with the guidelines, with the inclusion of the appropriate and practicable conditions listed above (in III.B.2.b.iv) to minimize pollution or adverse effects to the affected ecosystem.
- The discharge fails to comply with the requirements of these guidelines because:
 - There is a practicable alternative to the proposed discharge that would have less adverse effect on the aquatic ecosystem and that alternative does not have other significant adverse environmental consequences.
 - The proposed discharge will result in significant degradation of the aquatic ecosystem under 40 CFR 230.10(b) or (c).
 - The discharge does not include all appropriate and practicable measures to minimize potential harm to the aquatic ecosystem.
 - There is not sufficient information to make a reasonable judgement as to whether the proposed discharge will comply with the guidelines.

c. Public interest determination: I find that issuance of a Department of the Army permit (with special conditions), as prescribed by regulations published in 33 CFR Parts 320

to 330, and 40 CFR Part 230:

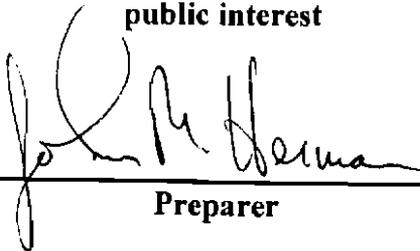
is not contrary to
the public interest

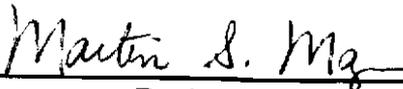
24 Oct 2008
Date

6 Nov. 08
Date

11/6/08
Date

is contrary to the
public interest


Preparer


Reviewer

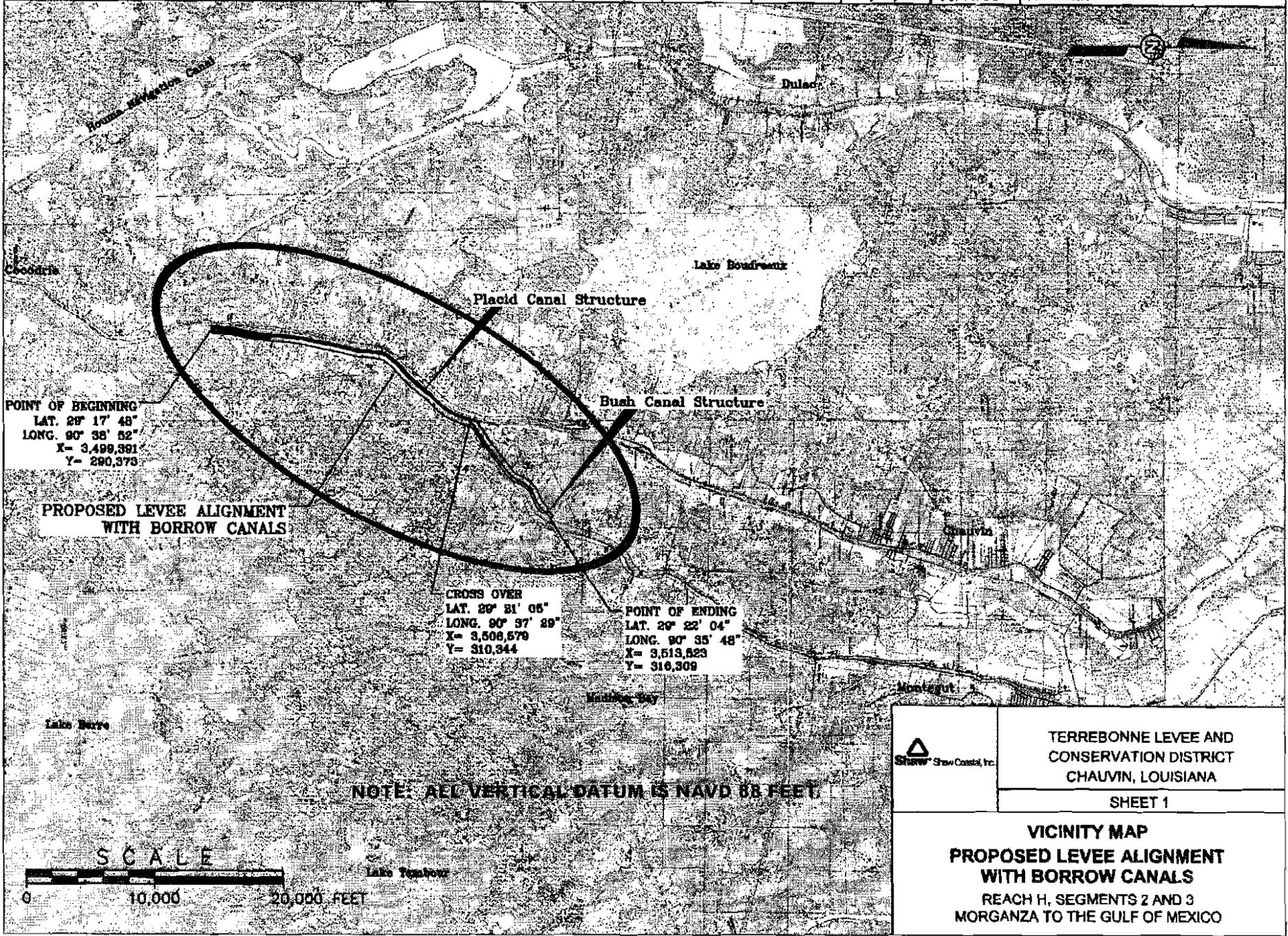

Approving Official

Literature Cited

U.S. Army Corps of Engineers. 2002. Mississippi river and Tributaries Morganza, Louisiana to the Gulf of Mexico Hurricane Protection. Final Feasibility Report. Volume I – Main Report and Programmatic Environmental Impact Statement.

U.S.D.A. Soil Conservation Service. 1960. Terrebonne Parish Soil Survey. Series 1956. No. 1.

IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY	REVISED DATE:		DRAWING NUMBER	VICINITY
D:\QUADS	---	HOUMA	C.LINER	02/22/05	J.PENA	04/11/05	09/11/08		



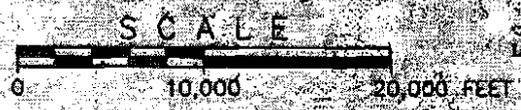
POINT OF BEGINNING
 LAT. 29° 17' 48"
 LONG. 90° 38' 52"
 X= 3,499,391
 Y= 290,373

PROPOSED LEVEE ALIGNMENT
 WITH BORROW CANALS

CROSS OVER
 LAT. 29° 51' 05"
 LONG. 90° 37' 29"
 X= 3,508,579
 Y= 310,344

POINT OF ENDING
 LAT. 29° 22' 04"
 LONG. 90° 35' 48"
 X= 3,513,523
 Y= 316,309

NOTE: ALL VERTICAL DATUM IS NAVD 88 FEET



TERREBONNE LEVEE AND
 CONSERVATION DISTRICT
 CHAUVIN, LOUISIANA

SHEET 1

VICINITY MAP
 PROPOSED LEVEE ALIGNMENT
 WITH BORROW CANALS

REACH H, SEGMENTS 2 AND 3
 MORGANZA TO THE GULF OF MEXICO

IMAGE	X-REF	OFFICE	DRAWN BY	CHECKED BY	REVISED DATE:	DRAWING NUMBER
---	---	HOUMA	C.LINER 02/23/05	J.PENA 03/30/05	04/11/05 05/01/08	111838 PLANVIEW1

