Attachment D

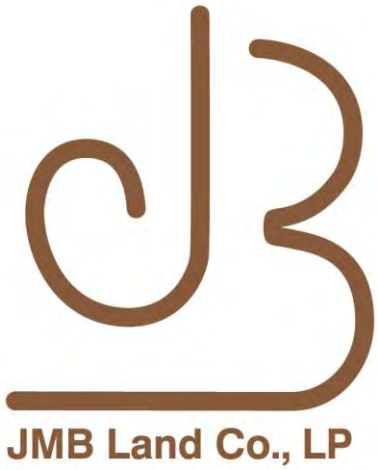
Draft Permittee Responsible Mitigation Plan

Permittee Responsible Mitigation Plan
Bastrop Bayou

SWG -2013-00147

Brazoria County, Texas

August 13, 2019



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List of Tables

List of Attachments

1.0 INTRODUCTION

At the request of Freeport LNG, JMB Land Company, LP (JMBL and/or Consultant), submits this Bastrop Bayou Permittee Responsible Mitigation Plan (BBPRMP) to the U.S. Army Corps of Engineers - Galveston District (CESWG). There are currently no mitigation credits available for unavoidable impacts to palustrine emergent wetlands (PEM) within the proposed wetland impact area located in U.S. Geological Survey Hydrologic Unit Code (HUC) 12040205 (Austin-Oyster). Therefore, Freeport LNG is proposing the BBPRMP to offset/mitigate for the permanent unavoidable impacts to Wetlands and Waters of the U.S. resulting from construction and fill activities associated with the proposed Freeport LNG Confined Dredge Material Placement Area (CDMPA and/or Impact Site) Project, in HUC 12040205 and Brazoria County, Texas. JMBL has prepared this BBPRMP in accordance with the regulatory program regulations listed in Section 33 CFR § 332.4(c) and 40 CFR § 230.92.4(c) to establish and operate the proposed Bastrop Bayou PRM Site.

The Bastrop Bayou PRM Site (BBPRM) has the potential to be restored to high quality palustrine emergent wetlands through the implementation of restoration and enhancement mitigation types as defined in 33 CFR § 332.2:

- *Restoration*: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

- *Enhancement*: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

2.0 PROJECT GOALS AND OBJECTIVES

The goal of this PRM is to restore 66.9 acres and enhance 50 acres of PEM to compensate for the in-kind lost to the physical, biological, and chemical IHGM values associated with permanent unavoidable impacts from the CDMPA fill (Table 1). The restoration and enhancement of the current Bastrop Bayou PRM site would restore the natural historical herbaceous wetland habitat and provide wetland functions and values not currently realized under the existing conditions. Presently, the proposed PRM site is being used for cattle production and sod farming. In reaching the goals and objectives of the PRM, land use would pivot away from heavily managed agricultural land to herbaceous wetland. The Brazoria National Wildlife Refuge (BNWR) and its objectives would also be served by this conversion (Sanchez 2012). In summary, the proposed PRM would restore hydrology, remove noxious species, and re-vegetate the BBPRM site with native herbaceous wetlands species.

Goals and Objectives of the BBPRMP:

- Remove interior fencing to allow uninhibited wildlife access to BBPRM.

- Remove cattle from the BBPRM.
- Remove noxious species such as Chinese Tallow (*Triadica sebifera*) through aerial application and spot spraying of herbicides.
- Recruitment and planting of indigenous herbaceous wetlands species.
- Restore the topography, hydrology, and vegetation to improve the water quality of BBPRM's runoff and in turn its natural hydrologic cycling, sheet flow, and water storage.
- Create herbaceous wetlands, which are threatened by the spread of Chinese tallow, as habitat for wildlife.
- Ensuring the quality of BBPRM habitat through annual vegetation monitoring, noxious invasive species control, and adaptive management if necessary.
- Provide long-term protection through financial assurances and the institution of a conservation servitude.

Table 1: PRM: Current Habitat Types and Land Use

Current land Use	Current Wetland Determination	Proposed Habitat Type	Restoration Type	Acreage
Cattle Pasture	Wetland	PEM	Enhancement	21.9
Invasive Chinese tallow	Wetland	PEM	Enhancement	28.2
Cattle Pasture	Non-Wetland	PEM	Restoration	66.9
Water	Non-Jurisdictional	PEM	Restoration	3.6
		Total		120.5

A request for an approved jurisdictional determination was submitted to the Galveston District in October 2015, and was approved on March 15, 2019.

