

THREE CREEKS MITIGATION BANK PROSPECTUS CLAIBORNE PARISH, LOUISIANA

Prepared for:



Peace River Mitigation, LLC
P.O. Box 856
Minden, Louisiana 71058

Prepared by:



Matrix New World Engineering,
Land Surveying, and Landscape Architecture, P.C.
4451 Bluebonnet Blvd., Suite E
Baton Rouge, Louisiana 70809

Matrix Project No. 17-345

March 2018

TABLE OF CONTENTS

| <u>Section</u> | <u>Page</u> |
|--|-------------|
| 1.0 INTRODUCTION | 1 |
| 2.0 GOALS AND OBJECTIVES..... | 1 |
| 3.0 PROPERTY OWNERSHIP, ENCUMBRANCES, AND SITE PROTECTION..... | 2 |
| 3.1 Ownership | 2 |
| 3.2 Servitudes/Easements..... | 2 |
| 3.3 Liens/Encumbrances/Restrictions | 2 |
| 3.4 Site Protection Instrument..... | 2 |
| 4.0 SPONSOR AND CONTRACTOR QUALIFICATIONS | 2 |
| 4.1 Peace River Mitigation, LLC | 2 |
| 4.2 Matrix New World Engineering..... | 2 |
| 5.0 WETLAND DELINEATION..... | 2 |
| 6.0 CURRENT SITE CONDITIONS | 3 |
| 7.0 EXISTING LAND USE | 3 |
| 7.1 Existing Plant Communities..... | 4 |
| 7.2 Soils..... | 5 |
| 7.3 Existing Hydrology | 5 |
| 7.4 Geographic Service Area | 5 |
| 8.0 SITE RESTORATION PLAN..... | 5 |
| 8.1 Surface Hydrology | 7 |
| 8.2 Proposed Bottomland Hardwood Rehabilitation and Enhancement..... | 8 |
| 8.3 Proposed Cypress/Tupelo Swamp Enhancement..... | 8 |
| 8.5 Proposed Stream Buffer Bottomland Hardwood Rehabilitation and Enhancement | 9 |
| 8.7 Proposed Bottomland Hardwood and Stream Buffer Preservation..... | 10 |
| 8.8 Proposed Upland Buffer and Upland Stream Buffer Restoration | 10 |
| 8.9 Proposed Upland Buffer and Upland Stream Buffer Preservation | 11 |
| 9.0 ACCOUNTING PROCEDURES, METHODS FOR DETERMINING CREDITS AND RELEASE OF CREDITS..... | 11 |
| 10.0 FINANCIAL ASSURANCES..... | 11 |
| 11.0 LONG-TERM MANAGEMENT OF MITIGATION BANK..... | 12 |
| 11.1 Long-Term Management | 12 |

- 11.2 Impacts to Mitigation Bank..... 12
- 11.3 Mitigation for Impacts to Mitigation Bank 12
- 11.4 Timber Management 12
- 12.0 ADAPTIVE MANAGEMENT..... 13
- 13.0 SUCCESS CRITERIA..... 13
 - 13.1 Bottomland Hardwood Performance Standards..... 13
 - 13.2 Stream Mitigation..... 16
- 14.0 MAINTENANCE, MONITORING, AND REPORTING 20
 - 14.1 Maintenance Provisions 20
 - 14.2 Monitoring Provisions..... 20
 - 14.2 Post-Construction/Post-Planting Report 21
 - 14.3 Monitoring Reports: 23
- 15.0 CORRECTIVE ACTIONS 25
 - 15.1 Contingency Plans/Remedial Actions..... 25
 - 15.2 Completion of Corrective Actions 25
 - 15.3 Deficits 25
 - 15.4 Non-Compliance 25
 - 15.5 Adjustment of Mitigation Potential..... 26
 - 15.6 Force Majeure 26
- 16.0 CONCLUSION..... 26
- 17.0 REFERENCES 27

List of Tables

| <u>Table No.</u> | <u>Title</u> |
|------------------|---|
| 1 | Pre-Restoration Habitat Acreage Summary |
| 2 | Post-Restoration Habitat Acreage Summary |
| 3 | Bottomland Hardwood Rehabilitation and Enhancement Species List |
| 4 | Cypress/Tupelo Swamp Enhancement Species List |
| 5 | Stream Buffer Bottomland Hardwood Rehabilitation and Enhancement Species List |
| 6 | Upland Buffer and Upland Stream Buffer Restoration Species List |

List of Figures

| <u>Figure No.</u> | <u>Title</u> |
|-------------------|--|
| 1 | Vicinity Map |
| 2 | Site Location Map |
| 3a-3d | Pre-Restoration Site Plans |
| 4a-4d | Post-Restoration Site Plans - Wetlands |
| 5a-5d | Post-Restoration Site Plans – Streams and Stream Buffers |
| 6 | 1949 Aerial Photograph |
| 7 | 1981 Aerial Photograph |
| 8 | 2017 Aerial Photograph |
| 9 | Soils Map |
| 10 | Primary Service Area Map |
| 11 | LIDAR Map |

List of Attachments

| <u>Attachment</u> | <u>Title</u> |
|-------------------|-----------------------------|
| A | Preliminary JD MVK-2017-951 |

1.0 INTRODUCTION

The following prospectus summarizes the mitigation potential on approximately 275.56 acres in Sections 11, 12, and 13, Township 23 North, Range 5 West of Claiborne Parish, Louisiana. The purpose of the prospectus is to summarize the existing conditions of the proposed Three Creeks Mitigation Bank (TCMB) and assess the potential for establishing a mitigation bank to provide compensatory wetland mitigation for unavoidable impacts to wetlands associated with Department of the Army (DA) permits authorized under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act issued by the U.S. Army Corps of Engineers (USACE), Vicksburg District.

2.0 GOALS AND OBJECTIVES

The proposed TCMB will encompass 275.56 acres placed in a conservation easement, including 274.43 acres of land in which restoration, enhancement, and preservation activities are proposed. The sponsor of the TCMB is Peace River Mitigation, LLC (Peace River). The goal of Peace River will be to conduct bottomland hardwood wetland, instream, riparian buffer, upland buffer, and upland stream buffer rehabilitation, enhancement, and preservation activities on the TCMB (Tract or Site).

Bottomland hardwood wetland activities will consist of 96.09 acres of rehabilitation, 9.01 acres of non-bedded pine dominant wetland enhancement, 9.16 acres of degraded cypress/tupelo swamp enhancement, and 15.61 acres of preservation. Stream activities will consist of 14.78 acres (16,041.13 linear feet) of preservation of Three Creeks, and 17.05 acres (2,638.7 linear feet) of instream construction and riparian buffer rehabilitation to restore the hydrology to two, intermittent tributaries of Three Creeks. In addition to the instream construction and riparian buffer rehabilitation corridor associated with the two, intermittent tributaries of Three Creeks, additional riparian buffer activities will consist of 35.53 acres (7,195.32 linear feet) of stream buffer bottomland hardwood rehabilitation, 5.19 acres (1,051.05 linear feet) of stream buffer bottomland hardwood enhancement, and 32.72 acres (6,626.26 linear feet) of stream buffer bottomland hardwood preservation. Upland buffer activities will consist of 31.70 acres of rehabilitation and 1.82 acres of preservation. Upland stream buffer activities will consist of 2.38 acres (481.98 linear feet) of rehabilitation and 3.39 acres (686.52 linear feet) of preservation. Remaining acreage associated with the TCMB, not proposed for rehabilitation, enhancement, and preservation activities includes 1.13 acres of roads.

Peace River, the bank sponsor, intends for the TCMB to serve as a bottomland hardwood and stream mitigation bank offering for sale, wetland mitigation and stream credits as compensation for unavoidable impacts to wetlands associated with DA Section 404 permits. A conservation easement will be executed for the entire 275.56-acre Tract. Through a contractual agreement with individual permit recipients, Peace River will, for a fee to be paid by permittees, commit to implementing the mitigation specified in DA permits and incur the responsibility of the long-term maintenance, management, protection, and overall success of the TCMB.

3.0 PROPERTY OWNERSHIP, ENCUMBRANCES, AND SITE PROTECTION

3.1 Ownership

The legal owner of the land encompassed in the TCMB is Madden Contracting Company, LLC. Peace River has entered into a contractual agreement with the legal owner of the land encompassed by the TCMB.

3.2 Servitudes/Easements

No servitudes or easements have been identified on the portions of the properties proposed for rehabilitation, enhancement, or preservation.

3.3 Liens/Encumbrances/Restrictions

No liens, encumbrances, or restrictions have been identified on the portions of the properties proposed for rehabilitation, enhancement, or preservation.

3.4 Site Protection Instrument

A conservation easement will be executed for the entire 275.56-acre TCMB. Additionally, Peace River intends to designate a third-party holder of the conservation easement for TCMB.

4.0 SPONSOR AND CONTRACTOR QUALIFICATIONS

4.1 Peace River Mitigation, LLC

Peace River has approximately nine years' experience in the mitigation banking business, with six approved mitigation banks: one in the USACE New Orleans District and five in the USACE Vicksburg District. Currently, Peace River has one mitigation bank pending in the USACE Vicksburg District, one in the USACE New Orleans District, and one in the USACE Mobile District.

4.2 Matrix New World Engineering

Matrix New World Engineering (Matrix) has over 20 years of experience providing industrial, commercial, and private clients with multi-media (air, water, waste, and natural resources) environmental compliance expertise. Matrix has been involved with various stages of 51 mitigation banks, totaling over 40,000 acres of wetland restoration, in the Vicksburg, New Orleans, Galveston, Little Rock, and Mobile Districts of the USACE.

5.0 WETLAND DELINEATION

A wetland delineation was conducted on the TCMB by Matrix in April and November 2017. A request for preliminary jurisdictional determination (JD) was submitted to the USACE, Vicksburg District on December

5, 2017, and subsequently a preliminary JD was rendered on March 1, 2018 (MVK-2017-951) for the TCMB and is included as **Attachment A**.

6.0 CURRENT SITE CONDITIONS

The 275.56-acre Site is approximately six miles north of Summerfield, Louisiana and approximately seven miles southwest of Junction City, Arkansas. Approximate center coordinates of the Site are Latitude 32.995385°; Longitude -92.843781° in Sections 11, 12, and 13, Township 23 North, Range 5 West of Claiborne Parish, Louisiana (**Figure 2**). Access to the western portion of the Site is via an unnamed logging road commencing from West Stateline Road/New Home Road, terminating at the southwestern corner of the Site boundary. Access to the eastern portion of the Site is via an unnamed logging road commencing from Kinnebrew Road, terminating at the northeastern boundary of the property.

The Site was previously owned by Tri State Land and Minerals, LLC (Tri State), headquartered in Bossier City, Louisiana. Clear cutting of the Site commenced in 2007 and was completed by 2009. Following the clear cut, the Site was replanted in pine in 2010. Following the 2010 planting, and due to poor survivorship of the planted pines, the Site was bedded between 2014 and 2015, and replanted in the winter of 2015 by Tri State. Subsequent to the bedding/replanting, Tri State put the tract on the market and it was purchased by Peace River in November 2016.

Claiborne Parish has a humid, subtropical climate characterized by rainfall averaging 51.23 inches per year. The average monthly maximum temperature is 75.7°F. The growing season for Claiborne Parish spans from April to September, approximately 250 days (United States Department of Agriculture [USDA] Soil Conservation Service 1907 and 1980).

7.0 EXISTING LAND USE

The 275.56-acre tract of the proposed TCMB currently contains approximately 146.20 acres of bedded pine dominant wetlands, 48.69 acres of bottomland hardwood wetlands, 14.20 acres of non-bedded pine dominant wetlands, 9.16 acres of degraded cypress/tupelo swamp wetlands, 41.01 acres of uplands, and 1.13 acres of existing roads (**Figures 3a-3d**). The tract also contains approximately 14.78 acres of perennial streams (Three Creeks) and 0.39 acres of an unnamed intermittent tributary to Three Creeks.

Table 1 contains pre-restoration habitat descriptions and acreages of the jurisdictional wetlands, other waters of the U.S., and upland areas associated with the 275.56-acre tract proposed for rehabilitation, enhancement, and preservation activities within the TCMB (**Figures 3a-3d**).

Table 1: Pre-Restoration Habitat Acreage Summary

| CLASS | HABITAT | ACREAGE |
|--|----------------------------------|---------------|
| Jurisdictional Wetlands | | |
| | Bottomland Hardwood | 48.69 |
| | Bedded Pine Dominant | 146.20 |
| | Non-Bedded Pine Dominant | 14.20 |
| | Degraded Cypress/Tupelo Swamp | 9.16 |
| Jurisdictional Other Waters of the U.S. | | |
| | Three-Creeks (Perennial) | 14.78 |
| | Unnamed Tributary (Intermittent) | 0.39 |
| Non-Jurisdictional Areas | | |
| | Hardwood Dominant Uplands | 5.26 |
| | Pine Dominant Uplands | 35.75 |
| | Existing Roads | 1.13 |
| TOTAL | | 275.56 |

7.1 Existing Plant Communities

Dominant habitat types associated with the jurisdictional wetlands on the tract consists of bottomland hardwood forested wetlands, bedded and non-bedded pine dominant wetlands, and degraded cypress/tupelo swamp. Dominant species identified in these habitats include: loblolly pine (*Pinus taeda*), willow oak (*Quercus phellos*), water oak (*Quercus nigra*), swamp chestnut oak (*Quercus michauxii*), sweetgum (*Liquidambar styraciflua*), southern bald-cypress (*Taxodium distichum*), American hornbeam (*Carpinus caroliniana*), common buttonbush (*Cephalanthus occidentalis*), southern arrow-wood (*Viburnum dentatum*), groundseltree (*Baccharis halimifolia*), southern bayberry (*Morella cerifera*), saw-tooth blackberry (*Rubus argutus*), dog-fennel (*Eupatorium capillifolium*), common boneset (*Eupatorium perfoliatum*), swamp smartweed (*Persicaria hydropiperoides*), round-head rush (*Juncus validus*), lamp rush (*Juncus effuses*), broom rosette grass (*Dichanthelium scoparium*), cypress rosette grass (*Dichanthelium dichotomum*), yellow-fruit rush (*Carex annectens*), white-edge sedge (*Carex debilis*), common fox sedge (*Carex vulpinoidea*), marsh flat sedge (*Cyperus pseudovegetus*), rusty flat sedge (*Cyperus odoratus*), short-bristle horned beak sedge (*Rhynchospora corniculata*), slender wood-oats (*Chasmanthium laxum*), tall goldenrod (*Solidago altissima*), blunt spike-rush (*Eleocharis obtusa*), wing-leaf primrose-willow (*Ludwigia decurrens*), late goldenrod (*Solidago gigantea*), muscadine (*Vitis rotundifolia*), and American buckwheatvine (*Brunnichia ovata*).

Dominant species identified within upland habitats include: loblolly pine, American beech (*Fagus grandifolia*), water oak, American hornbeam, groundseltree, American witch-hazel (*Hamamelis virginiana*), American holly (*Ilex opaca*), northern frogfruit (*Phyla lanceolata*), dog-fennel, tapered rosette grass (*Dichanthelium acuminatum*), saw-tooth blackberry, slender wood-oats, tall goldenrod, perennial rye grass

(*Lolium perenne*), and long-leaf wood-oats (*Chasmanthium sessiliflorum*).

7.2 Soils

The Web Soil Survey shows that the Site may be underlain by four soil map units (NRCS Web Soil Survey 2017); Bowie fine sandy loam, 1 to 5 percent slopes (Bw); Guyton-Ouachita silt loams, frequently flooded (Go); Eastwood very fine sandy loam, 5 to 12 percent slopes (Ed); and Flo loamy fine sand, 5 to 12 percent slopes (Fo) (**Figure 9**).

7.3 Existing Hydrology

Existing hydrology is restricted to rainfall, sheet flow, and backwater flooding from Three Creeks. Historic drainage throughout the Site is mainly toward the center, into Three Creeks. However, surface hydrology on much of the site is impaired, as the bedded rows and windrows are generally oriented north to south and restrict natural drainage towards the center of the Site.

The Site is bisected by Three Creeks, a perennial stream, which meanders through the center of the tract. Three Creeks begins north of the TCMB at the junction of several creeks in Union County, Arkansas, flows south into Claiborne Parish, Louisiana, and crosses the Site before it joins into Corney Bayou approximately 2.5 miles downstream.

There are also the remnants of two unnamed, intermittent tributaries to Three Creeks which historically drained from the northwest (Intermittent Tributary to Three Creeks #1, **Figure 4b**) and west (Intermittent Tributary to Three Creeks #2, **Figure 4b**) boundary of the TCMB and joined the western branch of Three Creeks near the center of the Site. These intermediate tributaries were hydrologically impaired by prior property owners and the previous silviculture activities of clearing and bedding for pine cultivation.

7.4 Geographic Service Area

The TCMB is in the Bayou D'Arbonne Watershed; within USGS HUC 08040206, which includes portions Columbia and Union Counties, Arkansas and Claiborne, Union, Lincoln, Ouachita, Jackson, and Bienville Parishes, Louisiana. HUC 08040206 and 08040207 will serve as the TCMB's primary service area (**Figure 10**).

8.0 SITE RESTORATION PLAN

Within the 275.56-acre TCMB, the Sponsor proposes to conduct bottomland hardwood wetland, cypress/tupelo swamp, instream, riparian buffer, upland buffer, and upland stream buffer activities on the TCMB.

Bottomland hardwood wetland activities will consist of 96.09 acres of rehabilitation, 9.01 acres of non-bedded pine dominant wetland enhancement, 9.16 acres of degraded cypress/tupelo swamp enhancement, and 15.61 acres of preservation. Stream activities will consist of 14.78 acres (16,041.13 linear feet) of preservation of Three Creeks, and 17.05 acres (2,638.7 linear feet) of instream construction and riparian buffer rehabilitation to restore the hydrology to two, intermittent tributaries of Three Creeks. In addition to the instream construction and riparian buffer rehabilitation corridor associated with the two, intermittent tributaries of Three Creeks, additional riparian buffer activities will consist of 35.53 acres (7,195.32 linear feet) of stream buffer bottomland hardwood rehabilitation, 5.19 acres (1,051.05 linear feet) of stream buffer bottomland hardwood enhancement, and 32.72 acres (6,626.26 linear feet) of stream buffer bottomland hardwood preservation. Upland buffer activities will consist of 31.70 acres of rehabilitation and 1.82 acres of preservation. Upland stream buffer activities will consist of 2.38 acres (481.98 linear feet) of rehabilitation and 3.39 acres (686.52 linear feet) of preservation. Remaining acreage associated with the TCMB, not proposed for rehabilitation, enhancement, and preservation activities includes 1.13 acres of roads (**Figures 5a-5d**).

Table 2 contains post-restoration habitat and acreage descriptions for the proposed rehabilitation, enhancement, and preservation of wetlands, stream buffers, upland buffers, and streams associated with the 275.56-acre TCMB.

Table 2: Post-Restoration Habitat Acreage Summary

| CLASS | HABITAT | ACREAGE |
|---------------------------------|---|---------------|
| Jurisdictional Areas | | |
| | Bottomland Hardwood Rehabilitation (Bedded Pine Dominant Wetlands) | 96.09 |
| | Bottomland Hardwood Enhancement (Non-Bedded Pine Dominant Wetlands) | 9.01 |
| | Cypress/Tupelo Swamp Enhancement | 9.16 |
| | Bottomland Hardwood Preservation | 15.61 |
| | Stream Buffer Bottomland Hardwood Rehabilitation (Bedded Pine Dominant Wetlands) | 35.53 |
| | Stream Buffer Bottomland Hardwood Enhancement (Non-Bedded Pine Dominant Wetlands) | 5.19 |
| | Stream Buffer Bottomland Hardwood Preservation | 32.72 |
| | Intermittent Tributaries Preliminary Alignment and Riparian Buffer Corridor | 17.05 |
| | Instream Preservation (Three Creeks) | 14.78 |
| | TOTAL | 235.14 |
| Non-Jurisdictional Areas | | |
| | Upland Buffer Restoration | 31.70 |
| | Upland Buffer Preservation | 1.82 |

| | | |
|--|-----------------------------------|--------------|
| | Upland Stream Buffer Restoration | 2.38 |
| | Upland Stream Buffer Preservation | 3.39 |
| | Existing Roads | 1.13 |
| | TOTAL | 40.42 |

8.1 Surface Hydrology

Hydrologic restoration proposed on the TCMB involves four primary improvements of the existing conditions.

