December 21, 2002

FINDING OF NO SIGNIFICANT IMPACT

To All Interested Agencies and Public Groups:

In accordance with the environmental review guidelines of the Council on Environmental Quality at 40 Code of Federal Regulations (CFR) Part 1500, the U. S. Environmental Protection Agency (EPA) has performed an Environmental Assessment (EA) of the following proposed action under the authority of the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) of November 1990, House Document 646, 101st Congress (Public Law 101-646).

Project Name: Timbalier Island Dune and Marsh Creation Project (TE-40/XTE-45a).

Location: Sections 27, 28, 29, 33, 34, 35, & 36 T23 South - R20 East, Section 1, T24 South - R19 East, and Sections 3, 4, 5, & 6 T24 South - R20 East in Terrebonne Parish, Louisiana.

Sponsors: U. S. Environmental Protection Agency, Region 6
Louisiana Department of Natural Resources.

Proposed Action: The proposed project to restore the eastern end of Timbalier Island and enhance the structural integrity of the island will affect approximately 739 acres (ac) of open water, beach, vegetated dune and marsh and consists of two sub-areas, Areas A and B. Area A will be restored through creation of dune and marsh on the east end of Timbalier Island. It consists of 254 ac of open water and 219 ac of remnant beach and marsh. This acreage reflects the current island length and width of the east end of Timbalier, and a constructed beach/dune and marsh platform 1500 feet (ft.) wide. The existing habitat for the project footprint consists of zero acres of dune ($\geq$5.0 ft. North American Vertical Datum of 1988 - NAVD), 55 ac of supra-tidal (2.0 to 4.9 ft.), and 164 ac of intertidal (zero to 2.0 ft.). Area B will be enhanced through the addition of sediment into the near shore system to maintain the west-northwest migration of the island and attenuate wave energy. It consists of approximately 112 ac of land and 154 ac of open water. This acreage reflects the shoreline dynamics of the western end of the island and 20 years worth of continued lateral migration.

The proposed project will include utilizing the existing 200 ft. beach rim as a sacrificial beach. The constructed dune will have an elevation of 8.0 ft. NAVD with a top width of 400 ft. and side slopes of 1 to 10. The marsh platform will have a width of 800 ft. with elevations of 1.6 ft. NAVD at the dune, and slope back to 0.6 ft. NAVD on the bay side. There will also be a 100 ft. wide berm on the back of the dune, at an elevation of 4.0 ft. NAVD. The project will require a portion of the marsh platform to be built in open water north of the island. The created marsh platform will be built around existing marsh, or with as minimal impact to existing marsh as possible.

CWPPRA provides Federal funds for planning and implementing projects that create, protect, restore and enhance wetlands in coastal Louisiana. Under CWPPRA, the project cost must be shared between the Federal sponsoring agency and the State of Louisiana. Pursuant to approval of the Louisiana Coastal Wetlands Conservation Plan, the Federal government will provide 85 percent of the project cost and the Louisiana Department of Natural Resources (LDNR) would provide the remaining 15 percent non-Federal share. Phase 1 funding for the proposed Timbalier Island Dune and Marsh Creation Project was approved for funding on January 11, 2000, and is included on the CWPPRA ninth Priority Project List. The estimated fully funded cost for Phase 1 and 2 of the project is $16,234,679.

The proposed Timbalier Island Dune and Marsh Creation Project to restore the eastern end of Timbalier Island and enhance the structural integrity of the island is part of and consistent with the Louisiana Coastal Wetlands Conservation and Restoration Task Force, and the Wetlands Conservation and Restoration Authority, *Coast 2050: Toward a Sustainable Coastal Louisiana,* (1998) Region 3 ecosystem strategy to restore barrier islands and gulf shorelines. Construction of the recommended action proposed in the EA may be authorized as soon as compliance with the appropriate environmental laws and regulations is achieved and the project plans and specifications are complete.

Finding. On the basis of the EA performed by the EPA of the proposed project, the Regional Administrator has determined that the proposed project is not a major Federal action significantly adversely affecting the quality of the human environment, and that the preparation of an Environmental Impact Statement (EIS) is not warranted. Comments regarding this preliminary decision not to prepare an EIS may be submitted to the U.S. Environmental Protection Agency, Office of Planning and Coordination (6EN-XP), 1445 Ross Avenue, Dallas, Texas 75202-2733.

This preliminary Finding of No Significant Impact (FNSI) will become final after the 30-day comment period expires if no new information is provided to alter this finding. No administrative action will be taken on this decision during the 30-day comment period. Copies of the EA and requests for review of the Administrative Record containing the information supporting this decision may be requested in writing at the above address, or by telephone at (214) 665-8150. The EA and FNSI documents are also available through the Internet (URL) at "http://www.epa.gov/earth1r6/6en/xp/enxp4c.htm."

Responsible Official,

Gregg A. Cooke
Regional Administrator

ENVIRONMENTAL ASSESSMENT
FOR THE
TIMBALIER ISLAND DUNE AND MARSH CREATION PROJECT
COASTAL WETLANDS PLANNING, PROTECTION
AND RESTORATION ACT (CWPPRA) PROJECT
(TE-40/XTE-45a)
TERREBONNE PARISH, LOUISIANA

1.0 SUMMARY

1.1 Summary of Environmental Assessment.

Project Name: Timbalier Island Dune and Marsh Creation (TE-40/XTE-45a)

Location: Timbalier Island is located in Terrebonne Parish, Louisiana at 29° 03' 32" north latitude and 90° 25' 54" west longitude (Fig.1).

Sponsors: Federal: U.S. Environmental Protection Agency (EPA), Region 6
Non-Federal: Louisiana Department of Natural Resources (LDNR)

Land rights: Eleven tracts are privately owned (Fig.2). The western portion of the island is owned by the State of Louisiana.

Resource Information:

Project Purpose: Enhance the structural integrity of Timbalier Island.

Proposed Sites: Area A. Area restored through direct creation of 473 acres (ac) of dune, marsh platform and berm on the east end of Timbalier Island. The existing footprint contains 55 ac of supra-tidal, 164 ac of intertidal, and 254 ac of open water habitat. After construction, the project's footprint will contain 264 ac of intertidal marsh habitat; 46 ac of supra-tidal habitat and 163 ac of dune habitat (Fig.3).

Area B: Approximately 266 ac of land and open water down drift of the creation footprint that could benefit from provision for additional sediment in the near shore system.

Dredged Material: 3.9 million cubic yards (cy) from the Little Pass Timbalier Borrow Area 2 will be used in this proposed project and 22,000 cy of access dredging will also be required.

Wetlands: Saline marsh

Threatened and Endangered Species: The threatened piping plover, the endangered brown pelican, and five species of threatened or endangered sea turtles may occur in the proposed project vicinity. The proposed project is not expected to adversely impact these species.

Cultural Resources: There are no known cultural or historic sites in the proposed project area.

Permits and Compliance: The proposed project must comply with a variety of Federal and State environmental statutes. Construction of the project is authorized to begin as soon as all applicable environmental laws and regulations are met, project plans finalized, necessary land rights acquired, and upon approval of the CWPPRA Task Force.[1] The proposed project is not expected to cause adverse environmental impacts requiring compensatory mitigation.

1.2 Proposed Project. The proposed plan would restore the eastern end of Timbalier Island through the direct creation of 163 ac of dune habitat, 264 ac of intertidal marsh habitat and 46 ac of supra-tidal habitat. The project would also enhance down drift acreage through provision of additional sand-rich sediment in the near shore where sediment redistribution via littoral drift is likely, maintaining the lateral migration of Timbalier Island. The project boundary is divided into two sub-areas, Areas A and B, affecting approximately 739 ac of open water, beach, vegetated dune and marsh located in Sections 27, 28, 29, 33, 34, 35, & 36 T23 South - R20 East, Sections 1, T24 South - R19 East, Section 3, 4, 5, & 6 T24 South - R20 East in Terrebonne Parish (Fig.4).

Area A will be restored through creation of dune and marsh on the east end of Timbalier Island. Area A consists of 254 ac of open water and 219 ac of remnant beach and marsh. This acreage reflects the current island length and width of the east end of Timbalier Island and a constructed 1500 ft. wide beach/dune and marsh platform. The existing habitat for the project footprint consists of zero ac of dune ($\geq$5.0 feet North American Vertical Datum of 1988 - NAVD), 55 ac of supra-tidal (2.0 to 4.9 feet), and 164 acs of intertidal (zero to 2.0 ft.).

Area B consists of approximately 112 ac of land and 154 ac of open water. The area will be enhanced through addition of sediment into the near shore system to maintain the west-northwest migration of the island and attenuate the wave energy. This acreage reflects the shoreline dynamics of the western end of the island and 20 years worth of continued lateral migration.

[1] Title III of Public Law 101-646, the Coastal Wetlands Planning, Protection and Restoration Act established the Louisiana Coastal Wetlands Conservation and Restoration Task Force comprised of five Federal agencies and the State of Louisiana. The Federal agencies involved are the Natural Resources Conservation Service; the U.S. Army Corps of Engineers, National Oceanic and Atmospheric Administration, National Marine Fisheries Service; the U.S. Fish and Wildlife Service; and the U.S. Environmental Protection Agency. The Governor represents the State of Louisiana, with the Louisiana Department of Natural Resources providing the primary source of the non-Federal share of funding. The proposed Timbalier Island Dune and Marsh Creation Project was included on the CWPPRA ninth Priority Project List.

The proposed project will utilize the 200 ft. existing beach rim as a sacrificial beach. The constructed dune will have an elevation of 8.0 ft. NAVD with a top width of 400 ft. and side slopes of 1 to 10. The marsh platform will have a width of 800 ft. with elevations of 1.6 ft. NAVD at the dune, and slope back to 0.6 ft. NAVD on the bay side. There will also be a berm on the back of the dune, 100 ft. wide, at an elevation of 4.0 ft. NAVD. The project will require a portion of the marsh platform to be built in open water north of the island. The created marsh platform will be built around existing marsh or with as minimal impact to existing marsh as possible.

The proposed footprint of the project will contain approximately 473 ac, of which 264 ac will be intertidal habitat, 46 ac will be supra-tidal habitat and 163 ac will be dune habitat. For the proposed intertidal marsh platform, 209 ac will be converted from open water and 55 ac are existing marsh. For the proposed berm, 20 ac will be converted from open water, 24 ac from intertidal marsh and 2 ac are existing supra-tidal habitat. For the sand dune, 25 ac will be converted from open water, 85 ac from intertidal marsh and 53 ac from supra-tidal habitat. There will be a net gain of approximately 100 ac of intertidal habitat, a net loss of 254 ac of open water, and a net loss of 9 ac of supra-tidal marsh habitat.

A hydraulic dredge will be used to mine approximately 3.9 million cubic yards (cy) of dredge material sediment from Little Pass Timbalier Borrow Area 2. An additional 22,000 cy of access dredging will be used in this project. Approximately 19,210 linear ft. of sand fencing will be placed on the dune to capture and accumulate fine-grained sand that is transported by the wind.

The project will initially be vegetated by aerial seeding of bermuda and rye to hold newly placed sediments. Final vegetation will include planting the marsh platform with *Spartina alterniflora* plugs, and four-inch containers of *Spartina patens*, *Spartina spartinae*, and Bitter Panicum. The dune platform will be planted with four-inch containers of Bitter Panicum and *Spartina patens*, and gallon containers of Sea Oats. All plants will be 5-foot centers.

Timbalier Island is considered part of the Bayou Lafourche barrier system, and lies about 46 miles west of the mouth of the Mississippi River and about 50 south of New Orleans. The project area is in the southern portion of Terrebonne Parish, Louisiana, bordered on the north by Caillou Pass, on the south by the Gulf of Mexico, and flanked by two tidal passes, Cat Island Pass to the west and Little Pass to the east (Fig.1). The large Caillou Island oil field is located north of Timbalier Island with numerous pipelines, flow lines, and wells transecting the bay, inlets, and island. The proposed project to restore the eastern end of Timbalier Island and enhance the structural integrity of the island is consistent with the 1998 Coast 2050 Plan[2], Region 3 ecosystem strategy to restore barrier islands and gulf shorelines. The proposed project was approved for Phase 1 funding by the CWPPRA Task Force on January 11, 2000. A regional strategy proposed for the Timbalier Island Shorelines includes restoring and maintaining the Timbalier barrier island chain.

2 Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority. 1998. *Coast 2050: Toward a Sustainable Coastal Louisiana*. Louisiana Department of Natural Resources. Baton Rouge, LA.

1.3 Purpose and Need for Action. Timbalier Island is migrating rapidly to the west-northwest at a rate of approximately 260 feet (ft.) per year.[3] The island continues to undergo overall narrowing and shortening, and the western end of the island is undergoing lateral migration by spit-building processes at the expense of erosion along the eastern end. This loss can be attributed to an inadequate sediment supply, relative sea level rise, that is estimated to account for 1/3 of erosion in the area, and storm events. Rock placement would inhibit these natural restorative processes from occurring.

1.4 Project Benefits and Potential Adverse Impacts. Benefits from the project would be the direct creation of approximately 473 ac of dune and marsh habitat with dredged material on the eastern end Timbalier Island. There will be a net gain of approximately 100 ac of intertidal habitat. Increased acreage will benefit both migratory and resident birds by increasing potential nesting and feeding habitat as well as fisheries nursery and feeding habitat. It is estimated that this project could also benefit over 260 ac of down drift habitat through provision for additional sediment in the near shore system, maintaining the lateral migration of the island and enhancing its structural integrity.

The bays, estuaries, and wetlands behind the island are habitat for one of the most productive commercial fisheries in the United States, as well as habitat of continental importance for North American waterfowl populations. Loss of the barrier islands would expose large areas of the valuable estuary and associated wetlands to wave attack, saltwater intrusion, and storm surges. The loss would effectively result in the conversion of the bays to open gulf waters with different habitats supporting different fish and wildlife populations, and result in severe impact to important coastal infrastructure, fish, and wildlife resources.

Many important coastal fish species that utilize barrier island habitat have migration patterns critical to completion of their life cycles.[4] The barrier islands act as buffers for this habitat, absorbing much of the wave action and storm surges, and reducing the tidal prism from the Gulf of Mexico. Open beach would be devoid of fish and the function of larval fish moving in from offshore waters would be lost if the islands were surrounded by rocks.[5] Island fauna would come to consist of organisms that complete their entire life cycle in estuarine conditions; these being mostly gobies, killifish, and silversides.

Potential adverse impacts that have been identified would include the dredging at borrow areas which would temporarily disturb bottom habitat to remove the sediment. The dredged area would fill in naturally over time. The deposition of the material on Timbalier Island would replace bottom habitat with beach, dune and marsh habitat. There would be a net replacement of 254 ac of open water with new land, and a net loss of nine acres of supra-tidal marsh.

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3 McBride and Byrnes, 1997

4 McHugh, 1967

5 Guillen and Landry, 1980, and Ruple, 1984

Construction activities would cause minor and temporary disturbance to adjacent wetlands, oyster leases, wildlife and recreation use, and water and air quality. No other adverse effects are anticipated.

