TE-43 - GIWW Bank Restoration of Critical Areas in Terre

CWPPRA
GIWW Restoration of Critical Areas (TE-43)
Phase II Request

Technical Committee Meeting

December 6, 2006

Baton Rouge, LA

Project Overview

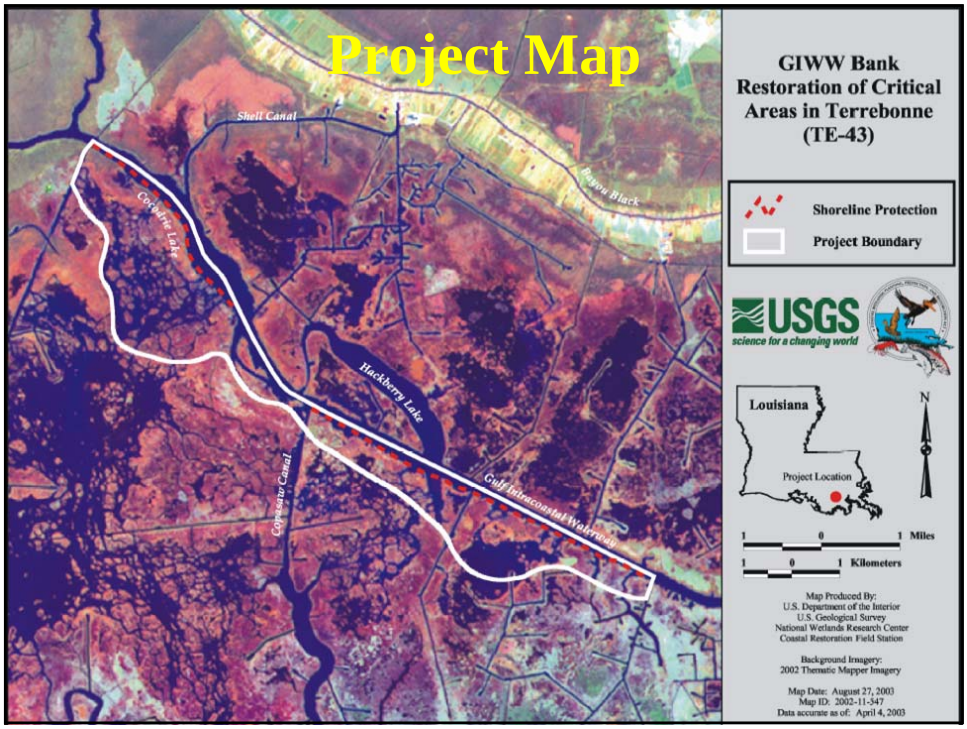
Project Location: Region 3, Terrebonne Basin, Terrebonne Parish, south bank of the GIWW from mile marker 80 to mile marker 70.

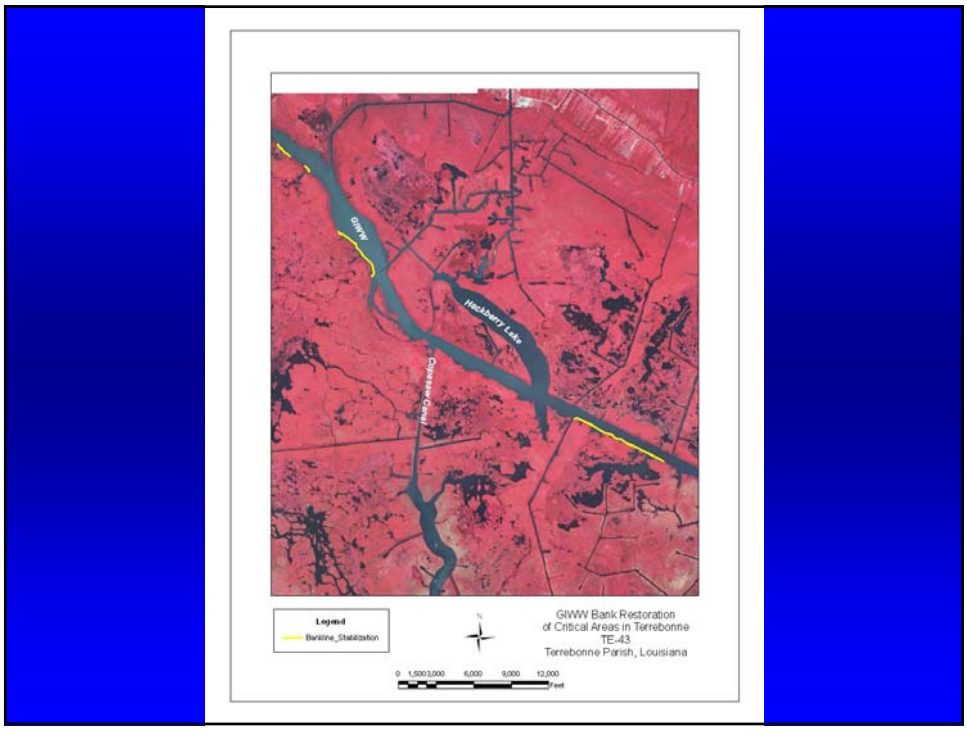
Problem: Deterioration of the southern bankline of the GIWW threatens fragile floating marshes of Penchant Basin and short-circuits freshwater conveyance to the east.

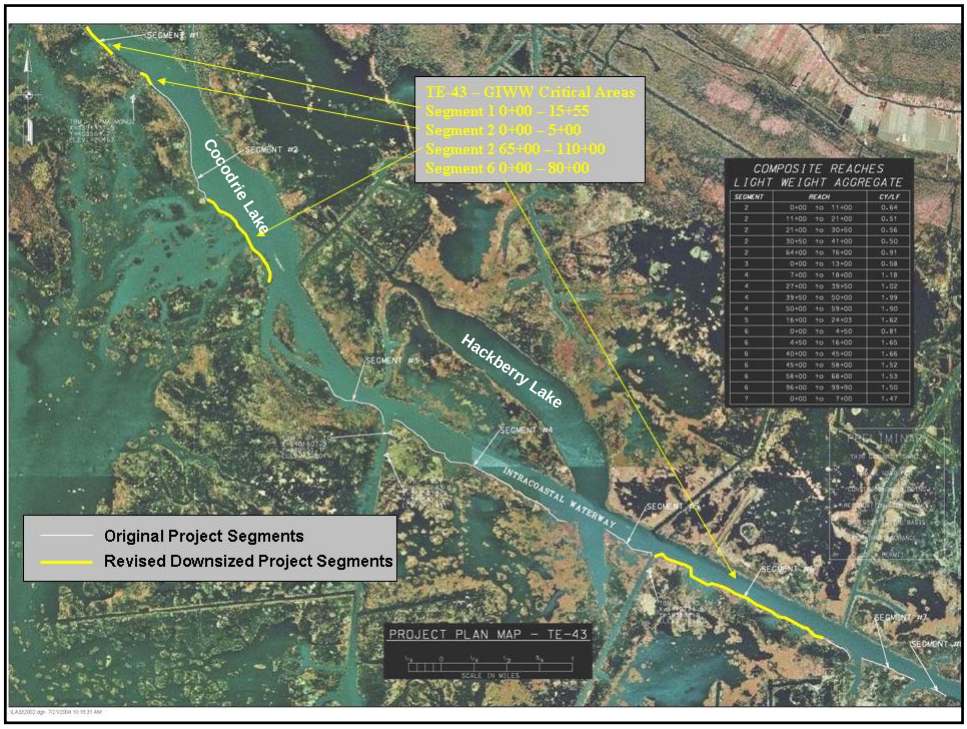
Goals:

1) Stop bankline erosion into the fragile floating marshes.
2) Maintain freshwater conveyance function of the GIWW.