3.0 IMPACT SITE DESCRIPTION

The Freeport LNG CDMPA encompasses 110.1 acres located within HUC 12040205 (Austin-Oyster) in Brazoria County, Texas (proposed Impact Site). The Impact Site consists primarily of non-tidal wetlands and is located north of Levee Road that is south of the city of Freeport (WGS 83, 095° 22' 3"W 28° 55' 36"N). Freeport LNG is proposing to use the 110.1 acres as a confined dredge material placement area. Dredge material to be placed within the CDMPA would originate from the Freeport LNG Basin.

3.1 Impacted Wetland Habitat Descriptions

The proposed Impact Site, excluding open waterbody areas, is comprised of several palustrine emergent (PEM) and palustrine scrub-shrub (PSS) wetland patches totaling 110.1 (WA001) acres. Of the 110.1 acres, PEM wetlands comprised 106.4 acres and PSS wetlands comprised 3.7 acres.

According to the Natural Resources Conservation Service (NRCS) Soil Survey for Brazoria County (USDA 2015), two soil map units are present within the Impact Site – Surfside clay and Velasco clay. Surfside clay consists of very deep, saline soils located on Gulf Coast floodplains and saline prairies. These soils are very poorly drained, occasionally flooded by both fresh and salt water, and are saturated at or near the surface for several months at a time. Surfside clay is listed as a hydric soil on the 2014 NRCS National Hydric Soil List. Velasco clay consists of very deep, saline clays located on Gulf Coast floodplains. These soils are very poorly drained, occasionally flooded by both fresh and salt water, and the zone of water saturation fluctuates from the surface to a depth of 30 inches. Velasco clay is listed as a hydric soil on the 2014 NRCS National Hydric Soil List.

SWCA identified two vegetation community types within the Impact Site including PEM and PSS wetland. Species identified along with their areal coverage, as documented at representative data points, are recorded on the reports data sheets. A photographic log, depicting representative images of the vegetation communities within the Impact Site was included in the report. Examples of dominant species identified within each vegetation community type are listed in the following paragraphs.

PEM Wetland:
PEM wetland community patches were delineated throughout the Impact Site by SWCA on October 5, 2015. The PEM wetland patches are dominated by non-woody vegetation such as grasses and forbs under three feet in height. Dominant herbaceous species include turtleweed (*Batis maritima*), bushy seaside-tansy (*Borrichia frutescens*), Carolina desert-thorn (*Lycium carolinianum*), seaside club-rush (*Schoenoplectus robustus*), salt-meadow cord grass (*Spartina patens*), Gulf cord grass (*Spartina spartinae*), and broad-leaf cat-tail (*Typha latifolia*).

PSS Wetland:
The PSS wetland community patches were delineated in the western and southern portions of the Impact Site. The PSS wetland patches are dominated by woody species greater than three feet in height and less than three inches in diameter at breast height. Dominant woody species include groundsel tree (*Baccharis halimifolia*), Jesuit's-bark (*Iva frutescens*), and Carolina desert-thorn (*Lycium carolinianum*). Herbaceous species are similar to PEM wetland patches with the addition of sweetscent (*Pluchea odorata*).

3.2 Proposed Impact Site Ecological Functions and Values

The Riverine Herbaceous/Shrub HGM Interim Model (IHGM) was used to assess the PEM and PSS wetland values that would be lost due to the CDMPA impacts. Acreages are based on all PEM wetland acreage and all PSS wetland acreage identified in the Jurisdictional Determination (2015-00305). The IHGM analysis yielded the existing physical, biological, and chemical functional capacity index (FCI) of each wetland (PEM and PSS) impacted and the number of functional capacity units (FCUs) for each wetland within the CDMPA impact area proposed for mitigation are indicated in Attachment B.

4.0 MITIGATION SITE SELECTION

The proposed Bastrop Bayou PRM site was selected due to its potential for the desired habitat type, vicinity to the Impact Site, its location within HUC 12040205 (Austin-Oyster),

and its vicinity to the Brazoria National Wildlife Refuge. The PRM site is located 11.3 miles from the Impact site, within the same HUC (12040205 Austin-Oyster) as the Impact Site. The PRM site is 2.8 miles from the Brazoria National Wildlife Refuge, with cattle pastures and natural wetlands separating the two sites. The proposed site restoration would be a valuable asset to water quality and wildlife within the Western Gulf Coastal Plains Eco-region III. Wetland functions and values not currently realized under the proposed site's existing conditions have the capacity for high functional lift for offsetting unavoidable impacts when restored. The restoration of this site would provide 120.5 acres of much needed herbaceous habitat (PEM) for many species of concern.