2.0 ALTERNATIVES

Criteria established for the project include avoiding vegetated areas to the greatest extent practicable, avoiding nesting season for wading birds or sea bird colonies, offsetting all dredging areas to a minimum of 200 ft. on either side of existing pipelines, discharging dredged fill material within the project footprint in a manner that would minimize overflow, selecting borrow areas with incremental volumes not less than 70 percent sand, and limiting dredging depth to no more than 7.5 ft. below the existing bottom.

The proposed project considered three fill configuration options (Figs.5-7) and five borrow areas (Figs.8-11). Sedimentary, vegetative and structural techniques included structural and non-structural alternatives. Hydrologic techniques that involve restoring riverine inputs of fine and coarse grained sediment were not considered feasible in this case as the scale needed is beyond the scope of technology and sources of funding. Current planning concepts are influenced by actual experience at shoreline and island protection projects. These real-world experiences concerning structural and non-structural alternatives are another important input to the discussion of alternatives, and are detailed in length in the December 1993, Environmental Assessment for Isles Derniers Barrier Island Restoration and Coastal Wetland Creation.[6]

2.1 No-action Alternative. The No-action Alternative involves leaving Timbalier Island with no restoration effort. This alternative would allow the erosion of Timbalier Island to continue, resulting in decreasing island area and height.

2.2 Structural Alternative. This alternative include the placement of rocks along the project area shoreline to reduce gulf side and bay side wave energy and reduce erosion of beach and marsh plant communities. A rock dike six ft. high with a top width of 10 ft. and a bottom width of 16 ft. will have a cross-sectional area of seventy-eight square feet. Multiplying that figure by the 14,800 ft. of length will result in a volume of rock of 1,154,400 cubic feet or 42,755 cubic yards. At a cost of rock of $60 per cubic yard, the cost of material alone would be about $2,565,333.

This alternative would have a long-term negative effect on marshes by preventing the overwash of sand and other materials to the marsh. Continuing subsidence of the marsh substrate and eustatic sea level rise would not be counterbalanced by sand deposition and accretion. Loss of frequent exchange and tidal circulation across the rock structures would reduce nutrient influx and diminish the vigor of marsh plant growth. In more extreme storm surge events, flood waters could become impounded behind the rock shoreline protection

6 December 1993, Environmental Assessment for Isles Derniers Barrier Island Restoration and Coastal Wetland Creation

structure, leading to water logging, stress and loss of marsh vegetation. Further consideration for a structural alternative was not considered a feasible or reliable alternative for this project.

2.3 Non-structural or Sedimentary Alternative. The Non-structural Alternative is the proposed plan using fill configuration Option C (Fig.12), with Borrow Area 2, Little Pass Timbalier (Fig.10), for the sand source. Sand fencing and vegetative plantings are integral parts of the proposed plan. This alternative would repair breaches in the island, fill shallow ponds, create marsh elevations and a dune, add width to the island, increase the elevation of the island, stabilize areas of the gulf and bay shoreline, and plant the created elevations with appropriate vegetation. This alternative includes constructing sand dunes to prevent small storm surges from inundating the island, increasing the width of the island, retaining overwashed sand that might be lost from the system. The non-structural approach would restore Timbalier Island through the direct creation of dune and marsh habitat (Fig.12), and would enhance the structural integrity of the island through restoration of the littoral drift system and addition of sediment into the near shore environment. This approach would result in a reduction in the rate of land loss and the protection of habitat from loss over the 20-year project life.

2.3.1 Fill Configuration Options. Fill configuration options A, B and C, were developed to evaluate erosion performance and the feasibility of construction as described below (Fig.12).

Fill Option A. This option would create a five ft. high dune with a 100 ft. width and 300 ft. wide marsh platform. This option meets marsh creation goals, has the least volume and cost, and is similar to a portion of the Whiskey Island Restoration Project (TE-27).

Fill Option B. This option would creates a six ft. high dune with a 200 ft. width and 500 ft. wide marsh platform. It is larger than Option A and provides more setback and more marsh.

Fill Option C. Creates an eight ft. high dune with a 400 ft. width and 800 ft. wide marsh platform. It is the largest option considered, and is similar in cross-section to the Trinity Island (TE-24) and East Isle (TE-20) Restoration Projects. This option creates the largest marsh of the three options and is the preferred method for restoring Timbalier Island using non-structural solutions.

The three fill configuration options were analyzed for sustainability and performance using the SBEACH model.[7] The results show that the primary design factors that reduce storm erosion are dune height and width. The higher dunes prevent or limit overwash, and protect the integrity of the dune-marsh interface. Output from the model shows a tendency for the toe of the dune to slough as higher waves and water levels scour the berm. However, the sediment taken from the dune reforms in the near shore to create shallow water bars would likely be a temporary feature to be reshaped in the cross-shore system, or transported along the shore to the adjacent beach.

7 T. Baker Smith & Son, Inc., August 2002

The lower dune heights allow considerably more overwash to occur and the more severe storms would erode portions of the entire dune area. Dune height loss may not recover, as seen in most of the deltaic barrier islands. Added dune width reduces the occurrence and magnitude of overwash. In more severe storms, the toe of the dune will undergo erosion and reduce the effectiveness of preventing erosion from subsequent storms. A wider dune crest leaves more elevated area to protect the island and may promote some dune rollover as wind and water pushes sand to the north. No significant benefits are attributed to variations in the marsh platform configuration in terms of mechanical erosion. Widening the near shore berm would be beneficial in reducing the amount of dune erosion at the toe, but is considered less beneficial than dune height and width. The gradual dune degradation at the toe will likely reshape the berm as the system matures.

All three fill configuration options are within the estimated construction budget. The large acreage of habitat created, combined with sustainability against storm erosion, points to Option C as the recommended proposed plan. Options A and B offer less acreage and are higher in cost per cubic yard of sediment delivered to the project than Option C. Option C provides a higher and wider dune capable of withstanding the more frequent hurricane events. The wide platform creates a large runoff area to be used to naturally develop cuts and channels in the newly built marsh. The platform also provides a wider base for sand to be stored during overwash conditions.

2.3.2 Borrow Areas. Five borrow sites were delineated for the investigation. The "suitable" criteria for determining the preferred borrow area requires sediment of large grain size (>0.12 mm), limit overburden (<2.5 ft.), and ensure that the majority of the sediment placed in the project area is sand (70 percent). The geotechnical investigation shows that Borrow Areas 1, 2, and 5 have sections of suitable sand with no overburden. The median grain size and uniform sorting of Borrow Area 2, Little Pass Timbalier, produces the lowest overfill factor and best long-term performance per the re-nourishment factor of the three borrow areas. The modeling simulations show that dredging Little Pass Borrow Area 2 from a current depth of -6.5 to -13.5 ft. to a final dredged depth of between -14 and -22 ft. will result in no significant changes in wave direction. Little Pass Borrow Area 2 also was selected based on its cost effectiveness and close proximity to the project site, and conforms to the criteria established.[8]

There is no "reason to believe"[9] that Little Pass Borrow Area 2 is a carrier of contaminants and therefore, testing is not required. The dredged or fill material is composed

8 T. Baker Smith & Son, Inc., April 2002 and August 2002

9 Subpart G of the Clean Water Act Section 404(b)(1) guidelines requires the use of available information to make a preliminary determination concerning the need for testing of the material proposed for dredging. This principle is commonly known as "reason to believe". The decision not perform testing based on prior information must be documented in order to provide a "reasonable assurance that the proposed discharge material is not a carrier of contaminants" (by virtue of the fact that it is sufficiently removed from sources of pollution). The reason to believe that no testing is required is based on the type of material to be dredged and its potential to be contaminated. For example, dredged material is most likely to be free of contaminants if the material is composed primarily of sand, gravel, or other inert material and is found in areas of high current or wave energy. In addition, knowledge of the proposed dredging site proximity to other sources of contamination, as well as that gained from previous testing or through experience and knowledge of the area to be dredged, may be utilized to conclude that there is no reason to believe that contaminants are present and, therefore, no need for testing.

primarily of sand and is found in an area of high wave energy, and there has been no recent source of sediment input into the system other than sediment provided from eroding marshes in the bays.

Marsh/Dune Platform. The target elevation of the marsh platform must be compatible with the flooding tolerance of the desired plant species. If the elevation of the platform is too high, it will never be inundated by normal tidal flow and will not serve as a nursery for marine organisms. In addition, the desired wetland plant species will be out-competed by non-wetland plant species. Conversely, if the elevation of the marsh platform is too low, the wetland plants will not survive due to water logging, and no root system will be in place to keep the marsh platform from eroding. A bio-benchmark survey was conducted to establish an optimum elevation range for the marsh platform. From this study, it was determined the target elevation range for the marsh platform should be about 0.6 to 1.6 ft. NAVD with an average elevation of about 0.9 ft. NAVD. The marsh platform should be constructed so that the entire range of elevation is represented. This action would allow ingress and egress of marine organisms and speed the development of intertidal channels and ponds on the marsh platform and may also speed natural plant colonization by creating paths for seed dissemination. To help stabilize the platform, it should be planted with oyster grass and black mangrove, the dominant species in healthy bay side marshes on Timbalier Island.

Vegetation. From observations made by the CWPPRA Environmental Work Group, vegetation on the island included smooth cordgrass or oyster grass (*Spartina alterniflora),* saltmeadow hay or marshhay cordgrass (*Spartina patens),* black mangrove (*Avicennia germinans),* saltwort (*Batis maritima),* saltgrass *(Distichlis spicata),* sea ox-eye daisy (*Borrichia frutescens), Cakile ssp., Cynadon ssp., Iva frutescens,* groundsel (*Baccharis halinifolia),* sea purslane (*Sesuvium portulacastrum),* and *Salicornia ssp.*

Vegetative plantings are an integral part of all barrier island post construction activities. Vegetation will be planted on the marsh and dune platforms. The project will initially be vegetated by aerial seeding of bermuda and rye to hold newly placed sediments. Final vegetation will include planting the marsh platform with *Spartina alterniflora* plugs, and four-inch containers of *Spartina patens*, *Spartina spartinae*, and Bitter Panicum. The dune platform will be planted with four-inch containers of Bitter Panicum and *Spartina patens*, and gallon containers of Sea Oats. All plants will be on five-foot centers.

Sand Fences. Sand fences are an integral part of dune restoration projects and will be placed on the dune where they are less susceptible to wave energy. Sand fences capture the Aeolian transport of fine grain sand and will add elevation to the dune from sand accumulation. Unlike the sand fence project west of the rock seawall, the sand fences should be placed on the dune where they are not susceptible to wave energy. Sand fencing was included in all alternative cost estimates.

Beach Fill. Beach fill directly adds sediment to the near shore by widening the existing shoreline and profile to the closure depth. This enhancement provides protection to the dune while also providing sediment in the littoral system to feed down drift beaches. With the

exception of two projects, Grand Isle and Holly Beach, beach fill projects have not been used in Louisiana. For this proposed project, a beach fill solution would require a large volume of material to effectively cover the 14,500 ft. of project length, and is dependent on the availability of comparable native grain sized sand. Also, there is no critical infrastructure that would be impacted should the shoreline continue to migrate. Therefore, a beach fill solution may be less desirable in the initial project construction, but should be considered in the future to maintain the project and provide a systemic maintenance feature for the entire island.

2.4 Conclusion. This EA is based on a comprehensive review of relevant literature, site-specific data, and project engineering and environmental reports. This EA concludes that there are no significant adverse environmental impacts anticipated by the implementation of the wetland restoration project as proposed. This finding supports the recommendations of the CWPPRA Task Force, the EPA and LDNR. The long-term protection and enhancement of the project area is expected to be beneficial to wetlands, fisheries, wildlife, recreational, and cultural resources as well as restoration of natural structural framework of the Terrebonne-Barataria estuary and the coast of Louisiana.

3.0 AFFECTED ENVIRONMENT

3.1 Climate. The island has a semi-tropical climate with water temperatures ranging from 64.4 degrees Fahrenheit (°F) in February to 84.2°F in August, and air temperatures ranging from 57.2°F in January to 82.4°F in July and August. Wind direction, which controls wave direction and aeolian transport, is primarily from the south and southeast during the summer and from the north and northeast during the winter. The average annual rainfall is 5.25 ft. with monthly averages ranging from 0.3 ft. in October to 0.62 ft. in July. The project will have no effect on climate, water temperature, wind direction and precipitation.

3.2 Soils. Timbalier Island is considered part of the Bayou Lafourche barrier system. The island originated from the westward progradation of the Caminada-Moreau headland. When the spit subsequently breached during storms, the island was detached from the headland. Sand erosion from the Caminada-Moreau headland remains the primary source of coarse-grained sediment to Timbalier Island. There has been no recent source of sediment input into the system other than sediment provided from eroding marshes in the bays. Consequently, the headland and barrier islands have experienced extensive erosion.[10]

The dunes of Timbalier Island are less than 6.5 ft. above mean sea level and are composed primarily of fine-grained sands and not well developed. Beach, dune and overwash soils are sandy, while saline marshes are typically clays and mucky clays. Much of the near shore sediment is hard, compacted sand. The near shore profile is very flat with only minor sandbar features offshore in 6-8 ft. of water. The largest grain size in the project footprint is in the dune areas with median grain sizes of 0.187 to 0.196 millimeter (mm). The near shore

10 T. Baker Smith & Son, Inc., August 2002

samples have a median grain size ranging from 0.178 mm on the beach to 0.091 mm at a water depth of 12 ft. None of the alternatives would have an impact on soils.

3.3 Water Quality. The project area is located in the Terrebonne Basin at the saline/brackish end of the Terrebonne estuary. There is no fresh surface water on the island. Timbalier Island is at the lower end of the water quality standards sub-segment system, which identifies the largest of the lower bay systems, and delineates the inland estuarine coastal waters from the near shore state waters of the Gulf of Mexico. The largest bay system above the island is Timbalier Bay (sub-segment 120803). A part of the island intrudes into the Terrebonne Bay sub-segment. The sand for the restoration work on Timbalier is offshore in sub-segment 120806. There are no apparent water quality problems.

One of the standards that apply to this area is turbidity, 50 nephelometric turbidity units. This standard is usually associated with contact recreation, but may apply to other water uses. Coastal waters are naturally very turbid due to the considerable amount of suspended sediments from freshwater inflows and coastal erosion, and would probably exceed the turbidity standard. However, according to the Louisiana Department of Environmental Quality (LDEQ),[11] this standard is mostly applied to outstanding natural resource waters (ONRW) and used as a secondary parameter when applied to Gulf of Mexico or other ambient waters, but would not have to meet as stringent a criterion as ONRW. Also, the standards for turbidity allow for an exemption from meeting the criteria for periods of time for activities permitted under Clean Water Act (CWA) Sections 402 and 404, certified under Section 401.

Regarding oyster propagation, fecal coliform median most probable number (MPN) shall not exceed 14 fecal coliforms per 100 ml, and not more than 10 percent of the samples shall exceed an MPN of 43 per 100 ml for a five-tube decimal dilution test in those portions of the area most probably exposed to fecal contamination during the most unfavorable hydrolgraphic and pollution condition. The islands are 40 to 50 miles removed from significant sources of inland freshwater pollution such as fecal coliform bacteria. Therefore, the fecal coliform standard that applies to this area would probably not be exceeded. There are no apparent water quality problems.