1. Following the removal of planted pine, the Sponsor will mechanically level all bedded rows and restore surface hydrology to the bottomland hardwood rehabilitation areas. Within the non-bedded areas, the Sponsor will carefully survey the areas to determine the existence of any remnant, unnatural hydrologic influences (i.e. remnant beds, etc.). If hydrologic alterations are present, the Sponsor will take appropriate actions to restore contours and natural hydrologic conditions.
2. Following the removal of bedded rows, the Sponsor will remove windrows that stretch north to south throughout most of the Site. The windrows are approximately two to four feet tall, ten feet wide, and spaced 45’-60’ apart. The windrows are composed of woody debris and shrub-scrub growth. The Sponsor will remove the windrows through a series of controlled burns.
3. The Sponsor will enhance the flow within Intermittent Tributary to Three Creeks #1 (Tributary #1). Currently, flow within Tributary #1 is severely segmented by the existing bedded rows. Evidence of a defined bed and bank is present in short segments between bedded rows. Additionally, current and historic aerial photography suggest that an oxbow of Tributary #1 near its northern reaches has been hydrologically severed. Following the removal of the bedded rows, the Sponsor will enhance the flow in Tributary #1 through channel bed reconstruction and restore the connection to the oxbow.
4. The Sponsor will restore the flow within Intermittent Tributary to Three Creeks #2 (Tributary #2). Historic aerial photography and topographic maps suggest that an intermittent creek once flowed into the west branch of Three Creeks from the property west of TCMB. Current aerial photography indicates a hardwood stream management zone (SMZ) on the adjacent property, suggesting the presence of the creek. Additionally, scattered remnants of the creek were observed on TCMB near the historic confluence with Three Creeks. Following the removal of the bedded rows, the Sponsor will restore the flow in Tributary #2 through channel bed reconstruction.

Preliminary centerlines of Tributaries #1 and #2 are depicted in **Figures 5a-5d**. These centerlines were based on a combination of current and historic aerial photography, topographic maps, and on-site data collection and

observations. The final alignment of these creeks will be determined through further hydrologic and hydraulic studies and will be presented in the draft Mitigation Banking Instrument.

8.2 Proposed Bottomland Hardwood Rehabilitation and Enhancement

Following the hydrologic restoration discussed in Section 8.1 and prior to planting, the rehabilitation and enhancement acreage will be treated with herbicide to control the growth of invasive and noxious species. Approximately 105.10 acres (96.09 acres of bottomland hardwood rehabilitation and 9.01 acres of bottomland hardwood enhancement) will be planted with an appropriate species mixture of bottomland hardwoods during the standard planting season (December-March). Seedlings will be planted using 12 x 12 foot spacing, for an initial stand density of at least 302 seedlings per acre. A mixture of no greater than 60 percent hard-mast and a minimum of 40 percent soft-mast producing species will be planted in accordance with the species list shown in **Table 3**. If seedling availability renders a discrepancy of more than five percent from the desired mixture of hard-mast to soft-mast species, Vicksburg District approval to modify the plan will be obtained.

Table 3: Bottomland Hardwood Rehabilitation and Enhancement Species List

| SPECIES | SCIENTIFIC NAME | MAST | COMPOSITION |
|-----------------------------|--------------------------------|------|---------------|
| Sweet-gum | <i>Liquidambar styraciflua</i> | Soft | 4.00% |
| Southern Bald-cypress | <i>Taxodium distichum</i> | Soft | 10.00% |
| Red maple | <i>Acer rubrum</i> | Soft | 4.00% |
| Persimmon | <i>Diospyros virginiana</i> | Soft | 7.00% |
| Red mulberry | <i>Morus rubra</i> | Soft | 4.00% |
| American elm | <i>Ulmus americana</i> | Soft | 4.00% |
| American sycamore | <i>Platanus occidentalis</i> | Soft | 7.00% |
| TOTAL SOFT MAST | | | 40.00% |
| Texas red oak (Nuttall Oak) | <i>Quercus texana</i> | Hard | 10.00% |
| Willow oak | <i>Quercus phellos</i> | Hard | 10.00% |
| Water oak | <i>Quercus nigra</i> | Hard | 10.00% |
| Overcup oak | <i>Quercus lyrata</i> | Hard | 10.00% |
| Swamp chestnut oak | <i>Quercus michauxii</i> | Hard | 10.00% |
| Water hickory | <i>Carya aquatica</i> | Hard | 10.00% |
| TOTAL HARD MAST | | | 60.00% |

8.3 Proposed Cypress/Tupelo Swamp Enhancement

The Sponsor will supplemental plant approximately 9.16 acres of degraded cypress/tupelo swamp with an appropriate species mixture of cypress/tupelo swamp species during the standard planting season (December-March). Seedlings will be planted using 12 x 12 foot spacing, for an initial stand density of at least 302

seedlings per acre. A mixture of species will be planted in accordance with the species list shown in **Table 4**. If seedling availability renders a discrepancy of more than five percent from the desired mixture of species, Vicksburg District approval to modify the plan will be obtained.

Table 4: Cypress/Tupelo Swamp Enhancement Species List

| SPECIES | SCIENTIFIC NAME | MAST | COMPOSITION |
|------------------------|---------------------------|------|----------------|
| Southern Bald-cypress | <i>Taxodium distichum</i> | Soft | 80.00% |
| Water tupelo | <i>Nyssa aquatica</i> | Soft | 20.00% |
| TOTAL SOFT MAST | | | 100.00% |

8.5 Proposed Stream Buffer Bottomland Hardwood Rehabilitation and Enhancement

Following the hydrologic restoration discussed in Section 8.1 and prior to planting, the rehabilitation and enhancement acreage will be treated with herbicide to control the growth of invasive and noxious species. The Sponsor is proposing to rehabilitate/enhance and maintain a 150-foot-wide riparian buffer on both sides (300 feet total) of the Three Creeks that is preserved within the TCMB; totaling 40.72 acres (8,246.37 linear feet) of stream buffer (35.53 acres/7,195.32 linear feet of stream buffer bottomland hardwood rehabilitation and 5.19 acres/1,051.05 linear feet of stream buffer bottomland hardwood enhancement). Forested riparian buffer zones are essential to stream system function, channel stability, and maintenance of water quality and in-stream habitat.

Within the buffer, rehabilitation/enhancement will be accomplished by planting an appropriate mixture of bottomland hardwoods species during the standard planting season (December-March). Seedlings will be planted using 12 x 12 spacing, for an initial stand density of at least 302 seedlings per acre (**Table 5**). A mixture of no greater than 60 percent hard-mast and a minimum of 40 percent soft-mast producing species will be planted in accordance with the following species selection list. If seedling availability renders a discrepancy of more than five percent from the desired mixture of hard-mast to soft-mast species, Vicksburg District approval to modify the plan will be obtained.

Table 5: Stream Buffer Bottomland Hardwood Rehabilitation and Enhancement Species List

| SPECIES | SCIENTIFIC NAME | MAST | COMPOSITION |
|--------------|--------------------------------|------|-------------|
| Sweet-gum | <i>Liquidambar styraciflua</i> | Soft | 3.00% |
| Bald-cypress | <i>Taxodium distichum</i> | Soft | 9.00% |
| Red maple | <i>Acer rubrum</i> | Soft | 5.00% |
| Persimmon | <i>Diospyros virginiana</i> | Soft | 4.00% |
| Red mulberry | <i>Morus rubra</i> | Soft | 3.00% |

| SPECIES | SCIENTIFIC NAME | MAST | COMPOSITION |
|-----------------------------|------------------------------|------|---------------|
| American elm | <i>Ulmus americana</i> | Soft | 4.00% |
| American sycamore | <i>Platanus occidentalis</i> | Soft | 7.00% |
| American hornbeam | <i>Carpinus caroliniana</i> | Soft | 5.00% |
| TOTAL SOFT MAST | | | 40.00% |
| Texas red oak (Nuttall Oak) | <i>Quercus texana</i> | Hard | 10.00% |
| Willow oak | <i>Quercus phellos</i> | Hard | 10.00% |
| Overcup oak | <i>Quercus lyrata</i> | Hard | 10.00% |
| Water oak | <i>Quercus nigra</i> | Hard | 10.00% |
| Swamp chestnut oak | <i>Quercus michauxii</i> | Hard | 10.00% |
| Water hickory | <i>Carya aquatica</i> | Hard | 10.00% |
| TOTAL HARD MAST | | | 60.00% |

8.7 Proposed Bottomland Hardwood and Stream Buffer Preservation

The Sponsor is proposing to preserve 15.61 acres of existing bottomland hardwood forest. Bottomland hardwoods play an important role in maintaining the ecological health of wetland areas. Bottomland hardwood forests perform many important functions including sediment capture and dispersal, aquifer recharge, flood damage minimization as well as countless benefits to game and non-game wildlife species.

In addition to the bottomland hardwood wetlands preservation, 32.72 acres (6,626.26 linear feet) of bottomland hardwood stream buffer preservation is proposed on the TCMB. The buffer will be a 75-foot-wide buffer on the western side of the stream. Bottomland hardwood forest stream buffers provide many of the same benefits as bottomland hardwood forests but are especially important because of their direct positive effects to adjacent streams. The proposed stream buffer preservation areas will provide important functions and ecological sustainability to the watershed, and the site will be permanently protected through the establishment of the TCMB.

8.8 Proposed Upland Buffer and Upland Stream Buffer Restoration

Following the hydrologic restoration discussed in Section 8.1 and prior to planting, the restoration acreage will be treated with herbicide to control the growth of invasive and noxious species. The Sponsor is proposing to enhance 31.70 acres of upland buffer and 2.38 acres of upland stream buffer enhancement. The areas will be planted with an appropriate species mixture of upland species during the standard planting season (December-March). Seedlings will be planted using 12 x 12 foot spacing, for an initial stand density of at least 320 seedlings per acre. A mixture of hardwood and pine species will be planted to mimic the natural upland mixed hardwood-pine forests typically found in this area. Appropriate hardwood and pine species for the TCMB were determined through the use of the US Environmental Protection Agency’s Level IV Ecoregions (Ecoregion

35a- South Central Plains, Tertiary Uplands), and will be planted in accordance with the species list shown in **Table 6**. If seedling availability renders a discrepancy of more than five percent from the desired mixture of upland species, Vicksburg District approval to modify the plan will be obtained.

Table 6: Upland Buffer and Upland Stream Buffer Restoration Species List

| SPECIES | SCIENTIFIC NAME | COMPOSITION |
|--------------------|--------------------------------|----------------|
| American beech | <i>Fagus grandifolia</i> | 20.00% |
| Shortleaf pine | <i>Pinus echinata</i> | 20.00% |
| Southern red oak | <i>Quercus falcata</i> | 10.00% |
| White oak | <i>Quercus alba</i> | 10.00% |
| Post oak | <i>Quercus stellata</i> | 10.00% |
| Pecan | <i>Carya illinoensis</i> | 10.00% |
| Bitter-nut hickory | <i>Carya cordiformis</i> | 10.00% |
| Sweet-gum | <i>Liquidambar styraciflua</i> | 10.00% |
| TOTAL | | 100.00% |

8.9 Proposed Upland Buffer and Upland Stream Buffer Preservation

The sponsor is proposing to preserve 1.82 acres of upland buffer and 3.39 acre of upland stream buffer. Upland buffers can play an important role in watershed health. They are often used in agriculture to improve environmental health and water quality. Upland buffers provide a larger, contiguously forested area, and when in conjunction with riparian and wetland buffers can increase overall watershed health. Upland buffers provide added benefits to watersheds such as slowed runoff of surface water, sequestration of surface water pollutants, erosion control and increased wildlife habitat.

9.0 ACCOUNTING PROCEDURES, METHODS FOR DETERMINING CREDITS AND RELEASE OF CREDITS

The Sponsor proposes that approximately 274.43 acres of the TCMB can be used as compensatory mitigation through the rehabilitation, enhancement, and preservation of bottomland hardwood wetlands, streams, and riparian corridors. Credits and debits will be assessed based on wetland acreage of rehabilitated, enhanced, and preserved bottomland hardwoods and linear footage of restored, enhanced, and preserved stream buffer. The available wetland and stream credits shall be determined by the Interagency Review Team (IRT) in accordance with the Charleston Methodology (2010).

10.0 FINANCIAL ASSURANCES

Financial assurances will be in the form of two sets of accounts, established at a federally insured depository that is well, or adequately, capitalized as defined in Section 38 of the Federal Deposit Insurance Act. The

escrow account funds shall be placed into the proper account upon receipt of payment from permit recipients and divided as follows between the four funds: wetland construction and establishment account, wetland long-term maintenance and protection account, stream construction and establishment account, and stream long-term maintenance and protection account. Specified percentages of this assurance shall be released back to the Sponsor incrementally in accordance with the achievement of milestones specified in the initial contract.

11.0 LONG-TERM MANAGEMENT OF MITIGATION BANK

11.1 Long-Term Management

The Sponsor, its heirs, assigns or successors, shall be responsible for maintaining and protecting lands contained within the restored portions of the TCMB, unless the bank lands are transferred to a state or federal resource agency or non-profit conservation organization or this responsibility is contractually conveyed to another person, subject to approval by the IRT. The IRT shall not unreasonably withhold authorization of transfer of long-term maintenance and protection to another person.

11.2 Impacts to Mitigation Bank

After restoration, wetlands as well as streams within the TCMB will be jurisdictional and will therefore be subject to all applicable requirements established under the Clean Water Act (CWA). As such, permits from the Vicksburg District will be required for the deposition of dredged or fill material, including mechanized land clearing, in these areas. All requests for permits within the Mitigation Bank will be coordinated with the IRT; however, decisions regarding the issuance of such permits will be made by the Vicksburg District in accordance with applicable permit regulations and guidance.

11.3 Mitigation for Impacts to Mitigation Bank

If impacts to wetland portions of the Mitigation Bank are permitted, the permittee will be required to compensate for the loss of wetland values associated with the project, past wetland impacts that are being mitigated by these wetlands, and all temporal losses associated with the restoration of new mitigation sites. The amount of compensation required will be based upon the acreage of wetlands actually impacted. Impacts to wetlands within the TCMB shall be mitigated at the TCMB if appropriate acreage is available. In cases where sufficient acreage is not available, the permittee will be responsible for fulfilling all or part of his compensatory mitigation requirement elsewhere, as approved by the Vicksburg District in consultation with the IRT.

11.4 Timber Management

All timber harvests and thinning operations conducted in the TCMB shall be authorized by the IRT and shall only be performed if such activities are needed to maintain or enhance the ecological value of the site.

12.0 ADAPTIVE MANAGEMENT

Exotic/noxious plant species (e.g., Chinese tallow-tree, cottonwood, and black willow) will be controlled as needed until crown closure has occurred. All timber harvests and thinning operations conducted in the TCMB will be authorized by the Vicksburg District and will be performed in a manner that maintains and enhances timber stand and wildlife habitat quality.

13.0 SUCCESS CRITERIA

Performance standards refer to measurable physical (including hydrological), chemical and/or biological attributes that are used to determine if the compensatory mitigation is meeting the restoration objectives for the TCMB. Compliance with the following performance standards shall demonstrate that the TCMB is meeting the restoration objectives and is achieving the community types outlined in restoration plan. Measures to achieve the performance standards, as outlined below, shall be implemented during the initial restoration of the site (Year 1), and shall be documented in the as-built baseline submittal for the TCMB. Following Year 1, documentation that the TCMB is meeting performance standards, as outlined below, shall be provided in monitoring reports, with monitoring conducted as described in Section 14.0.

The following are standards which must be met to achieve credit releases at the specified year.

13.1 Bottomland Hardwood Performance Standards

Year 0 – BLH – Initial:

1. Approval of this Mitigation Banking Instrument and approval of restoration plan,
2. A copy of the approved and recorded conservation servitude that protects the site in perpetuity,
3. Submittal of a professional land survey,
4. Receipt of necessary permits,
5. Establishment of financial assurances for the construction account and the long-term maintenance and protection account.

Year 1 – BLH – Post Construction:

1. Submittal of a monitoring/as-built report,
2. Completion of initial planting (verified by the IRT),
3. Establishment and marking of monitoring plots,
4. Implementation of hydrologic features,
5. Placement of redox tubes,
6. Demonstration that a wetland functional capacity increase has occurred as a result of implementation

of the restoration plan (via completion of an HGM Functional Assessment by a qualified professional individual, and verified by the IRT, through the Chair),

7. Maintenance of financial assurances.

Year 3 – BLH – Success/Performance: [to occur after the 3rd full growing season]

1. Submittal of a monitoring report,
2. Verification of an 80% or greater survival rate (or 240 trees/acre) of planted species at the minimum required initial planting density of 302 trees/acre,
3. Documentation verifying that hydrology restoration features are successful,
4. Maintenance of financial assurances,
5. Demonstration of positive growth in planted tree: lateral canopy diameter, stem diameter, and/or height. Must have at least two additional feet in height from planted species, and at least 50% growth in lateral canopy from previous monitoring event.
6. Exotic and nuisance (Chinese tallow, privet, or as defined by the US Department of Agriculture National Invasive Species Information Center) species shall not comprise more than 5% cover and noxious species (e.g., honey locust, black willow, baccharis, cotton wood) shall not comprise more than 20% of the total stem density.

Year 5 – BLH – Success/Performance: [to occur after the 5th full growing season]

1. That the bank qualifies as a jurisdictional wetland. (A delineation must be submitted at Year 5 to document site conditions and extent of jurisdictional areas.)
2. Submittal of a monitoring report,
3. Vegetative success, verified by the following:
 - a. a survival rate of 150 trees/acre or greater. This number may include desirable natural recruitment,
 - b. seven (7) to ten (10) target species or greater per acre from the species listed in Appendix C, with no single species comprising more than 25% of the overall stocking,
 - c. hard mast species comprising between 50 to 60% of the total species planted,
 - d. demonstration of positive growth in planted tree: lateral canopy diameter, stem diameter, and/or height. Must have at least two additional feet in height from planted species, and at least 50% growth in lateral canopy from previous monitoring event.
 - e. exotic and nuisance (Chinese tallow, privet, or as defined by the US Department of Agriculture National Invasive Species Information Center.) species shall not comprise more than 5% cover and noxious species (e.g., honey locust, black willow, cotton wood, baccharis) shall not comprise more

- than 20% of the total stem density.
4. Wetland hydrology, verified by the following:
 - a. primary and secondary indicators of wetland hydrology are present,
 5. Hydric soils, verified by the following:
 - a. field data that document the existence of hydric soil criteria as described in the USACE Wetland Delineation Method, 1987 Manual or appropriate Regional Supplement,
 - b. data from soil reduction tubes (GPS-referenced) that indicate that soils are significantly anaerobic and saturated.
 6. Demonstration of a wetland functional capacity increase from baseline conditions by using the HGM Functional Assessment (to be completed by a qualified professional individual), and verified by the IRT, through the Chair,
 7. Maintenance of financial assurances.

Year 8 – BLH – Success/Performance: [to occur after the 8th full growing season]

1. Submittal of a monitoring report,
2. Verification of an 50% or greater survival rate (or 150 trees/acre) of planted species at the minimum required initial planting density of 302 trees/acre,
3. Documentation verifying that hydrology restoration features are successful,
4. Maintenance of financial assurances.
5. Demonstration of positive growth in planted tree: lateral canopy diameter, stem diameter, and/or height. Must have at least two additional feet in height from planted species, and at least 50% growth in lateral canopy from previous monitoring event.
6. Exotic and nuisance (Chinese tallow, privet, or as defined by the US Department of Agriculture National Invasive Species Information Center) species shall not comprise more than 5% cover and noxious species (e.g., honey locust, black willow, cotton wood, baccharis) shall not comprise more than 20% of the total stem density.

Year 10 – BLH – Success/Performance: [to occur after the 10th full growing season]

1. Submittal of a monitoring report,
2. Vegetative success, verified by the following:
 - a. a survival rate of 120 trees/acre or greater. This number may include desirable natural recruitment,
 - b. seven (7) to ten (10) target species or greater per acre from the species listed in Appendix C,

- c. a range of hard to soft mast ratio between 50/50 and 60/40,
 - d. a minimum of three years of positive growth of planted tree species through demonstration of positive growth in planted tree: lateral canopy diameter, stem diameter, and/or height. Must have at least two additional feet in height from planted species, and at least 50% growth in lateral canopy from previous monitoring event.
 - e. average height of the planted canopy is a minimum of five (5) feet or greater, excluding fast growing genera such as *Platanus* and *Populus*,
 - f. the plant community must be comprised primarily of hydrophytic vegetation typical of bottomland hardwood community types where more than 50% of all dominant species are facultative (FAC), facultative-wetland (FACW) or wetland (WET), *excluding FAC-plants*, using routine delineation methods as described in the USACE Wetland Delineation Method, 1987 Manual or appropriate Regional Supplement,
 - g. exotic and nuisance species (Chinese tallow tree, Chinese privet, or as defined by the US Department of Agriculture National Invasive Species Information Center) shall not comprise more than 5% cover, and noxious species (e.g., honey locust, black willow, cottonwood, and baccharis) shall not comprise more than 20% of the total stem density.
3. Demonstration of a minimum of three years of positive functional benefit using the HGM Functional Assessment (to be completed by a qualified professional individual), and verified by the IRT, through the Chair.
 4. Maintenance of financial assurances. Long term management account is fully funded one year prior to bank close-out.