The proposed PRM is located within property owned by JMBL. JMBL has designated the proposed PRM acreage as a standalone project, while proposing a wetland mitigation bank on the surrounding property, which has already been reviewed by the Interagency Review Team and determined to have potential (Attachment F). The purpose of the combined proposal is to allow the PRM to move forward and ultimately manage the entire property as one aquatic resource system for the overall benefit of the watershed.

4.1 Mitigation Site Description

BBPRM is located approximately 5.5 miles southeast of Angleton, Texas. BNWR is located 2.5 miles to the east of the property. The BBPRM is located at Northing 10,568,547.6ft and Easting 889,958.3ft NAD83 UTM zone 15N (approximate corner) in Brazoria County, Texas, and also in HUC 12040205 Austin-Oyster. Named water ways in the direct vicinity of the BBPRM are Bastrop Bayou, Little Slough, and Big Slough. BBPRM is in the EPA's Level III Ecoregion 34 which is the Western Gulf Coastal Plain. The US EPA describes Ecoregion 34 as largely coastal prairie with wooded areas and adjacent rivers. Topography in and surrounding the PRM is a ridge-swale landscape created by the historic courses of meandering bayous. Some of the higher ridges are forested while most of the swales are herbaceous. Over the last two hundred years the prairie of Brazoria County has been extensively converted to cattle pastures and cropland, the PRM and surrounding properties included.

4.2 Driving Directions

To reach the property from Angleton, Texas, drive south on S. Velasco Street (Highway 288) for 2.2 miles; turn left onto Coale Road (Highway 220); continue on Coale Road for 2.2 miles; turn right onto FM523 S.; continue on FM523 S. for 2.0 miles; turn left onto Fairway Drive; continue on Fairway Drive for 1.4 miles; and the property would be on the right (see Attachment A: Figure 2).

5.0 SITE PROTECTION INSTRUMENT

BBPRM would be protected in perpetuity by a conservation easement pursuant to Texas Natural Resources Code Sections 183.001-183.005. The easement would be held by a conservation-oriented 501(c)(3) organization: U.S. Land Conservancy. The conservation servitude would be bound to and run with the property title. A long-term management fund will be established to provide the resources necessary to monitor and enforce the site protections in perpetuity. The servitude would prohibit activities such as fill discharges, cattle grazing, or other commercial surface development that would diminish the quality or quantity of restored wetlands. A letter of intent to hold the easement and a draft version of the conservation easement are located in Attachment F.

6.0 BASELINE INFORMATION

6.1 General Ecological Characteristics

Current land use of the PRM site consists primarily of cattle pasture, sod farm, and three scrub-shrub areas, two of which are mainly Chinese tallow (*Triadica sebifera*) (Attachment A: Figure 3). Adjacent land use consists primarily of cattle pasture to the east and west, and a landfill to the south. BBPRM would provide very similar habitat for the same species that Brazoria National Wildlife Refuge (BNWR) is striving to protect and preserve.

6.2 Historical Ecological Characteristics

The Coastal Prairie of Texas consisted of 9 million acres in the early 1800s. Since that time, this acreage has been greatly reduced due to cropland, livestock, and urban sprawl. Brazoria County has been affected by all three of these land altering activities (Smeins 1991). The proposed PRM is a prime example of an herbaceous wetland as seen in its historical imagery from in 1930 and 1944 aerial photography (Attachment A: Figures 5 & 6). Post 1970 aerial photography shows the site as cleared and mowed for rice farming. The 72.4 acre reservoir, located on the northeast corner of the property was constructed for rice irrigation. Soon after rice farming was abandoned and the site was utilized for livestock grazing and sod farming.

Review of the historic aerial photography suggests the lack of Mima mounds and natural ponds, therefore no depressional features or mound restoration is proposed. The remnant stream bed contours that run west to east across the site are easily visible on all historic aerials providing micro-topography that would enhance the chemical, physical, and biological functions of the site once they are reconnected and restored.

6.3 Current Ecological Characteristics

6.3.1 Jurisdictional Determination

The jurisdictional determination (JD) request, for the proposed PRM and surrounding JMBL land, was approved on March 15, 2019. The reference number is SWG 2015-00305. The jurisdictional determination encompasses a larger area than the proposed BBPRM site. The proposed BBPRM contains 50 acres of wetland, 66.9 acres of non-wet pasture.