The No-action Alternative would allow the present conditions to continue resulting in increased wave energies, greater erosion, and high-energy tidal surges. The situation would allow the potential connection of the higher salinity waters from the Gulf with the interior bay waters, and potentially contribute to an increase in turbidity in the Terrebonne estuary. The Non-structural Alternative would have no long-term adverse impact on present conditions. However, short-term adverse temporary impacts due to increased turbidity from dredging in the borrow areas and placement of material on the island could occur during project construction. These impacts are minor and would be limited to the construction phase of the project. It is expected that turbidity levels would return to normal shortly after construction ended. Long-term benefits include decreased likelihood of higher wave energies causing greater erosion around interior bay

11 Louisiana Department of Environmental Quality, memo of 9/5/02.

wetlands, creation of wetlands that provide important water quality functions such as pollutant and sediment removal, retention of flood waters, and reduction in salinity by reduction of the tidal exchange with the bay. Data used by the CWPPRA Wetlands Valuation Assessment indicated an annual salinity of 20 parts per thousand (ppt) for this area.

3.5 Air Quality. There are no air quality monitoring stations in Terrebonne Parish, although existing air quality can be considered good. Except for minor boat traffic and small oil and gas processing facilities, there are no air pollution sources located on or near Timbalier Island. The closest major sources of air pollution are 60 or more miles away in the urban-industrial corridor from New Orleans to Baton Rouge.

The No-action Alternative would have no impact on present air quality conditions. The Non-structural Alternative would have no long-term adverse impact on present conditions. Minor temporary impacts due to emissions from dredging equipment could occur during project construction. It is expected that exhaust emissions from dredging equipment should be quickly dissipated by prevailing winds and be limited to the construction phase of the project.

3.6 Wetland Loss. The east end marsh creation area of Timbalier Island is typified by sparse island marsh vegetation, washover sands, mudflats, and shallow bay waters, with some deeper holes. The eastern portion of the island measures approximately 14,530 ft. from the eastern tip to the Gulf of Mexico shoreline rock revetment. Average water depth on the bay side is estimated to be 2 ft. The average island width on the eastern end is 600 ft. with a multitude of prominent channel formations where the island width is only 180-33 ft. The Timbalier Island Shorelines mapping unit area is comprised of approximately 76 percent open water, eight percent saline marsh, and 11 percent barrier beach. The remainder consists of five percent hardwood forest. Within the project boundary, wetlands are classified as saline marsh.

According to the Coast 2050 Plan, this project lies within the Timbalier Island Shorelines Region 3 mapping unit. The average loss of land in this unit for the period 1978-1988/90 was approximately 631 ac per year with subsidence rates estimated at 2.1-3.5 ft. per century. According to the CWPPRA Environmental Work Group Wetland Value Assessment, from 1978-1988 the gulf side erosion rate along eastern end of Timbalier Island was 65 feet per year (ft./yr), and the bay side erosion rate was 42 ft./yr for the Option A area. Option B area on the eastern end of Timbalier Island averaged a gulf side shoreline change rate of 10 ft./yr. Timbalier Island is migrating to the west-northwest at 80 m/yr or approximately 5,249 ft. over the next 20 years. During the past 100 years, Timbalier Island has decreased 58 percent in size, with the eastern half eroding at a rate of 61 ft./yr, while the western end has accreted at a rate of 57.7 ft./yr. An additional 20 percent was lost between 1978 and1985.[12] In 1988, the average width of Timbalier Island was 1,360 ft., more than 3,000 ft. less than in 1887, and the length of the island was 8 to 9 miles.

12 Hester and Mendelssohn 1992

Most of the land loss and erosion of the islands is attributable to storm events. Tropical storms and hurricanes have resulted in substantial beach erosion and overwash of these islands over the years. Winter storms and cold front movements also erode the islands, particularly the back barrier salt marsh shorelines. The erosional forces acting on Timbalier Island, combined with western long shore transport, cause up drift erosion and down drift accretion, resulting in the southeast to northwest lateral migration of the island.[13] Some of the highest average erosion rates of the nation occur along the coastline of the Gulf of Mexico. The Coast 2050 Plan indicates that from 1978 to 1990, about 495 acs of land in the Timbalier Island Shorelines mapping unit were converted to open water. Shoreline erosion is a primary cause of land loss in the Terrebonne Basin. Tropical storms and hurricanes have resulted in substantial beach erosion and overwash of these islands over the years. According to a Geographic Information Systems (GIS) land-water analysis, the island was consisted of approximately 811 ac land and 205 ac un-vegetated sand in 1993.

For Wetland Value Assessment (WVA) purposes, the current net gulf side and bay side shoreline erosion rates in the project area were estimated to be 107 ft./yr. The No-action Alternative would not stabilize the Timbalier area, allowing the marsh to continue to dissipate. Studies conducted prior to restoration of East and Trinity Islands in 1999, found that the Isles Dernieres were expected to disappear by 2050, if no action was taken. Based on shoreline loss rate data, Timbalier Island is also projected to disappear by 2050. The Non-structural Alternative would create approximately 254 additional acres of vegetated wetlands, the erosion rate may be slowed, and the life of the wetlands should be increased. Long-term benefit would result from re-establishing the marsh platform at an elevation conducive to the establishment of marsh vegetation. Establishing dune vegetation would increase the overall health, diversity, and stability of the island.

3.7 Wildlife and Fisheries. The emergent wetlands and associated open water and marsh habitat in the vicinity of the proposed project are a valuable nursery and food source for many commercial and recreational species of finfish and shellfish (Fig.14). Project area wetlands also provide food, cover, nesting and resting habitat for a multitude of fish and wildlife species. According to the Coast 2050 Timbalier Island Shorelines mapping unit, the seabird populations in open water habitats are projected to remain stable, while wading birds and shore birds are expected to decline in saline and brackish marsh areas. Colonial nesting water birds that repeatedly nested on and in the vicinity of Timablier Island include sandwich, royal, and least terns and black skimmers. Mammals that utilize the area include raccoons (*Procyon lotor*), muskrats (*Ondatra zibethicus*), nutria (*Myocastor coypus*), mink (*Mustela vison*), and river otter (*Lutra canadensis*). For saline marsh areas, these mammals are listed as declining and are not historically present in open waters for Timbalier Island Shorelines mapping unit. The Atlantic bottlenose dolphin (*Tursiops truncatus*) is the only marine mammal in near shore gulf waters.

Marshes of the Coast 2050 Timbalier Island Shorelines mapping unit support populations of marine fisheries resources. Characteristic species include, but are not limited to, red drum

13 Hester and Mendelssohn 1992; LGS 1992; McBride et al. 1991

(*Sciaenops ocellatus*), black drum (*Pogonias cromis*), Spotted seatrout (*Cynoscion nebulosus*), Spanish mackerel (*Scombermorus maculatus*), gulf menhaden (*Brevoortia patronus*), southern flounder (*Paraichthys lethostigma*), white shrimp (*Litopenaeuss setiferus*), brown shrimp (*Farfantepenaeus aztecus*), blue crab (*Callinectes sapidus*), and American oyster (*Crassostrea virginica*). These species utilize project area aquatic resources primarily as nursery, foraging, and predator refugia habitat. Only the Spanish mackerel is believed to be increasing in abundance in this unit, while finfish, shellfish, birds, reptiles and mammals and other species as listed above are believed to be decreasing.

The No-action Alternative would allow the loss of saline marsh, shoreline, and shallow open water habitat to continue, causing fish and wildlife populations, specifically southern flounder, black drum, brown shrimp, American oyster, seabirds, shorebirds, waterfowl, and raptors in the area to continue to decline. The loss of vegetation would reduce the quality of marsh as habitat for terrestrial and semi-aquatic wildlife, but in the short-term could result in an increase in the value of the area as a nursery and associated food source for finfish and shellfish. However, continued land loss leads to increasing water depth and the value of the area as a food source and nursery declines further. The Non-structural Alternative would provide protection of existing marsh, creation of vegetated wetlands, and a reduction in the rate of land loss. As project area marshes are protected and enhanced, the habitat value for associated fish and wildlife species will increase and persist for a longer period of time.

Although colonial nesting waterbirds do not nest in the vicinity of Timbalier Island every year, they are protected under the Migratory Bird Treaty Act. Therefore, a survey for bird nesting, as well as wintering piping plover, would be conducted in coordination with the Louisiana Department of Wildlife and Fisheries (LDWF) and the U.S. Fish and Wildlife Service (FWS) prior to construction of the project. A provision of the CWA, Section 404 permit would be that if bird nesting or piping plover use are documented, construction activities within 1,500 feet of the site would be coordinated with LDWF, FWS, LDNR, EPA, and all contractors would be required to minimize habitat disturbance.

3.8 Threatened and Endangered Species. Federally listed species and critical habitat currently known to occur in the proposed project area include the endangered brown pelican (*Pelecanus occidentalis*), the threatened piping plover (*Charadrius melodus*) and its designated critical habitat, and five species of threatened or endangered sea turtles. Endangered brown pelicans are currently known to nest on Raccoon Point on Isles Dernieres, Queen Bess Island, Plover Island near Baptiste Collette Bayou, and islands in the Chandeleur chain. Pelicans change nesting sites as habitat changes occur and may be found nesting on mud lumps at the mouth of South Pass of the Mississippi River Delta, and on small islands in St. Bernard Parish. In winter, spring, and summer, nests are built in mangrove trees or other shrubby vegetation, although occasional ground nesting may occur. Brown pelicans feed in shallow estuarine waters, using sand pits and offshore sand bars as rest and roost areas. Brown pelicans were found at six colonies during a survey conducted in 1997 by Louisiana State University. None of these colonies were found on Timbalier Island.[14] Major threats to this species include chemical

14 Visser and Peterson 1999

pollutants, colony site erosion, disease, and human disturbance. The brown pelican population is expected to remain stable in the Timbalier Island Shorelines mapping unit.

The threatened piping plover winters in coastal Louisiana and occurs in the vicinity of the proposed project. Piping plovers may be present in Louisiana for 8 to 10 months, arriving from the breeding grounds as early as late July and remaining until late March or April. Piping plovers feed extensively on intertidal beaches, mudflats, sandflats, algal flats, and washover passes with no or very sparse emergent vegetation and require unvegetated or sparsely vegetated areas for roosting. Roosting areas may have debris, detritus, or micro-topographic relief offering refuge to plovers from high winds and cold weather. In most areas, wintering piping plovers are dependant on a mosaic of sites distributed throughout the landscape, as the suitability of a particular site for foraging or roosting is dependent on local weather and tidal conditions. A study of 48 wintering piping plovers in south Texas found a mean home range size of 3,117 ac, with a mean distance moved per individual of approximately 2 miles.[15] Plovers may move among sites as environmental conditions change.

Designated critical habitat of the piping plover are those habitat components that support foraging, roosting, and sheltering and the physical features necessary for maintaining the natural processes. Constituent elements are found in geologically dynamic coastal areas that contain intertidal beaches and flats between annual low tide and annual high tide, and associated dune systems and flats above annual high tide. Important components or primary constituent elements of intertidal flats include sand and mud flats with no or very sparse emergent vegetation. Adjacent un-vegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting plovers. Major threats to this species include the loss and degradation of habitat due to development, disturbance by humans and pets, and predation.

Sea turtles require three major habitats - nesting beaches, pelagic developmental habitats, and benthic feeding habitats - for juveniles and adults.[16] It is possible that any of these species of sea turtles, the endangered Kemp's ridley (*Lepidochelys kempii*), the threatened loggerhead turtle (*Caretta caretta*), the threatened green turtle (*Chelonia mydas*), the endangered hawksbill turtle (*Eretmochelys imbricata*), and the endangered leatherback turtle (*Dermochelys coriacea*) could be found along the Louisiana coast, though occurrences of hawksbill and leatherback turtles would be extremely rare. The hawksbill is rare in the Gulf and leatherbacks prefer offshore waters.

The endangered Kemp's ridley (*Lepidochelys kempii*) sea turtle feeds mainly on crabs. Dredging operations affect the ridley through incidental take and by degrading the habitat. Incidental take of ridleys has been documented with hopper dredges. The National Marine Fisheries Service (NMFS) consulted with the U.S. Army Corps of Engineers (COE) in November 1991, and issued a biological opinion under Section 7 of the Endangered Species Act

15 Drake 1999

16 Bjorndal and Bolten, 1989

finding that the unrestricted operation of hopper dredges from North Carolina to Cape Canaveral, Florida, jeopardized the continued existence of sea turtles, particularly Kemp's ridley. In addition to direct take, channelization of the inshore and near shore areas can degrade foraging and migratory habitat through spoil dumping, degraded water quality/clarity and altered current flow. Nesting areas and habitats for the ridley include barrier islands of south Texas and near shore habitats, especially the crab-rich waters off the mouth of the Mississippi River.[17] The sheltered estuaries, bays, and lagoons of Louisiana may be primary developmental areas and feeding grounds. Trawlers report seeing Kemp's ridleys frequently, and in Louisiana, Kemp's ridleys account for 60 percent of all strandings and 52 percent of these in the vicinity of Isles Derniers. These near shore areas are most exposed to habitat degradation from land-based pollution and loss of adjacent nursery habitats such as marshes. Human activities such as fishing and dredging are also concentrated in these areas.

The threatened loggerhead turtle (*Caretta caretta*) is relatively common in the near shore waters of the Gulf of Mexico. The loggerhead feeds on sponges, jellyfish, mollusks, crustaceans, sea urchins, fishes, seaweeds and grasses. Rocky places and shellfish beds are prime foraging habitat. They use hard bottom or offshore reef areas, and have been sighted around oil rigs. They also enter estuaries, coastal streams, salt marshes and the mouths of large rivers. The threatened green turtle (*Chelonia mydas*) is relatively common in the near shore waters of the Gulf of Mexico. Its diet is primarily marine grasses and macrophytic algae. The endangered hawksbill turtle (*Eretmochelys imbricata*) is usually found in seawaters with a depth of less than 15 meters (49 feet or 8 fathoms) and feeds on invertebrates, marine grasses and macrophytic algae. These turtles are regularly, but less and less frequently, found in the Gulf of Mexico, particularly off the Yucatan peninsula of Mexico. In the United States, they are found using coral reefs, as well as lagoons, shoals, and vegetated bays. The endangered leatherback turtle (*Dermochelys coriacea*) is found in deeper oceanic waters and feeds primarily on jellyfish. There have been reports of leatherbacks in the bays of Alabama.[18]

The No-action Alternative would allow existing loss of potential brown pelican and piping plover habitat to continue. The Non-structural Alternative is not likely to adversely impact the brown pelican or the piping plover, and would likely enhance the quantity and quality and increase the longevity of the available habitat for these species. Although the proposed project will fill in the sandflat/overwash areas of Timbalier Island, only a relatively small amount of habitat will be affected when compared to the amount of critical habitat available. In addition, filling in any breaches along the island will create new suitable beach habitat for the piping plover on the gulf side of the island and prevent and reduce erosion of existing habitat in the vicinity. Wintering plovers in Louisiana depart for the breeding grounds during late March and early April so that when construction is planned to begin in April or May, most birds will have left the wintering grounds. Because any plovers remaining in the project area during construction would be displaced to other suitable habitats in the vicinity, the proposed project

17 Byles, 1989

18 Weber, 1989

will not adversely modify critical habitat and is not likely to adversely affect the wintering piping plovers. The LDNR will take all necessary precautions to avoid impacts to wintering and nesting populations of piping plovers in the project area, both during construction and future operation and maintenance work. In addition, LDNR will conduct surveys to document any nesting birds and other avian activities in the area and coordinate all construction activities within 1,500 feet of the documented nesting sites with the LDWF, EPA and FWS.