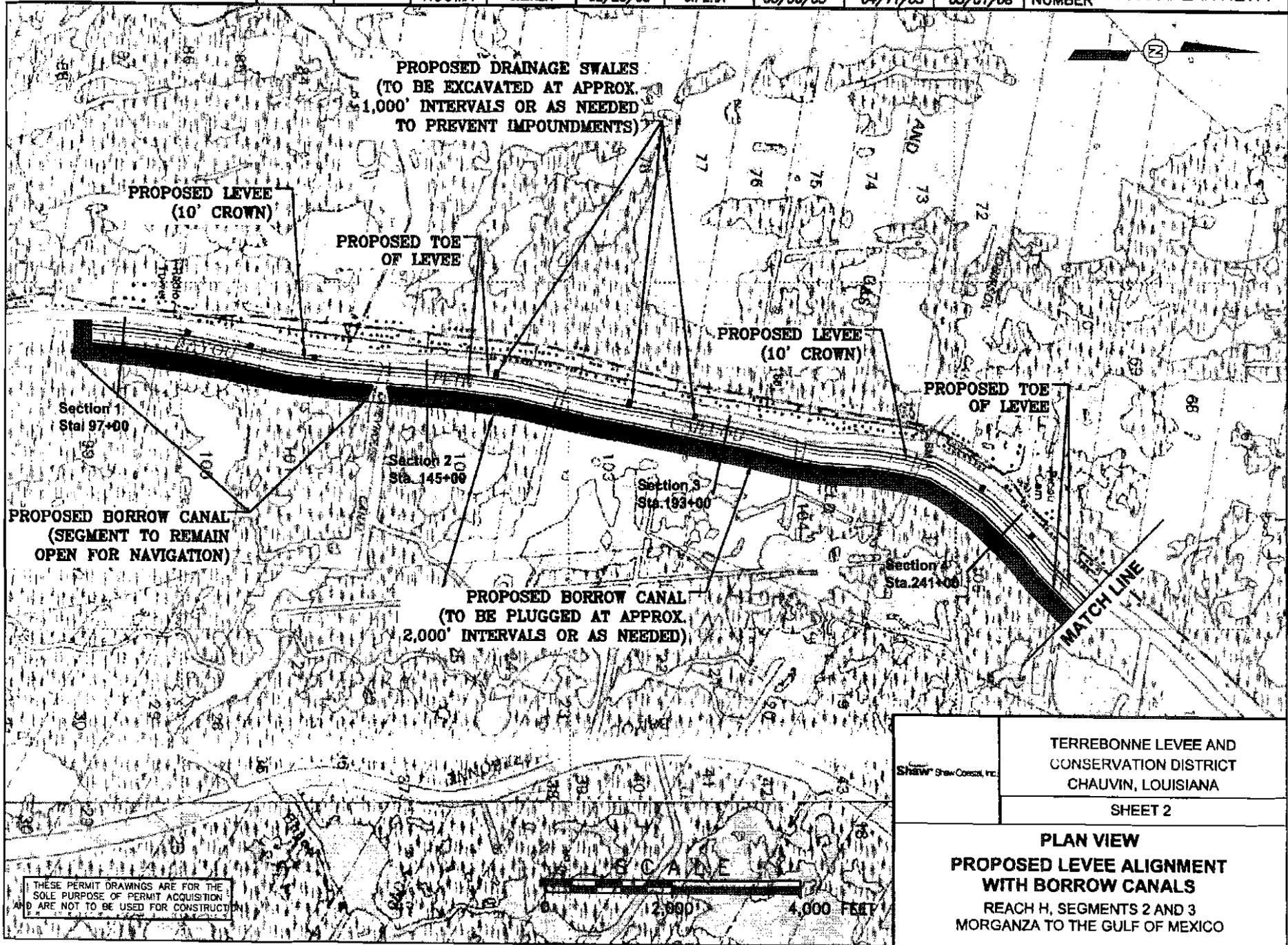
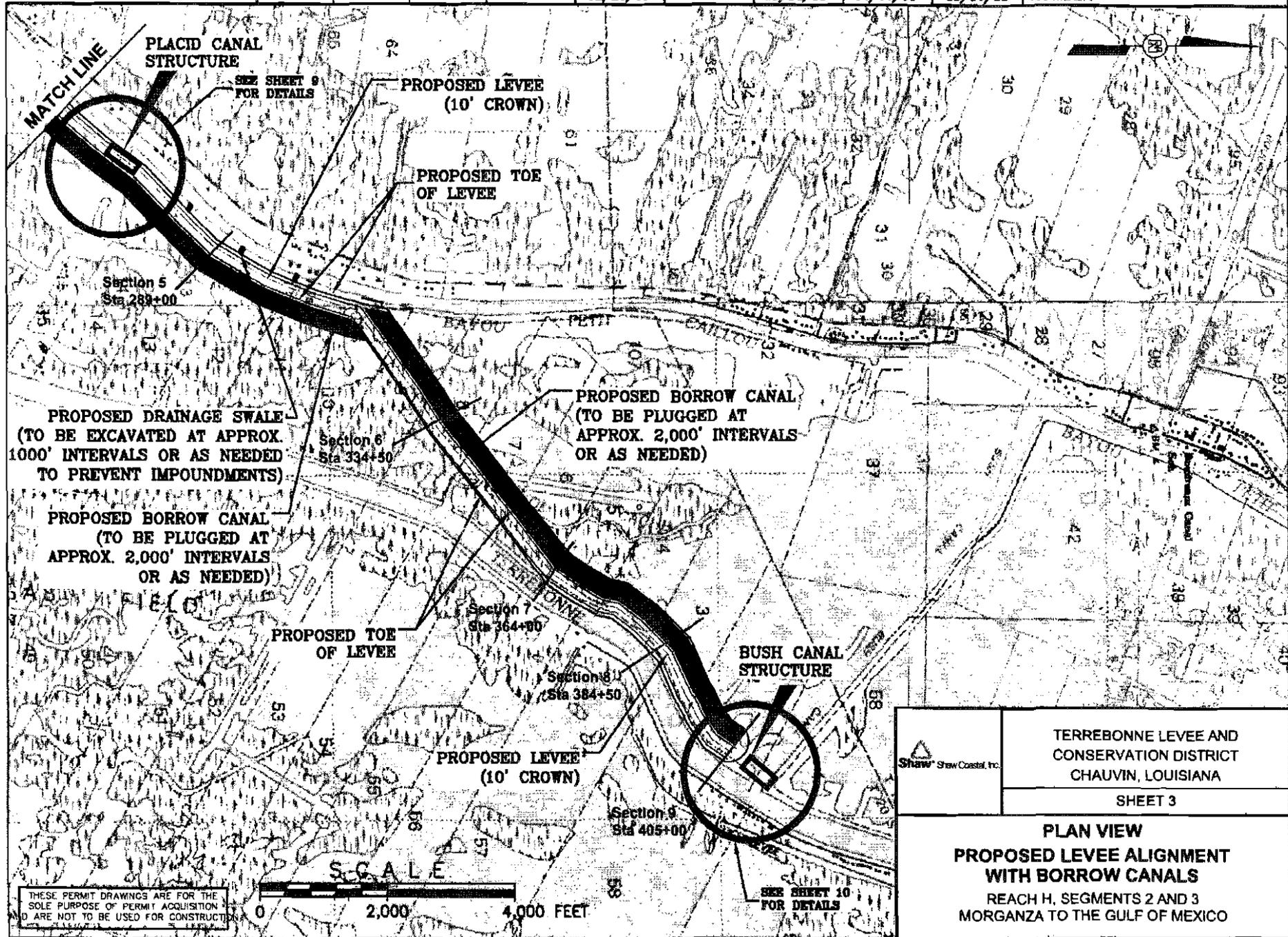
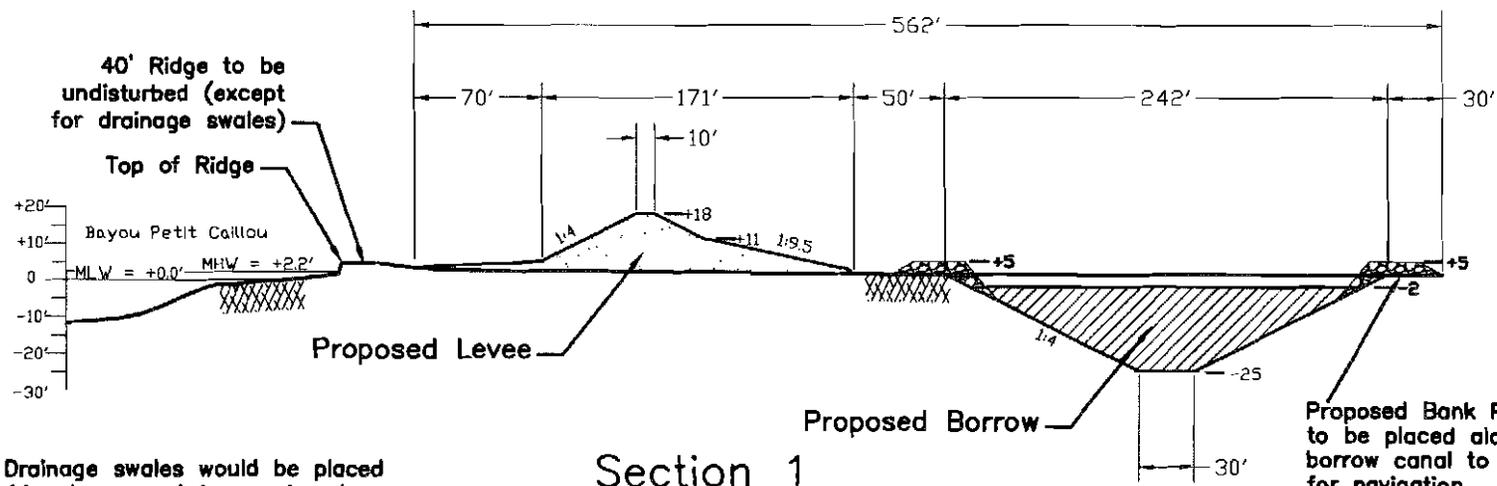