13.2 Stream Mitigation

ALL YEARS – Stream –Exhibiting the Following Characteristics:

1. **Dimension:** The analysis of representative riffle cross-section shall indicate that it has neither aggraded, degraded, widened, nor narrowed to the point where it has become unstable or will cause instability. The following measurements will be used to aid in making this determination each monitoring year:
 - a. The Width/Depth Ratio Stability Rating (measured Width/Depth Ratio divided by the baseline Width/Depth Ratio) shall not be greater than 1.3 as appropriate to the associated stream type.
 - b. The Bank Height Ratio shall be 1.0 to 1.2.
 - c. Entrenchment ratio will be greater than 2.2 for C and E stream types and greater than 1.4 for B stream types.

- d. Other measurements to consider include cross-sectional (bankfull) area of the channel, flood prone elevation, bankfull elevation, flood prone width, entrenchment ratio, mean depth, bankfull width, and hydraulic radius to demonstrate the project meets stated restoration goals.
2. **Pattern:** The analysis of the plan-view survey or field measurements shall indicate that the stream is not migrating significantly to the point where it will cause significant bank erosion and cause instability. The following standards will be used to aid in making this determination each monitoring year:
 - a. Within any given year, the sinuosity of the stream shall not increase or decrease by an amount greater than 0.2 of the approved channel design and associated stream-type or evolutionary phase.
 - b. The centerline of each channel cross-section will not move by more than 20% of the width of the approved as-built channel width in any given year.
 - c. The Radius of Curvature/Width Ratio shall remain within the range of variability present in the design criteria.
 - d. Pool to pool spacing shall be 5 to 7 for watersheds greater than 5 square miles and 4 to 5 for watersheds less than 5 square miles.
 3. **Profile:** The analysis of the longitudinal profile shall indicate that the bed elevation has neither aggraded nor degraded to the point where it will cause instability. The following performance standards will be used to aid in making this determination each monitoring year:
 - a. The analysis of the Longitudinal Profile shall not indicate significant alterations in the target locations, depths, and slopes of stream features (riffle, run, pool, and glide).
 - b. Bankfull Shear Stress, and Mean Depth and Slope (calculated using Critical Dimensionless Shear Stress) shall be appropriate for transporting the D50 of either the bar sample or the sub-pavement sample.
 - c. The slope of the longitudinal profile shall not increase or decrease by an amount greater than 0.2% of the appropriate stream type.
 4. **Rosgen Stream Type:** Channel meets definition of designed type.
 5. **Stream Reach Stability:** The analysis of the streambank from the top of the bank to the ordinary high water mark shall indicate a significant amount of natural protection to prevent streambank erosion that could jeopardize the stability of the streambank or the stream reach.
 - a. The individual Index Values of the Bank Erodibility Hazard Index (BEHI) rating for any identified reach shall be equal to or less than the previous year's Index Value. In addition, the Total Score shall be equal to or less than the previous year's Total Score and shall have a Total Score of "Moderate" by Monitoring Year 3, and a Total Score of "Low" by Monitoring Year 4 and maintained at "Low" throughout the remainder of the monitoring period.

Year 0 – Stream – Initial:

1. Approval of the Mitigation Banking Instrument and approval of a restoration plan which will include but is not limited to planform, profile, and typical dimensions as well as expected credits generated,
2. A copy of the approved and recorded conservation servitude that protects the site in perpetuity,
3. Establishment of permanent monitoring cross-sections,
4. Establishment of financial assurances for the construction account and the long-term maintenance and protection account.

Year 1 – Stream – Construction:

1. Submittal of:
 - a. Stream Construction Report – with as-built drawings that show the completion of all initial physical improvements of a Reach made pursuant to the Stream Bank Restoration Plan
 - b. Buffer Construction Report – with buffer woody species planting list, submittal of planting report, and proof of planting,
 - c. Wetland Construction Report – with wetland woody species planting list, submittal of planting report, and proof of planting
2. Submittal of a monitoring report with the following information:
 - a. Stream morphology/stability exhibits the required conditions approved in the MBI
 - b. where streambank plantings were undertaken, the numbers of live stakes, planted, or volunteer woody species providing bank stabilization from the top of bank to edge of riparian buffer shall be at least 15 living stems per 1/20th acre sample plot,
 - c. exotic and nuisance species (Chinese tallow tree) shall not comprise more than 5% cover, and noxious species (e.g., honey locust, black willow, cottonwood, thistle, and *Baccharus*) shall not comprise more than 20% of the total stem density.
3. Maintenance of financial assurances.

Year 2 – Stream – Success/Performance:

1. Submittal of a monitoring report with the following information:
 - a. Stream morphology/stability exhibits the required conditions approved in the MBI
 - b. the U.S. Forest Service Stream Reach Inventory and Channel Stability Evaluation (Pfankuch, 1975) rating shall be “Good”,
 - c. exotic and nuisance species (Chinese tallow tree) shall not comprise more than 5% cover, and

noxious species (e.g., honey locust, black willow, cottonwood, thistle, and *Baccharus*) shall not comprise more than 20% of the total stem density.

2. Maintenance of financial assurances.

Year 3 – Stream – Success/Performance:

1. Submittal of a monitoring report with the following information:
 - a. Documentation of at least 2 overbank events.
 - b. Stream morphology/stability exhibits the required conditions approved in the MBI
 - c. where streambank plantings were undertaken, the numbers of live stakes, planted, or volunteer woody species providing bank stabilization from the top of bank to edge of riparian buffer shall be at least 15 living stems per 1/20th acre sample plot,
 - d. where riparian buffer zones were established, there should be an 80% or greater survival rate (240 trees /acre survivability) of planted species at the minimum required planting density of 302 trees/acre,
 - e. the individual Index Values of the Bank Erodibility Hazard Index (BEHI) rating for any identified reach shall have a Total Score between the Adjective Ratings of “Very Low to Moderate”,
 - f. the U.S. Forest Service Stream Reach Inventory and Channel Stability Evaluation (Pfankuch, 1975) rating shall be “Good”,
 - g. exotic and nuisance species (Chinese tallow tree, Chinese privet or as defined by the US Department of Agriculture National Invasive Species Information Center) shall not comprise more than 5% cover, and noxious species (e.g., honey locust, black willow, cottonwood, thistle, and *Baccharus*) shall not comprise more than 20% of the total stem density.
2. Maintenance of financial assurances.

Year 4 – Stream – Success/Performance:

1. Submittal of a monitoring report with the following information:
 - a. Stream morphology/stability exhibits the required conditions approved in the MBI
 - b. the individual Index Values of the Bank Erodibility Hazard Index (BEHI) rating for any identified reach shall be equal to or less than the Year 3 Total Score.
 - c. the U.S. Forest Service Stream Reach Inventory and Channel Stability Evaluation (Pfankuch, 1975) rating shall be “Good”,
 - d. exotic and nuisance species (Chinese tallow tree, Chinese privet, or as defined by the US Department of Agriculture National Invasive Species Information Center) shall not comprise more

than 5% cover, and noxious species (e.g., honey locust, black willow, cottonwood, thistle, and *Baccharus*) shall not comprise more than 20% of the total stem density.

2. Maintenance of financial assurances.

Year 5 – Stream – Success/Performance:

1. Submittal of a monitoring report with the following information:
 - a. Stream morphology/stability exhibits the required conditions approved in the MBI
 - b. the individual Index Values of the Bank Erodibility Hazard Index (BEHI) rating for any identified reach shall be equal to or less than the Year 4 Total Score.
 - c. the U.S. Forest Service Stream Reach Inventory and Channel Stability Evaluation (Pfankuch, 1975) rating shall be “Good”,
 - d. a hard to soft mast ratio of 50/50 to 60/40 should be exhibited on the site,
 - e. exotic and nuisance species (Chinese tallow tree, Chinese privet, or as defined by the US Department of Agriculture National Invasive Species Information Center) shall not comprise more than 5% cover, and noxious species (e.g., honey locust, black willow, cottonwood, thistle, and *Baccharis*) shall not comprise more than 20% of the total stem density.
2. Maintenance of financial assurances. Long-term management account is fully funded one year prior to bank closeout.

14.0 MAINTENANCE, MONITORING, AND REPORTING

14.1 Maintenance Provisions

The Sponsor agrees to perform all necessary work to maintain the Mitigation Bank consistent with the maintenance criteria established in the Mitigation Bank Restoration Plan. The Sponsor shall continue with such maintenance activities until closure of the Mitigation Bank. Upon closure of the Mitigation Bank, the Sponsor shall implement the management requirements established in the Long-Term Management Plan. Deviation from the approved Mitigation Bank Restoration Plan is subject to review and written approval by the IRT, acting through the Chair.

14.2 Monitoring Provisions

The Sponsor agrees to perform all necessary work to monitor the Mitigation Bank to demonstrate compliance with the performance criteria developed by the USACE, Vicksburg District, for jurisdictional areas and associated upland buffers. If the Sponsor does not provide a complete monitoring report, the District Engineer has the right to suspend further credit sales and / or terminate the mitigation bank. The following should be described in monitoring reports:

Wetland:

- **Wetland Hydrology:** The hydrology monitoring should display wetland hydrology which is defined as whether the site is inundated (flooded or ponded) or the water table is ≤ 12 inches below the soil surface for ≥ 14 consecutive days during the growing season at a minimum frequency of 5 years in 10 ($\geq 50\%$ probability) (ERDC TN-WRAP-05-2). Any combination of inundation or shallow water table is acceptable in meeting the 14-day minimum requirement. Short-term monitoring data may be used to address the frequency requirement if the normality of rainfall occurring prior to and during the monitoring period each year is considered. A site must be inundated or saturated typical of a reference condition for the same HGM hydrology classification. A site must meet wetland hydrology criteria as described in the USACE Wetland Delineation Method, 1987 Manual and/or appropriate Regional Supplement.
- **Wetland Vegetation:** The bank should display a dominance of wetland vegetation, defined as a vegetation community of species where more than 50% of all dominant species are facultative (FAC), facultative-wetland (FACW) or wetland (WET), excluding FAC- plants, using routine delineation methods as described in the USACE Wetland Delineation Method, 1987 Manual and/or appropriate Regional Supplement.
- **Hydric Soils:** The mitigation bank should display hydric soils, which are soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (United States NRCS Version 7.0, 2010).

Streams:

- Must exhibit a dimension/ pattern/ profile within 15% of designed channel and meet stream stability metrics.
- Stream buffers should display a dominance of wetland vegetation, defined as a vegetation community of species where more than 50% of all dominant species are facultative (FAC), facultative-wetland (FACW) or obligate (OBL), excluding FAC- plants, using routine delineation methods as described in the USACE Wetland Delineation Method, 1987 Manual and/or the appropriate Regional Supplement.

14.2 Post-Construction/Post-Planting Report

An as-built report shall be submitted to the IRT within 90 days of completion of each Phase of mitigation activities depicted in the bank Restoration Plan. The as-built report is submitted to meet the requirements of the Post Construction credit release. The report shall include:

1. The GPS referenced locations for all required monitoring plots and soil reduction tubes.
2. A plan view map of the constructed/restored wetlands, streams, and adjacent buffers with location of all permanent sampling stations, in-stream and stream bank structures, and all permanent cross-sections and profiles;
3. A description and map of vegetation monitoring plots established at the time of planting. Vegetation monitoring plots will be:
 - a. Distributed throughout the mitigation bank.
 - b. Cover at least 10% of the mitigation bank and represent each of the vegetative community types (e.g. cypress sloughs, bottomland hardwoods, wet pine savannah, etc.).
 - c. Be at least 1/10-acre randomized circular plots established using a randomly selected, evenly distributed grid approach.
4. The establishment of a photo point at the center of each monitoring plot, with four photos taken facing outward toward each of the four cardinal directions (north, south, east and west).
5. The installation of soil reduction tubes to provide evidence of soil saturation at selected fixed vegetative monitoring plots.
 - a. be displayed on a map (including GPS coordinates) and presented to the IRT for approval prior to field establishment
 - b. be evenly distributed throughout the mitigation bank, to the maximum extent practicable,
 - c. be installed at a rate of one tube per for every 70 acres of restored bank area, at selected fixed vegetative monitoring plots,
 - d. be painted with one coat of ferrihydrate paint and installed to a minimum depth of 20 inches below the surface leaving a minimum of ½ inch of coating above the surface,
 - e. be considered as providing a positive indicator of sufficient anaerobic and saturation conditions if most of the ferrihydrate paint coating is dissolved,
6. A baseline HGM Functional analysis of the site prior to planting and restoration utilizing the appropriate HGM form in Attachment G of this instrument.
7. Profile of in-stream structures, stream cross-sections, longitudinal stream profiles from permanent monitoring locations, and other relevant baseline information for stream success metrics. Please see required data in restoration plan.
8. Description regarding invasive species prevalence and composition.
9. Professional stamped survey of mitigation area.
10. A survey of cross-sections and profile to establish a baseline will be conducted for stream restoration projects.

14.3 Monitoring Reports:

Monitoring reports shall be provided to the USACE no later than December 15th following the growing seasons in years 1, 3, 5, 8, and 10 so that any corrective measures by the Sponsor may be undertaken. The USACE will distribute the report to the members of the IRT. In the event monitoring reveals that initial standards have not been met, the Sponsor shall take measures to achieve the performance standards the following year. Monitoring, reporting and remedial action shall be conducted in accordance with the following:

1. The Sponsor shall provide a written report to USACE by December 15th to allow for the Sponsor to complete vegetative chemical control, if needed. Reports shall be submitted following the growing seasons in years 1, 3, 5, 8, and 10 documenting the results of the monitoring conducted above. The report shall include, at minimum, the following:
 - a. A United States Geological Survey topographic quadrangle with the TCMB indicated.
 - b. A detailed narrative that summarizes the condition of the TCMB and all maintenance activities.
 - c. Appropriate site maps that show the locations of all sampling plots, permanent photographic stations, soil reduction tubes, and hydrologic monitoring devices or stations.
 - d. Data and analysis regarding the hydrology of the TCMB (e.g., hydroperiod, extent and depth of inundation, groundwater monitoring results, precipitation records, etc.). Additionally, during each monitoring event, all primary and secondary hydrology indicators will be observed and documented for each monitoring plot, as currently defined in the USACE Delineation Manual, Environmental Laboratory, 1987, Corps of Engineers' Wetlands Delineation Manual (and Supplemental Guidance), Technical Report Y-87-1, USACE of Engineers Waterways Experiment Station, Vicksburg, Mississippi.
 - e. Results and analysis of vegetation surveys, including the following: The Sponsor shall conduct surveys of living seedlings on the tract at each monitoring location. Sampling shall be done between April 15th and September 15th. Seedling survival shall be documented by performing monitoring at the vegetative plots indicated in the Restoration Plan. A table will be provided which documents the following for each monitoring plot: monitoring plot identification, latitude, longitude, count of planted trees per plot, height of trees, volunteer tree species per plot, hard mast and soft mast percent, and tree per acre value for each plot. Provide averages over entire site for tree per acre, hard mast/ soft mast ratio. A table should be provided which shows invasive species information for each plot and an estimate of invasive or exotic species over the entire site. Visual estimates of overall percent cover and of percent cover within each stratum of vegetation over the entire bank; species composition; hard mast to soft mast ratio; indices of species diversity; estimates of percent cover of exotic species within each stratum of vegetation present; composition of plant community (wetland indicator status); calculations of survival, density of all trees within

- the monitoring plots (including natural recruitment), diameter or DBH, and height of all planted trees; and estimates of natural recruitment.
- f. Results of surveys of wildlife usage of the site (e.g., observations of amphibians, reptiles, mammals, birds and macro invertebrates on or near the TCMB).
 - g. A discussion of likely causes of observed tree mortality within those plots or areas that did not achieve specified performance standards at Years 3, 5 and 10, or note plots in monitoring reports for Years 1 and 8 which are candidates for corrective measures.
 - h. A completed HGM functional assessment of each planting zone utilizing the appropriate HGM Methodology. The HGM assessment will be utilized to assess the ecological functional lift of the restoration effort. The HGM score for each monitoring event will be compared to the original baseline pre-restoration score, and to the score of the previous monitoring event to determine both overall ecological functional lift and ecological functional lift between monitoring events. The HGM Assessment shall determine a score for the Functional Classification Indices required in the appropriate HGM regional guidebook.
 - i. A drawing based upon the grading plans of the site that depicts topography, sampling plots, cross-sections, and permanent photo stations. Survey data and comparison to as-built data.
 - j. Metrics relating to dimension, pattern and profile performance standards will be submitted and compared to as-built reports.
 - k. Data regarding the hydrology of the bank (e.g. hydroperiod, extent and depth of inundation, precipitation records, etc.).
 - l. Monitoring reports shall present yearly data in tabular and graphical format comparing as-built, target, current and previous years monitoring data, and shall include a discussion of any deviation from as-built, target, or previous year's data. For stream banks with in-stream work, metrics measured should reflect metrics in restoration plan.
2. The Sponsor shall provide funding information on financial assurance mechanisms.
 3. If survival (as determined by sampling or observing high mortality rates within any planting zone) is less than indicated performance standards, the Sponsor shall take appropriate actions, as recommended by the IRT, to address the causes of mortality and shall replace all dead trees with new seedlings of the appropriate species during the following non-growing season. Replanting, in accordance with this paragraph, and monitoring and reporting, as described in paragraphs 1 and 2 of this section, shall occur thereafter as needed to achieve and document the minimum required survival density for five consecutive years.
 4. If tree survival or any other corrective measure is required for the site to meet restoration goals (as documented in monitoring reports), the Sponsor shall develop and implement an adaptive management

plan. This adaptive management plan will be submitted to USACE for approval. Upon approval, any replanting will require the site to be monitored according to monitoring and reporting guidance above until success criteria are met.

5. The Sponsor shall continue monitoring and reporting of each planting effort, in accordance with the Restoration Plan for a minimum of ten (10) years for wetlands/ vegetative work and five (5) years for streams. Annual reports will be provided to USACE for distribution to the IRT members.

15.0 CORRECTIVE ACTIONS

15.1 Contingency Plans/Remedial Actions

In the event the Mitigation Bank fails to achieve any of the short-term or long-term success criteria, the Sponsor shall develop necessary contingency plans and implement appropriate remedial actions for the TCMB in coordination with the IRT. In the event the Sponsor fails to implement necessary remedial actions within 45 calendar days after notification by the USACE of necessary remedial action to address any failure in meeting the criteria, the IRT (acting through the Chair) will notify the Sponsor and the appropriate authorizing agencies and recommend appropriate remedial actions.

15.2 Completion of Corrective Actions

At the request of the Sponsor, the IRT will perform a final compliance visit to determine whether all performance standards have been satisfied. Upon satisfaction of the performance standards, any remaining contingency funds will be released to the Sponsor, if eligible.

15.3 Deficits

If the authorizing agencies determine that the TCMB is operating at a deficit, debiting of credits will immediately cease, and the authorizing agencies, in consultation with the IRT and the Sponsor, will determine what remedial actions are necessary to correct the situation. As determined by the Chair, in coordination with the IRT and the Sponsor, if conditions at the TCMB continue to deteriorate or do not improve within a reasonable time frame from the date that the need for remediation was first identified in writing to the Sponsor by the Chair of the IRT, the Construction Account Funds and the Long-Term Management Account shall be transferred from the identified Financial Institution to the Vicksburg District and will be used to undertake corrective measures in accordance with IRT specifications.

15.4 Non-Compliance

In the event the Sponsor does not comply with the mitigation covenant/conservation easement, the Sponsor will be required to immediately perform corrective actions (e.g., replanting and repair or replacement of water control structures). The USACE will then convene a meeting with the Sponsor and the IRT to determine if a

reassessment of the management or mitigation potential is necessary. At that time, the IRT may choose to stop use of the bank until corrective action has occurred. If remedial action is not taken within one year, the IRT will cease recognition of the TCMB, and the Sponsor will be required to implement mitigation, as approved by the USACE, to replace all mitigation which had been performed at the TCMB but was not successful. Alternatively, if placed in default, failure by the Sponsor to replace mitigation will result in forfeiture of the portion of the letter of credit or funds pertaining to the tract(s) for which the Sponsor has been placed in default.