This proposed alternative would create vegetated dune and marsh and restore the structural integrity of the island resulting in a reduction in the future habitat loss rate and protection of habitat from loss over the 20-year project life. The proposed project would create new feeding and loafing areas for the pelican while preventing/reducing erosion of existing habitat. Also, any pelicans utilizing the project area during the project construction could easily relocate. Therefore, the proposed project is not likely to adversely affect the brown pelican.

Suspended sediments from restoration activities could impact sea turtles. A discharge plume could potentially impact species by displacing or reducing the food sources, or by impairing their ability to locate prey. Sea turtles probably would avoid increased turbidity and activities surrounding construction sites, thus no adverse impacts would be anticipated to these species. The endangered Kemp's ridley sea turtle could benefit form improvement of sheltered marshes and the threatened green sea turtles would also benefit only if sea grasses were successfully reintroduced as part of the restoration program. Similar work has been conducted on adjacent islands, Isles Dernieres Island and East Timbalier Island; therefore, the proposed project is not likely to adversely affect the sea turtles.

3.9 Essential Fish Habitat.[19] The proposed project is located in an area identified as Essential Fish Habitat (EFH) for juvenile, sub-adult, and adult red drum (*Sciaenops ocellatus*), juvenile, sub-adult, and adult Spanish Mackerel (*Scombermorus maculatus*), postlarval, juvenile, sub-adult, and adult white shrimp *(Litopenaeus setiferus*) and brown shrimp (*Farfantepenaeus aztecus*), and juvenile gray snapper (*Lutjanus griseus*). Project evaluation included examination of habitat considered to be essential for fisheries as established under the provisions of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). Categories of EFH in the project vicinity include estuarine emergent wetlands, mangrove wetlands, mud, sand, shell, and rock substrates, and estuarine water column.

In addition to being designated for EFH for Federally-managed species, barrier island wetlands, shallow water bottoms, and tidal flats provide unique nursery and foraging habitat for numerous marine and estuarine fishery organisms, such as blue crab, lesser blue crab, gulf menhaden, sand seatrout, southern flounder, black drum, stone crab, Atlantic croaker, striped mullet, white mullet, spot, and Atlantic brief squid.[20] Additional, ongoing studies by the

19 Detailed information on Federally-managed fisheries and their EFH are identified in the 1998 generic amendment of the Fishery Management Plans for the Gulf of Mexico prepared by the Gulf of Mexico Fishery Management Council. The 1998 generic amendment was prepared as required by the Magnuson-Stevens Fishery Conservation and Management Act (P.L. 94-265).

20 Williams, P.R. 1998. Nekton assemblages associated with the barrier island aquatic habitats of East Timbalier Island, Louisiana. M.S. thesis, Louisiana State University. 121pp.

Louisiana State University, Coastal Fisheries Institute, have identified Timbalier Island as important habitat for shark assemblages dominated in frequency and abundance by neo-nate and juvenile blacktip and Atlantic sharpnose sharks. Estuarine-dependent species that utilize Timbalier Island serve as prey for other species managed under the MSFCMA by the Gulf of Mexico Fishery Management Council (e.g., red drum, mackerel, snapper, and grouper), and highly migratory species managed by the NMFS (e.g., billfish and sharks). Shallow water bottoms also provide habitat for benthic communities, including marine worms and crustaceans, which are important components of the aquatic food web, that contribute to the fishery productivity of the estuaries in the Timbalier and Terrebonne bays.

The No-action Alternative would allow the direct loss of marsh estuarine habitat, shoreline, and shallow open water habitat to continue and would compromise EFH, potentially contributing to declines in commercial nursery habitat and recreational fisheries species of concern. The Non-structural Alternative would provide for the protection of existing marsh and associated shallow open water habitat, and would reduce the land loss rate. Protection and enhancement of project marsh and shallow open water areas will increase the habitat value for associated fisheries species and maintain it longer than without the project. Specifically, 254 ac of open water, 164 ac of intertidal marsh, and 55 ac of supra-tidal marsh will be converted to create the marsh platform, dune and berm. The project footprint would consist of approximately 473 ac consisting of 264 ac of intertidal habitat, 46 ac of supra-tidal habitat, and 163 ac of dune habitat, a net gain of 100 ac of intertidal marsh and net losses of 9 ac of supra-tidal marsh and 254 ac of open water.

Protection of the resource base should satisfy the objective of essential fish habitat pursuant to MSFCMA. This EA is provided to initiate Federal consultation requirements pertaining to EFH under MSFCMA. The preliminary finding is that the proposed project will have no significant adverse impacts on EFH.

3.10 Timbalier, East Timbalier and Brush Islands. Brush Island is located approximately 1.7 miles north of Timbalier Island, while East Timbalier Island is located approximately 5.6 miles east of Timbalier Island. Little Pass Timbalier separates Timbalier Island and East Timbalier Island.

The No-action Alternative would have no impact on East Timbalier Island and Brush Island. The Non-structural Alternative, according to the Regional Coastal Processes wave (RCPWAVE) and generalized model for simulating shoreline change (GENESIS) models impact analysis of dredging sand from Little Pass Timbalier and placing it on Timblaier Island,[21] The daily wave model results represent the average wave conditions over the 1976-1995 period. The engineers chose these conditions to represent a probable wave height and period, while looking at the dominant wave directions. The results show minor, localized changes in direction and wave height at the interface of the dredging cuts. However, these changes are localized and do not change the long shore transport rates that move sediment along the shoreline. Larger wave conditions were included as part of the long shore transport analysis and do contribute to the

21 T.Baker Smith & Son, Inc., April 2002 and August 2002 - The RCPWAVE model was performed partially as input to the GENESIS model, as well as to illustrate changes in high frequency (daily) wave conditions. For the GENESIS model, the wave model included wave events every three hours from 1976-1995. This included daily waves, tropical storms, frontal systems, and hurricanes such as Juan and Andrew. Therefore, the array of conditions from 1976-1995 were used to analyze impacts from dredging in Little Pass and the results indicated no change in erosion conditions as long as the contractor follows the limits and boundaries specified in the plans and specifications.

erosion of the island. However, the analysis shows that dredging in Little Pass under the dredging limitations established does not impact this erosion rate. no change in the erosion rate will occur due to dredging the specified areas in Little Pass. The areas where dredging will occur are near the deepest section in Little Pass and the footprint left after dredging will be shallower than that portion of the channel. The design also limits the depth of dredging cut to 7.5 feet below the existing bottom in the areas specified in the plans. This limitation will ensure that the contractor does not excavate large, deeper holes that could eventually increase erosion rates.

The Timbalier Island project will reduce the area of Timbalier Bay marginally by creating 254 ac of habitat in existing open water. This acreage represents less than 0.2 percent of the estimated bay acreage and would slightly reduce the tidal prism.[22] The recommended Borrow Area 2 in Little Pass Timbalier is adjacent to the primary channel where tidal exchange occurs. The tidal prism could be increased by dredging Borrow Area 2, which improves the inlet hydraulics by providing a larger cross-sectional area and longer inlet length for tidal exchange to occur. A tidal prism analysis was conducted comparing existing conditions in Little Pass and the post-dredging conditions after the project is completed. The estimated tidal prism under existing conditions is calculated as 4.2 billion cubic feet. The inlet length, which is measured as the primary deep conduit for exchange, is 7,400 feet in a northwest to southeast direction.

In summary, the change in tidal amplitude by 0.025 feet, or 0.3 inches, appears to be negligible as the bay tidal characteristics continue to move towards resembling ocean tides as the bays increase. In addition, solidifying the eastern portion of Timbalier Island will also contribute to reducing tidal exchange rather than the island eroding and increasing the size of Little Pass. The tidal prism analysis does not account for future increases in the bay area due to existing coastal erosion processes, or future sedimentation in Little Pass that would continue to close the inlet and reduce hydraulic efficiency. These two counteractive factors could considerably change the impacts of the analysis performed, but these are complex processes that involve the entire Terrebonne Basin and were not included in this design effort.

4.0 OTHER ENVIRONMENTAL CONSIDERATIONS

4.1 Oyster Leases. There are seven oyster leases (Fig.15) close to the island that may be impacted by the project. Six of the seven oyster leases will expire in 2003 and will not be renewed. The one remaining oyster lease that will not expire in 2003 is ID# 32117, which is located to the northeast of lease # 29170.

The No-action Alternative would have no impact on present oyster leases. However, further erosion of the islands and continued breaching may cause overwashed sediment to be deposited on the existing oyster beds as well as increased difficulty in fishing these areas due to increased wave energies. With no action, these leases will become less productive as low-energy erosive conditions are replaced by high-energy gulf conditions. The Non-structural Alternative would have no long-term adverse impact on present conditions and may contribute to long-term

22 Tidal prism, by definition, is the volume of water exchanged in a bay system between mean high and mean low tides. The prism is governed by two factors, the amplitude of the tide and the area of the bay.

viability of oyster beds behind the islands through protection from high gulf energy waves and sediment deposition during overwash events. A provision of the CWA, Section 404 permit would limit dredging operations to 0.5 miles from the leases due to possible impact to oyster beds. Also, precautions will be taken to avoid impact to oyster leases with the installation of 4,800 linear ft. of turbidity screens, and by requiring the contractor to locate the weir/spill box to prevent sediment from impacting oyster leases during construction and where it will be least likely to impact the oyster leases.

4.2 Recreation. The Timbalier Island has immense recreational value due to its unique location between the Gulf and inland marshes. Eleven tracts of land are privately owned and the accretion to the west end of the island is owned by the State of Louisiana. Recreational activities associated with Timbalier Island include fishing, making use of the beaches, picnicking, hiking, and camping overnight. Fishing and hunting are the primary recreation activities near Cocodrie and Timbalier Island.

The No-action Alternative would decrease recreational use and fisheries, nursery, and wildlife habitat would decline as beach erosion continues to destroy habitat and as wetland deterioration is exacerbated by the increasing size of the beach. Land and marsh loss would be accelerated by saltwater intrusion and shoreline erosion resulting from wave action. The Non-structural Alternative would beneficially affect recreational resources. Project components may provide for greater long-term productivity and viability of project area beach, dune, and marsh, thus contributing to the stability of fish and wildlife populations upon which recreational activities are based. Some temporary adverse short-term impacts to recreation would occur as a result of filling and construction activity. These impacts include having to avoid fill areas until compaction and re-vegetation are completed, increased turbidity of surface waters, and increased noise within the project area during construction.

4.3 Infrastructure. There is substantial oil and natural gas activity in the area and, especially, behind the island in Terrebonne and Timbalier bays. There are no major port or terminal installations within this unit. Oil and natural gas access canals dredged on the island have negatively impacted Timbalier Island. These canals serve as potential weak spots, or focal points, for breaches to form during severe storm and overwash events. The Timbalier Island Shorelines has 258 oil and natural gas wells and no roads. There are no major port or terminal installations within this unit. The pipeline atlas shows one pipeline crossing the island. Adverse impacts to regional infrastructure are not anticipated with the project. The project, rather, would enhance the structural integrity of the island allowing the island to continue providing potential storm surge attenuation benefits for infrastucture located north of the island.

4.4 Cultural Resources. According to the Louisiana Office of Cultural Development, Division of Archaeology, there are no archaeological sites or historic standing structures either listed on or determined eligible for listing on the National Register of Historic Places located within the project area. Additionally, there are no other known cultural resources within the project area. None of the alternatives would have an impact on any significant cultural resources.

4.5 Socioeconomics and Environmental Justice. The project is located in open water and there are no residential areas within the project area. A basic Environmental Justice analysis was not performed.

4.6 Coastal Zone Management, Prime Farmlands and Floodplains.

4.6.1 Coastal Zone Management. The CWPPRA Task Force approved the proposed project for funding on January 11, 2000. The EPA Region 6 and the LDNR are co-sponsors of the project. In order to comply with Coastal Zone Management requirements, the project will need a Coastal Use Permit (CUP) prior to construction, which is issued by the LDNR. Applications for the CUP and COE CWA, Section 404 permits have been submitted. A Joint Public Notice for both permits will be issued upon completion of this EA.

4.6.2 Floodplains. The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps delineate the 100-year Special Flood Hazard Areas, designated "A" or "V" zones. A-zone Special Flood Hazard Areas are areas that have a 1 percent chance of experiencing a 100-year level flood in any given year. Coastal zone areas are designated "V" zones in which structures are subject to damage from both flooding and significant wave action. According to FEMA, the Timbalier Island is designated to be in a "V" zone area. Coastal barriers are unique landforms that provide protection for diverse aquatic habitats and serve as the first line of defense against the impacts of coastal storms and erosion on the mainland.

Congress initially enacted the Coastal Barrier Resources Act (CBRA) in 1982, to reduce or restrict Federal government actions that were believed to encourage development in certain undeveloped coastal barrier areas, including both islands and mainland property. While CBRA does not prevent private financing and development, it does limit financial assistance by Federal agencies on undeveloped coastal barriers, except for enumerated situations such as assistance for emergency actions essential to saving lives, protecting property, and preserving public health and safety. Any form of expenditure of federal funds for a loan, grant insurance payment, rebate, subsidy, or any other form of direct or indirect Federal assistance would not include disaster assistance and government loans. Implementation of the proposed project proposal will not result in the construction or introduction of any structure that would impede, displace, retard or cause flood waters to backup[23] (Fig.16). The proposed project will be located at the eastern end of Timbalier Island and will enhance the structural integrity of the island.

4.6.3 Prime Farmland. The project site is located in the Terrebonne Basin. None of the project site has been used for cultivation and soils are not considered prime farmland. It is the opinion of Natural Resources Conservation Service (NRCS) that overgrazing is not a problem in this project area. No livestock are currently grazing in the area and that there is no potential for grazing once the project is installed.

23 However, there is a camp that the State currently leases to an individual. The camp owner will lose the use of two buildings that are built at an elevation of 2 ft., but would be able to use the wharf to be constructed in the middle of the project footprint. The wharf and access channel needed for construction activity for this proposed project would be used by the State for monitoring and inspection purposes throughout the 20-year project life. It would be located north of the marsh platform. The camp is located in the middle of the project footprint. The lease holder may be allowed to build a boardwalk from the camp to the wharf, if coordinated with the Office of State Lands due to the fact that the boardwalk would sit on state property.

4.7 Cumulative Impacts. Potential cumulative impacts would be the aggregate impacts to the environment resulting from the proposed action in combination with other ongoing actions, and actions being considered within the reasonably foreseeable future. The proposed action is part of an effort under CWPPRA to create, protect, restore and enhance wetlands in coastal Louisiana. CWPPRA provides Federal funds for planning and implementing such projects. These projects were authorized prior to the promulgation of the Regional Ecosystem Strategies of the Coast 2050 Plan and address critical problems identified in the 1993 Restoration Plan (LCWCRTF 1993).[24] The New Cut Dune/Marsh Restoration Project (TE-11a/TE-37) is currently underway which will close the breach between Trinity Island and East Island through the direct creation of beach, dune and marsh habitat. Other barrier island restoration projects are likely to be proposed and selected under CWPPRA that will conform to the strategies outlined by the Coast 2050 Plan.