6.3.2 Current Site Vegetation

The BBPRM is currently being managed for cattle grazing. The actively managed areas consist of the levees and pasture. The pasture does have wetland vegetation even with canalization and ditching of the land. The levees and roads have been built up so that they are not affected by the water on the site. The vegetation in these areas consist of St. Augustine Grass (*Stenotaphrum secundatum*) and Angleton Bluestem (*Dichanthium aristatum*), Gulf Cordgrass (*Spartina spartinae)*, Saltmarsh Aster (*Symphyotrichum tenuifolium var.* aphyllum)

The unmanaged areas on the property consist of pasture and Chinese tallow forest. The pasture area has remnant wetland species in it, but areas that are not managed have large swaths of Chinese Tallow (*Triadica sebifera*). The scrub-shrub area consists of Baccharis (*Baccharis halimifolia*), Hackberry (*Celtis laevigata*), and Elm (*Ulmus americana*). Some of the wet spaces are affected by ponding due to small levees next to the ditches.

Table 2: Current Vegetation Species List

Scientific Name	Common Name (USDA)	Wetland Indicator Status Atlantic and Gulf Coastal Plain (USDA)
Current vegetation within cleared cow pasture		
Spartina patens	Cordgrass	FACW
Dichanthelium scoparium	Velvet Panicum	FACW
Stenotaphrum secundatum	St. Augustine Grass	FAC
Eleocharis acicularis	Needle Spikerush	OBL
Symphyotrichum tenuifolium var. aphyllum	Saltmarsh Aster	OBL
Current vegetation within scrub/forested areas		
Baccharis halimifolia	Eastern Baccharis	FAC
Sabal minor	Saw Palmetto	FACW
Ulmus americana	American Elm	FAC
Celtis laevigata	Hackberry	FACW
Triadica sebifera	Chinese Tallow	FAC

6.3.3 Current Site Hydrology

BBPRM is located in the Austin-Oyster watershed (HUC 12040205), specifically within the Lower Oyster Creek (HUC 120402050400) drainage area. This region is dominated by ridge-swale topography; natural ridges being only two to three feet higher than the swales. This is evident within the PRM as well. This unique topography gives way to drainage patterns in which water is moved through the sloughs down the elevation gradient. The site's topography currently drains into Bastrop Bayou via man-made drains, a remnant of past agricultural use. Elevated roads, levees, and spoil banks impound water on the site and prevent overbank flooding, hydrologically isolating the site (Attachment A: Figure 15).

Wetlands and un-named drainages on-site are hydrologically isolated due to spoil banks, elevated roads, and levees. Wetland hydrology on-site is currently driven by direct precipitation and runoff from adjacent properties – spoil banks have been minimally gapped to allow some of the excessive precipitation to flow from the site as runoff. Proposed drainage patterns are discussed in Section 4.2.1 and visually represented in Attachment A: Figure 16.

The BBPRMP project area drains into Bastrop Bayou, which met all water quality requirements except nutrient levels in 2015; nutrient levels are deteriorating according to TCEQ. Bastrop Bayou flows into Bastrop Bay and Oyster Lake, which are currently impaired by fecal coliform. Removing cattle from BBPRM would eliminate a source of fecal coliform. Additionally, accepting runoff from adjacent areas would filter drainage water from a larger area than the PRM site and further decrease fecal coliform in Bastrop Bayou. Ceasing agricultural activities and degrading spoil banks, roads, and levees would aid in meeting the current and future Total Maximum Daily Loads of the PRM's receiving water bodies by reducing the site's fecal coliform contribution and increasing filtration and plant uptake of nutrients (i.e., nonpoint source pollution prevention). BBPRM would also improve the quality of water flowing into Bastrop Bayou off this site.

6.3.4 Existing Soils

The Brazoria County Soil Survey maps BBPRM soils as: Francitas clay, zero (0) to one (1) percent slopes, somewhat poorly drained and Lake Charles clay, zero (0) to one (1) percent slopes, rarely flooded. All of these soil types are listed as hydric soils of Brazoria County on the USDA NRCS National List of Hydric Soils; All States (2014). A wetland delineation conducted in January 2015 confirmed that these soils present hydric indicators and are wetland soils in areas other than the sod field which had been contoured to drain. Figure 11 presents the current soils within the project area.