15.5 Adjustment of Mitigation Potential

The management or mitigation potential may be adjusted by the IRT at any time should any activity adversely affect the value or functioning of the TCMB. Any adjustments to the management or mitigation potential will apply only to unsold credit acreage within the bank. If all credits have been sold, then other means of corrective action will be taken within the bank and will not affect those tracts that have already been debited.

15.6 Force Majeure

Force majeure damage, including natural disasters or any other “Act of God”, will remain the responsibility of the Sponsor until the short-term bottomland hardwood success criteria have been met. If the IRT determines that a Force Majeure event has occurred, and that event affects the long-term viability of the Bank, the IRT can require appropriate measures be taken by the Sponsor to implement corrections that may be funded by a release of funds from the construction account or interest earnings from the long-term endowment.

16.0 CONCLUSION

In summary, establishment of a 275.56-acre tract within the TCMB will include 274.43 acres of land in which rehabilitation, enhancement, and preservation activities are proposed. Bottomland hardwood wetland activities will consist of 96.09 acres of rehabilitation, 9.01 acres of non-bedded pine dominant wetland enhancement, 9.16 acres of degraded cypress/tupelo swamp enhancement, and 15.61 acres of preservation. Stream activities will consist of 14.78 acres (16,041.13 linear feet) of preservation of Three Creeks, and 17.05 acres (2,638.7 linear feet) of instream construction and riparian buffer rehabilitation to restore the hydrology to two, intermittent tributaries of Three Creeks. In addition to the instream construction and riparian buffer rehabilitation corridor associated with the two, intermittent tributaries of Three Creeks, additional riparian buffer activities will consist of 35.53 acres (7,195.32 linear feet) of stream buffer bottomland hardwood rehabilitation, 5.19 acres (1,051.05 linear feet) of stream buffer bottomland hardwood enhancement, and 32.72 acres (6,626.26 linear feet) of stream buffer bottomland hardwood preservation. Upland buffer activities will consist of 31.70 acres of rehabilitation and 1.82 acres of preservation. Upland stream buffer activities will consist of 2.38 acres (481.98 linear feet) of rehabilitation and 3.39 acres (686.52 linear feet) of preservation. Remaining acreage associated with the TCMB, not proposed for rehabilitation, enhancement, and preservation activities includes 1.13 acres of roads.

17.0 REFERENCES

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss. Technical Report Y-87-1. 207 p.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/> Accessed [3/06/2018].

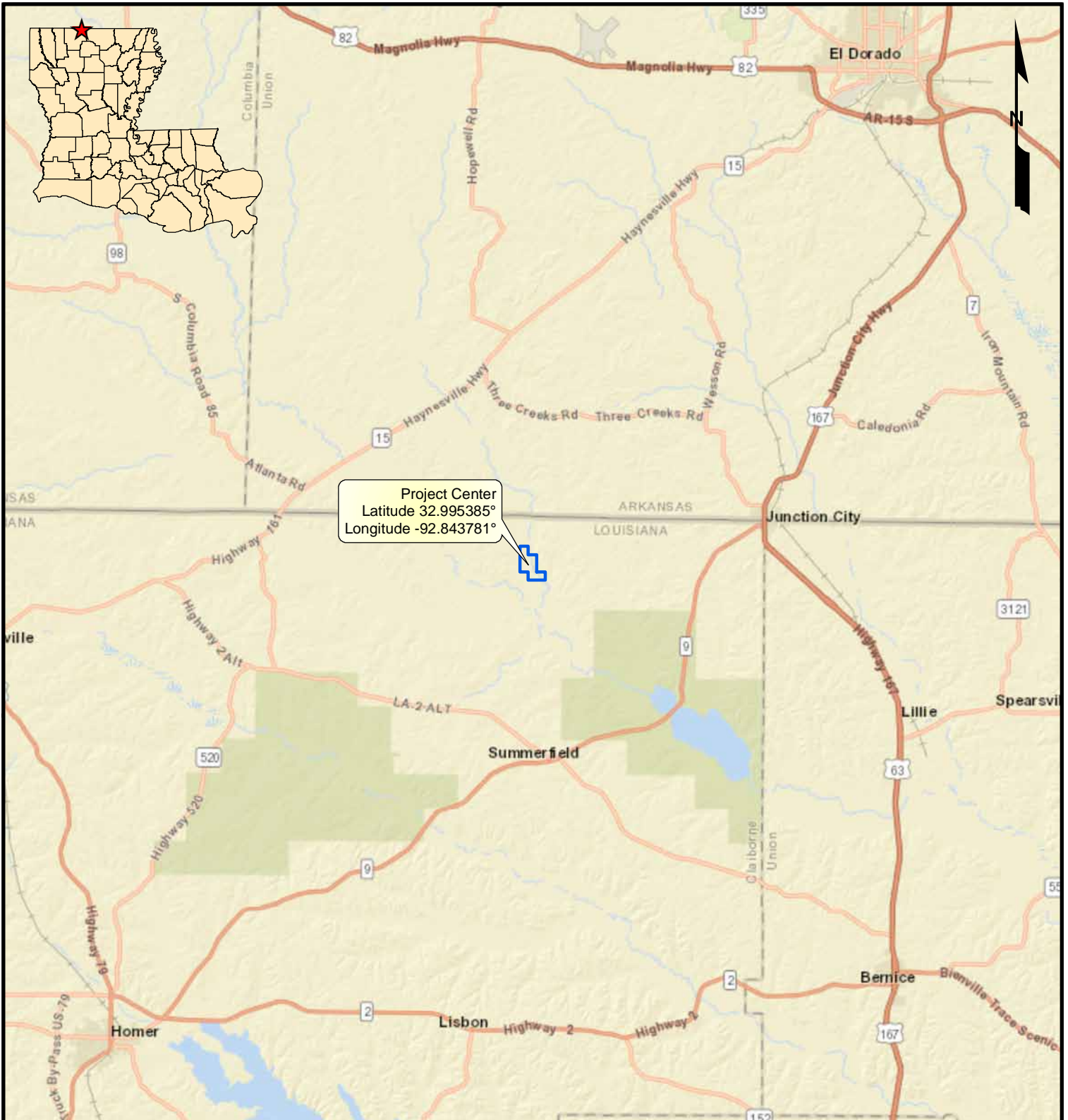
United States Army Corps of Engineers. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0)*, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-08-30. Vicksburg, MS: U. S. Army Engineering Research and Development Center.

United States Department of Agriculture, Soil Conservation Service. 1907. *Soil Survey of Claiborne Parish, Louisiana*.

United States Department of Agriculture, Soil Conservation Service. 1980. *Soil Survey of Claiborne Parish, Louisiana*.

United States Environmental Protection Agency, Summary Table: Characteristics of the Ecoregions of Louisiana (Ecoregion 35a). Available online at http://www.epa.gov/wed/pages/ecoregions/la_eco.htm Accessed [4/23/2015]

FIGURES



Project Center
 Latitude 32.995385°
 Longitude -92.843781°

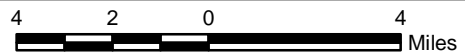
Legend

 Three Creeks Mitigation Bank (275.56 acres)

Vicinity Map

Mitigation Bank Prospectus
 Claiborne Parish, Louisiana

Peace River Mitigation, LLC
 Three Creeks Mitigation Bank

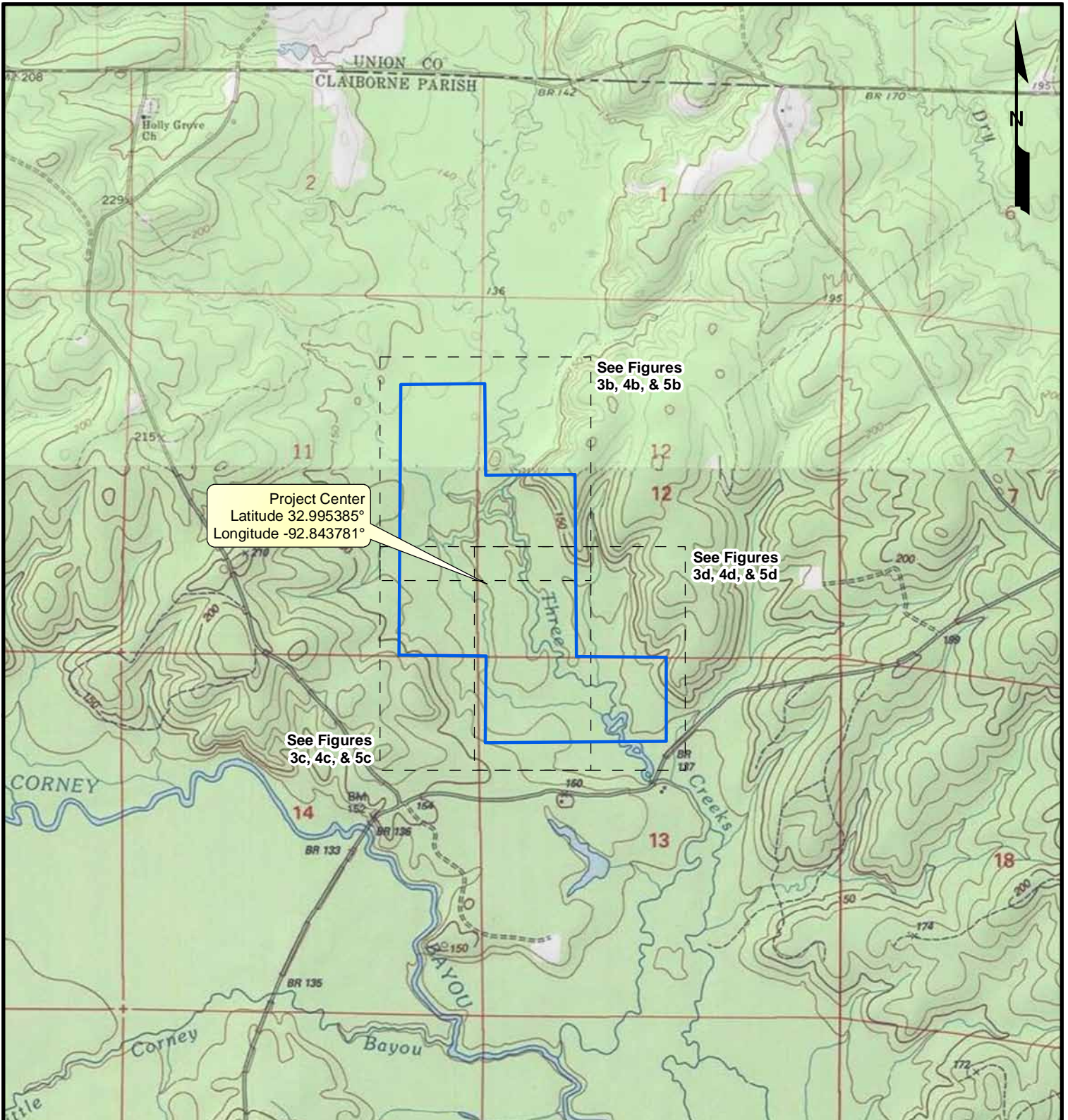


MATRIXNEWORLD
 Engineering Progress

| | |
|-------------|-------------|
| Approved By | LAW |
| Date | 3/5/2018 |
| Drawing No. | 17-345-A010 |

1
 Figure No.

Source: Base map comprised of ESRI StreetMap USA data.



Legend

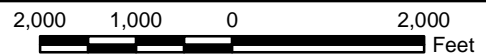
- Three Creeks Mitigation Bank (275.56 acres)
- Site Plan Index

Site Location Map

Mitigation Bank Prospectus
Claiborne Parish, Louisiana

Peace River Mitigation, LLC

Three Creeks Mitigation Bank



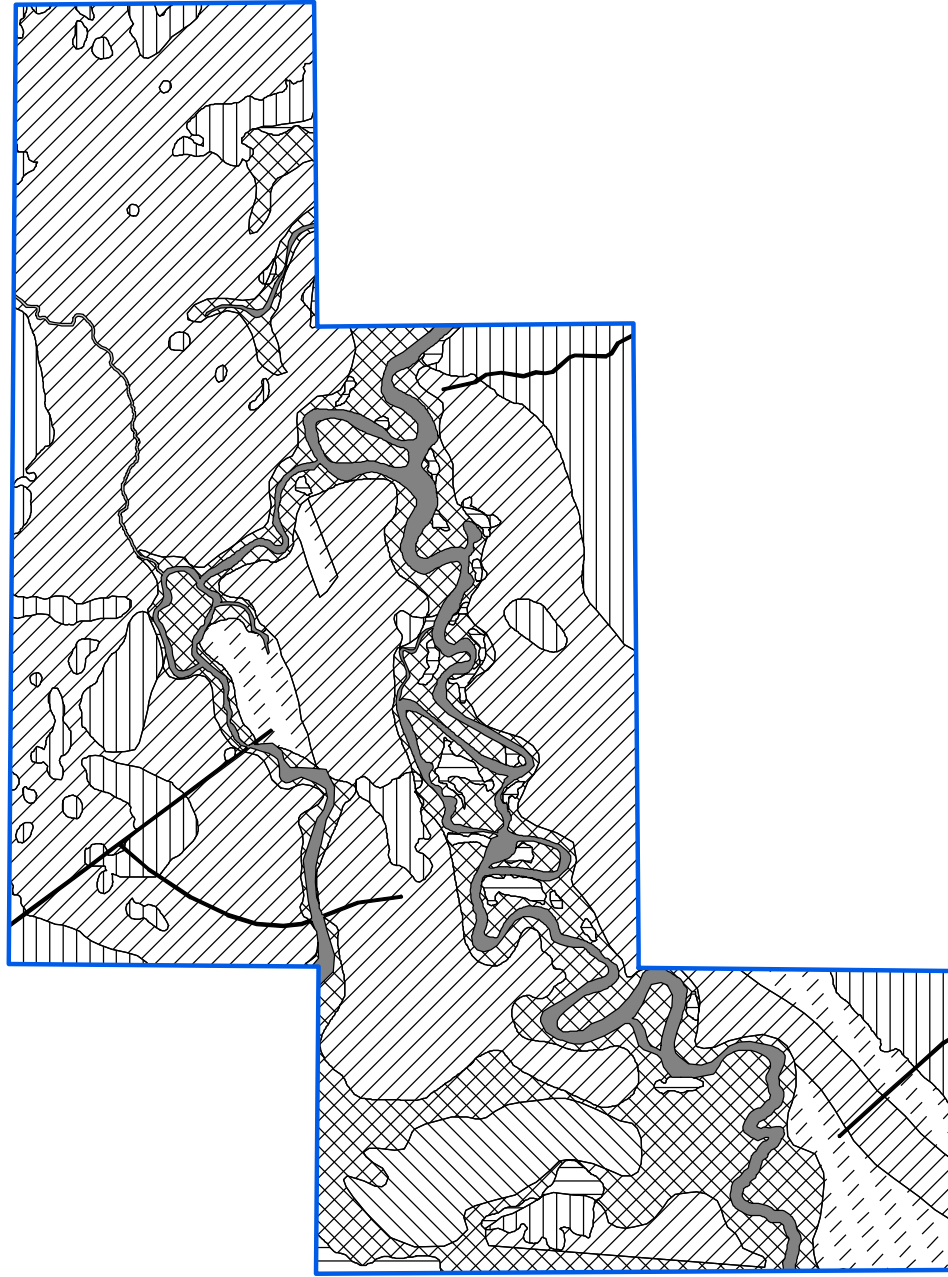
MATRIXNEWORLD
Engineering Progress

| | |
|-------------|-------------|
| Approved By | LAW |
| Date | 3/7/2018 |
| Drawing No. | 17-345-A011 |

2





Figure No.

Source: Base map comprised of U.S.G.S. 7.5-minute topographic map(s), "Summerfield, LA" dated 1986; and "Wesson, AR-LA" dates 1971, photoinspected 1976 .



New Home Road

Legend

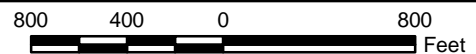
-  Three Creeks Mitigation Bank (275.56 acres)
-  Bottomland Hardwood Wetlands (48.69 acres)
-  Bedded Pine Dominant Wetlands (146.20 acres)
-  Non-Bedded Pine Dominant Wetlands (14.20 acres)
-  Degraded Cypress/Tupelo Swamp (9.16 acres)
-  Hardwood Dominant Uplands (5.26 acres)
-  Pine Dominant Uplands (35.75 acres)
-  Three Creeks (14.78 acres)
-  Intermittent Tributary to Three Creeks #1 (0.39 acre)
-  Existing Roads (1.13 acres)

Pre-Restoration Site Plan

Mitigation Bank Prospectus
Claiborne Parish, Louisiana

Peace River Mitigation, LLC

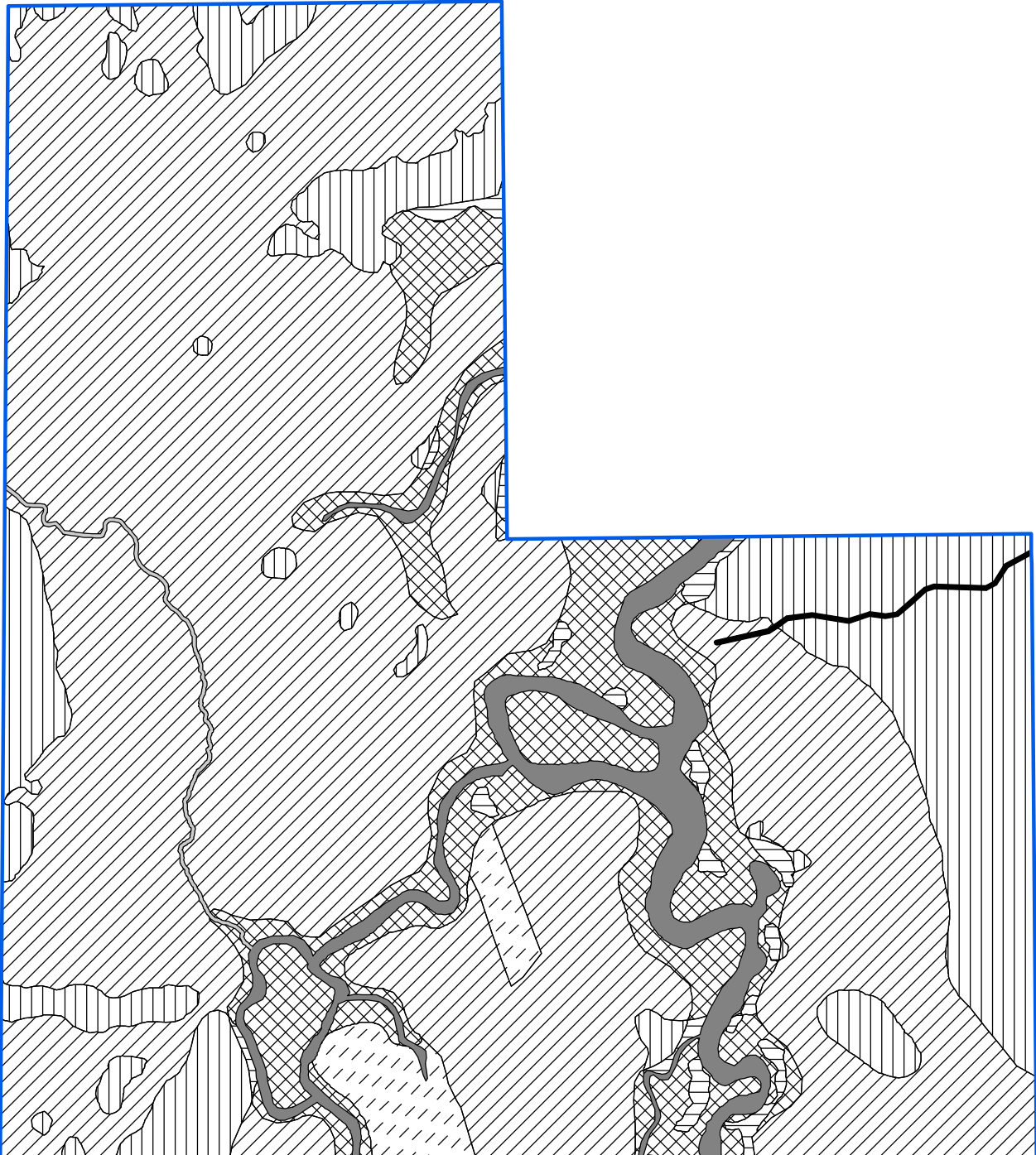
Three Creeks Mitigation Bank





MATRIXNEWORLD
Engineering Progress

| | |
|-------------|-------------|
| Approved By | LAW |
| Date | 3/19/2018 |
| Drawing No. | 17-345-A012 |

3a
Figure No.