IMAGE	X-REF	OFFICE	DRAWN BY	CHECKED BY	REVISED DATE:	DRAWING NUMBER
---	---	HOUMA	C.LINER	J.PENA	04/11/05 05/01/08	111838 PLANVIEW2



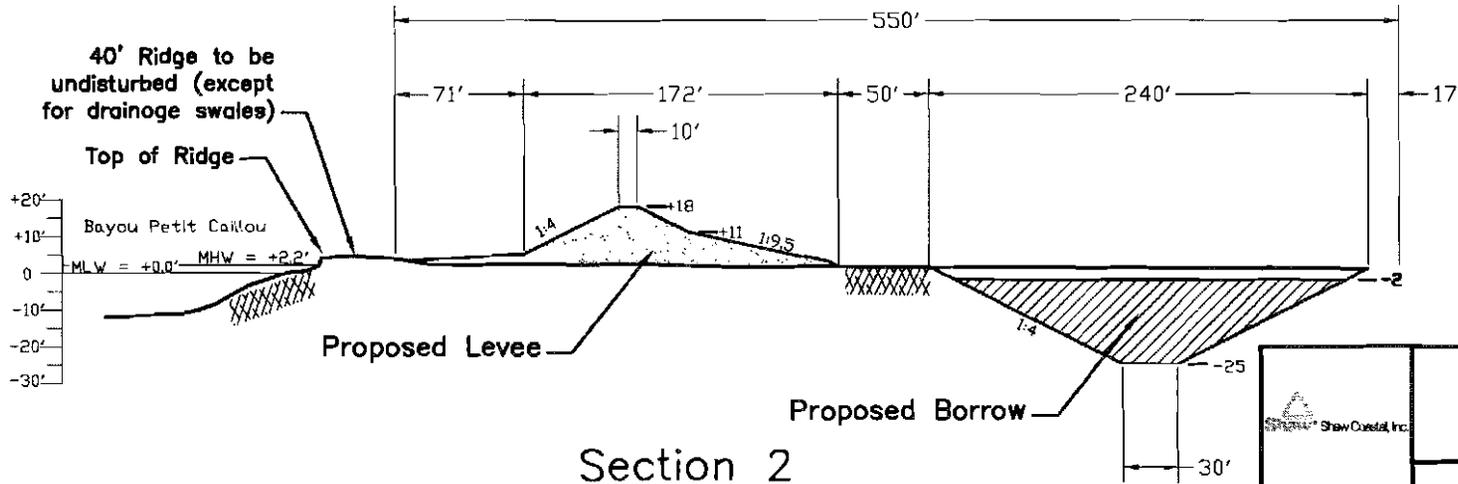
THESE PERMIT DRAWINGS ARE FOR THE SOLE PURPOSE OF PERMIT ACQUISITION AND ARE NOT TO BE USED FOR CONSTRUCTION

IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY	REVISED DATE:		DRAWING NUMBER
---	---	HOUMA	C.LINER	03/01/05	J.PENA	04/11/05	05/01/08	111838\CROSS SECTIONS



Note: Drainage swales would be placed in the ridge to prevent impoundments between the ridge and levee. They would be placed at approx. 1,000' intervals or as needed.

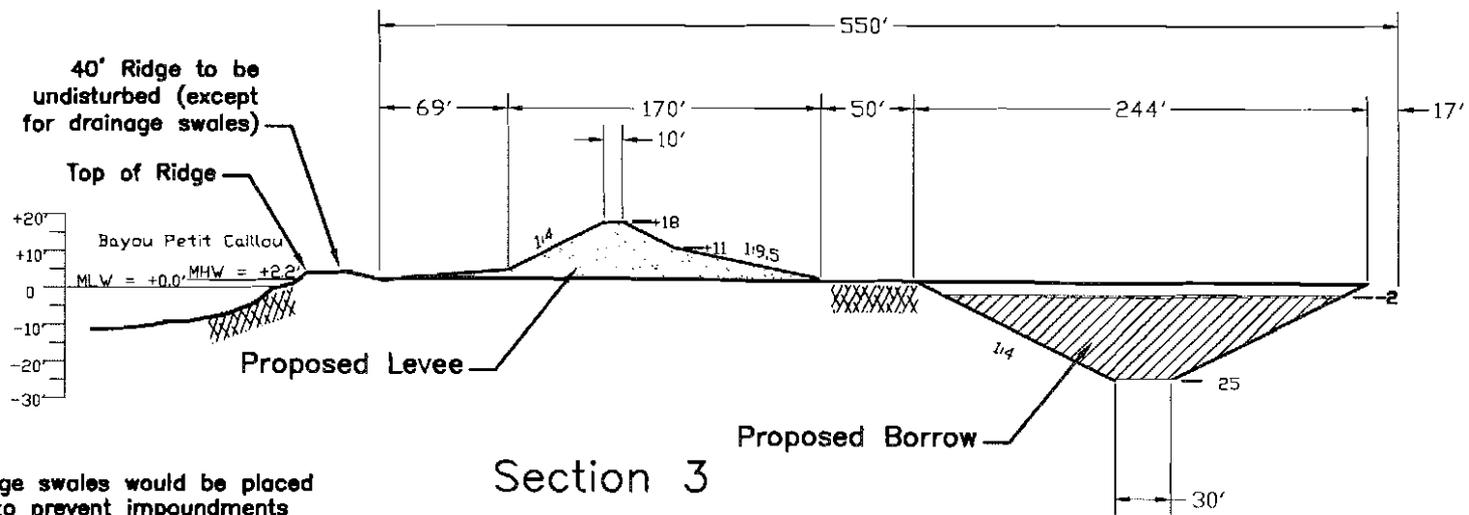
Proposed Bank Protection/Armor to be placed along portion of borrow canal to remain open for navigation. The borrow canal to remain open for navigation in that portion from Bayou Petit Caillou to Lapeyrouse Canal only. Armoring would be installed during the lifts, as needed.