Project Map


Shell Canal
Cocodrie Lake
Bayou Black
Hackberry Lake
Cocodrie Canal
Gulf Intracoastal Waterway
GIWW Bank Restoration of Critical Areas in Terrebonne (TE-43)
Shoreline Protection
Project Boundary
USGS
science for a changing world
Louisiana
Project Location
N
1 0 1 Miles
1 0 1 Kilometers
Map Produced By:
U.S. Department of the Interior
U.S. Geological Survey
National Wetlands Research Center
Coastal Restoration Field Station
Background Imagery:
2002 Thematic Mapper Imagery
Map Date: August 27, 2003
Map ID: 2002-11-347
Data accurate as of: April 4, 2003


GIWW
Hackberry Lake
Cocodrie Canal
Legend
Baseline_Stabilization
GIWW Bank Restoration
of Critical Areas in Terrebonne
TE-43
Terrebonne Parish, Louisiana
0 1,500 3,000 6,000 9,000 12,000
Feet


TE-43 – GIWW Critical Areas
Segment 1 0+00 – 15+55
Segment 2 0+00 – 5+00
Segment 2 65+00 – 110+00
Segment 6 0+00 – 80+00
COMPOSITE REACHES
LIGHT WEIGHT AGGREGATE
SEGMENT
REACH
CY/LF
2 0+00 to 11+00 0.64
2 11+00 to 21+00 0.51
2 21+00 to 30+50 0.56
2 30+50 to 41+00 0.50
2 64+00 to 76+00 0.91
3 0+00 to 13+00 0.58
4 7+00 to 18+00 1.18
4 27+00 to 39+50 1.02
4 39+50 to 50+00 1.99
4 50+00 to 59+00 1.90
5 16+00 to 24+03 1.62
6 0+00 to 4+50 0.81
6 4+50 to 16+00 1.65
6 40+00 to 45+00 1.66
6 45+00 to 58+00 1.52
6 58+00 to 68+00 1.53
6 96+00 to 99+90 1.50
7 0+00 to 7+00 1.47
SEGMENT #1
SEGMENT #2
SEGMENT #3
SEGMENT #4
SEGMENT #5
SEGMENT #6
SEGMENT #7
SEGMENT #8
Cocodrie Lake
Hackberry Lake
INTRACOASTAL WATERWAY
Original Project Segments
Revised Downsized Project Segments
PROJECT PLAN MAP – TE-43
SCALE IN MILES

Project Features Overview

- **Installation of approximately 14,555 lf of shoreline protection along the southern bank of the GIWW by constructing a foreshore rock rip-rap dike and in places of poor soil bearing capacities using composite rock rip-rap with lightweight core aggregate.**

- **The foreshore rock dike will be situated along the –1.0-ft NAVD 88 contour in approximately 2.0 ft to 3.0 ft of water, stage dependant. The dike crown will be constructed to an elevation of +3.5 NAVD88 and have a width of 3.0 ft. The dike will have front and back side-slopes of 2.5:1.**

Project Benefits & Costs

- **Total Area Benefitted:** **1,180 acres**
- **Net acres after 20 yrs:** **132 acres**
- **Prioritization Score:** **40.25**
- **Project Costs:**
  - **Fully Funded Phase II** **$15,968,229**
  - **Phase II, Increment 1** **$13,175,994**
  - **Total Fully Funded** **$17,704,212**

Project Comparison/Contrast

The Present **vs.** PPL # 10

- **Original Phase II Funding vs Present Request:**
  - **$17,922,015 original**
  - **$13,175,994 present (reflects inflationary costs and adjustments to length and design of features)**
- **Changes in Project Features**
  - **37,000 linear feet to 14,555 linear feet**
- **Changes in WVA – Benefit area reduced from 3324 acres to 1,180 acres and the acres created/protected/restored from 366 acres to 132 acres. No change in Prioritization Score (40.25).**

Why Should You Fund this Project Now?

- To improve the efficiency of Atchafalaya freshwater conveyance via the GIWW to eastern and southern marshes of the Terrebonne Basin that would benefit from increased flows of freshwater and nutrients.

- To close major breaches and sustain GIWW bankline that eminently threatens to breach into adjacent floating marshes.

Questions?

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
646 Cajundome Blvd., Suite 180
Lafayette, Louisiana 70506

November 27, 2006

Mr. Troy Constance, Acting Chair
CWPPRA Technical Committee
U.S. Army Corps of Engineers
P.O. Box 60267
New Orleans, Louisiana 70160-0267

Dear Mr. Constance:

RE: GIWW Bank Restoration of Critical Areas (TE-43)
Phase II Authorization Request

The Natural Resources Conservation Service (NRCS) and Louisiana Department of Natural Resources (LDNR) request Phase II authorization for the GIWW Bank Restoration of Critical Areas in Terrebonne (TE-43). The project was authorized for Phase I as a part of Priority Project List 10 (PPL 10) in January 2001 by the Louisiana Coastal Wetlands Conservation and Restoration Task Force (Task Force) under the authority of the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA). This request is submitted in accordance with the CWPPRA Project Standard Operating Procedures (SOP) Manual. Please be advised that the original Phase I candidate involved construction of 37,000 ft of bankline protection whereas this Phase II request has been revised to 15,000 ft (see Description of Phase II project in Enclosure 1 for details). Questions regarding this project may be referred to Ron Boustany at (337) 291-3067.

Sincerely,

Britt Paul
Assistant State Conservationist/Water Resources

encl

cc (via email only):
Mr. Greg Breerwood, Chairman, Technical Committee
Gerry Duszynski, DNR Technical Committee Member
Darryl Clark, USFWS Technical Committee Member
Rick Hartman, NMFS Technical Committee Member
Sharon Parrish, EPA, Technical Committee Member
Julie Leblanc, USACOE, P&E Subcommittee
Dan Llewellyn, DNR P&E Subcommittee Member
Kevin Roy,USFWS P&E Subcommittee Member
Detra Washington, Governors Office
Rachel Sweeney, NMFS P&E Subcommittee Member
Tim Landers, EPA P&E Subcommittee Member
John Jurgensen, NRCS P&E Subcommittee Member
Ron Boustany, Project Manager, NRCS
Ismail Merhi, Project Manager, LDNR
Michael Trusclair, District Conservationist, NRCS
Ronnie Faulkner, Design Engineer, NRCS
Randolph Joseph, Jr., ASTC/FO, NRCS

Enclosure 1
Information Required in Phase II Authorization Request

GIWW BANK RESTORATION OF CRITICAL AREAS IN TERREBONNE (TE-43)

Description of Phase I Project

The TE-43 GIWW Critical Areas project was approved relative to the 10th CWPPRA Priority Project List. The Natural Resources Conservation Service (NRCS) is the federal sponsor for this project. The objective of this project is to protect critically eroding portions of the southern bank of the Gulf Intracoastal Waterway (GIWW).

The Gulf Intracoastal Waterway (GIWW) Bankline Restoration Project is located in Terrebonne Parish approximately ten miles east of the Lower Atchafalaya River and ten miles southwest of Houma, Louisiana. The specific location proposed for the structures is the southern bank of the GIWW originating at a point close to mile marker 80 and terminating at a point close to mile marker 70.

In the past 20 years, as the efficiency of the Lower Atchafalaya River has decreased, Lake Verret subbasin flooding and Atchafalaya River flows via the GIWW have increased. Deterioration of fresh and intermediate wetlands, particularly the floating marsh, in the upper Penchant basin has been attributed to sustained elevated water levels. In addition, wave action from commercial and recreational traffic on the GIWW has caused floating marshes in some areas to become directly exposed to increased circulation through unnatural connections formed where channel banks have deteriorated.

The objective of the GIWW Bankline Restoration project is to protect critically eroding portions of the southern bank of the GIWW that act as an interface between the fragile fresh marshes and the turbulent high velocities that occur within the GIWW. Proposed measures include installing shoreline protection structures along the southern bank of the GIWW. The structures will provide protection to the banks of the GIWW, which have experienced severe erosion since the construction of the GIWW in the early 1950's.

The project goals were: 1) To enable the GIWW to function as a conveyance channel to direct Atchafalaya River freshwater flow to specific locations that would benefit from increased flows of fresh water and nutrients, and 2) To provide relief to marshes connected to the GIWW that are currently suffering from prolonged inundation and wave action while stopping shoreline erosion along the remaining bank of the GIWW.

The proposed solution is to restore critical lengths of deteriorated channel banks, and stabilize/armor selected critical lengths of deteriorated channel banks with hard shoreline stabilization materials.

The Wetland Value Assessment (WVA) conducted for the Phase I project estimated a benefited area of 3,324 acres and the net acres created/protected/restored of 366 acres at TY20.