Table 3: Existing Soils

Soil Name	Soil Code (NRCS)	Acreage of Soil on BBPRM	Percent of Soil on BBPRMP
Lake Charles clay	24	71.8	59.5%
Francitas clay	17	48.7	40.5%

According to the Brazoria County Soil Survey and the USDA Web Soil Survey the following soils are found to occur on the PRM, their descriptions are:

- Lake Charles clay (24) is a nearly level soil with slops at 0.1 percent. This soil is very dark gray to a depth of about 50 inches and is slightly acidic in this upper part. It is somewhat poorly drained and the water table in the winter is above the depth of two feet. Surface runoff is very slow and permeability is very slow.

- Francitas clay (17) is a nearly level, slightly saline soil with slopes at 0.3 percent. This soil surface is mildly alkaline and very dark clay about 18 inches thick. The soil is poorly drained and the surface runoff is very slow. The soil has a perched water table above the depth of two feet during the winter.

6.4 Threatened and Endangered Species

The PRM would provide a buffer to future development around the refuge and add to the habitat range for the species, especially the species of concern, which BNWR protects.

Table 4: Endangered and Threatened Species of Concern at BBPRM

Common Name	Scientific Name	State Status (TPW)	Federal Status (FWS)
Whooping Crane	*Grus americana*	Endangered	Endangered
Wood Stork	*Mycteria americana*	Threatened	-
White-faced Ibis	*Plegadis chihi*	Threatened	-
Swallow-tailed Kite	*Elanoides forficatus*	Threatened	-
Bald Eagle	*Haliaeetus leucocephalus*	Threatened	-

7.0 DETERMINATION OF CREDITS

This BBPRM would mitigate for unavoidable impacts to wetlands and their physical, biological, and chemical functions and values resulting from construction and fill activities associated with the Freeport LNG CDMPA Project through the restoration and enhancement of the BBPRM site to PEM wetlands. To guarantee all lost wetland function and values are mitigated for, the Riverine Herbaceous/Shrub HGM Interim model (IHGM)

was used to calculate compensation requirements. IHGM values were assessed for the impacts to PEM and PSS wetland values and functions from the CDMPA. Also, the wetland functions and values to be gained from the BBPRM were assessed by the IHGM. FCI and FCU values for both the impacts and the restoration were generated. Based on the IHGM analysis, it was determined that the BBPRM restoration of 66.9 acres and enhancement of 50 acres of PEM wetlands would fully compensate for wetland impacts from the CDMPA fill. IHGM details for the CDMPA and the BBPRM can be found in Attachment B.

8.0 MITIGATION WORK PLAN

8.1 Site Restoration Plan

In order to achieve the goals and objectives of the BBPRMP and to meet all requirements listed in 33 CFR § 332.8, the PRM workplan proposes to remove cattle, cease sod farming, remove interior fencing, restore hydrology, remove noxious species, re-vegetate with native herbaceous wetlands species, and maintain the re-vegetated PEM with a rotation of prescribed burns (Table 5).

Table 5: Site Restoration Plan and Timeline

Activities to be Completed	Timing	Reasoning
Permit Issued and Conservation Servitude	Start Date	
Spray Tallow Trees	First Summer	Tallow Trees Need to be Leafed Out
Dirt Work	Upon Issuance of Permit	
Establishment of Monitoring Transects	First Summer	Establishment of Monitoring Transects
Prescribed Burn	First Winter then Every 3-5 Years	6 Months After Spray
Seed/Plant Native Vegetation	Spring	
Monitor	Every Year for Years 1-5	

8.1.1 Hydrologic Restoration

To restore the area to a natural hydrologic state and meet the objectives of the BBPRMP, the features draining the site and associated berms would be removed. Additionally, small berms would be installed along the perimeter of low portions of the property to slow sheet flow and contain water on the property longer but not hold all the water as to not affect the adjacent properties.

The site historically drained into Bastrop Bayou about two miles to the east of the site. Today this connection would be maintained by an easement placed on the existing drainage located on the east side of the reservoir in the northeast portion of the property. This protected drainage way would serve as BBPRM's connection to Bastrop Bayou.

Depending on its location, material excavated during restoration would be either placed into the man-made ditches to restore the natural hydrologic regime of BBPRM, or used to

build the micro-berms to slow water across the site. The remnant stream bed contours would be returned to their historic grades to act as the drainage ways for the site. Cross sections of proposed work is shown in the Berg Oliver Construction Drawings (Attachment C).

Upon the restoration of the natural hydrologic conditions the site would experience an increase in hydraulic conductivity, soil organic matter, soil saturation potential, and the formation of redoximorphic features (Collins 2001) conducive to wetland function and value.