	TERREBONNE LEVEE AND CONSERVATION DISTRICT CHAUVIN, LOUISIANA
	SHEET 4
CROSS-SECTIONS PROPOSED LEVEE ALIGNMENT WITH BORROW CANALS REACH H, SEGMENT 2 AND 3 MORGANZA TO THE GULF OF MEXICO	

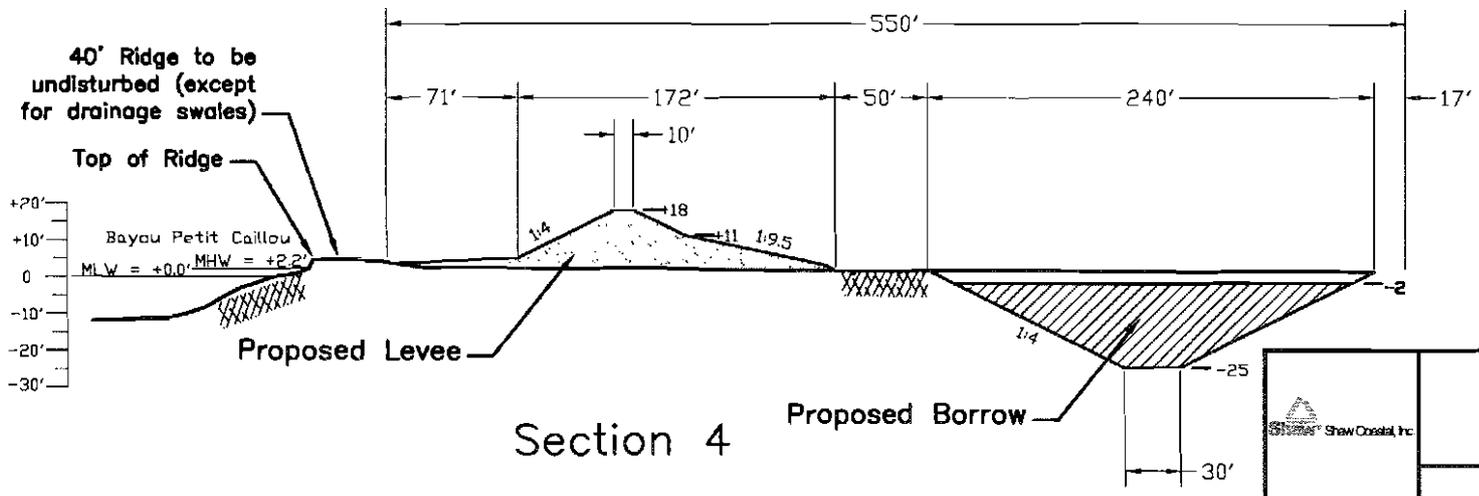
THESE PERMIT DRAWINGS ARE FOR THE SOLE PURPOSE OF PERMIT ACQUISITION AND ARE NOT TO BE USED FOR CONSTRUCTION

IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY	REVISED DATE:		DRAWING NUMBER
---	---	HOUMA	C.LINER	03/01/05	J.PENA	04/11/05	05/01/08	111838ICROSS SECTIONS



Section 3

Note: Drainage swales would be placed in the ridge to prevent impoundments between the ridge and levee. They would be placed at approx. 1,000' intervals or as needed.



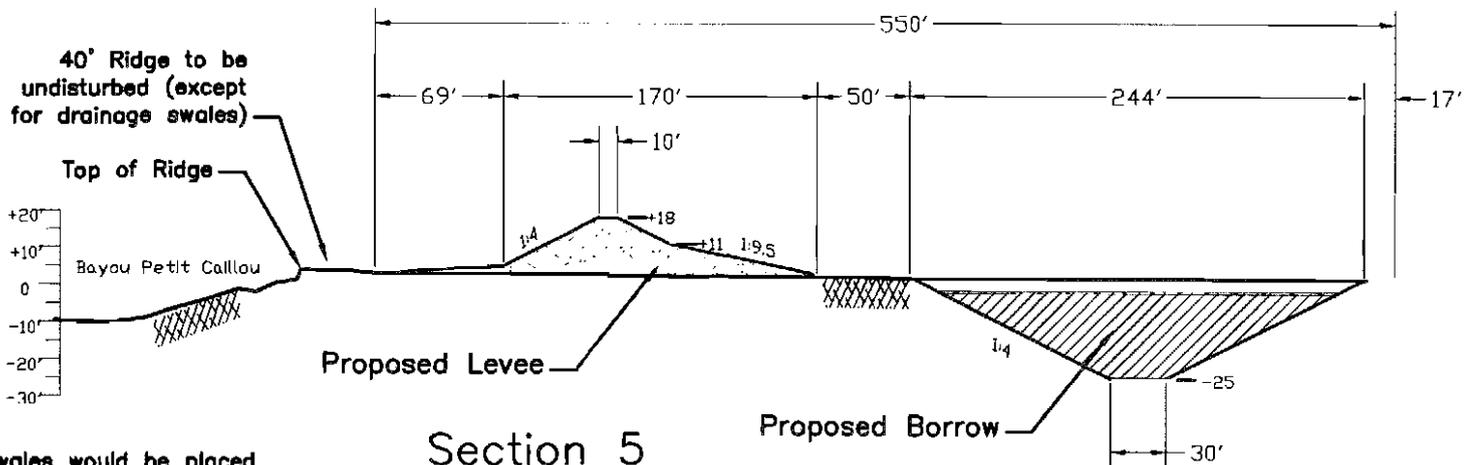
Section 4



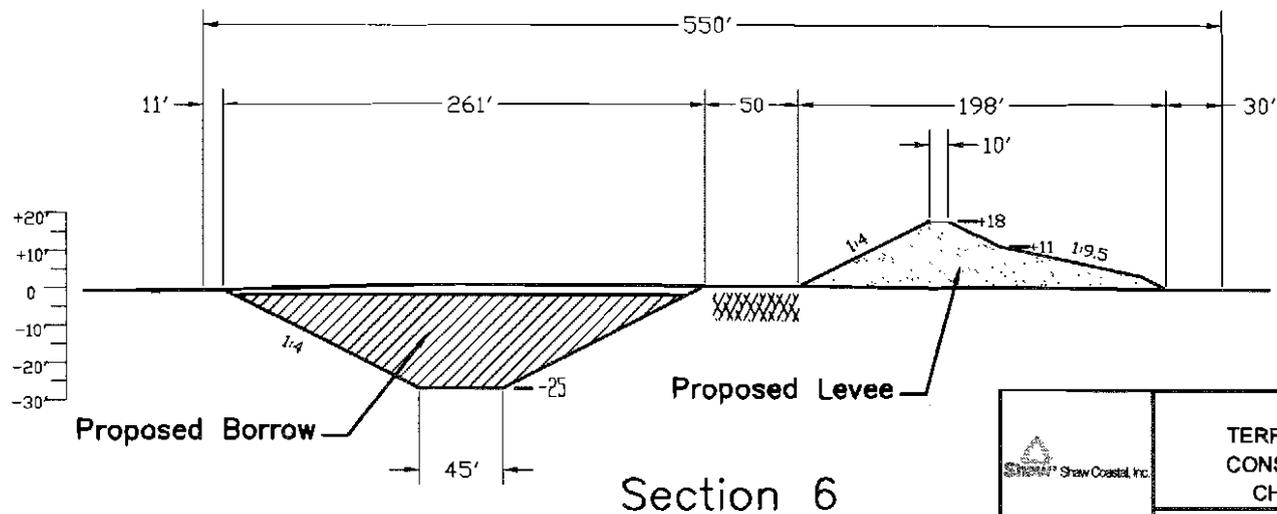
	TERREBONNE LEVEE AND CONSERVATION DISTRICT CHAUVIN, LOUISIANA
	SHEET 5
CROSS-SECTIONS PROPOSED LEVEE ALIGNMENT WITH BORROW CANALS REACH H, SEGMENT 2 AND 3 MORGANZA TO THE GULF OF MEXICO	