Legend

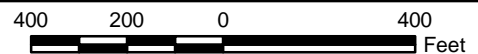
-  Three Creeks Mitigation Bank (275.56 acres)
-  Bottomland Hardwood Wetlands (48.69 acres)
-  Bedded Pine Dominant Wetlands (146.20 acres)
-  Non-Bedded Pine Dominant Wetlands (14.20 acres)
-  Degraded Cypress/Tupelo Swamp (9.16 acres)
-  Hardwood Dominant Uplands (5.26 acres)
-  Pine Dominant Uplands (35.75 acres)
-  Three Creeks (14.78 acres)
-  Intermittent Tributary to Three Creeks #1 (0.39 acre)
-  Existing Roads (1.13 acres)

Pre-Restoration Site Plan

Mitigation Bank Prospectus
Claiborne Parish, Louisiana

Peace River Mitigation, LLC

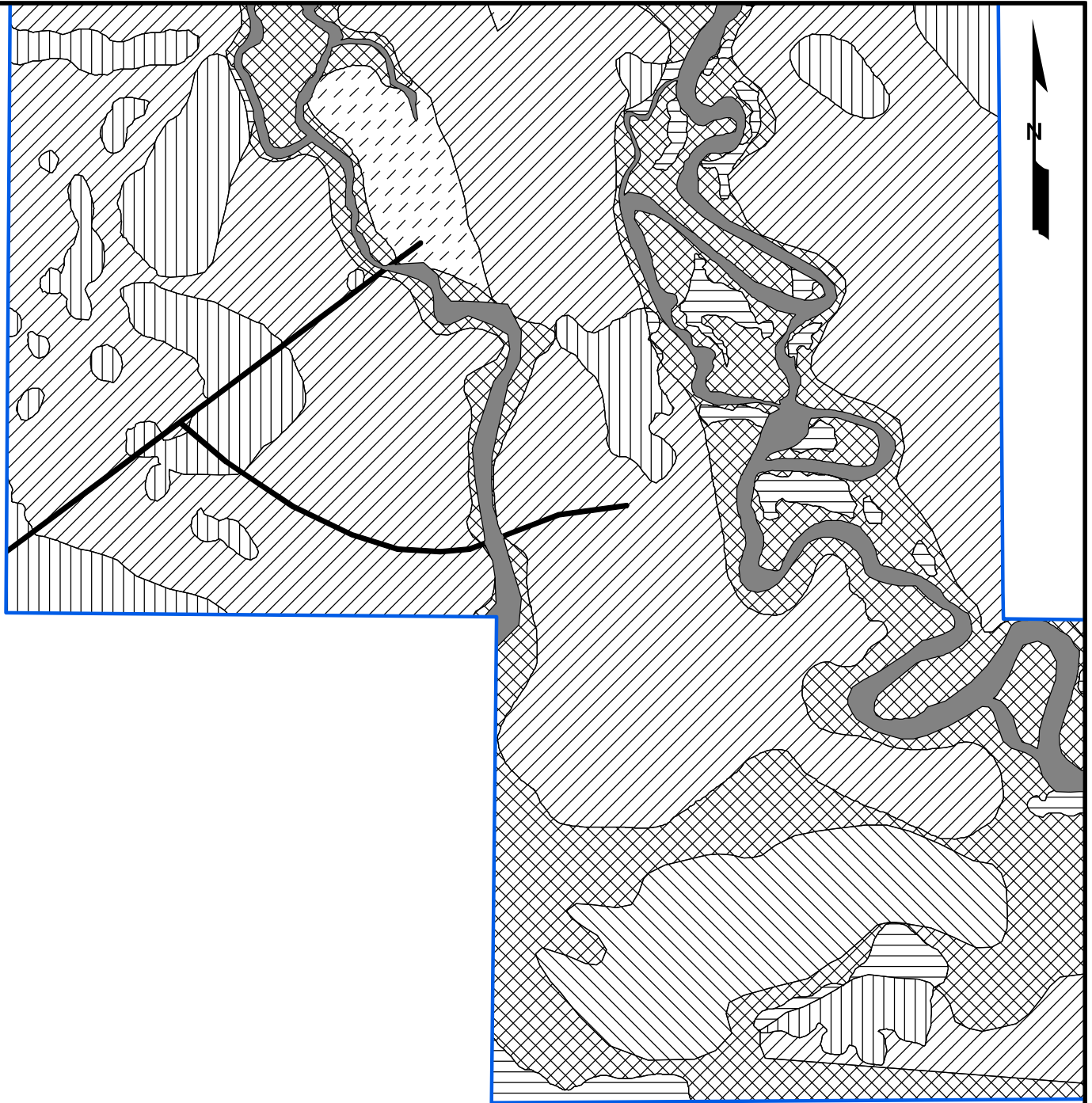
Three Creeks Mitigation Bank









MATRIXNEWORLD
Engineering Progress

| | |
|-------------|-------------|
| Approved By | LAW |
| Date | 3/6/2018 |
| Drawing No. | 17-345-A013 |

3b
Figure No.



Legend

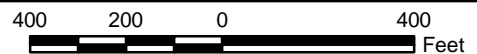
-  Three Creeks Mitigation Bank (275.56 acres)
-  Bottomland Hardwood Wetlands (48.69 acres)
-  Bedded Pine Dominant Wetlands (146.20 acres)
-  Non-Bedded Pine Dominant Wetlands (14.20 acres)
-  Degraded Cypress/Tupelo Swamp (9.16 acres)
-  Hardwood Dominant Uplands (5.26 acres)
-  Pine Dominant Uplands (35.75 acres)
-  Three Creeks (14.78 acres)
-  Intermittent Tributary to Three Creeks #1 (0.39 acre)
-  Existing Roads (1.13 acres)

Pre-Restoration Site Plan

Mitigation Bank Prospectus
Claiborne Parish, Louisiana

Peace River Mitigation, LLC

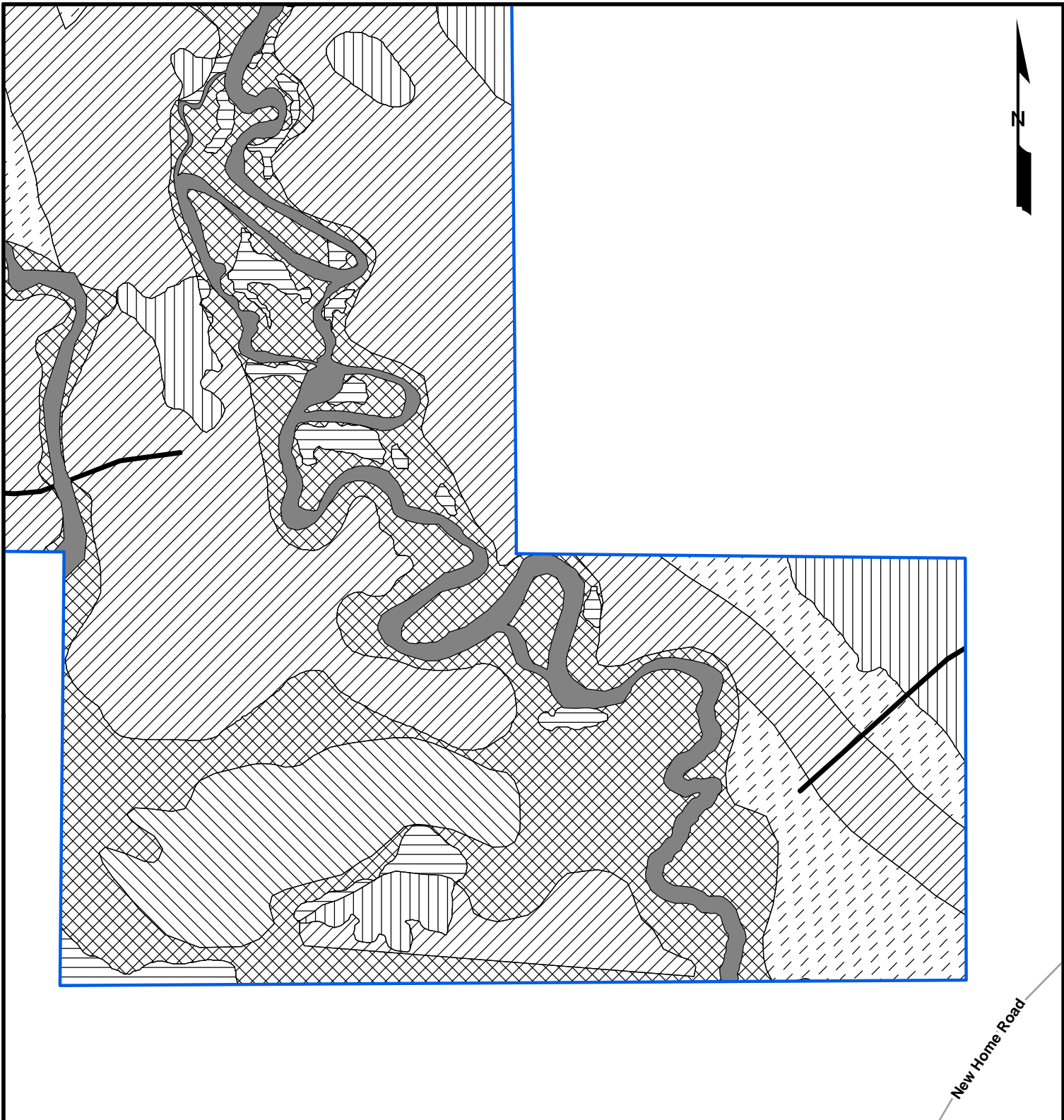
Three Creeks Mitigation Bank



MATRIXNEWORLD
Engineering Progress

| | |
|-------------|-------------|
| Approved By | LAW |
| Date | 3/6/2018 |
| Drawing No. | 17-345-A013 |

3c
Figure No.



Legend

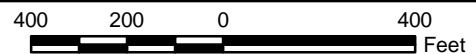
- Three Creeks Mitigation Bank (275.56 acres)
- Bottomland Hardwood Wetlands (48.69 acres)
- Bedded Pine Dominant Wetlands (146.20 acres)
- Non-Bedded Pine Dominant Wetlands (14.20 acres)
- Degraded Cypress/Tupelo Swamp (9.16 acres)
- Hardwood Dominant Uplands (5.26 acres)
- Pine Dominant Uplands (35.75 acres)
- Three Creeks (14.78 acres)
- Intermittent Tributary to Three Creeks #1 (0.39 acre)
- Existing Roads (1.13 acres)

Pre-Restoration Site Plan

Mitigation Bank Prospectus
Claiborne Parish, Louisiana

Peace River Mitigation, LLC

Three Creeks Mitigation Bank

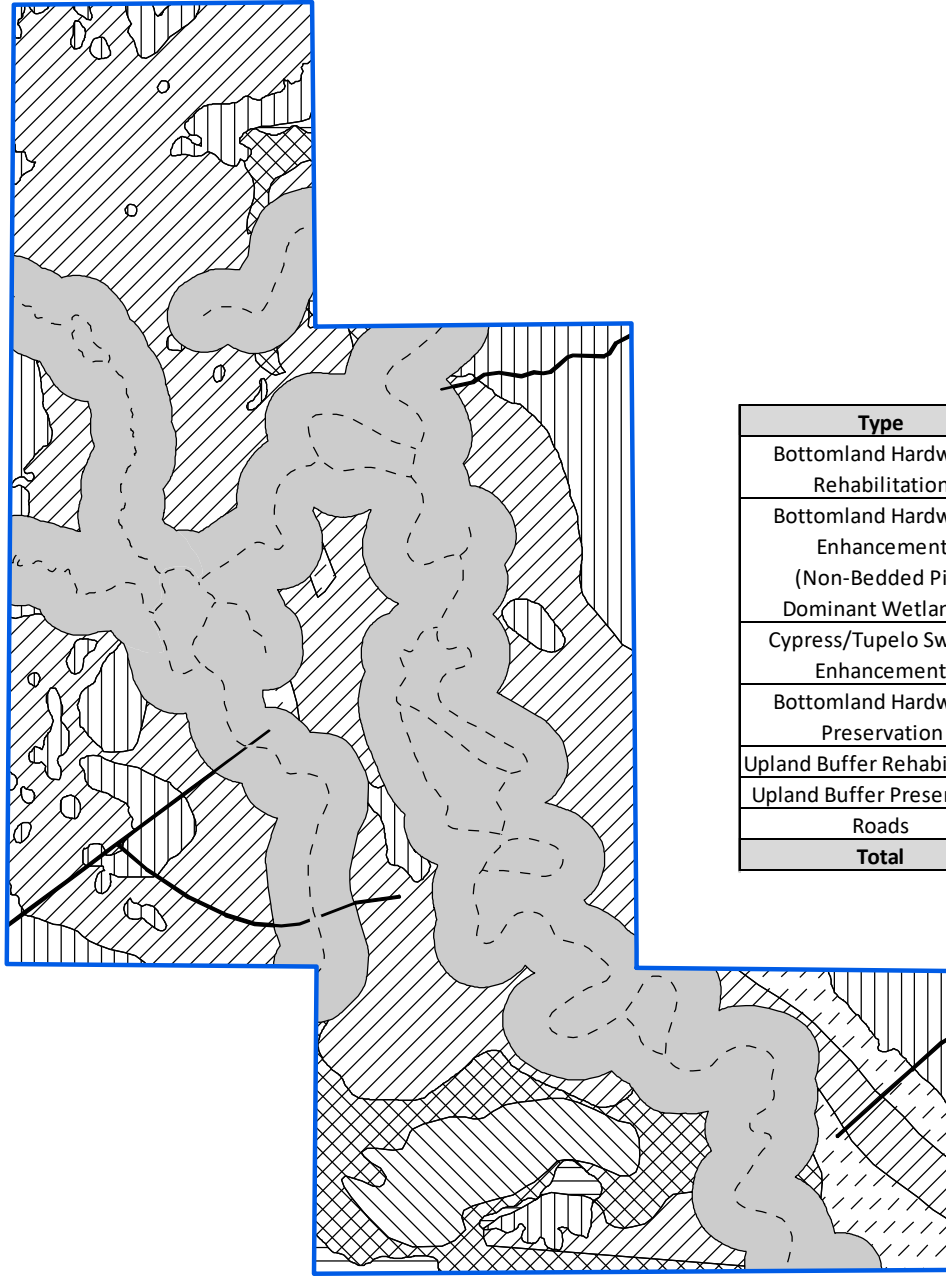


MATRIX**NEW****WORLD**
Engineering Progress

| | |
|-------------|-------------|
| Approved By | LAW |
| Date | 3/6/2018 |
| Drawing No. | 17-345-A013 |

3d
Figure No.

New Home Road



| Type | Acreage |
|---|---------------|
| Bottomland Hardwood Rehabilitation | 96.09 |
| Bottomland Hardwood Enhancement (Non-Bedded Pine Dominant Wetlands) | 9.01 |
| Cypress/Tupelo Swamp Enhancement | 9.16 |
| Bottomland Hardwood Preservation | 15.61 |
| Upland Buffer Rehabilitation | 31.70 |
| Upland Buffer Preservation | 1.82 |
| Roads | 1.13 |
| Total | 164.52 |

Legend

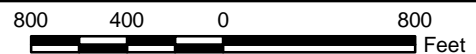
- Three Creeks Mitigation Bank (275.56 acres)
- Bottomland Hardwood Rehabilitation (Bedded Pine Dominant Wetlands)
- Bottomland Hardwood Enhancement (Non-Bedded Pine Dominant Wetlands)
- Cypress/Tupelo Swamp Enhancement
- Bottomland Hardwood Preservation
- Upland Buffer Rehabilitation
- Upland Buffer Preservation
- Existing Roads
- Stream Centerline
- Streams and Stream Buffers (See Figures 5a-5d)

**Post-Restoration Site Plan
Wetlands**

Mitigation Bank Prospectus
Claiborne Parish, Louisiana

Peace River Mitigation, LLC

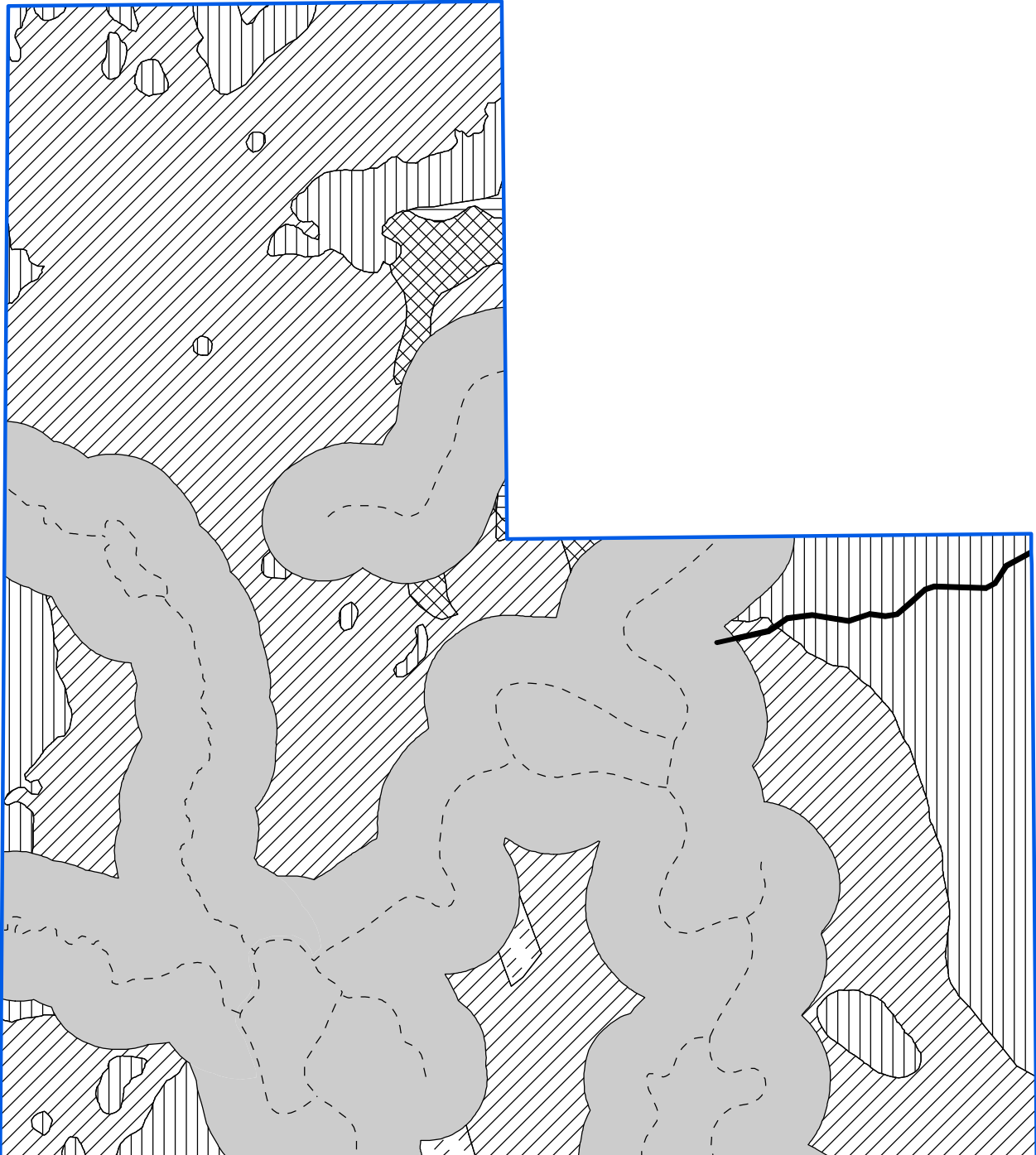
Three Creeks Mitigation Bank



MATRIXNEWORLD
Engineering Progress

| | |
|-------------|-------------|
| Approved By | LAW |
| Date | 3/19/2018 |
| Drawing No. | 17-345-A014 |

4a
Figure No.