No significant adverse cumulative impacts are expected. On the contrary, the value of barrier islands for protecting mainland shorelines, wetlands, and estuarine habitats has often been stated.[25] It has been estimated that every 1 kilometer (0.6 mile) of barrier island shoreline protects 30 square kilometers (12 square miles) of wetland-estuarine habitat.[26] There are approximately 3 million acres of marsh in Louisiana, or 40 percent of the coastal wetlands of the nation.[27] Since there are approximately 384 miles of marshes along the Louisiana coast, of which approximately 110 miles are behind barrier islands, the importance of barrier islands should not be underestimated and in fact the cumulative impacts of barrier island restoration would be the direct protection of highly productive marshes, reduction of coastal land loss, protection of inland communities from storm surge and flooding, the protection of unique fishery habitat, maintaining nesting and resting sites for shore birds and migrating birds, protecting critical energy supply infrastructure and maintaining shallow near shore marine fisheries habitat.

4.8 Unavoidable Adverse Effects. The resources described in this section are those recognized by applicable laws, executive orders, regulations, or other standards of national, state or regional agencies and organizations. Resources that might be impacted by the alternatives in the EA include fish and wildlife resources, essential fish habitat, threatened and endangered species, wetlands, water quality, air quality, cultural resources, and recreational resources. The primary unavoidable adverse effects are the immediate impacts from construction related sediment excavation and deposition on the non-mobile benthic organisms in the areas, and minor and temporary disturbance to adjacent wetlands, water, and air quality. The effects on air, wetlands, and water quality and the noise generated by the proposed project will be of a temporary nature. There will be a net loss of 254 ac of open water habitat, and a net loss of 9 ac of supra-tidal marsh habitat. Most of this open water will be converted to intertidal marsh habitat.

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24 Louisiana Coastal Wetland Conservation and Restoration Task Force. 2001

25 Nummedal, 1982; McBride et al., 1992; Boesch et al., 1994; van Heerden, 1994

26 Guntenspergen and Vairin, 1996; McBride and Byrnes, 1997

27 Boesch et al., 1994

4.9 Relationship Between Local, Short-Term Use of the Environment and the Maintenance and Enhancement of Long-Term Beneficial Uses. All structural and non-structural alternatives will have short-term localized impacts during construction, yet offer high long-term environmental benefits. The project is a restoration action and favors non-structural restoration. The social and environmental long-term benefits of the proposed project are considerably greater than the short-term environmental impacts and irretrievable commitment of resources identified in this document. The proposed project will reduce the identified risks of taking no action and would be beneficial by restoring and enhancing long-term functions provided by Timbalier Island through direct creation of island habitat and provision of sand-rich sediment to the littoral zone where sediment redistribution via littoral drift is likely. Specifically, this project would create approximately 473 ac of dune, supra-tidal and intertidal marsh habitat with dredged material, and would enhance 266 ac of down drift.

4.10 Irreversible and Irretrievable Commitment of Resources. The irreversible and irretrievable commitment of resources would be labor, materials, wear on machinery, monies spent, and energy expended for implementation of the restoration action.

5.0 CONSULTATIONS AND PUBLIC PARTICIPATION

Public involvement including input from the public, local, State, and Federal agencies is achieved through the Citizen Participation Group, and public meetings conducted during the project development and selection stages under CWPPRA. The project concept was originally proposed to the public at a nomination meeting held in 1999. An overview of the selected project was presented to the public in 2000. Terrebonne and LaFourche parishes were kept updated as project engineering and design progressed in 2002. Coordination has been maintained with each of the CWPPRA Task Force agencies and the LDNR concerning the proposed project. Consultation has been conducted with the FWS and LDWF, in accordance with the Endangered Species Act of 1973 and Fish and Wildlife Coordination Act, and with the Louisiana Department of Culture, Recreation and Tourism in accordance with the National Historic Preservation Act of 1966, and Archaeological and Historic Preservation Act of 1974.

Public awareness of the functional values of coastal wetlands and the significant, adverse consequences that result from the loss of wetlands has increased significantly in recent years. The public recognizes that the continued loss of coastal wetlands can ultimately result in the displacement of entire communities, the loss of occupational and recreational opportunities, and ultimately, the forfeiture of a unique culture and way of life. Passage of the Louisiana constitutional amendment establishing the Coastal Wetlands Conservation and Restoration Fund clearly overwhelmingly demonstrated public support to address the coastal land loss problem of the state. The fund has provided a mechanism for cost sharing the Timbalier Island project.

The EA has been prepared in coordination with the NMFS in determining categories of EFH and associated fisheries species within the project vicinity. Submittal of the EA is provided to initiate formal Federal consultation requirements pertaining to EFH under the MSFCMA.

Federal, State, and local agencies, as well as other interested stakeholders, will receive a copy of this EA.

U.S. Natural Resources Conservation Service
U.S. Army Corps of Engineers
U.S. National Marine Fisheries Service
U.S. Fish and Wildlife Service
Federal Emergency Management Agency
State Historic Preservation Officer
Louisiana Department of Environmental Quality
Louisiana Department of Natural Resources
Louisiana Department of Wildlife and Fisheries
National Audubon Society
Terrebonne Parish Consolidated Government
    Clyde & June Kimball
    Burlington Resources, Inc.
    Joseph & Rosemary Duplantis, Jr., et al
    George P. Broussard, Sr., Inc.
    Colmac Corporation, et al
    Eugene D. Broussard, Sr., et al
    Arthur C. Viguerie, et al
    Ida Lee Shaddieger Jurisich, et al
    Bill Persac