At the time of Phase I approval, the fully-funded project cost was $19,657,998. That figure included $1,735,983 for Phase I and $17,922,015 for Phase II. The original cost breakdown for Phases I and II is presented in the following table:

Task Name	Phase I Costs	Phase II Costs
Engineering and Design	$1,113,611	
Land Rights	$52,529	
DNR Administration	$267,256	$279,601
NRCS Administration	$286,282	$299,506
Monitoring	$14,954	$83,493
Corps Project Management	1,351	$20,740
Construction		$11,981,341
Contingency		$2,995,335
Supervision and Inspection		$182,451
Operations and Maintenance		$2,079,548
Total	**$1,735,983**	**$17,922,015**

The original project fact sheet and map depicting the project boundary and project features is provided below.

October 2003

GIWW Bank Restoration of Critical Areas in Terrebonne (TE-43)

Project Status

Approved Date: 2001 **Project Area:** 3,324 acres
Approved Funds: $2.2 M **Total Est. Cost:** $19.7 M
Net Benefit After 20 Years: 366 acres
Status: Engineering and Design
Project Type: Shoreline Protection

Location

The project is located in the Terrebonne basin, in Terrebonne Parish, Louisiana.

Problems

In the past 20 years, as the efficiency of the Lower Atchafalaya River has decreased, Verrett subbasin flooding and Atchafalaya River flows via the Gulf Intracoastal Waterway (GIWW) have increased. Deterioration of fresh and intermediate wetlands, particularly of the floating marshes in the upper Penchant basin, has been attributed to sustained elevated water levels. In addition, floating marshes in some areas have become directly exposed to increased circulation through unnatural connections formed where channel banks deteriorated.

Conversely, losses in the central Terrebonne Parish marshes have been attributed to the elimination of riverine inflow coupled with subsidence and altered hydrology from canal dredging that facilitated saltwater intrusion. Increased flow of the GIWW and wave pulses from navigation traffic are causing additional breakup and loss of floating marshes in unprotected areas.

Restoration Strategy

This project will restore critical lengths of deteriorated channel banks and stabilize/armor selected critical lengths of deteriorated channel banks with hard shoreline stabilization materials.

Progress to Date

Geotechnical soils investigation report is complete. Soils in the area are very soft and fluid.

This project is on Priority Project List 10.

Large mats of floating freshwater marsh, such as this one, detach from their point of origin and enter the GIWW through large breaches in the existing shoreline.

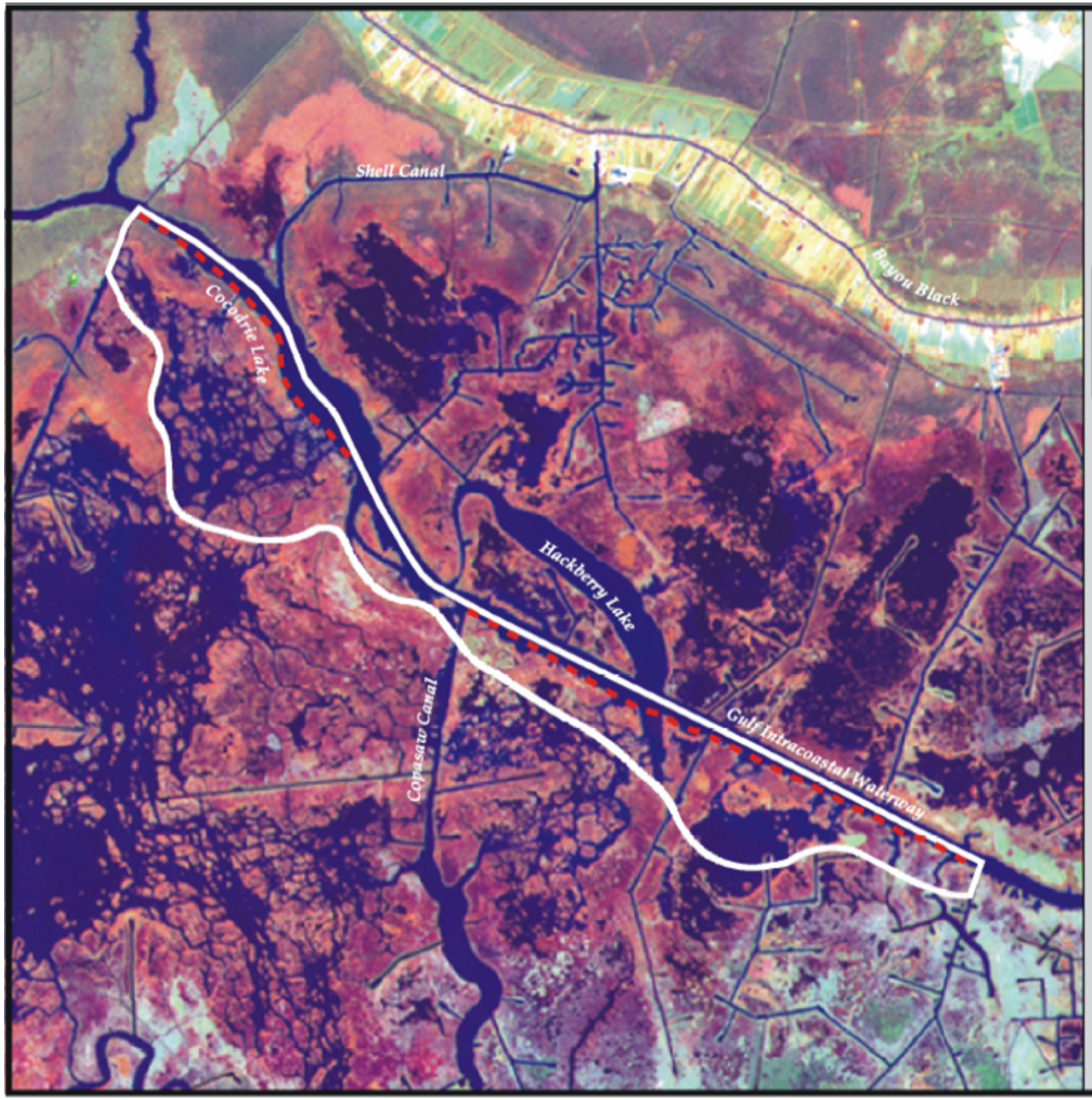
Concrete "H" pile/panel structures, similar to this one, will be installed at locations within the project area where shoreline erosion is critical. Soils with high amounts of organic material, which have poor strength, necessitated the use of a structure such as this.

For more project information, please contact:

NRCS Natural Resources Conservation Service

Federal Sponsor:
Natural Resources Conservation Service
Alexandria, LA
(318) 473-7756

Local Sponsor:
Louisiana Department of Natural Resources
Baton Rouge, LA
(225) 342-7308



GIWW Bank Restoration of Critical Areas in Terrebonne (TE-43)

Shoreline Protection

Project Boundary

USGS science for a changing world

N

1 0 1 Miles

1 0 1 Kilometers

Map Produced By:
U.S. Department of the Interior
U.S. Geological Survey
National Wetlands Research Center
Coastal Restoration Field Station

Background Imagery:
2002 Thematic Mapper Imagery

Map Date: August 27, 2003
Map ID: 2002-11-347
Data accurate as of: April 4, 2003

Overview of Phase I Tasks, Process, and Issues

The following tasks were completed during Phase I:

1) Interagency kickoff meeting and field trip
2) Final Cost Share Agreement executed between NRCS and DNR
3) Preliminary landrights
4) Magnetometer survey
6) Geotechnical investigation of the proposed alignment
7) 30% design review
8) 95% design review
9) Draft Ecological Review
10) Draft Environmental Assessment
11) Final construction cost estimate
12) Section 404 Permit complete
13) Overgrazing determination from NRCS
14) Cultural resources clearance

Geologic Information

The predominant soil that occurs along the existing bankline of the GIWW is Aquents, Dredged, occasionally flooded. For the remainder of the project area, Kenner muck – very frequently flooded, makes up the majority of the soil type. Other soil types present within the project area are Fausse Clay – frequently flooded, Barbary muck – frequently flooded, Gramercy/Cancienne – silty clay loam, and Allemands muck – very frequently flooded (NRCS 2002, unpublished data).

The mudline at the boring locations varied from elevations 0.0 to -3.0 NAVD88 and was located from 1 foot to 4 feet below the water surface at the time of drilling.

The upper soils are typically highly organic, classifying as high plastic clays with organic matter, organic clays, or peats. In general, soft consistencies are not encountered until depths exceed 30 feet with some medium stiff consistencies occurring below approximately 60 feet.

Water contents ranged from 29 percent on a sample of silty sands to 1,004 percent on a sample of peat with approximately two thirds of the water contents exceeding 100 percent.