Legend

- Three Creeks Mitigation Bank (275.56 acres)
- Bottomland Hardwood Rehabilitation (Bedded Pine Dominant Wetlands)
- Bottomland Hardwood Enhancement (Non-Bedded Pine Dominant Wetlands)
- Cypress/Tupelo Swamp Enhancement
- Bottomland Hardwood Preservation
- Upland Buffer Rehabilitation
- Upland Buffer Preservation
- Existing Roads
- Stream Centerline
- Streams and Stream Buffers (See Figures 5a-5d)

**Post-Restoration Site Plan
Wetlands**

Mitigation Bank Prospectus
Claiborne Parish, Louisiana

Peace River Mitigation, LLC

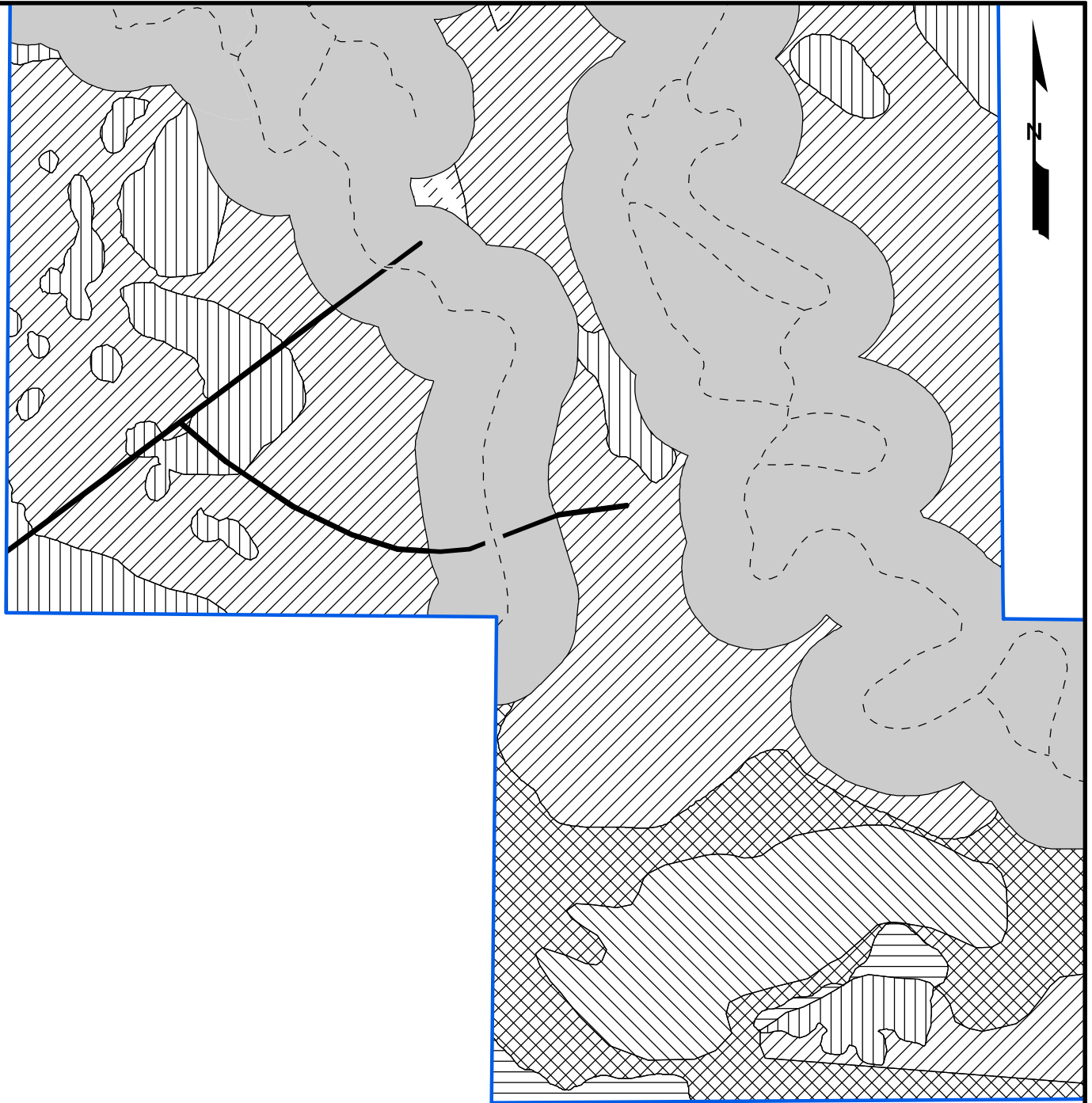
Three Creeks Mitigation Bank













MATRIXNEWORLD
Engineering Progress

| | |
|-------------|-------------|
| Approved By | LAW |
| Date | 3/19/2018 |
| Drawing No. | 17-345-A015 |

4b
Figure No.



Legend

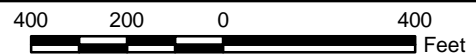
-  Three Creeks Mitigation Bank (275.56 acres)
-  Bottomland Hardwood Rehabilitation (Bedded Pine Dominant Wetlands)
-  Bottomland Hardwood Enhancement (Non-Bedded Pine Dominant Wetlands)
-  Cypress/Tupelo Swamp Enhancement
-  Bottomland Hardwood Preservation
-  Upland Buffer Rehabilitation
-  Upland Buffer Preservation
-  Existing Roads
-  Stream Centerline
-  Streams and Stream Buffers (See Figures 5a-5d)

**Post-Restoration Site Plan
Wetlands**

Mitigation Bank Prospectus
Claiborne Parish, Louisiana

Peace River Mitigation, LLC

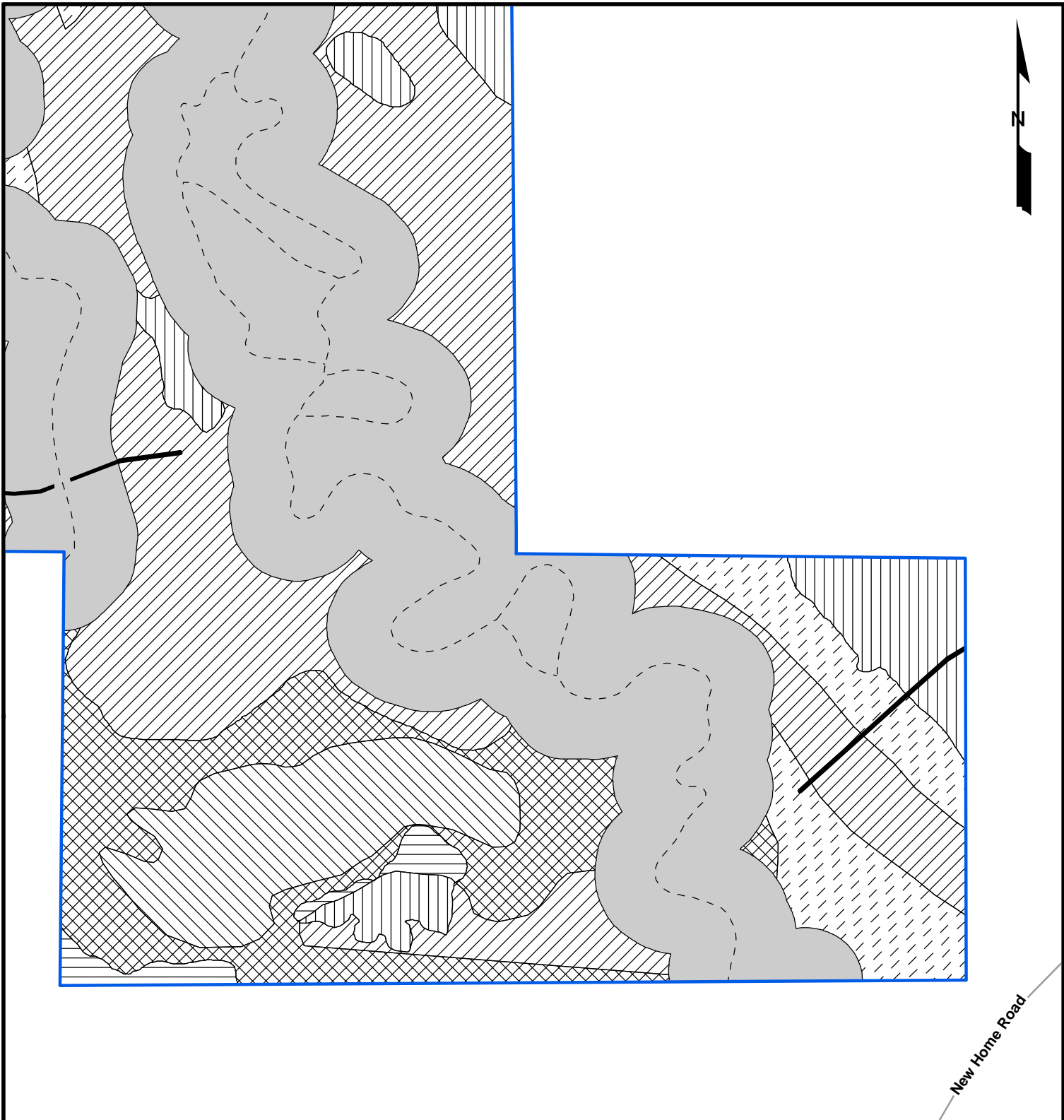
Three Creeks Mitigation Bank



MATRIXNEWORLD
Engineering Progress

| | |
|-------------|-------------|
| Approved By | LAW |
| Date | 3/19/2018 |
| Drawing No. | 17-345-A015 |

4c
Figure No.



Legend

- Three Creeks Mitigation Bank (275.56 acres)
- Bottomland Hardwood Rehabilitation (Bedded Pine Dominant Wetlands)
- Bottomland Hardwood Enhancement (Non-Bedded Pine Dominant Wetlands)
- Cypress/Tupelo Swamp Enhancement
- Bottomland Hardwood Preservation
- Upland Buffer Rehabilitation
- Upland Buffer Preservation
- Existing Roads
- Stream Centerline
- Streams and Stream Buffers (See Figures 5a-5d)

**Post-Restoration Site Plan
Wetlands**

Mitigation Bank Prospectus
Claiborne Parish, Louisiana

Peace River Mitigation, LLC

Three Creeks Mitigation Bank



MATRIXNEWORLD
Engineering Progress

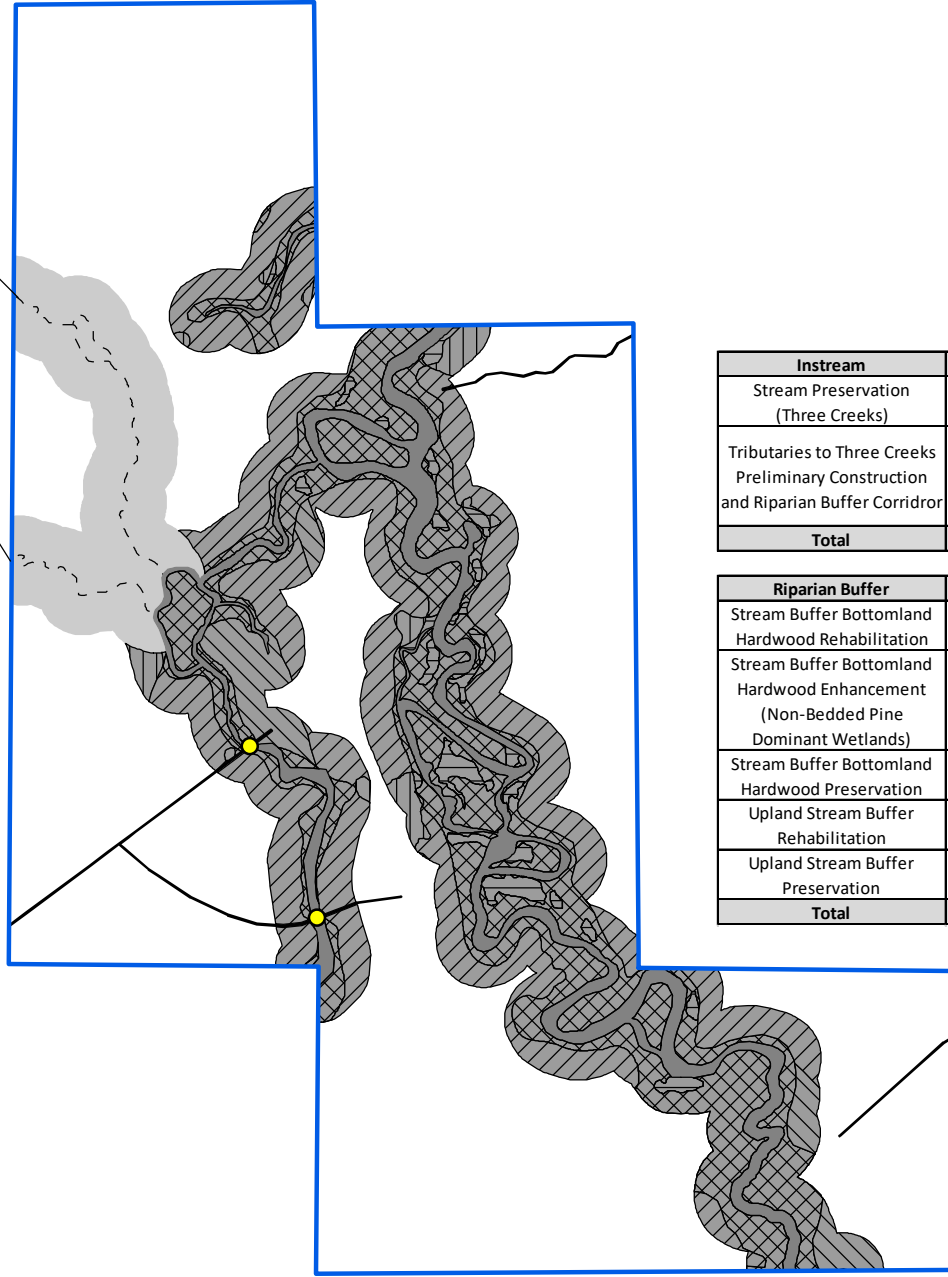
| | |
|-------------|-------------|
| Approved By | LAW |
| Date | 3/19/2018 |
| Drawing No. | 17-345-A015 |

4d
Figure No.



Intermittent Tributary to Three Creeks #1

Intermittent Tributary to Three Creeks #2



| Instream | Acreage | Linear Footage |
|---|--------------|------------------|
| Stream Preservation (Three Creeks) | 14.78 | 16,041.13 |
| Tributaries to Three Creeks Preliminary Construction and Riparian Buffer Corridor | 17.05 | 2,638.70 |
| Total | 31.83 | 18,679.83 |

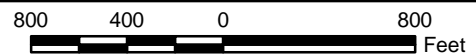
| Riparian Buffer | Acreage | Linear Footage |
|---|--------------|------------------|
| Stream Buffer Bottomland Hardwood Rehabilitation | 35.53 | 7,195.32 |
| Stream Buffer Bottomland Hardwood Enhancement (Non-Bedded Pine Dominant Wetlands) | 5.19 | 1,051.05 |
| Stream Buffer Bottomland Hardwood Preservation | 32.72 | 6,626.26 |
| Upland Stream Buffer Rehabilitation | 2.38 | 481.98 |
| Upland Stream Buffer Preservation | 3.39 | 686.52 |
| Total | 79.21 | 16,041.13 |

Legend

- Three Creeks Mitigation Bank (275.56 acres)
- Stream Buffer Bottomland Hardwood Rehabilitation
- Stream Buffer Bottomland Hardwood Enhancement (Non-Bedded Pine Dominant Wetlands)
- Stream Buffer Bottomland Hardwood Preservation
- Upland Stream Buffer Rehabilitation
- Upland Stream Buffer Preservation
- Stream Preservation (Three Creeks)
- Intermittent Tributaries to Three Creeks
- Tributaries to Three Creeks Preliminary Construction and Riparian Buffer Corridor
- Existing Roads
- Proposed Low Water Crossing

**Post-Restoration Site Plan
Streams and Stream Buffers
Mitigation Bank Prospectus
Claiborne Parish, Louisiana**

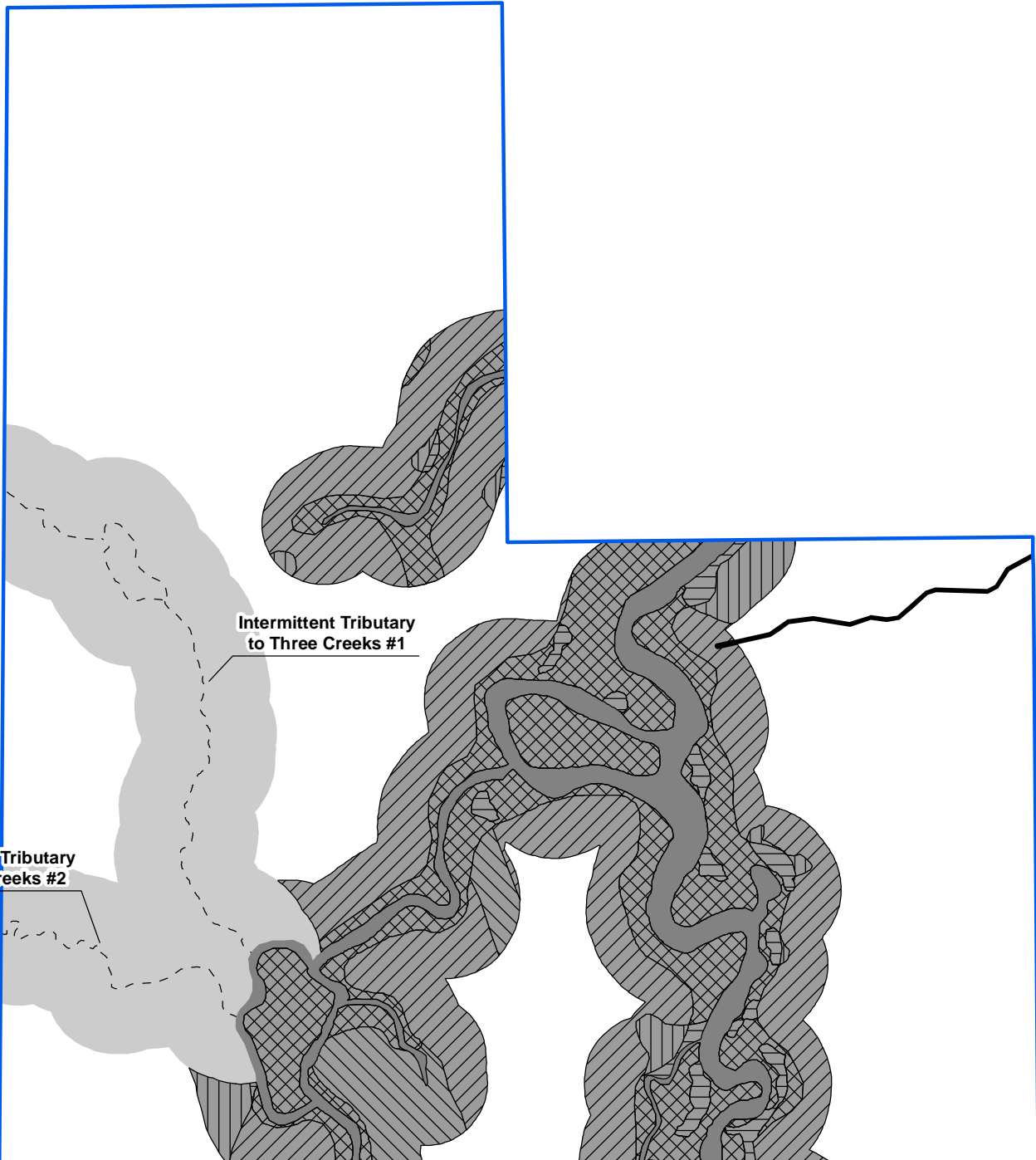
Peace River Mitigation, LLC
Three Creeks Mitigation Bank














MATRIXNEWORLD
Engineering Progress

| | |
|-------------|-------------|
| Approved By | LAW |
| Date | 3/19/2018 |
| Drawing No. | 17-345-A016 |

5a
Figure No.