6.0 MAPS

Timbalier Island Dune and Marsh Restoration Project
TE-40/XTE-45a
Figures

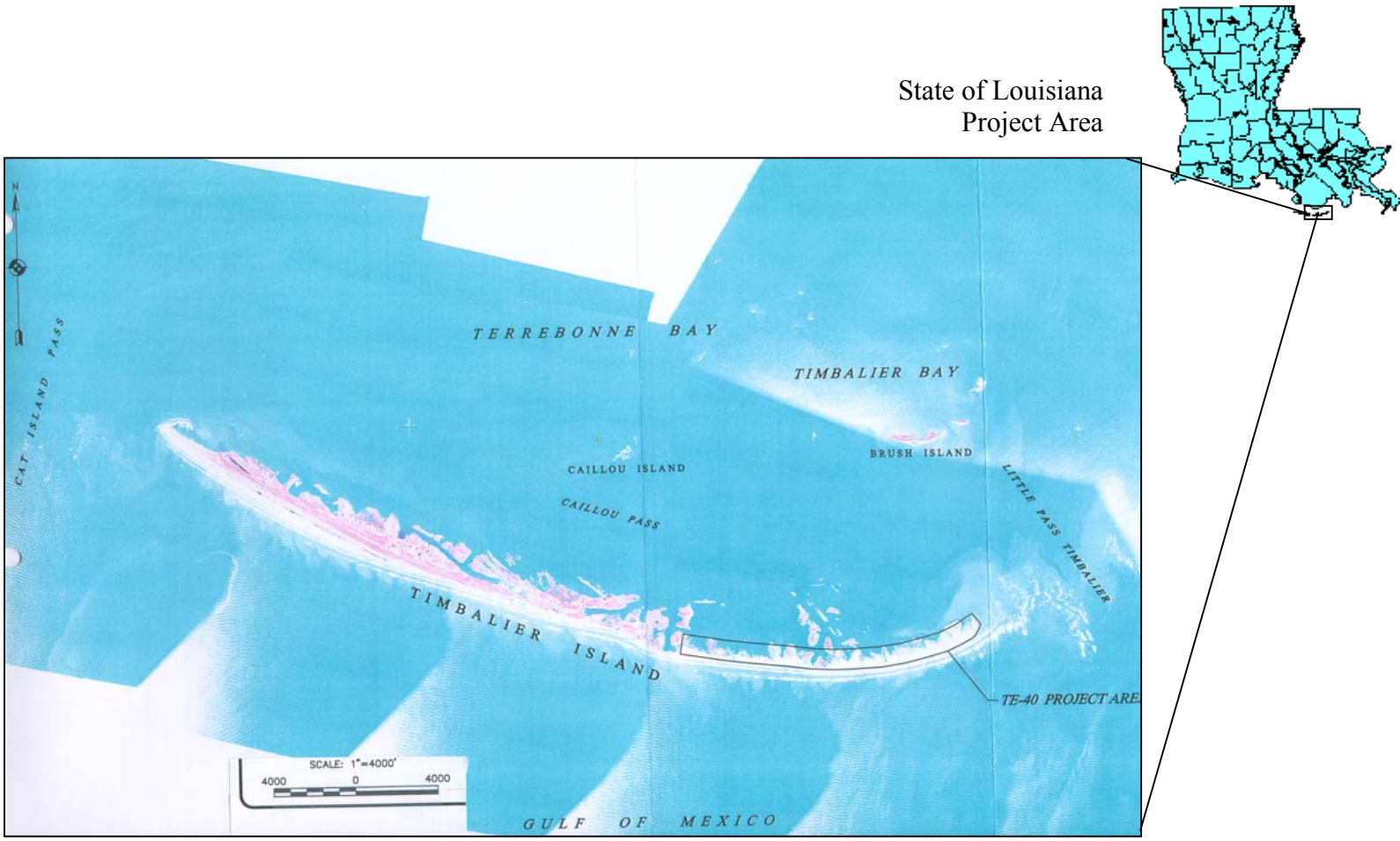

Figure 1 - Vicinity Map

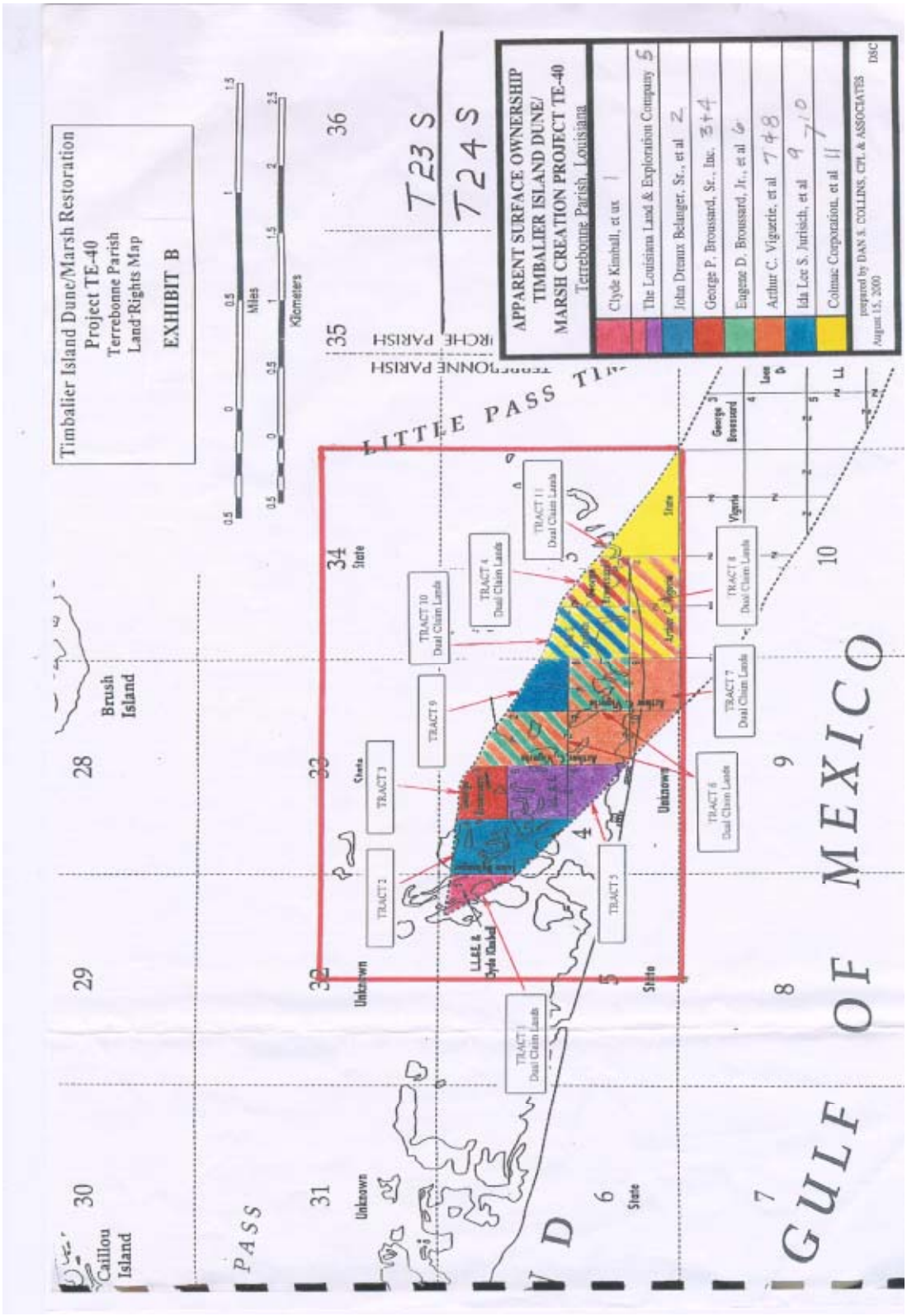

Fig.2 - Timbalier Island Land Rights Map

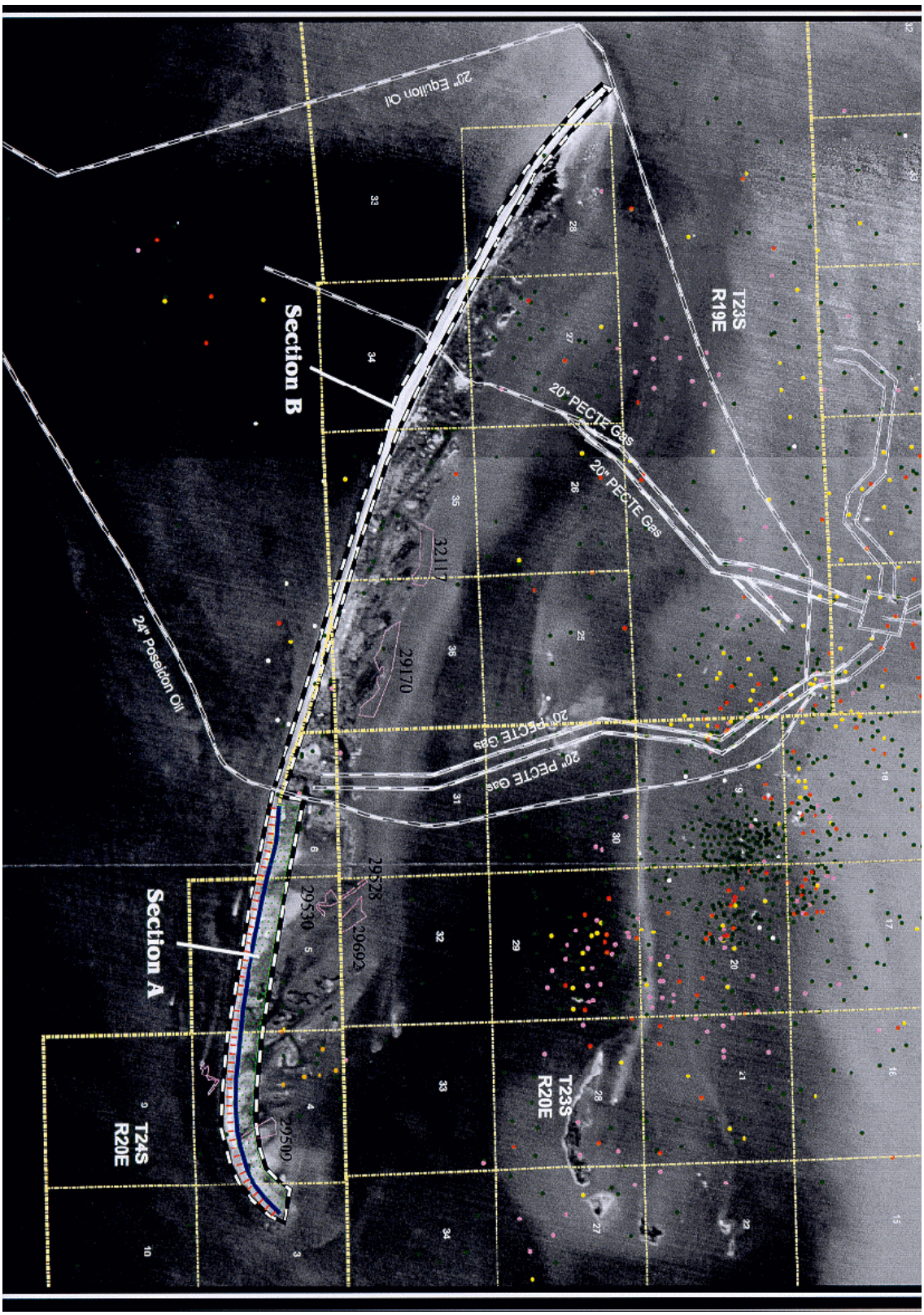

Fig. 3 - Timbalier Island Project Areas A and B

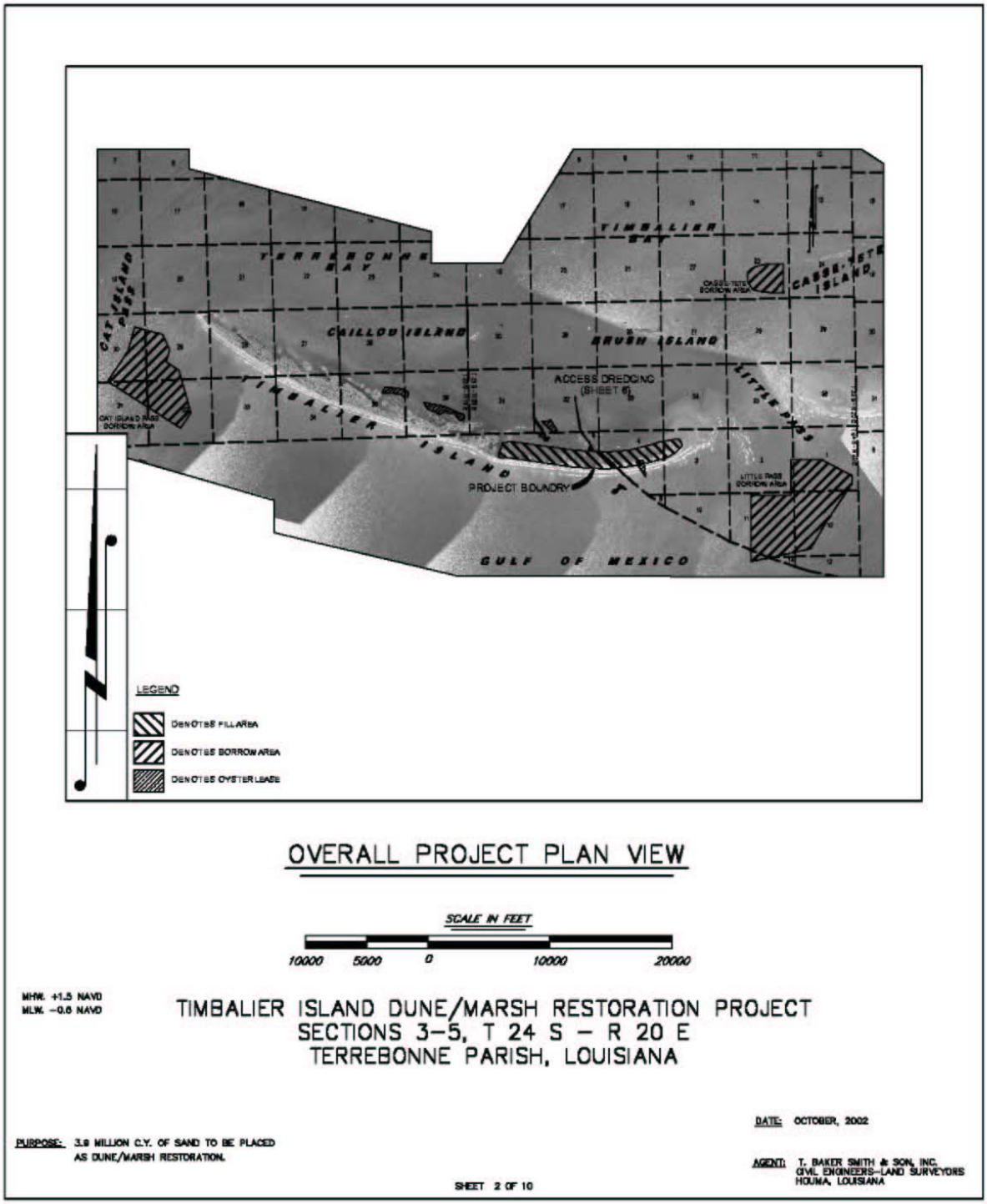

Fig. 4 - Overall Project Map

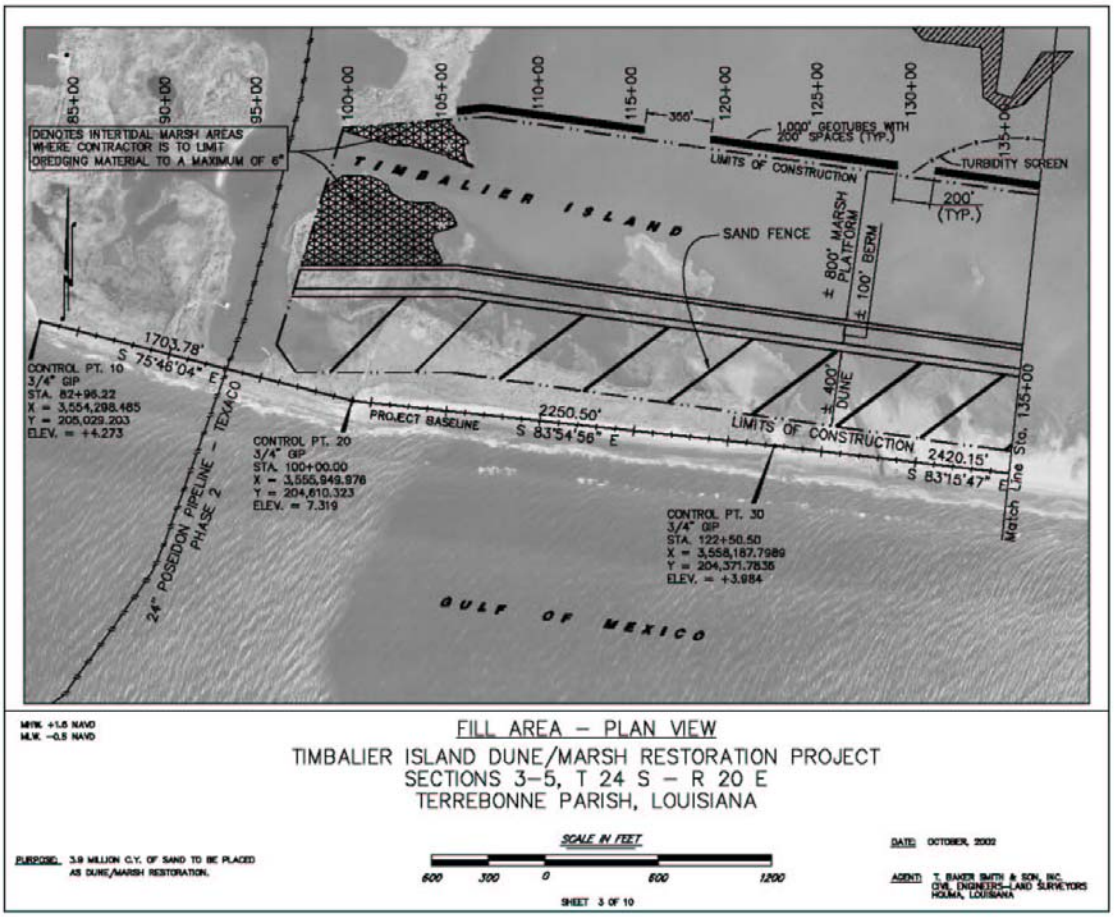

Fig. 5 – Fill Area – Plan view