Liquid limits ranged from 34 on a sample of silty clays to 807 percent on a sample of peat. More than 97 percent of the liquid limits exceeded 50 percent, and approximately 82 percent of the liquid limits exceed 100 percent.

Plastic limits ranged from 20 on a sample of silty clays to 450 percent on a sample of organic clays. However, about 96 percent of the plastic limits were between 20 and 100

percent, and slightly more than 86 percent of the plastic limits were between 20 and 50 percent.

Plasticity indices ranged from non-plastic on a sample of peat to 557 percent on a sample of clays with peat seams and pockets with nearly 90 percent of the plasticity indices exceeding 50 percent and slightly more than 73 percent of the plasticity indices exceeding 100 percent.

Unconfined and triaxial compression tests yielded cohesions ranging from 22 lbs per sq ft to 603 lbs per sq ft, except for one unconfined compression test which yielded a cohesion value of 1,328 lbs per sq ft. Slightly more than 88 percent of the unconfined and triaxial compression tests yielded cohesions below 250 lbs per sq ft, which is the upper limit of a very soft consistency. Slightly more than 36 percent of the unconfined and triaxial compression tests yielded cohesions below 100 lbs per sq ft.

Field vane test performed generally in the upper soils yielded cohesions ranging from 37 lbs per sq ft to 268 lbs per sq ft with nearly 40 percent of the field vane tests yielding cohesions below 100 lbs per sq ft.

Hydrology and Hydraulics

The water levels in the watershed are influenced by tides and wind. The mean high water is 2.0' NAVD88. The mean low water is 0.5' NAVD88.

Engineering and Design Tasks

The Department of Natural Resources letter "RE: Generalized Guidelines for Coastal Structures Design Parameters" dated January 07, 2000, and its attachment "Design Guidelines for CWPPRA Shoreline Protection Structures" were used to determine the wave heights used to design the rock / rock composite dike. Under the guidelines set forth in the letter a still water elevation (SWE), a wave height, the height of the structure, and the wave forces must be determined. In an effort to be conservative, the SWE was set at the storm water elevation of +2.5 NAVD88. Concurrently, the average bottom elevation was determined to be approximately -1.5 NAVD88.

Minimum and maximum design wave heights are determined according to the guidelines, where the minimum wave height is equal to 2.0 feet unless this is greater than the water depth and the maximum wave height is 0.78 times the water depth. Therefore the minimum and maximum wave heights were set at 2.0 and 3.12 feet respectively.

A wind generated wave height was determined using a 70 mph wind. The maximum peak gust, 70 mph, was chosen out of a comparison of New Orleans, Lake Charles and Baton Rouge wind speeds, provided in NOAA's "Climatic Wind Data for the United States". The wave height for this wind speed was used as an input for the ACES program in which wind in shallow and deep open water conditions was determined. The shallow and deep open water wave conditions return wave heights of 1.44 and 1.67 feet

respectively. Along with these wave heights, one other wave height was determined. This is the wave height due to boat traffic. Since most of the traffic in the GIWW is crew boats a wave height of 3.0 feet was used in accordance with the guidelines.

The minimum top elevation of the structure was determined to be 3.5 NAVD88 based on the ability of the structure to be overtopped, and the guidelines. The wave impact forces were determined by deciding if the maximum wave height is breaking or non-breaking. This is done using the Shore Protection Manual (SPM), Chapter 2, Section VI, Part 2. In this case, a wind duration of 2.0 seconds was used, which allowed for the determination of the deepwater wave steepness, 0.024. The deepwater wave steepness is used as an input into Figure 2-72 of the SPM in order to determine the breaker height index, which in turn is used to determine the breaking wave height, 3.0 feet. The breaking wave height was then used as an input in Equation 2-92 of the SPM in order to determine the depth of water that the breaking wave would break at, 4.59 feet. Since the depth of water at which the wave would break at is greater than the depth of water at the structure, the wave will break before it reaches the structure, and thus is not a concern in the design of the structure.

The geotechnical investigation provided the minimum slopes for a composite and a rock dike. With this information in combination with the settlements for each type of section, also provided in the geotechnical investigation, a determination of the most economic design method (rock / composite) was made on a per reach basis. The most economic method per reach was used as the determining factor for which sections of the dike would be composite rather than rock only. These determinations led to the specification of 2:1 (H:V) side slopes for the rock only sections and 2.5:1(H:V) side slopes for the composite sections, based on the minimum slopes provided by the geotechnical investigation.

With the maximum wave height, wave forces, and side slopes determined the size of the rock riprap was determined to be a Corps of Engineers R-1000 gradation. This was done using equation 7-117 from the SPM, with a stability coefficient of 2.2, and the two side slopes (2:1, 2.5:1) that were proposed for this structure. The top width of the structure was determined to be 3.0 feet using equation 7-120 of the SPM, with the median size of the gradation above.

A layer thickness for the composite sections of the structure had to be determined. This was accomplished using equations 7-123 and 7-124 of the SPM. The maximum thickness from these two equations was determined to be 1.6 feet. To be conservative a 2.0 foot layer thickness has been specified for the structure design.

Design meetings were held at the 30% (May 25, 2004) and 95% (August 26, 2004) levels.

Landrights, Cultural Resources, Environmental Compliance and Other Tasks

Preliminary landrights has proceeded smoothly and no problems are anticipated in acquiring final landrights.

No cultural resource sites are located within the project area.

Environmental concerns were considered in the planning and design of this project. A FONSI, Environmental Assessment, and Ecological Review Report have been completed. A Section 404 permit has been approved by the USACE. A Storm Water Pollution Prevention Plan has been developed for this project since the disturbed construction site is more than one (1) acre. A permit to dredge material for construction has been obtained by the local sponsors from the U.S. Corps of Engineers and the Louisiana Department of Natural Resources, Coastal Zone Management.

A draft Ecological Review is available and a final EA dated December, 2002 was developed after receiving comments on the draft EA, which was submitted for public comment in April, 2002.

Description of the Phase II Candidate Project

The original candidate for Phase I authorization of TE-43 involved a near complete armoring of a section of the GIWW bankline (referred to as Area G) (Figure 1) totaling 37,000 feet where the bankline had deteriorated significantly and at some points breached into the adjacent floating marshes of the upper Penchant Basin. The two major breach areas are located at the NW and SE extents of the project area (Figure 2). In Fall 2005 and Spring 2006, NRCS and LDNR with the consent of Terrebonne Parish and a major landowner reevaluated the project. Based upon new USGS data and joint NRCS and LDNR field analysis, a revised downsized project was agreed upon that removed segments along intact banks and targeted only the two major breach areas within the project boundary (Figure 3). The purpose of the downsizing was to concentrate efforts on those critical areas where the bankline had breached or is imminently threatening to breach into adjacent fragile floating marshes. NRCS and LDNR criteria for downsizing required that the revised project not add any new areas to the project and would not significantly alter the overall project goals.

The final design of the project features are essentially unchanged from the original Phase I project with exception to the total length. The project contains shoreline protection by means of a hard shoreline structure. The Phase 0 approved length of the structure was approximately 37,000 feet whereas the length of the designed project that targets just the major breach areas is approximately 14,555 feet.

The work to be accomplished will consist of the installation of approximately 14,555 feet of shoreline protection along the southern shoreline of the GIWW by constructing a rock rip-rap dike and in places of poor soil bearing capacities constructing a composite rock rip-rap dike with a lightweight core aggregate as seen in Figures 4 and 5 (typical and composite rock dike sections).

Previous projects involving similar bankline structures that have been successfully constructed along the GIWW and other similar type areas include Perry Ridge Shore Protection (CS-24), GIWW-Perry Ridge West Bank Stabilization (CS-30), Cameron Prairie NWR Shoreline Protection (ME-09), Freshwater Bayou Bank Stabilization (ME-13) and Freshwater Bayou Wetland Protection (ME-04). Additionally, the analysis and results included in the geotechnical investigations support the concept that a rock/rock composite structure is capable of being constructed, and establishes the required stable side slopes as well as expected settlements.