THESE PERMIT DRAWINGS ARE FOR THE SOLE PURPOSE OF PERMIT ACQUISITION AND ARE NOT TO BE USED FOR CONSTRUCTION

IMAGE	X-REF	OFFICE	DRAWN BY	CHECKED BY	REVISED DATE:	DRAWING NUMBER
---	---	HOUMA	C.LINER	J.PENA	04/11/05 05/01/08	1118381 CROSS SECTIONS



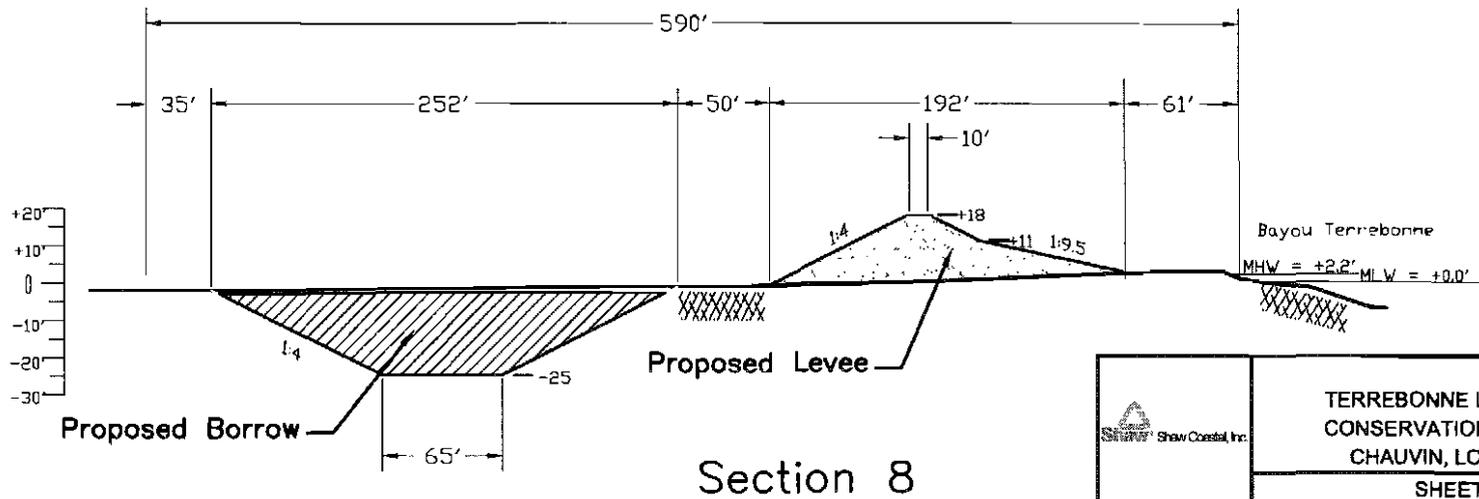
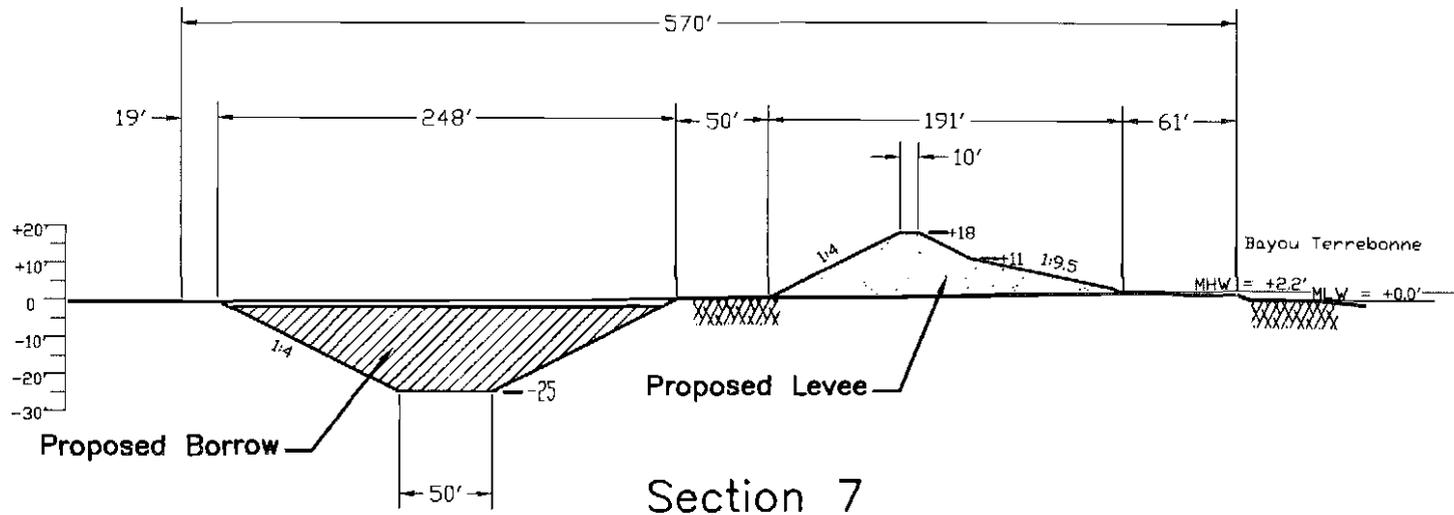
Note: Drainage swales would be placed in the ridge to prevent impoundments between the ridge and levee. They would be placed at approx. 1,000' intervals or as needed.



	TERREBONNE LEVEE AND CONSERVATION DISTRICT CHAUVIN, LOUISIANA
	SHEET 6
CROSS-SECTIONS PROPOSED LEVEE ALIGNMENT WITH BORROW CANALS REACH H, SEGMENT 2 AND 3 MORGANZA TO THE GULF OF MEXICO	

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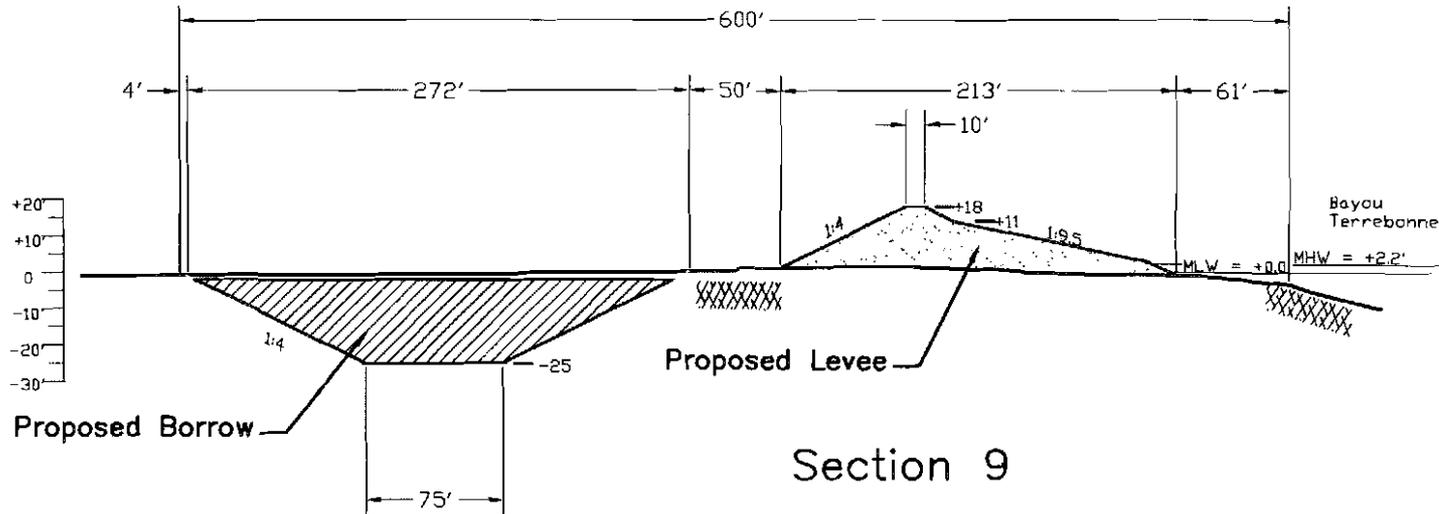
IMAGE	X-REF	OFFICE	DRAWN BY	CHECKED BY	REVISED DATE:	DRAWING NUMBER
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AND ARE NOT TO BE USED FOR CONSTRUCTION