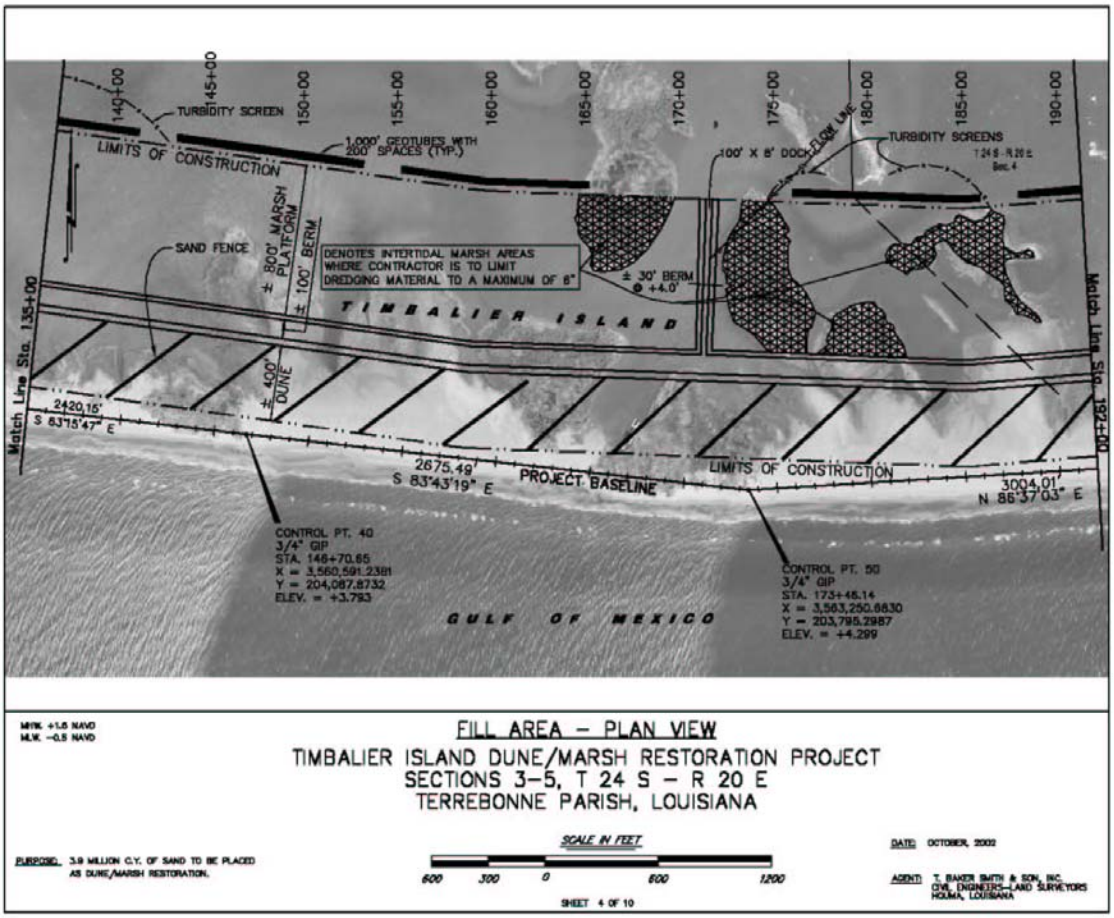

Fig. 6 - Fill Area – Plan view

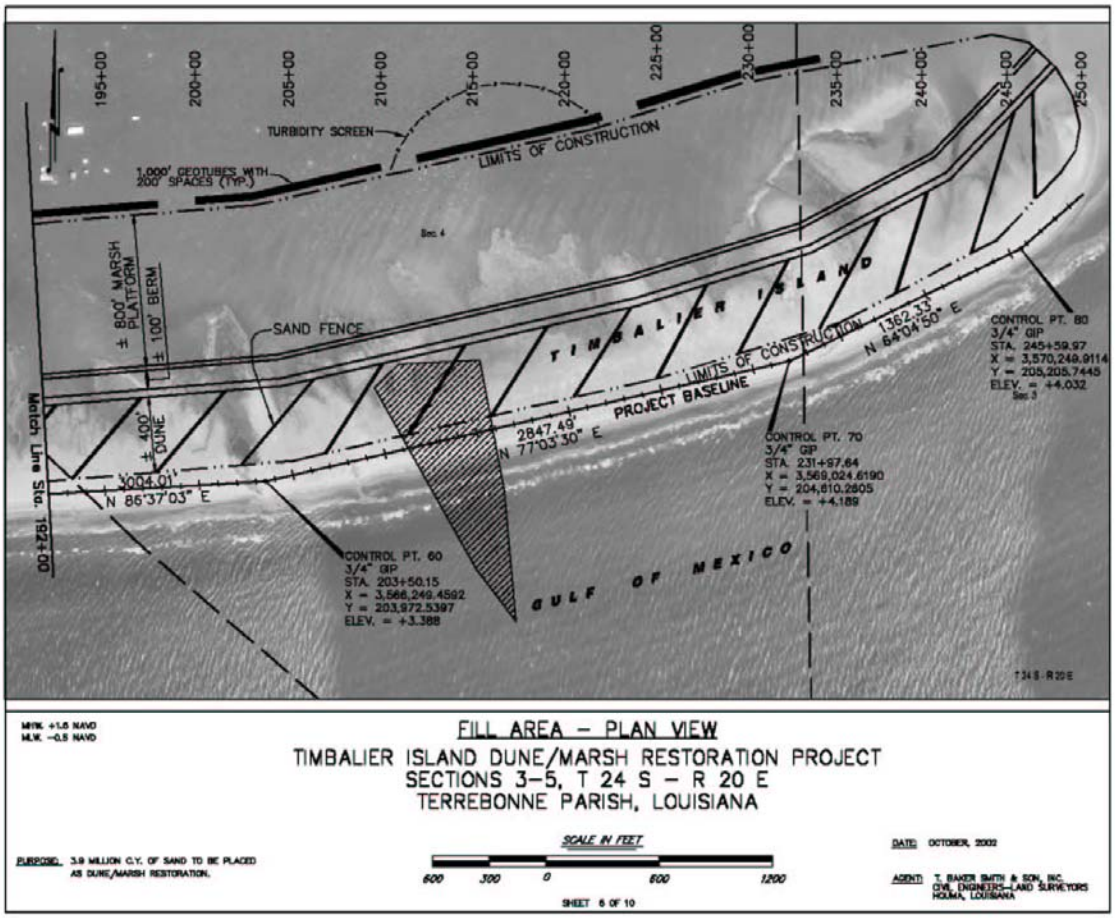

Fig. 7 - Fill Area – Plan view

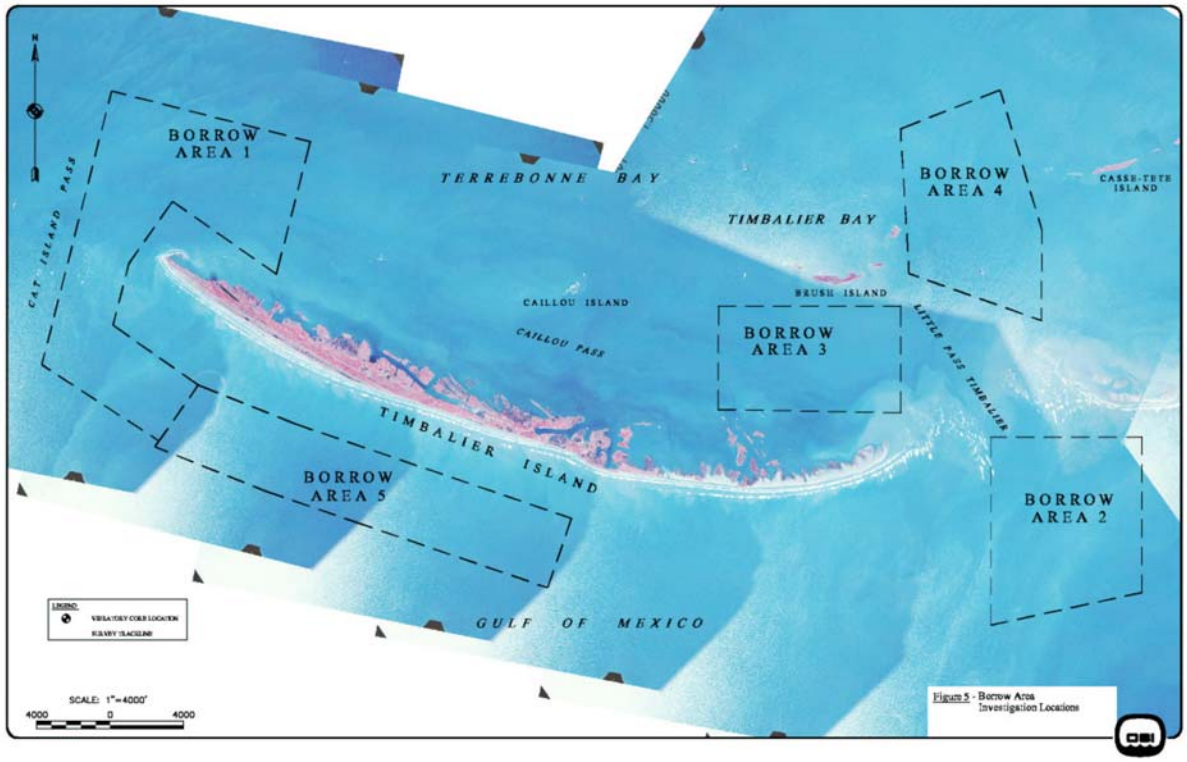

Fig. 8 – Borrow Area Investigation Locations

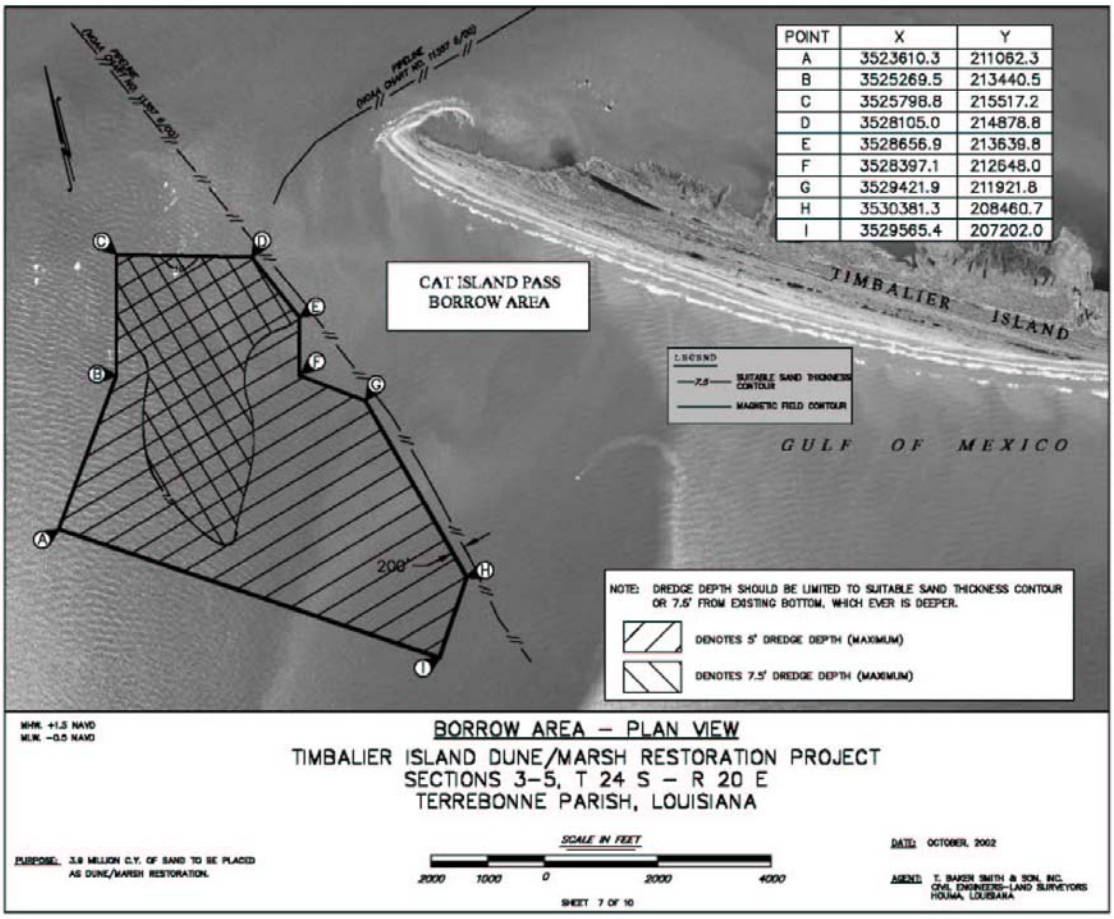

Fig. 9 - Cat Island Pass Borrow Area – Plan View

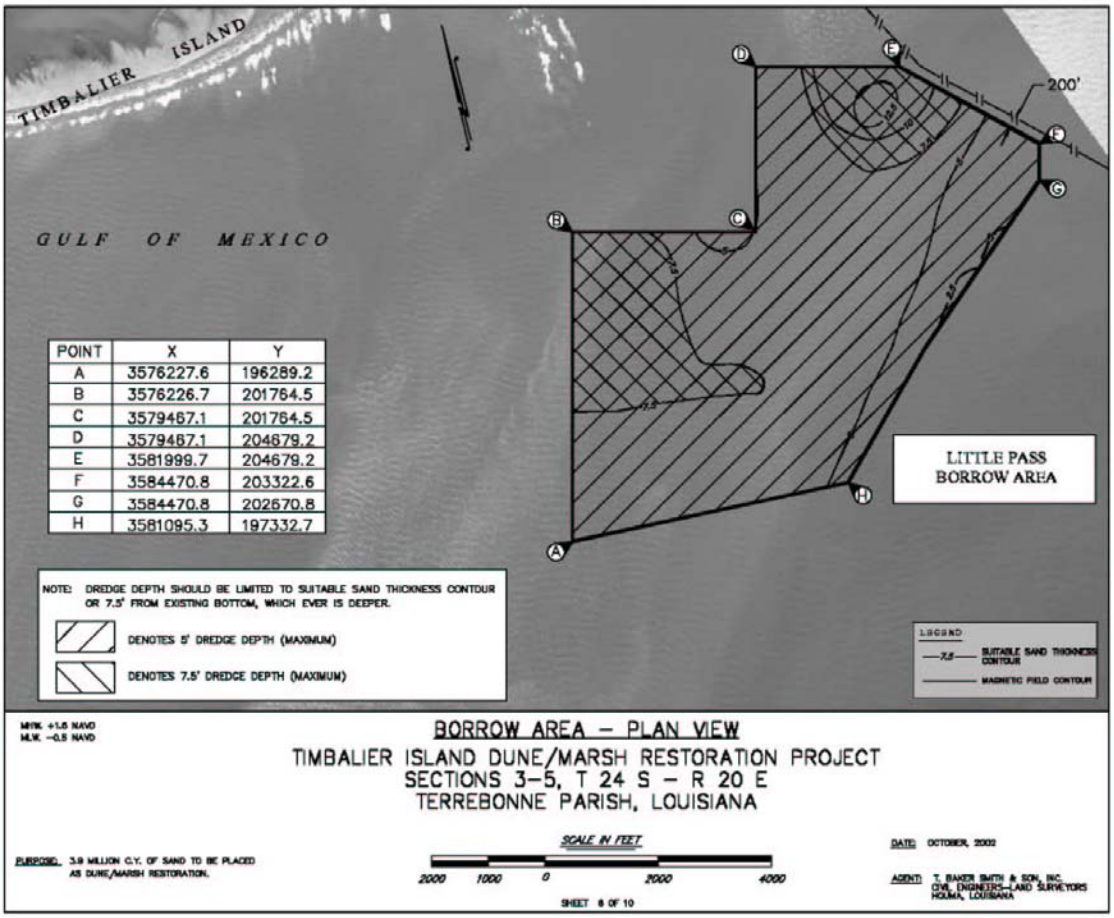

Fig. 10 - Little Pass Borrow Area – Plan View

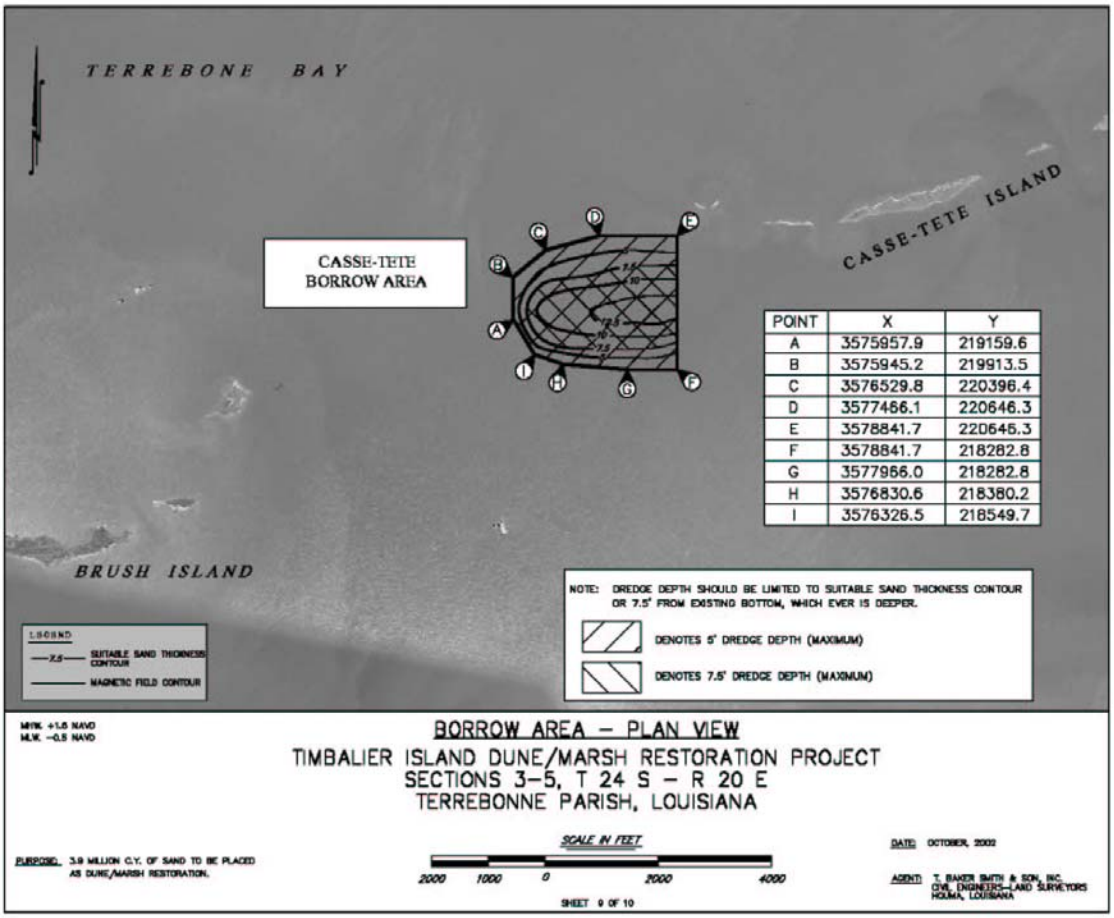

Fig. 11 - Casse-Tete Borrow Area – Plan View