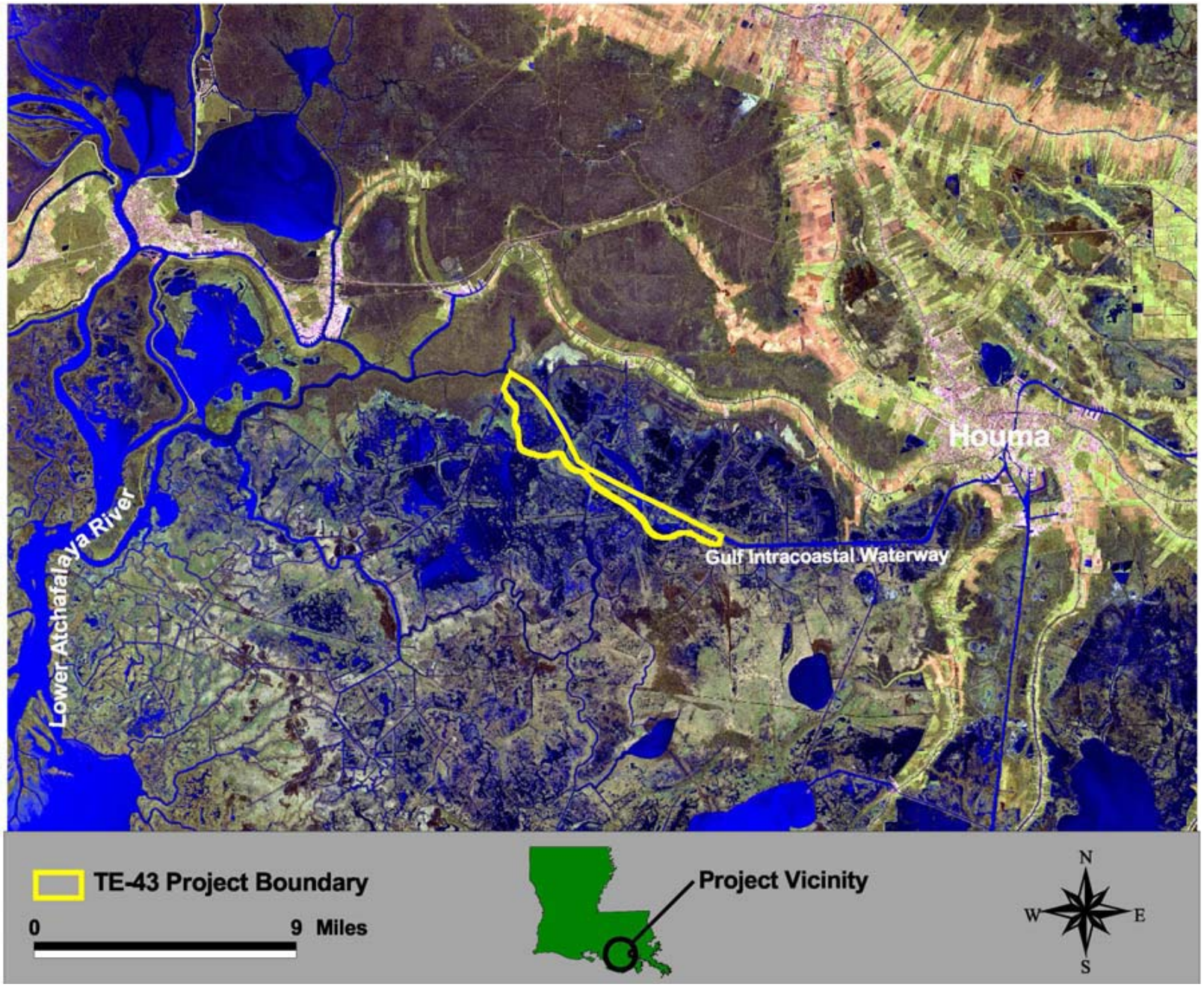


Figure 1. Vicinity map of original boundary of GIWW Bank Restoration of Critical Areas in Terrebonne (TE-43).

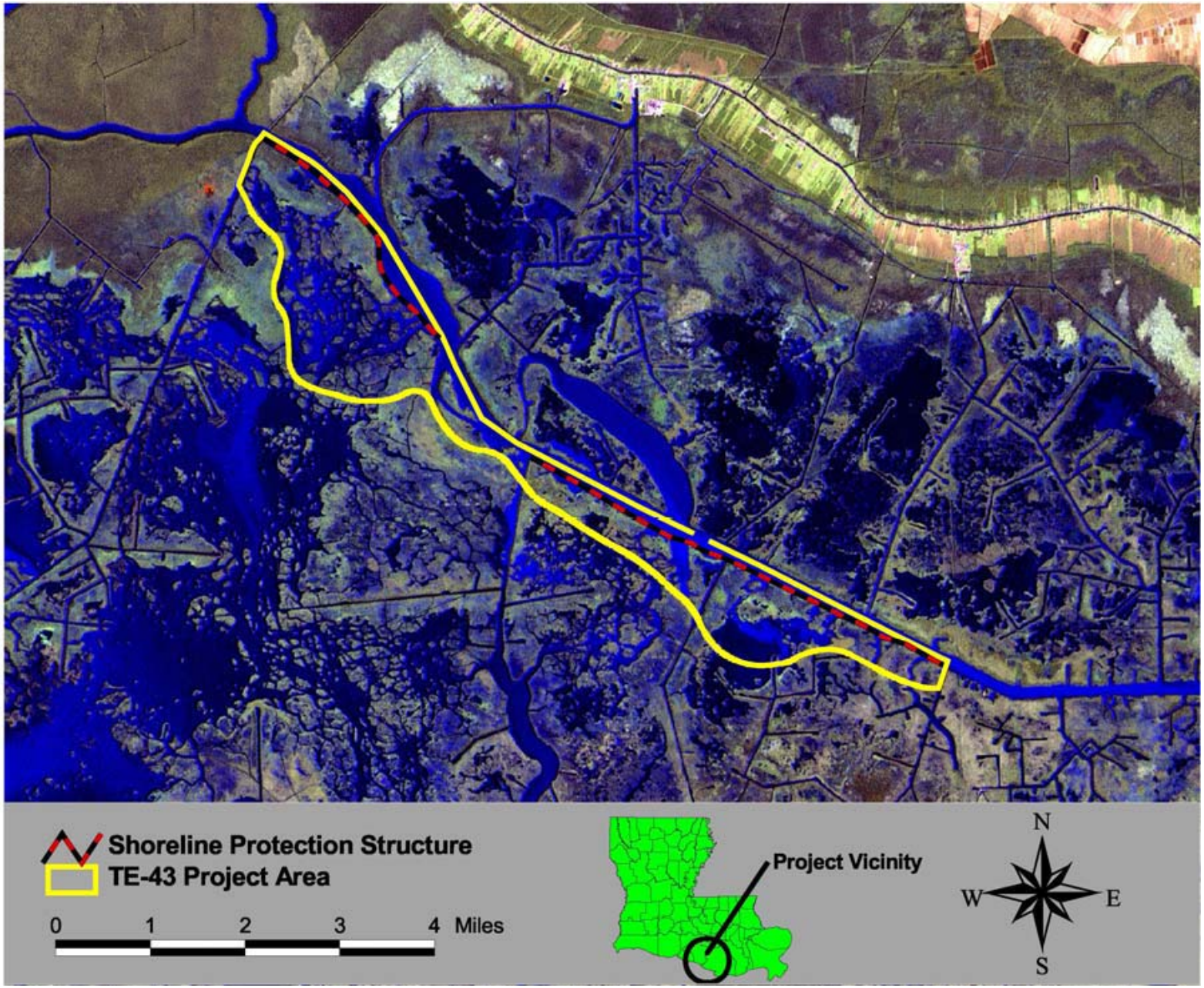


Figure 2. Expanded view of original project boundary of GIWW Bank Restoration of Critical Areas in Terrebonne (TE-43) also indicating extent of shoreline protection coverage.