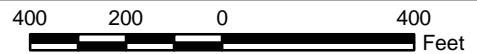


Legend

-  Three Creeks Mitigation Bank (275.56 acres)
-  Stream Buffer Bottomland Hardwood Rehabilitation
-  Stream Buffer Bottomland Hardwood Enhancement (Non-Bedded Pine Dominant Wetlands)
-  Stream Buffer Bottomland Hardwood Preservation
-  Upland Stream Buffer Rehabilitation
-  Upland Stream Buffer Preservation
-  Stream Preservation (Three Creeks)
-  Intermittent Tributaries to Three Creeks
-  Tributaries to Three Creeks Preliminary Construction and Riparian Buffer Corridor
-  Existing Roads
-  Proposed Low Water Crossing

**Post-Restoration Site Plan
Streams and Stream Buffers
Mitigation Bank Prospectus
Claiborne Parish, Louisiana**

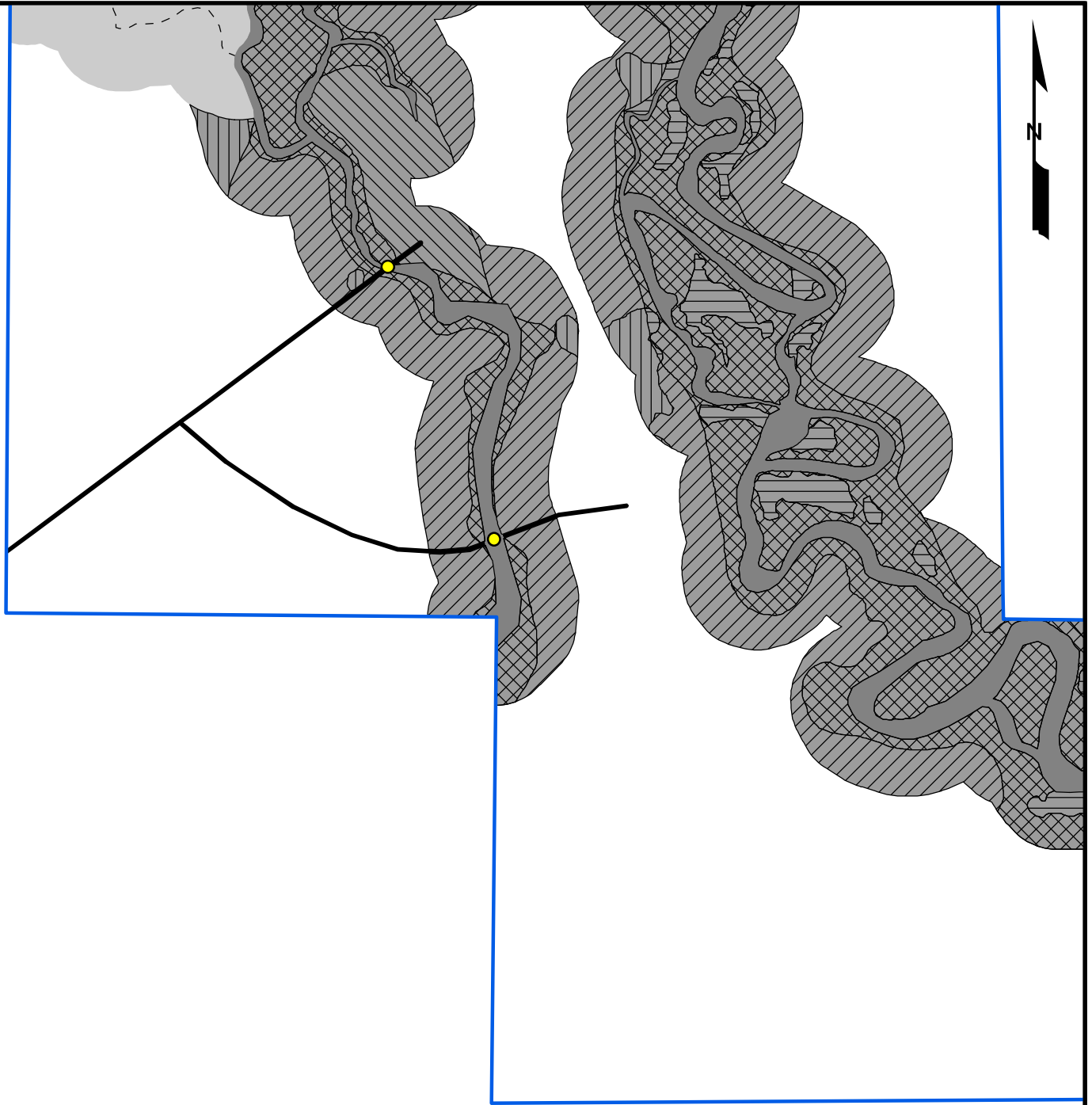
Peace River Mitigation, LLC
Three Creeks Mitigation Bank














MATRIXNEWORLD
Engineering Progress

| | |
|-------------|-------------|
| Approved By | LAW |
| Date | 3/19/2018 |
| Drawing No. | 17-345-A017 |

5b
Figure No.

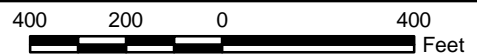


Legend

-  Three Creeks Mitigation Bank (275.56 acres)
-  Stream Buffer Bottomland Hardwood Rehabilitation
-  Stream Buffer Bottomland Hardwood Enhancement (Non-Bedded Pine Dominant Wetlands)
-  Stream Buffer Bottomland Hardwood Preservation
-  Upland Stream Buffer Rehabilitation
-  Upland Stream Buffer Preservation
-  Stream Preservation (Three Creeks)
-  Intermittent Tributaries to Three Creeks
-  Tributaries to Three Creeks Preliminary Construction and Riparian Buffer Corridor
-  Existing Roads
-  Proposed Low Water Crossing

**Post-Restoration Site Plan
Streams and Stream Buffers
Mitigation Bank Prospectus
Claiborne Parish, Louisiana**

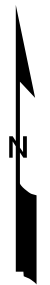
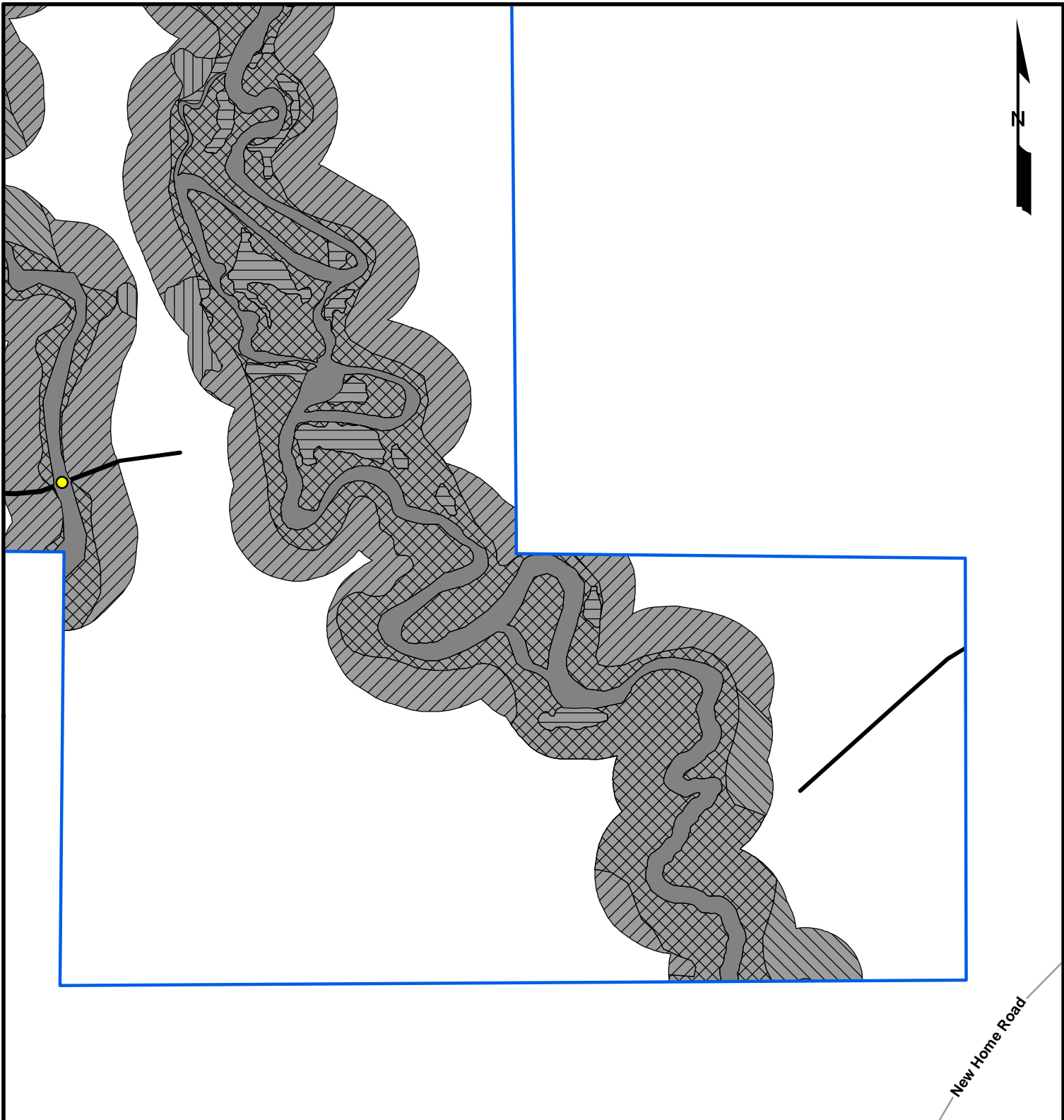
Peace River Mitigation, LLC
Three Creeks Mitigation Bank



MATRIXNEWORLD
Engineering Progress

| | |
|-------------|-------------|
| Approved By | LAW |
| Date | 3/19/2018 |
| Drawing No. | 17-345-A017 |

5c
Figure No.



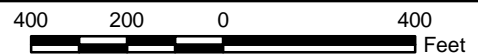
New Home Road

Legend

- Three Creeks Mitigation Bank (275.56 acres)
- Stream Buffer Bottomland Hardwood Rehabilitation
- Stream Buffer Bottomland Hardwood Enhancement (Non-Bedded Pine Dominant Wetlands)
- Stream Buffer Bottomland Hardwood Preservation
- Upland Stream Buffer Rehabilitation
- Upland Stream Buffer Preservation
- Stream Preservation (Three Creeks)
- Intermittent Tributaries to Three Creeks
- Tributaries to Three Creeks Preliminary Construction and Riparian Buffer Corridor
- Existing Roads
- Proposed Low Water Crossing

**Post-Restoration Site Plan
Streams and Stream Buffers
Mitigation Bank Prospectus
Claiborne Parish, Louisiana**

Peace River Mitigation, LLC
Three Creeks Mitigation Bank



MATRIXNEWORLD
Engineering Progress

| | |
|-------------|-------------|
| Approved By | LAW |
| Date | 3/19/2018 |
| Drawing No. | 17-345-A017 |

5d
Figure No.



Legend

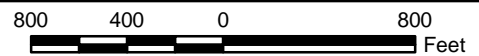
 Three Creeks Mitigation Bank (275.56 acres)

1949 Aerial Photograph

Mitigation Bank Prospectus
Claiborne Parish, Louisiana

Peace River Mitigation, LLC

Three Creeks Mitigation Bank



MATRIXNEWORLD
Engineering Progress

| | |
|-------------|-------------|
| Approved By | LAW |
| Date | 3/7/2018 |
| Drawing No. | 17-345-A018 |

6

Figure No.

Source: U.S. Geological Survey (U.S.G.S). Aerial Single Frame Photo ID: ARA000690241566 [aerial photo]. Sioux Falls, S. Dak.: EROS Data Center, November 20, 1949.



Legend

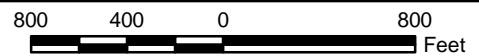
 Three Creeks Mitigation Bank (275.56 acres)

1981 Aerial Photograph

Mitigation Bank Prospectus
Claiborne Parish, Louisiana

Peace River Mitigation, LLC

Three Creeks Mitigation Bank



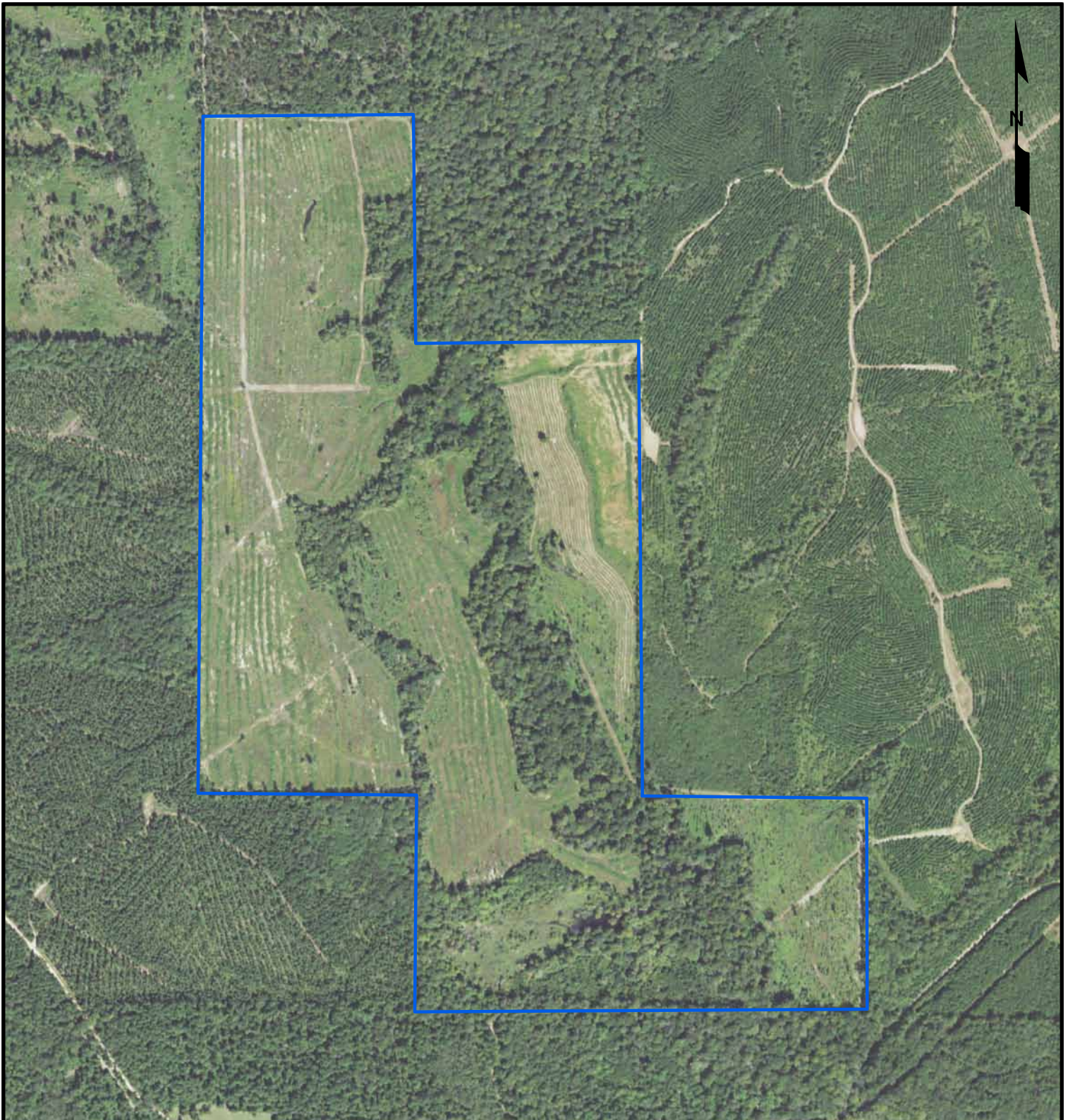
MATRIXNEWORLD
Engineering Progress

| | |
|-------------|-------------|
| Approved By | LAW |
| Date | 3/7/2018 |
| Drawing No. | 17-345-A019 |

7

Figure No.

Source: U.S. Geological Survey (U.S.G.S). Aerial Single Frame Photo ID: AR1VEWB00040003 [aerial photo]. Sioux Falls, S. Dak.: EROS Data Center, March 20, 1981.



Legend

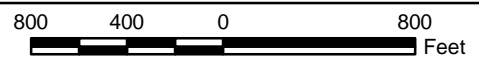
 Three Creeks Mitigation Bank (275.56 acres)

2017 Aerial Photograph

Mitigation Bank Prospectus
Claiborne Parish, Louisiana

Peace River Mitigation, LLC

Three Creeks Mitigation Bank



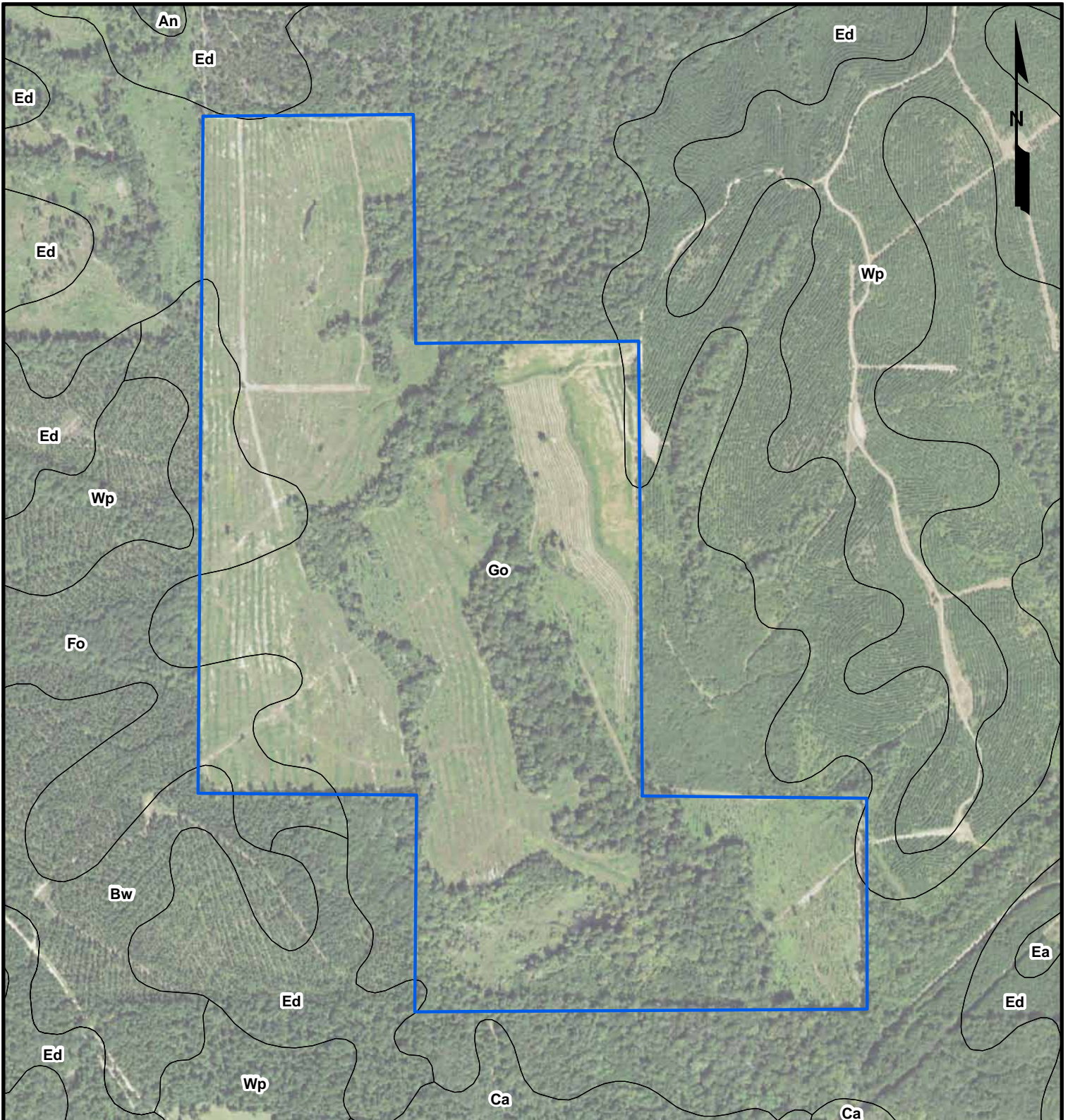
MATRIXNEWORLD
Engineering Progress

| | |
|-------------|-------------|
| Approved By | LAW |
| Date | 3/7/2018 |
| Drawing No. | 17-345-A020 |

8

Figure No.

Source: Base map comprised of 2017 aerial photograph from USDA/FSA Aerial Photography Field Office, National Agriculture Imagery Program (NAIP).



Legend

Three Creeks Mitigation Bank (275.56 acres)

Soils

- Bw - Bowie fine sandy loam, 1 to 5 percent slopes
- Ed - Eastwood very fine sandy loam, 5 to 12 percent slopes
- Fo - Flo loamy fine sand, 5 to 12 percent slopes
- Go - Guyton-Ouachita silt loams, frequently flooded

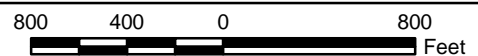
Source: Base map comprised of 2017 aerial photograph from USDA/FSA Aerial Photography Field Office, National Agriculture Imagery Program (NAIP). Soils data obtained from Natural Resources Conservation Service (NRCS) Web Soil Survey.