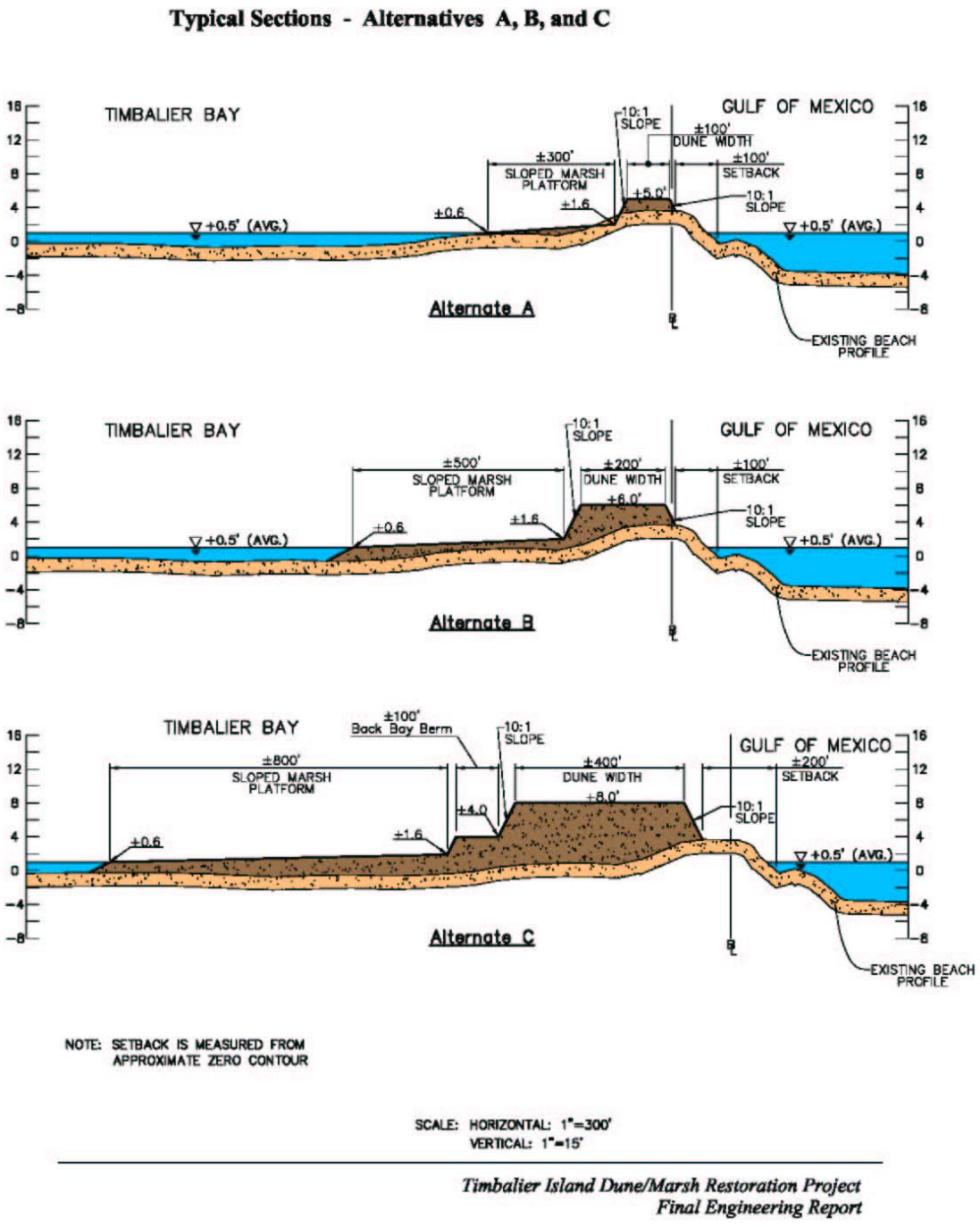

Fig. 12 – Options A, B, and C

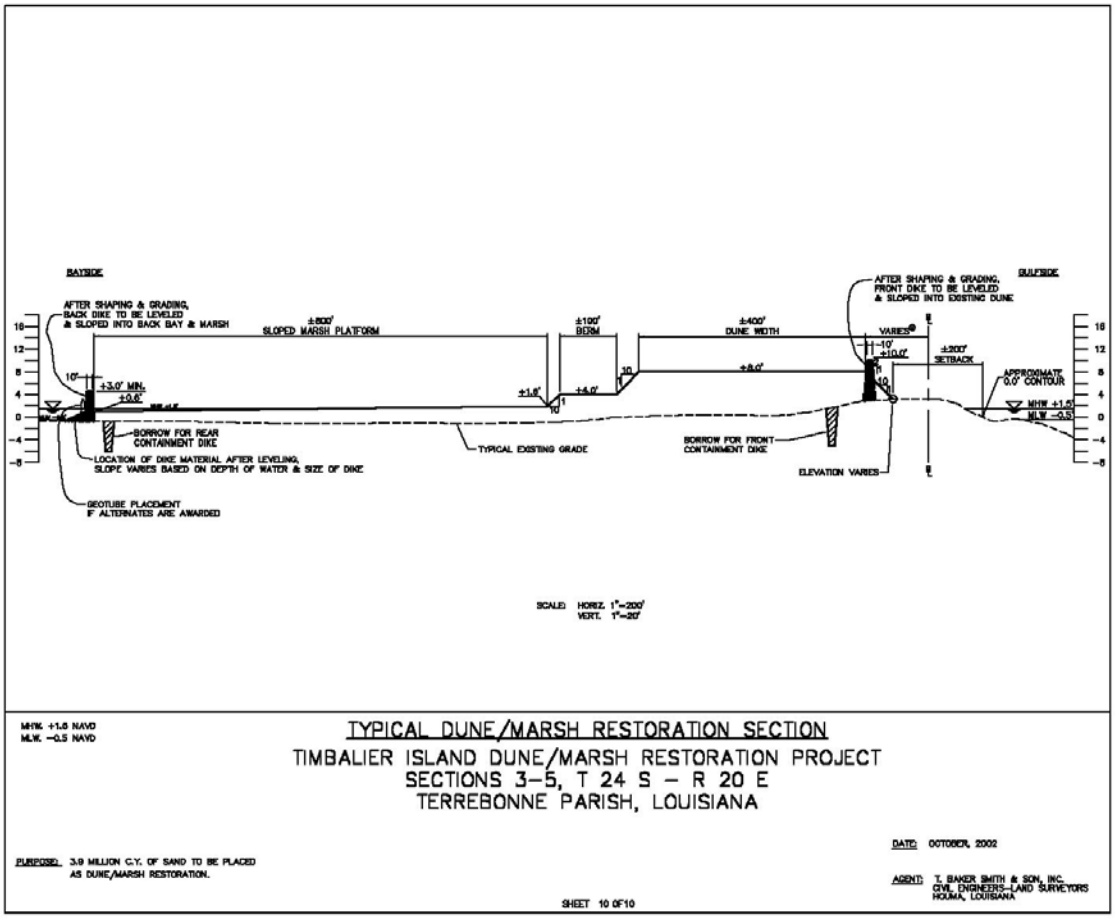

Fig. 13 - Typical Dune/Marsh Restoration Section

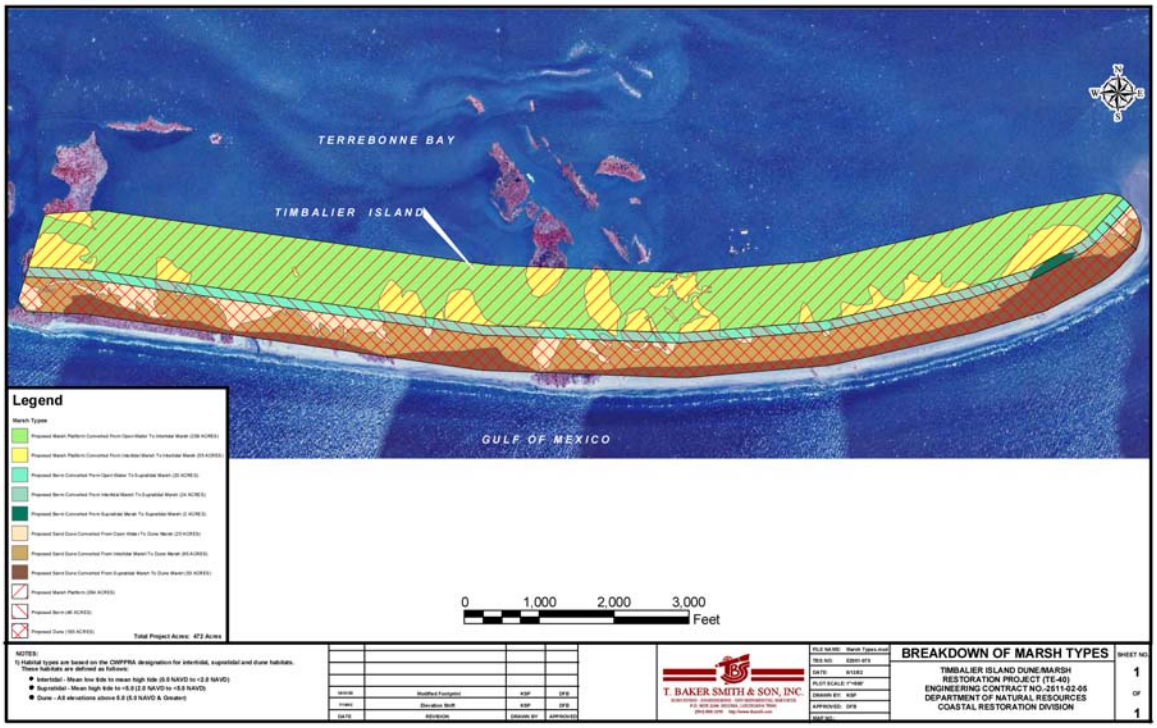

Fig. 14 – Habitat Classes

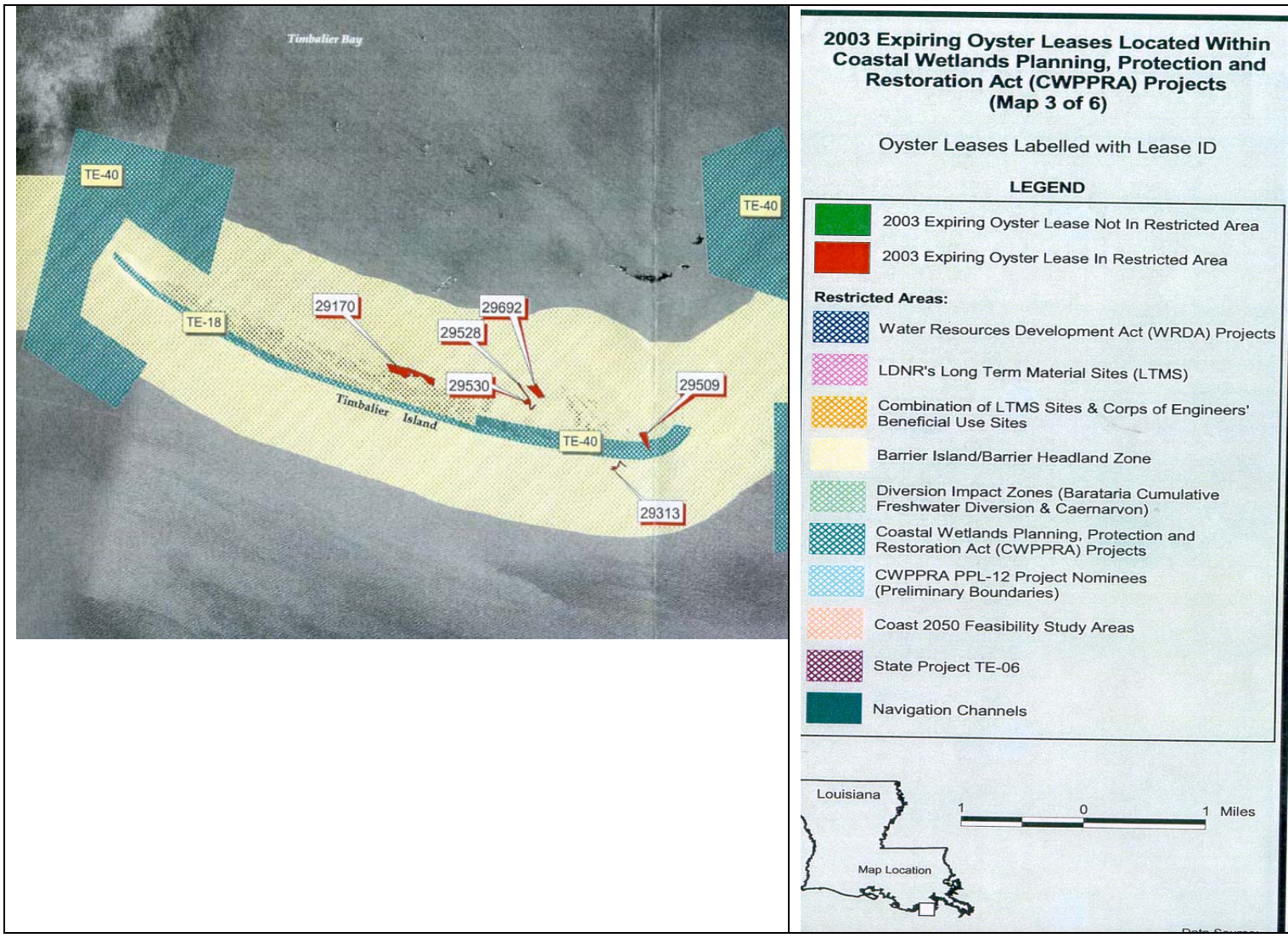

Fig. 15 – Expiring Oyster Leases Located within the Proposed Project Area

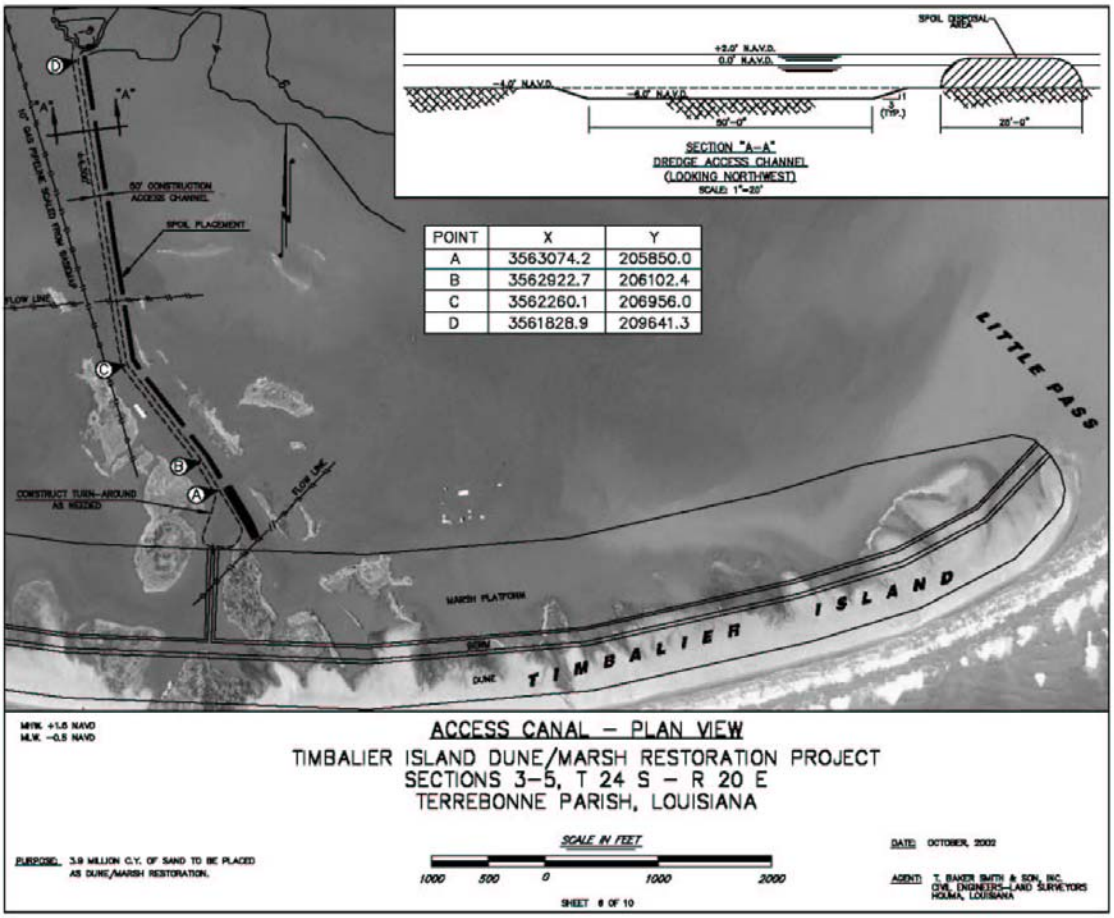

Fig. 16 – Access Canal – Plan view

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