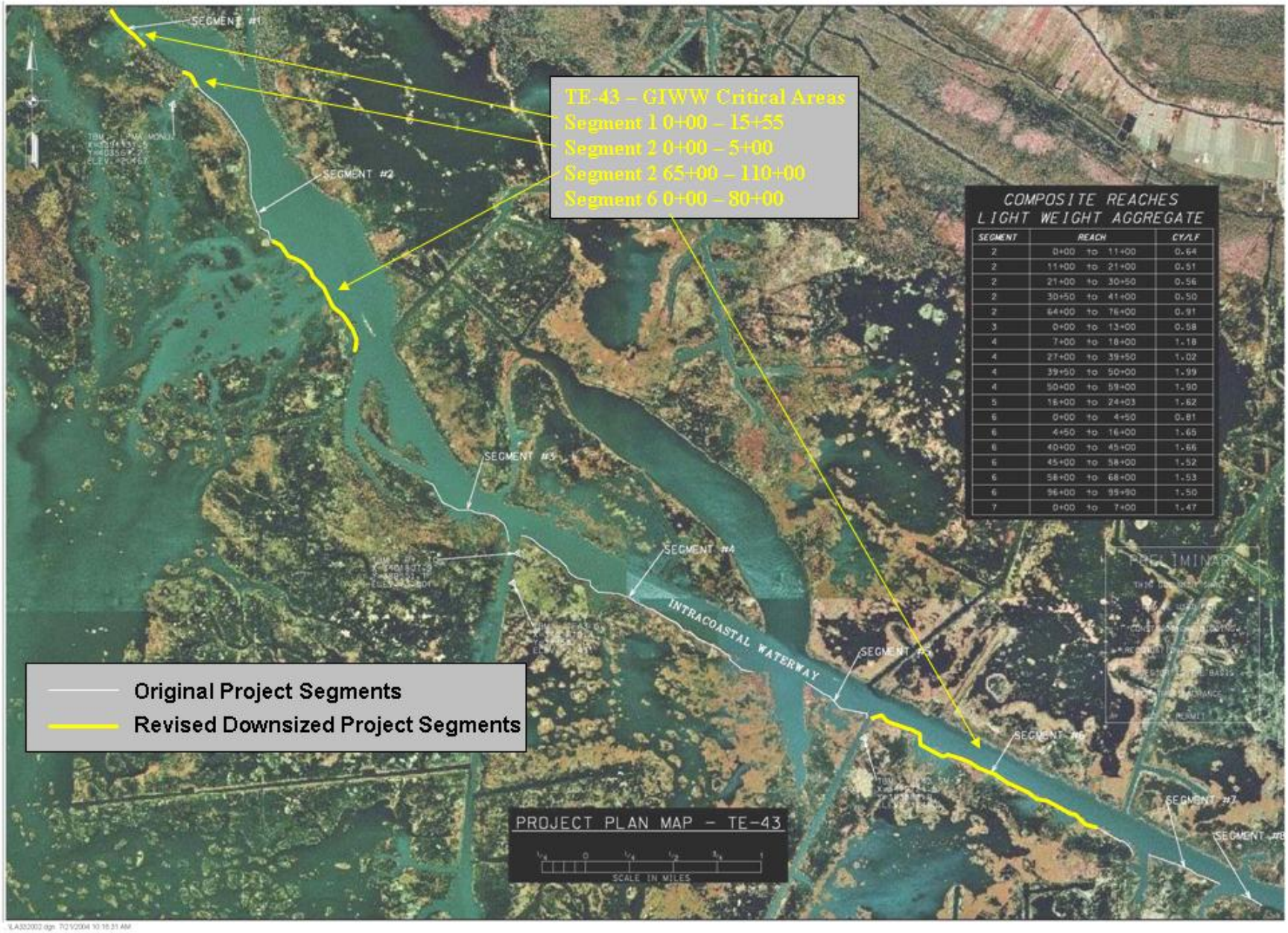
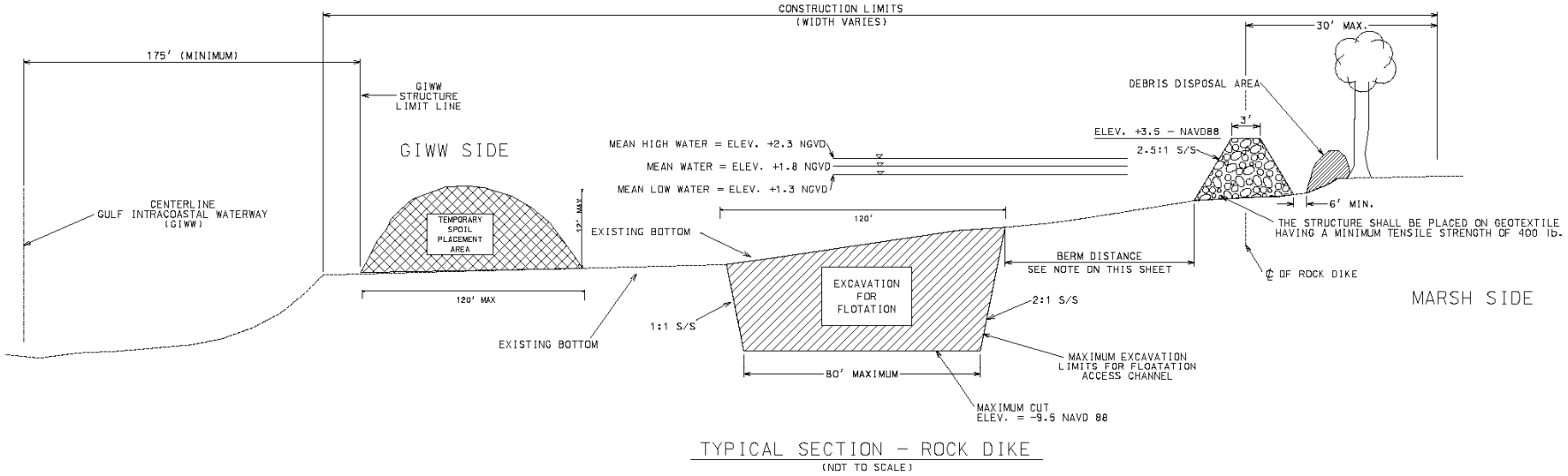


Figure 3. Original and Revised Project Segments on GIWW Bank Restoration of Critical Areas in Terrebonne (TE-43).



TYPICAL SECTION – ROCK DIKE

(NOT TO SCALE)

NOTE:

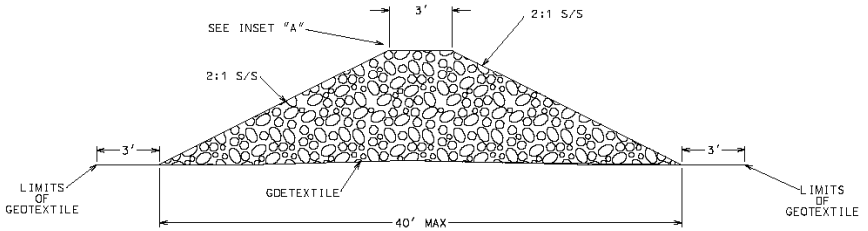
ALL SPOIL SHALL BE PLACED BACK INTO ACCESS CHANNEL AFTER CONSTRUCTION OF DIKE IS COMPLETE.

AS REQUIRED TREES SHALL BE REMOVED AND PLACED ON THE MARSH SIDE OF THE STRUCTURE.

THE BERM DISTANCE SHALL BE 30' EXCEPT FOR THE FOLLOWING REACHES WHICH SHALL BE 40':SEGMENT 3-STA. 16+00-36+33, SEGMENT 4-STA. 0+00-5+00, SEGMENT 6-STA. 19+00-34+00.

THE HEIGHT OF THE DIKE IS VARIABLE. THE DIKE IS PLANNED TO FOLLOW THE -1.0' CONTOUR. THE ACTUAL LAYOUT MAY VARY. THERFORE THE DIKE COULD VARY IN HEIGHT FROM 4.0' TO 5.0'.

THE DEPTH OF THE ACCESS CANAL IS ALSO VARIABLE. THIS DEPENDS ON THE TOPOGRAPHY AND HOW MUCH THE CONTRACTOR CHOOSES TO EXCAVATE.