	TERREBONNE LEVEE AND CONSERVATION DISTRICT CHAUVIN, LOUISIANA
	SHEET 7
CROSS-SECTIONS PROPOSED LEVEE ALIGNMENT WITH BORROW CANALS REACH H, SEGMENT 2 AND 3 MORGANZA TO THE GULF OF MEXICO	

IMAGE	X-REF	OFFICE	DRAWN BY	CHECKED BY	REVISED DATE:	DRAWING NUMBER
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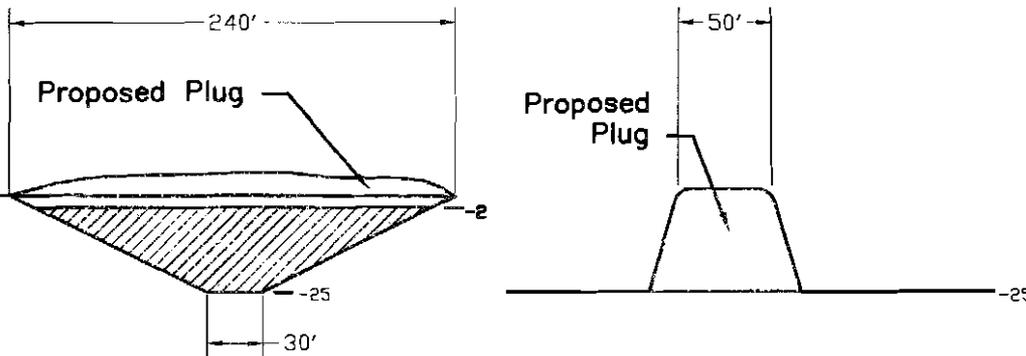


Note: Approximately 3,500,000 cubic yards of material will be borrowed and placed as levee alignment.

Borrow canal to be plugged at approximately 2,000' intervals or as needed as part of the design requirements and would be armored as needed.

Levee would be constructed in lifts.

Bank protection to be placed on all structures as needed to prevent erosion.



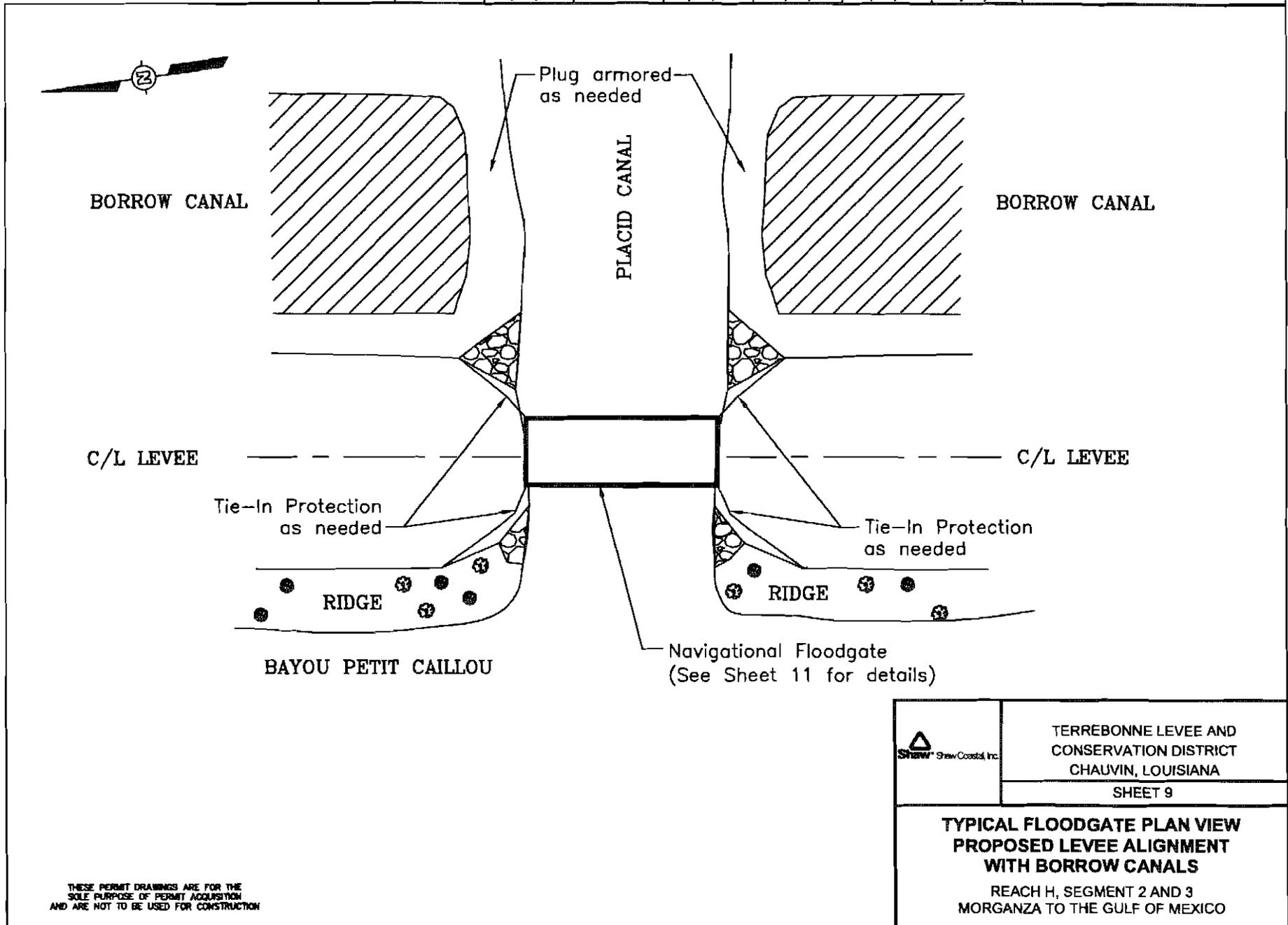
Typical Plug Sections
(Armored As Needed)
(Not To Scale)



THESE PERMIT DRAWINGS ARE FOR THE SOLE PURPOSE OF PERMIT ACQUISITION AND ARE NOT TO BE USED FOR CONSTRUCTION

	TERREBONNE LEVEE AND CONSERVATION DISTRICT CHAUVIN, LOUISIANA
	SHEET 8
CROSS-SECTIONS PROPOSED LEVEE ALIGNMENT WITH BORROW CANALS	
REACH H, SEGMENT 2 AND 3 MORGANZA TO THE GULF OF MEXICO	