Soils Map

Mitigation Bank Prospectus
Claiborne Parish, Louisiana

Peace River Mitigation, LLC

Three Creeks Mitigation Bank

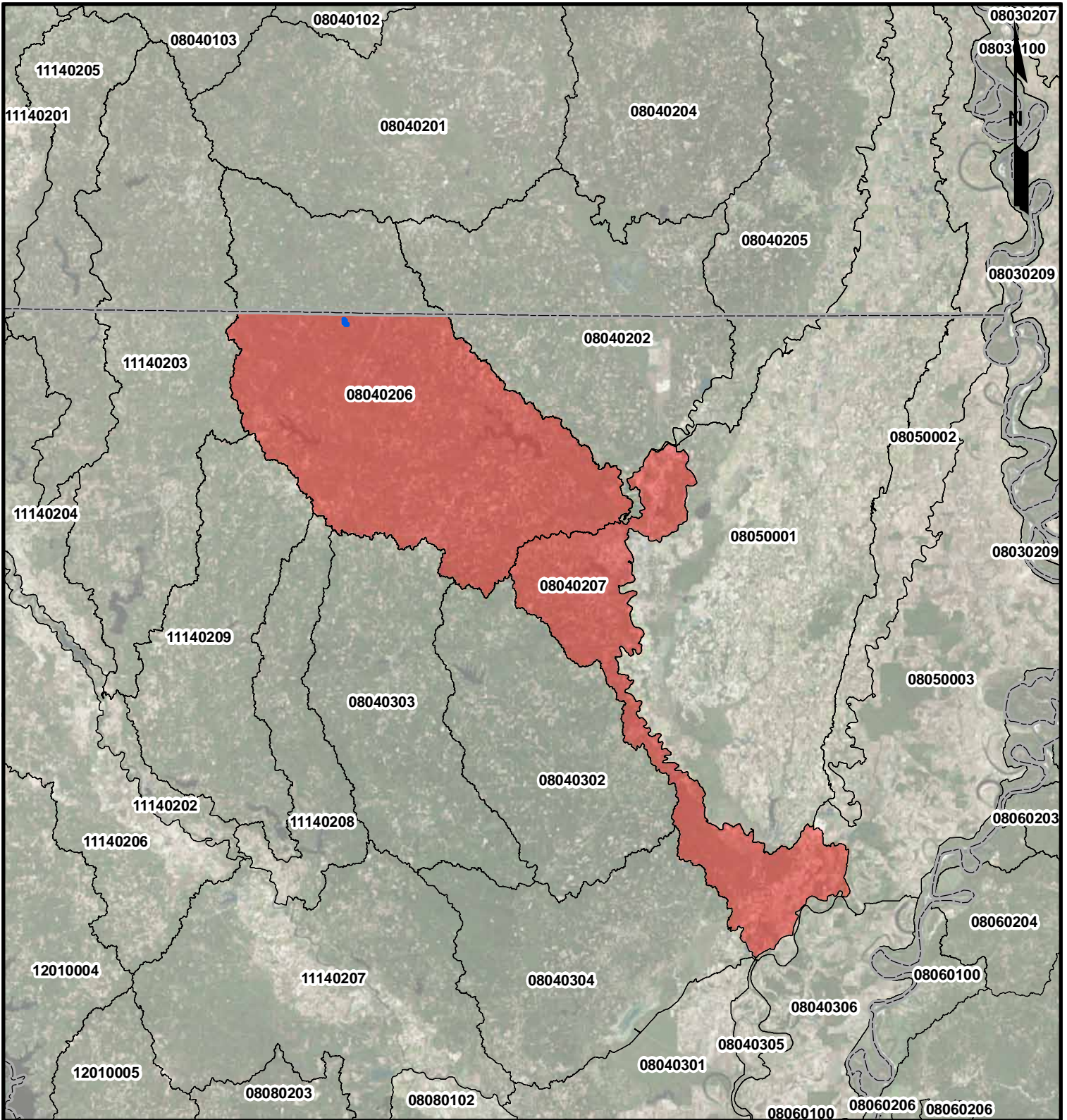


MATRIXNEWORLD
Engineering Progress

| | |
|-------------|-------------|
| Approved By | LAW |
| Date | 3/7/2018 |
| Drawing No. | 17-345-A021 |

9

Figure No.



Legend

- Three Creeks Mitigation Bank (275.56 acres)
- Primary Service Area (08040206 & 08040207)
- Hydrologic Unit Boundary
- State Boundary

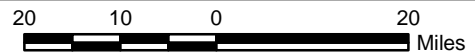
Source: Base map comprised of ESRI World Imagery. Hydrologic Unit Code (HUC) boundaries obtained from the U.S. Department of Agriculture (USDA).

Primary Service Area Map

Mitigation Bank Prospectus
Claiborne Parish, Louisiana

Peace River Mitigation, LLC

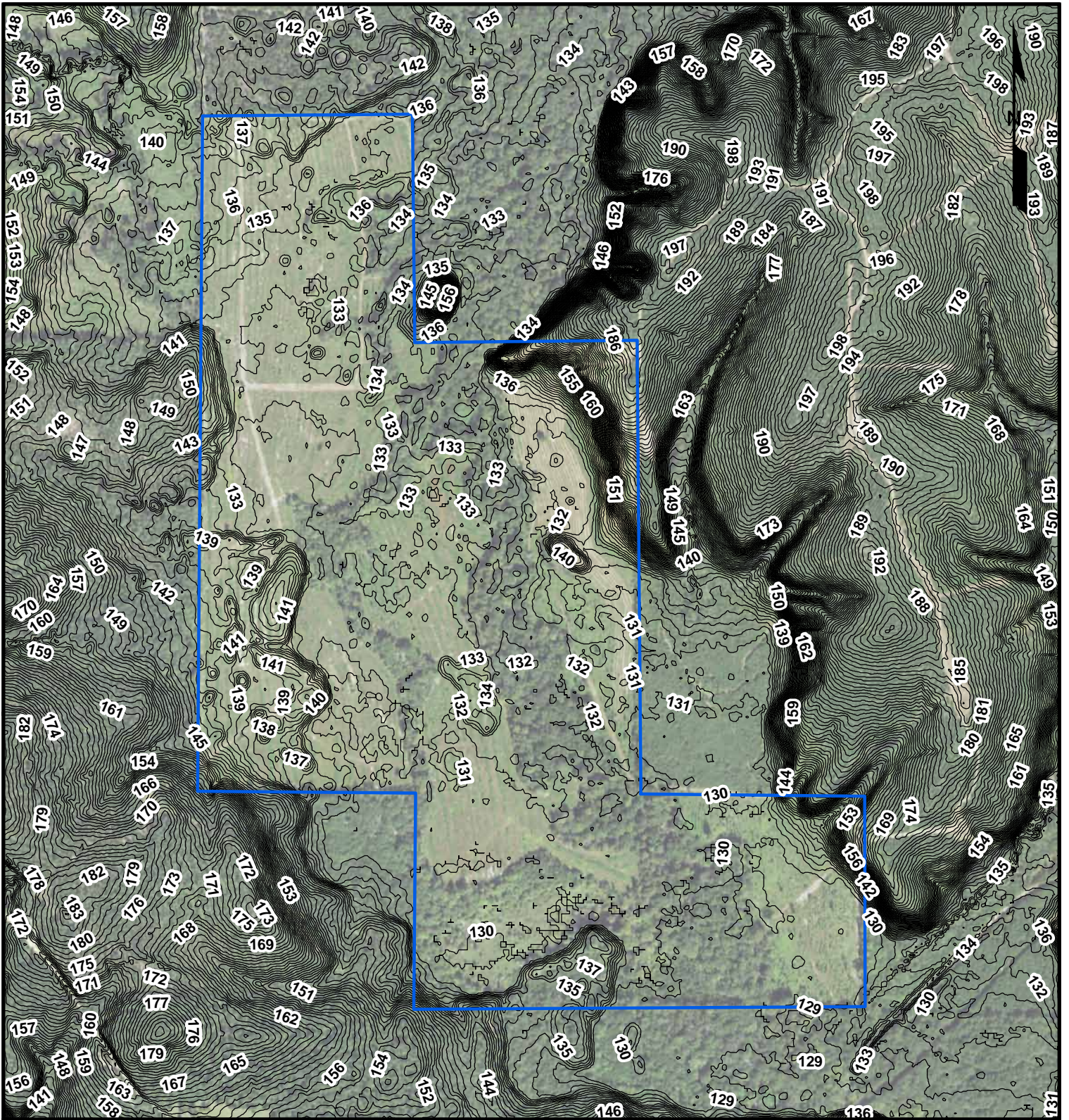
Three Creeks Mitigation Bank



MATRIXNEWORLD
Engineering Progress

| | |
|-------------|-------------|
| Approved By | LAW |
| Date | 3/7/2018 |
| Drawing No. | 17-345-A022 |

10
Figure No.



Legend

- Three Creeks Mitigation Bank (275.56 acres)
- LIDAR Elevation Contours

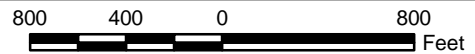
Source: Base map comprised of 2017 aerial photograph from USDA/FSA Aerial Photography Field Office, National Agriculture Imagery Program (NAIP). LIDAR Contours calculated from USACE/LOSCCO Digital Elevation Model, dated 2002/2009.

LIDAR Map

Mitigation Bank Prospectus
 Claiborne Parish, Louisiana

Peace River Mitigation, LLC

Three Creeks Mitigation Bank



MATRIXNEWORLD
 Engineering Progress

| | |
|-------------|-------------|
| Approved By | LAW |
| Date | 3/7/2018 |
| Drawing No. | 17-345-A023 |

11
 Figure No.

ATTACHMENT A

PRELIMINARY JD MVK-2017-951



DEPARTMENT OF THE ARMY

VICKSBURG DISTRICT, CORPS OF ENGINEERS

4155 CLAY STREET

VICKSBURG, MISSISSIPPI 39183-3435

REPLY TO
ATTENTION OF:

March 1, 2018

Operations Division

SUBJECT: Jurisdictional Determination – Peace River Mitigation, LLC, Three Creeks Tract, 275.59-Acre Proposed Mitigation Bank, Claiborne Parish, Louisiana;
MVK-2017-951

Mr. Lee Womack
Senior Project Manager
Matrix New World Engineering
4451 Bluebonnet Boulevard, Suite E
Baton Rouge, Louisiana 70809

Dear Mr. Womack:

I refer to the information you submitted on behalf of Peace River Mitigation, LLC, in regards to a preliminary jurisdictional determination request for the subject property located in Claiborne Parish, Louisiana (enclosure 1).

Based upon the information provided, it appears there are jurisdictional areas within the proposed project area subject to regulation pursuant to Section 404 of the Clean Water Act. The approximate extent of jurisdictional waters of the United States is depicted on the enclosed preliminary map (enclosure 2). Any work involving the discharge of dredged or fill material (land clearing, ditching, filling, leveeing, etc.) within the limits of the jurisdictional areas identified will require a Department of the Army Section 404 permit prior to beginning work.

For your convenience, an application packet may be obtained at our Regulatory Program webpage: <http://www.mvk.usace.army.mil/Missions/Regulatory.aspx>. Your application for any proposed work in wetlands or other waters of the United States should be submitted at least 120 days in advance of the proposed starting date. To expedite the evaluation process, please refer to Identification No. MVK-2017-951 when submitting the application or requesting project updates.

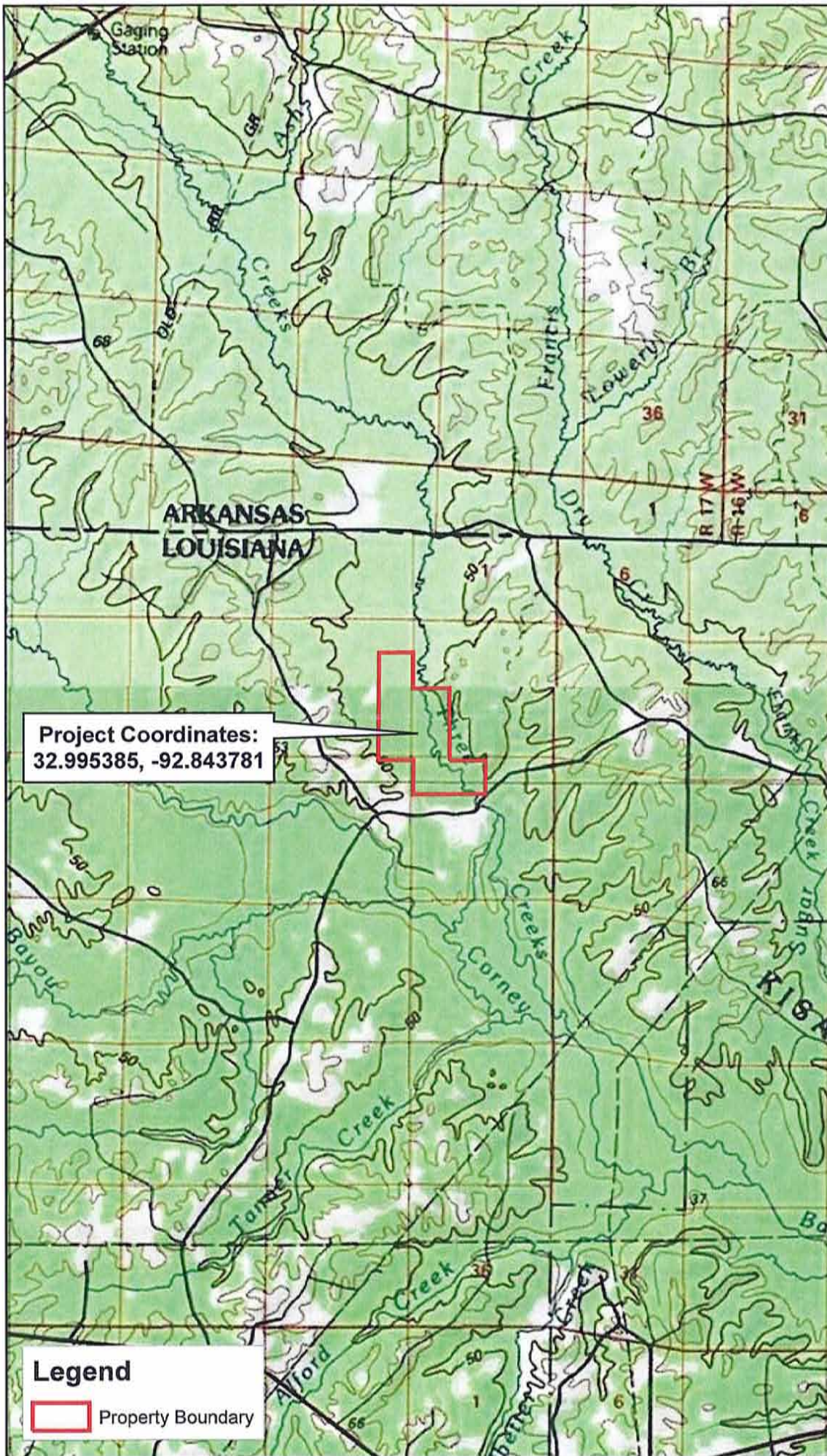
If we may be of any further assistance in this matter, please contact Mr. Joshua Moffi of this office, telephone (601) 631-7239, fax (601) 631-5459 or e-mail address: Joshua.H.Moffi@usace.army.mil.

Sincerely,

A handwritten signature in black ink that reads "Charles R. Allred, Jr." in a cursive style.

Charles R. Allred, Jr
Chief, Enforcement Section
Regulatory Branch

Enclosures



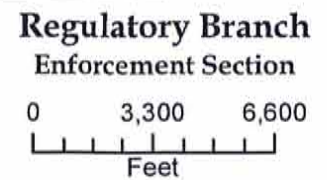
Project Coordinates:
32.995385, -92.843781

March 01, 2018
MVK-2017-951

Proposed Work:
Disposal of Dredge
Materials
Location:
Section 17, T8S-R25W
Murfreesboro, Quadrangle
Pike County, Arkansas

Map Background:
DigitalGlobe Imagery
Taken: October 29, 2016

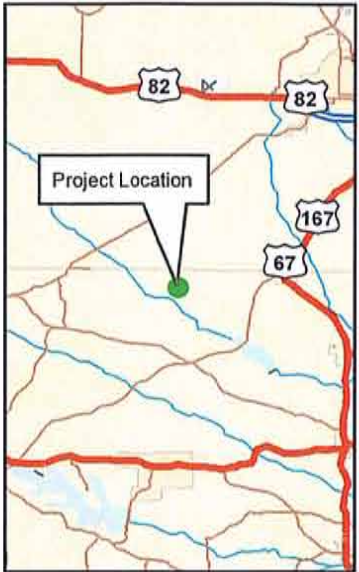
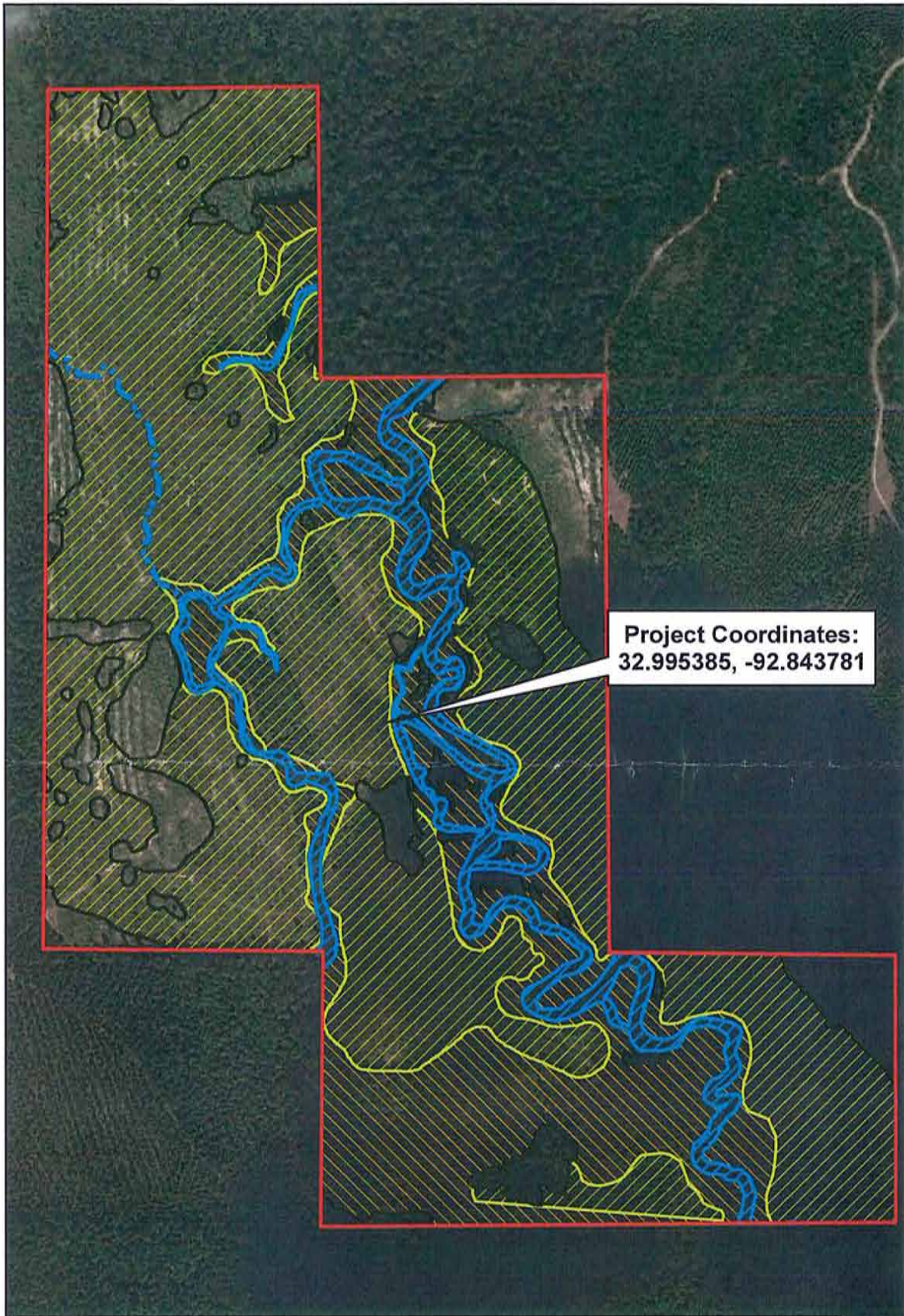
**Preliminary
Jurisdictional Determination**



Prepared by: Joshua Moffi
Enclosure 1

Legend

Property Boundary



March 1, 2018
MVK-2017-951
 Project Activities:
 Proposed Mitigation Bank
 Location:
 Section 12, T23N-R5W
 Summerfield, Quadrangle
 Claiborne Parish, Louisiana
 Map Background:
 DigitalGlobe Imagery
 Taken: October 04, 2016
**Preliminary
 Jurisdictional Determination**

Legend

- | | |
|-----------------------------------|------------------------------------|
| Property Boundary (275.59 acres) | Wetlands |
| Intermittent Stream (1719.5 feet) | Bottom Land Hardwood (57.90 acres) |
| Perennial Stream (16,041.13 feet) | Pine Dominated (161.43 acres) |
| Uplands (44.45) | |



**US Army Corps
of Engineers.**

**Regulatory Branch
Enforcement Section**



Prepared by: Joshua Moffi

Enclosure 2