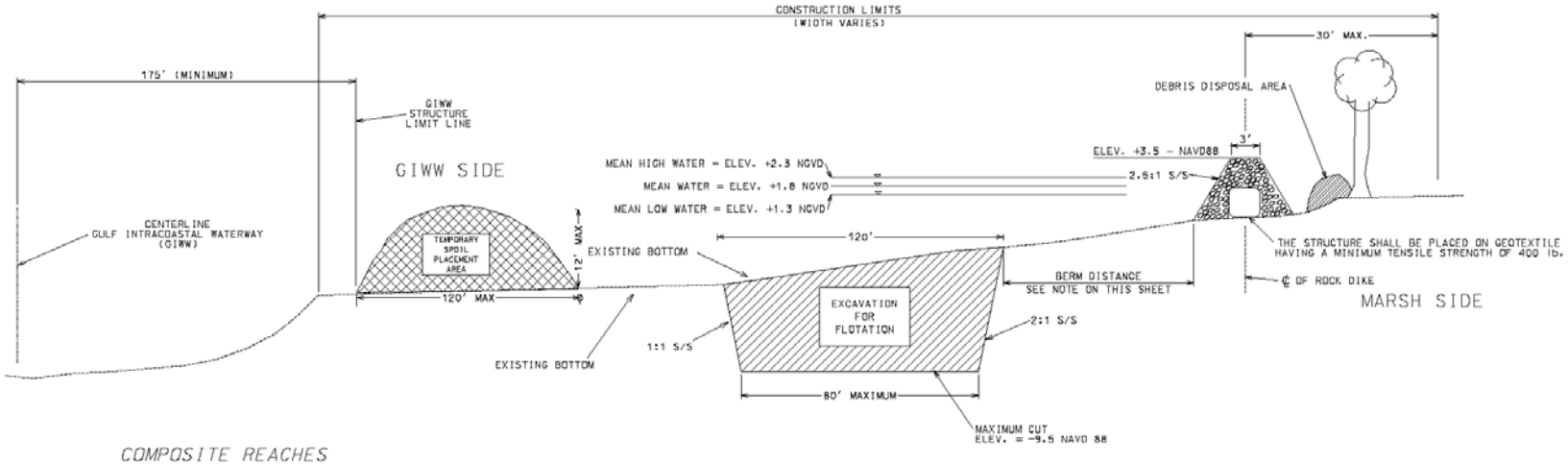


ROCK DIKE DETAIL

PRELIMINARY

THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, OR SALES.

Figure 4 – Typical Rock Dike Section.



TYPICAL SECTION – COMPOSITE ROCK DIKE
(NOT TO SCALE)

COMPOSITE REACHES
LIGHT WEIGHT AGGREGATE

SEGMENT	*REACH*	*CY/LF*
2	0+00 to 11+00	0.64
2	11+00 to 21+00	0.51
2	21+00 to 30+50	0.56
2	30+50 to 41+00	0.50
2	64+00 to 76+00	0.91
3	0+00 to 13+00	0.58
4	7+00 to 18+00	1.18
4	27+00 to 39+50	1.02
4	39+50 to 50+00	1.99
4	50+00 to 59+00	1.90
5	16+00 to 24+03	1.62
6	0+00 to 4+50	0.81
6	4+50 to 16+00	1.65
6	40+00 to 45+00	1.66
6	45+00 to 58+00	1.52
6	58+00 to 68+00	1.53
6	96+00 to 99+90	1.50
7	0+00 to 7+00	1.47

NOTE:

WIDTH AND HEIGHT OF BAGGED LIGHTWEIGHT AGGREGATE IS VARIABLE. A MINIMUM OF 2' OF ROCK COVERAGE SHALL BE PLACED ON SIDES AND TOP OF BAGGED AGGREGATE.

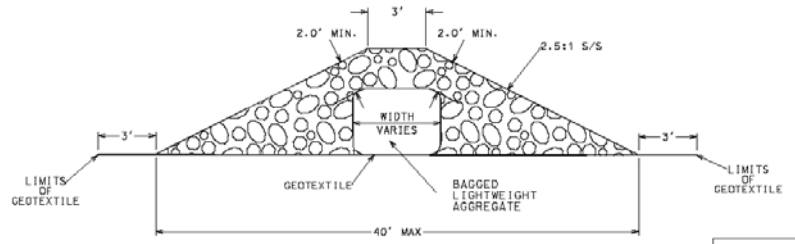
ALL SPOIL SHALL BE PLACED BACK INTO ACCESS CHANNEL AFTER CONSTRUCTION OF DIKE IS COMPLETE.

AS REQUIRED TREES SHALL BE REMOVED AND PLACED ON THE MARSH SIDE OF THE STRUCTURE.

THE BERM DISTANCE SHALL BE 30' EXCEPT FOR THE FOLLOWING REACHES WHICH SHALL BE 40': SEGMENT 3-STA. 16+00-36+33. SEGMENT 4-STA. 0+00-8+00. SEGMENT 6-STA. 19+00-34+00.

THE HEIGHT OF THE DIKE IS VARIABLE. THE DIKE IS PLANNED TO FOLLOW THE -1.0' CONTOUR. THE ACTUAL LAYOUT MAY VARY. THERFORE THE DIKE COULD VARY IN HEIGHT FROM 4.0' TO 5.0'.

THE DEPTH OF THE ACCESS CANAL IS ALSO VARIABLE. THIS DEPENDS ON THE TOPOGRAPHY AND HOW MUCH THE CONTRACTOR CHOOSES TO EXCAVATE.



COMPOSITE ROCK DIKE DETAIL
(ALTERNATIVE)

PRELIMINARY
THIS DOCUMENT SHALL
NOT BE USED FOR
CONSTRUCTION, BIDDING,
RECORDATION, CONVEYANCE,
OR SALES.

Figure 5 – Typical Composite Rock Dike Section.

Updated Assessment of Benefits

The original WVA conducted for the Phase I project estimated a benefited area of 3,324 acres and the net acres created/protected/restored of 366 acres at TY20. The downsized project pro-rated benefit area is 1,180 acres (36% of original) for a net acres created/protected/restored of 132 acres at TY 20.

Modifications to the Phase I Project

The Phase 0 approved length of the structure was approximately 37,000 feet, whereas the length of the designed project has been reduced to approximately 14,555 feet and confined to the major bankline breach areas. The final design of the project structures are essentially unchanged from the original Phase I project with exception to the total bankline coverage of the project. The project contains shoreline protection by means of a hard shoreline structure.

Current Cost Estimate

The revised total fully-funded cost prepared by the CWPPRA Economics Work Group is **$17,704,212** (see fully funded cost spreadsheet). Phase I costs are unchanged from the original Phase I project budget ($1,735,983). The total Phase II cost is estimated at **$15,968,229** and the Phase II-Increment 1 cost at **$13,175,995**.

Final Project Fact Sheet
November 27, 2006

Project Name - GIWW Bank Restoration of Critical Areas in Terrebonne (TE-43)

Coast 2050 Strategy – Region 3 - #6 Stabilize navigation channel banks or cross sections for water conveyance.

Project Location – Region 3, Terrebonne Basin, Terrebonne Parish, south shore of GIWW.

Problem - In the past 20 years, as the efficiency of the Lower Atchafalaya River has decreased, Lake Verret subbasin flooding and Atchafalaya River flows via the GIWW have increased. Deterioration of fresh and intermediate wetlands, particularly the floating marsh, in the upper Penchant basin has been attributed to sustained elevated water levels. In addition, wave action from commercial and recreational traffic on the GIWW has caused floating marshes in some areas to become directly exposed to increased circulation through unnatural connections formed where channel banks have deteriorated.

Goals - To enable the GIWW to function as a conveyance channel to direct Atchafalaya River freshwater flow to specific locations that would benefit from increased flows of fresh water and nutrients, and 2) To provide relief to marshes connected to the GIWW that are currently suffering from prolonged inundation and wave action while stopping shoreline erosion along the remaining bank of the GIWW.

Proposed Solution - The proposed solution is to restore critical lengths of deteriorated channel banks, and stabilize/armor selected critical lengths of deteriorated channel banks with hard shoreline stabilization materials.

Project Benefits – The project would benefit approximately 1180 acres adjacent to the largest floating marsh complex in coastal Louisiana and a predicted net acres created/protected/restored of 132 acres at TY 20.

Project Cost – Total fully funded cost is $17,704,212.

Sponsoring Agency and Contact – Natural Resources Conservation Service (NRCS)
Ron Boustany, Project Manager, Lafayette, LA (337) 291-3067,
ron.boustany@la.usda.gov

Legend

Bankline_Stabilization

N

GIWW Bank Restoration
of Critical Areas in Terrebonne
TE-43
Terrebonne Parish, Louisiana

0 1,500 3,000 6,000 9,000 12,000
Feet

Enclosure 2
Checklist of Phase II Requirements

TE-43 GIWW BANK RESTORATION OF CRITICAL AREAS
INCREMENT 1 – AREA 'G'

A. List of Project Goals and Strategies.

The project goals are: 1) To enable the GIWW to function as a conveyance channel to direct Atchafalaya River freshwater flow to specific locations that would benefit from increased flows of fresh water and nutrients, and 2) To provide relief to marshes connected to the GIWW that are currently suffering from prolonged inundation and wave action while stopping shoreline erosion along the remaining bank of the GIWW.