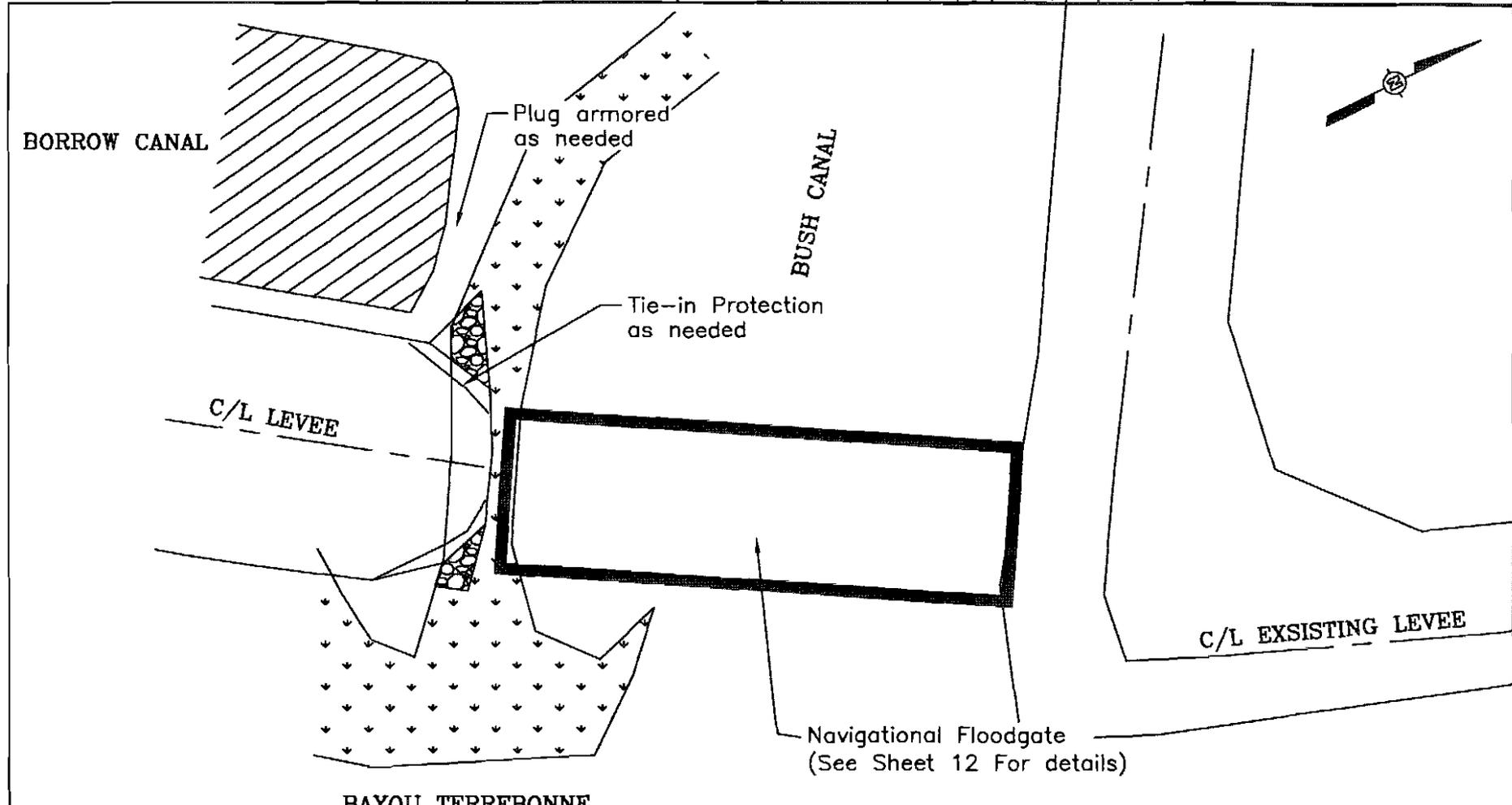
OFFICE	DRAWN BY	CHECKED BY	REVISED DATE:			DRAWING NUMBER		
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	TERREBONNE LEVEE AND CONSERVATION DISTRICT CHAUVIN, LOUISIANA
	SHEET 9
TYPICAL FLOODGATE PLAN VIEW PROPOSED LEVEE ALIGNMENT WITH BORROW CANALS	
REACH H, SEGMENT 2 AND 3 MORGANZA TO THE GULF OF MEXICO	

OFFICE	DRAWN BY	CHECKED BY	REVISED DATE:	DRAWING NUMBER
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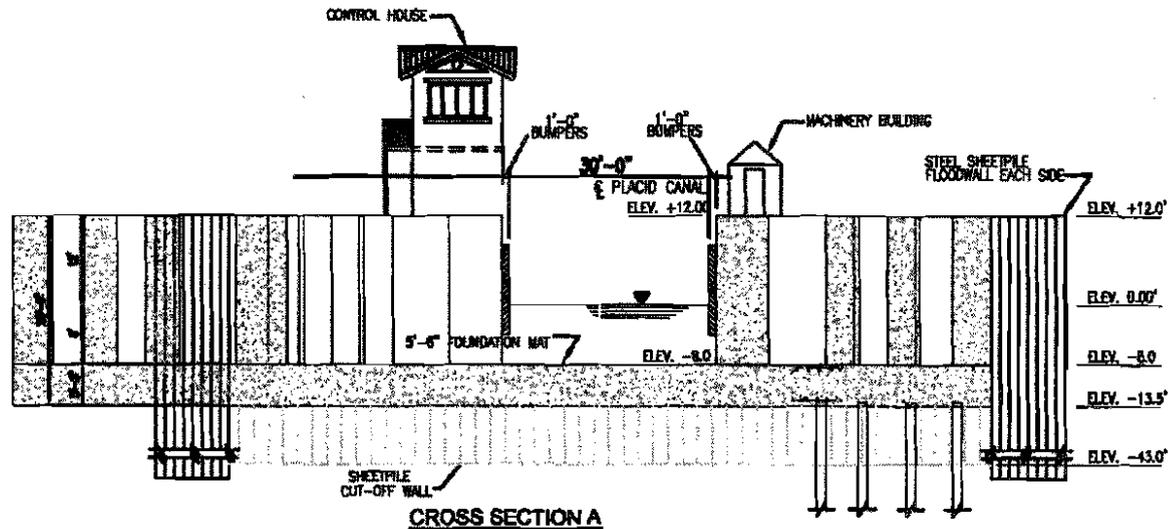
	TERREBONNE LEVEE AND CONSERVATION DISTRICT CHAUVIN, LOUISIANA
	SHEET 10

TYPICAL FLOODGATE PLAN VIEW
PROPOSED LEVEE ALIGNMENT
WITH BORROW CANALS
 REACH H, SEGMENT 2 AND 3
 MORGANZA TO THE GULF OF MEXICO

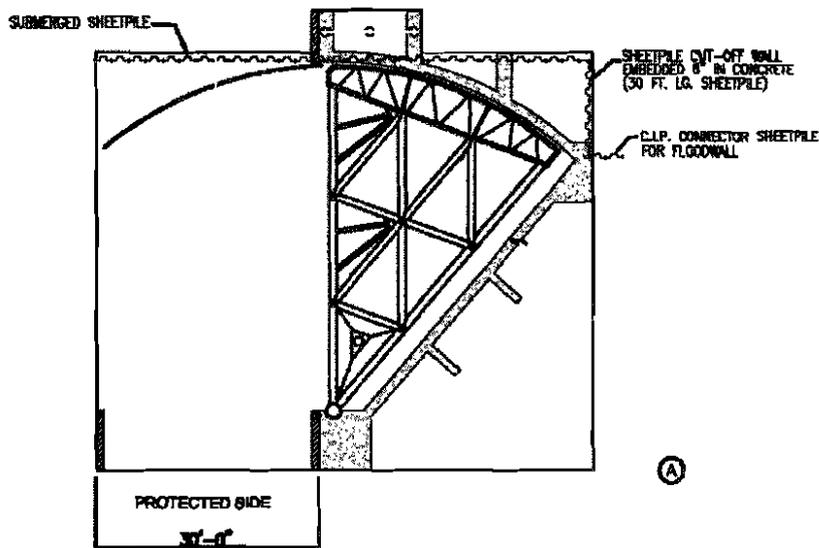
THESE PERMIT DRAWINGS ARE FOR THE
 SOLE PURPOSE OF PERMIT ACQUISITION
 AND ARE NOT TO BE USED FOR CONSTRUCTION