B. A Statement that the Cost Sharing Agreement between the Lead Agency and the Local Sponsor has been executed for Phase I.

A Cost Share Agreement between the Natural Resources Conservation Service and Louisiana Department of Natural Resources was executed on May 16, 2001. A draft amendment, authorizing construction, operation, maintenance, and monitoring, to the Cost Share Agreement has been prepared.

C. Notification from the State or the Corps that landrights will be finalized in a short period of time after Phase 2 approval.

NRCS has requested the required letter from DNR relative to landrights being finalized in a relatively short period of time after Phase 2 approval. By way of letter received Septemper 2, 2004, DNR stated that they anticipated no landrights acquisition problems with the project. At this time all landowners have indicated approval of project and signatures pending funding approval, and all pipeline companies have given consent.

D. A favorable Preliminary Design Review (30% Design Level). The Preliminary Design shall include completion of surveys, borings, geotechnical investigations, data analysis review, hydrologic data collection and analysis, modeling (if necessary), and development of preliminary designs.

A 30% design review meeting was held on May 25, 2004, and resulted in favorable reviews of the project design with minor modifications. DNR and NRCS agreed on the project design and agreed to proceed to the 95% design level and with project implementation.

E. Final Project Design Review (95% Design Level). Upon completion of a favorable review of the preliminary design, the Project plans and specifications shall be developed and formalized to incorporate elements from the Preliminary Design and the Preliminary Design Review. Final Project Design Review (95%) must be successfully completed prior to seeking Technical Committee approval.

A 95% design meeting was held on August 26, 2004, and resulted in favorable reviews of the project design with no modifications and few comments. DNR and NRCS agreed on the project design and agreed to proceed with project implementation.

F. A draft of the Environmental Assessment of the Project, as required under the National Environmental Policy Act must be submitted thirty days before the request for Phase 2 approval.

A final EA dated December, 2002 was developed after receiving comments on the draft EA, which was submitted for public comment in April, 2002.

G. A written summary of the findings of the Ecological Review.

A favorable 95% Design Review was conducted on August 26, 2004. The following paragraph is from the Recommendations section of the August 2004 draft Ecological Review:

> *Based on information gathered from similar restoration projects, engineering designs, and related literature, the proposed strategies in the GIWW Bank Restoration of Critical Areas in Terrebonne project will likely achieve the desired goals provided Operation and Maintenance funds are available for structure rehabilitation. It is recommended that this project progress towards construction authorization pending a favorable 95% Design Review.*

H. Application for and/or issuance of the public notices for permits. If a permit has not been received by the agency, a notice from the Corps of when the permit may be issued.

Section 404 Permit has been received dated January 18, 2006. Water Quality Certification (LDEQ) has been granted via letter dated September 20, 2005. A letter notifying consistency with Louisiana Coastal Resources Program (LCRP) has been issued, dated December 7, 2004.

I. A hazardous, toxic and radiological waste (HTRW) assessment, if required, has been prepared.

NRCS procedures do not call for an HTRW assessment on this project.

J. Section 303(e) approval from the Corps.

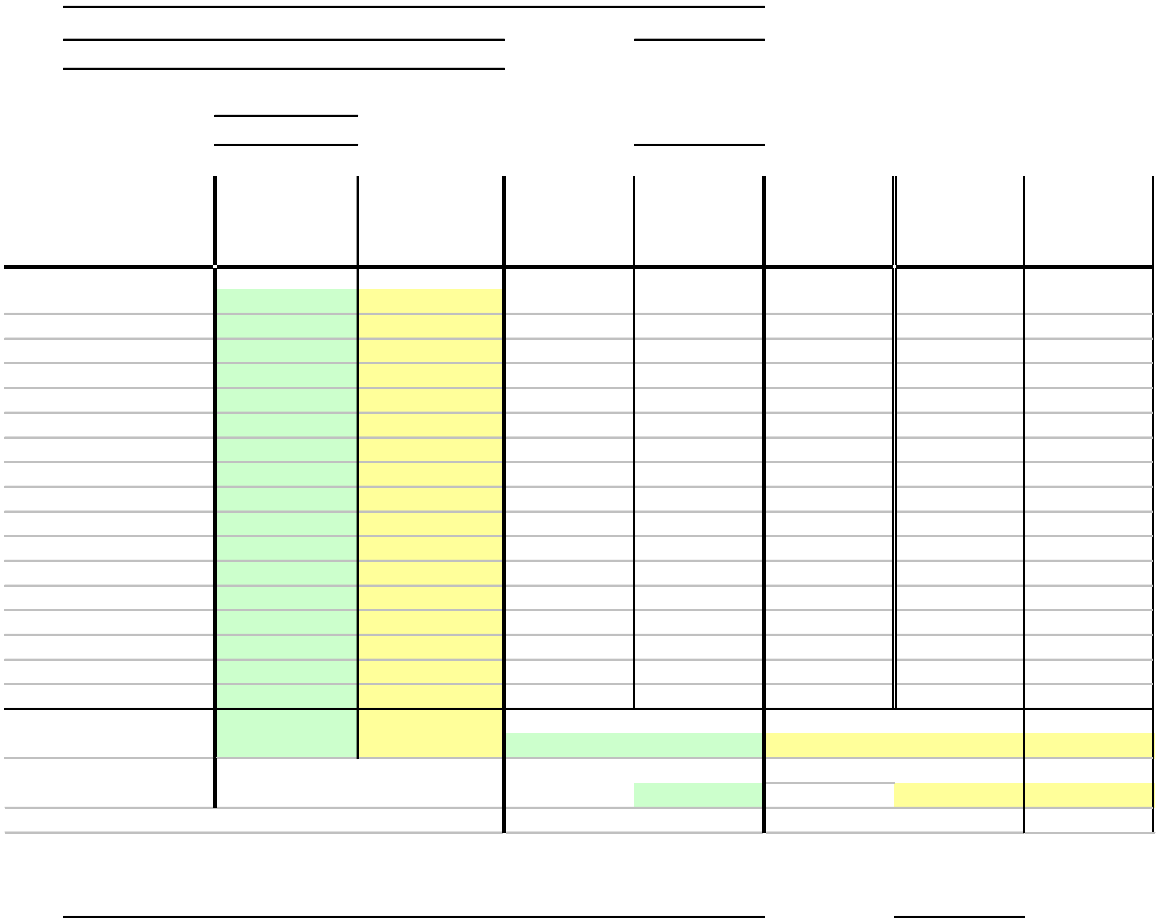
Section 303(e) approval was granted by the Corps via letter dated July 8, 2003.

K. Overgrazing determination from the NRCS (if necessary).

NRCS has determined that overgrazing is not, and is not anticipated to be, a problem in the project area.

L. Revised fully funded cost estimate, approved by the Economic Work Group, based on the revised Project design and the specific Phase 2 funding request as outlined in the below spreadsheet.

The specific Phase 2 funding request (updated construction estimate and three years of monitoring and O&M) is **$13,175,995**. The revised total fully-funded cost of the project is **$17,704,212**.



M. A revised Wetland Value Assessment reviewed and approved by the Environmental Work Group.

Because the change in the segment lengths did not significantly alter the objectives of the project, the WVA was revised to reflect pro-rated benefits with respect to the length of the project features. Therefore, the environmental benefits associated with this project are adjusted proportionally to the size. The original Phase I benefited project area was 3,324 acres and the net acres created/protected/restored at TY20 were 366 acres. The revised pro-rated benefit area is 1,180 acres (36% of original) and the net acres created/protected/restored is 132 acres.

N. A breakdown of the Prioritization Criteria ranking score, finalized and agreed-upon by all agencies during the 95% design review.

The following Prioritization Criteria scores were submitted for reviewed by the Engineering and Environmental Work Groups and agreed upon by all agencies:

Criteria	Score	Weight	Final Score
Cost Effectiveness	1.0	2	2
Area of Need	7.5	1.5	11.25
Implementability	10	1.5	15
Certainty of Benefits	8	1	8
Sustainability of Benefits	4	1	4
HGM – Riverine Input	0	1	0
HGM – Sediment Input	0	1	0
HGM – Landscape Features	0	1	0
Total Score			**40.25**