DRAWING NOT TO SCALE

OFFICE HOUMA	DRAWN BY C.LINER	CHECKED BY J.PENA	REVISED DATE: 04/11/05 06/04/06 09/11/08	DRAWING NUMBER 111838/SHEET 11
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PLACID CANAL



PLAN VIEW
PLACID CANAL STRUCTURE

In regards to flood protection measures, all floodgates are to remain open at all times except during tropical storm events, including hurricanes or other extreme tidal events. Tide gauges will be installed on each gate and will be monitored closely. When water levels at the gates approach the EL +2.5', the floodgates shall be closed until the water recedes. If a "named" storm is in the Gulf of Mexico and a sudden rise in water level due to storm surge is expected, the gates may be closed at the EL. +2.0'.

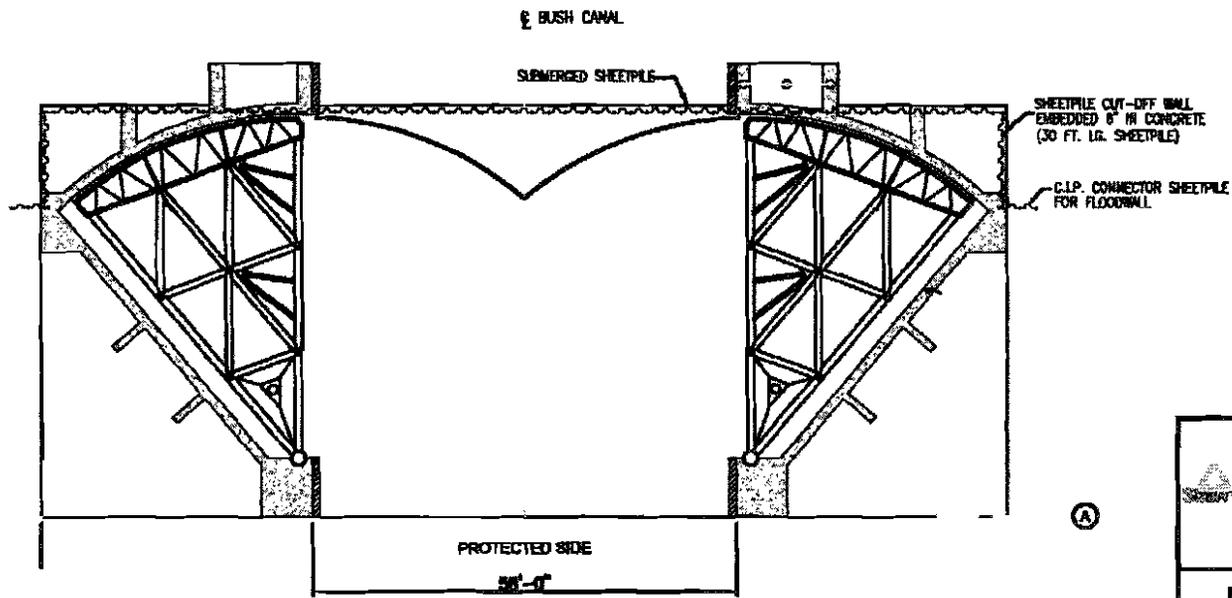
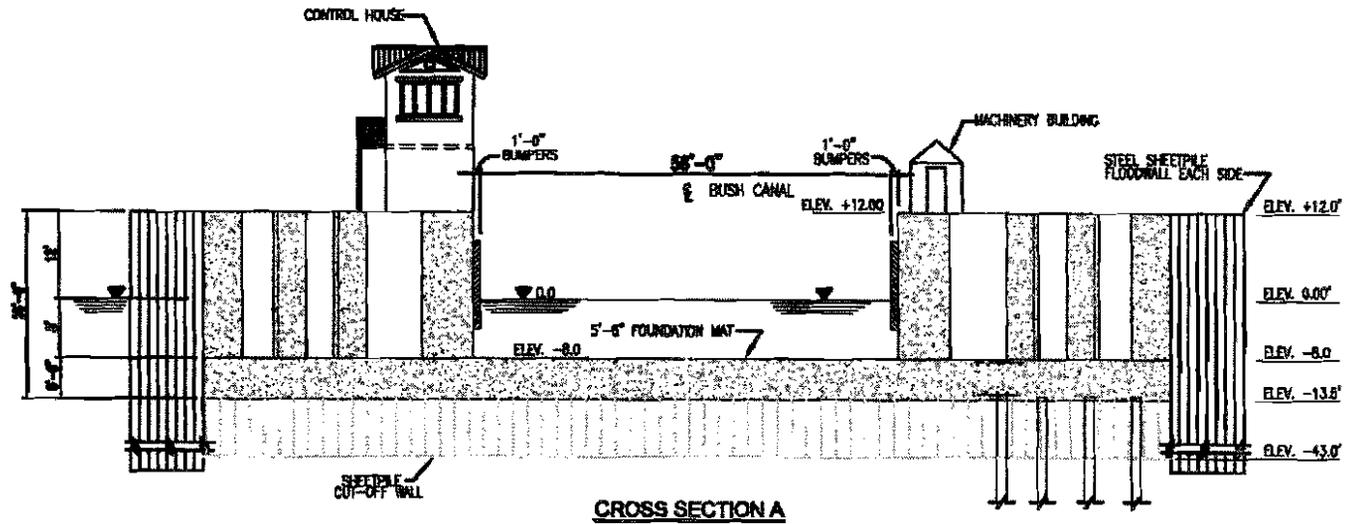
N.T.S.

Note: Vertical Datum is NAVD 88 Feet.

	TERREBONNE LEVEE AND CONSERVATION DISTRICT CHAUVIN, LOUISIANA
	SHEET 11
NAVIGATIONAL FLOODGATE DETAIL PROPOSED LEVEE ALIGNMENT AND BORROW CANALS REACH H, SEGMENT 2 AND 3 MORGANZA TO THE GULF OF MEXICO	

THESE PERMIT DRAWINGS ARE FOR THE
 SOLE PURPOSE OF PERMIT ACQUISITION
 AND ARE NOT TO BE USED FOR CONSTRUCTION

OFFICE HOUMA	DRAWN BY C.LINER	CHECKED BY J.PENA	REVISD DATE: 04/11/08 08/04/08 09/11/08	DRAWING NUMBER 111638/SHEET 12
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In regards to flood protection measures, all floodgates are to remain open at all times except during tropical storm events, including hurricanes or other extreme tidal events. Tide gauges will be installed on each gate and will be monitored closely. When water levels of the gates approach the EL. +2.5', the floodgates shall be closed until the water recedes. If a "named" storm is in the Gulf of Mexico and a sudden rise in water level due to storm surge is expected, the gates may be closed at the EL. +2.0'.

Vertical Datum is NAVD 88 feet

N.T.S.

 Shaw-Corral, Inc.	TERREBONNE LEVEE AND CONSERVATION DISTRICT CHALVIN, LOUISIANA
	SHEET 12
NAVIGATIONAL FLOODGATE DETAIL PROPOSED LEVEE ALIGNMENT AND BORROW CANALS REACH H, SEGMENT 2 AND 3 MORGANZA TO THE GULF OF MEXICO	

THESE PERMIT DRAWINGS ARE FOR THE
SOLE PURPOSE OF PERMIT ACQUISITION
AND ARE NOT TO BE USED FOR CONSTRUCTION