8.1.2 Vegetative Restoration

Vegetative recruitment and/or seeding/planting would be used to restore natural vegetation throughout the property. The restoration of the hydroperiod across the property in partnership with vegetative recruitment would create wildlife habitat as well as benefit water quality. Proposed herbaceous wetland restoration areas would be prepared by applying herbicides and, if necessary, tilling soil to remove invasive species prior to recruitment. If necessary, areas that are not showing signs of successful wetland plant establishment would be seeded and/or planted with a mesic mix appropriate for the ecoregion. Plugs of *Spartina patens*, *Iva frutescens* and other species will be obtained from areas within or adjacent to the proposed Impact Site and planted on the PRM site. If, due to constructing timing, plugs from the Impact Site are not available, vegetative plugs will be sourced from adjacent Freeport LNG-owned property or commercial nurseries with the same or similar vegetation. By sourcing plugs from the impact or nearby sites, this allows the PRM to have some similar vegetation. Herbaceous wetland habitat would be maintained by prescribed burning on a 3-5 year cycle (Allain 1999). Proposed herbaceous species are listed in Table 6.

Table 6: Proposed PEM Plant List

Scientific Name	Common Name (USDA)	Wetland Indicator Status Atlantic and Gulf Coastal Plain (USDA)
Andropogon gerardii	Big Bluestem	FAC
Andropogon virginicus	Broomsedge Bluestem	FAC
Andropogon glomeratus	Bushy Bluestem	FACW
Chasmanthium latifolium	Inland Seaoats	FAC
Coreopsis tinctoria	Golden Tickseed	FAC
Cyperus esculentus	Yellow Nutsedge	FAC
Dichanthelium scoparium	Velvet Panic Grass	FACW
Eleocharis acicularis	Needle Spikerush	OBL
Eleocharis quadrangulata	Squarestem Spikerush	OBL
Elionurus tripsacoides	Pan American Balsamscale	FACW
Hyptis alata	Clustered Bushmint	OBL

Iva frutescens	Jesuit's Bark	FACW
Juncus effusus	Common Rush	OBL
Panicum hemitomon	Maidencane	OBL
Paspalum floridanum	Florida Paspalum	FACW
Paspalum hartwegianum	Hartweg's Paspalum	FACW
Polygonum pensylvanicum	Pennsylvania Smartweed	FACW
Muhlenbergia filipes	Gulfhairawn Muhly	OBL
Schizachyrium scoparium	Little Bluestem	FAC
Sagittaria papillosa	Nipplebract Arrowhead	OBL
Solidago sempervirens	Seaside Goldenrod	FACW
Spartina patens	Cordgrass	FACW
Sporobolus airoides	Alkali Sacaton	FAC
Sporobolus silveanus	Silveus' Dropseed	FAC
Symphyotrichum tenuifolium	Saltmarsh Aster	OBL
Tripsacum dactyloides	Eastern Gamma	FAC

8.1.3 Noxious Plant Control

Invasive plant species such as Chinese tallow (*Triadica sebifera*) would be removed by selective application of herbicide prior to initial monitoring. The percent cover of invasive plants would be monitored during long-term and short-term success monitoring. If invasive species are found on the site then appropriate action would be taken to eliminate the species.

Within a majority of the impounded habitats, Chinese tallow appears to be dominant. To enhance these areas they would be chemically treated. The tree stems would be left in place to deteriorate naturally within the system. No mechanized land clearing or large logging equipment would be used for the exotic eradication, except where removed for associated dirt work for hydrologic modifications.

JMBL intends to use all prudent efforts: physical, chemical, or mechanical, to eliminate existing invasive/exotic vegetation present such as Chinese tallow (*Triadica sebiferum*) at BBPRM. This noxious vegetation would be treated with herbicides to reduce long-term presence to 5 percent relative cover per WAA. Prior to planting, all Chinese tallow within and immediately surrounding the PRM boundary would be chemically treated with herbicides.

9.0 MAINTENANCE PLAN

Monitoring for exotic and invasive species and the implementation of control techniques would occur annually. Maintenance would also include the annual inspection of hydrologic connections to ensure connectivity has not been blocked by man-made or natural processes. If in fact any blockage has occurred, hand clearing or mechanical clearing of those hydrologic connections would be initiated until the proper hydrologic connection is re-established. Adaptive management would allow for changes to the maintenance plan to maximize success of the PRM area. Prescribed burns would be used to maintain the ecological value of the PRM as necessary; and after performance standards are met, the prescribed burns would be performed by the Land Steward. As the habitat matures, monitoring would continue but exotic species control measures are expected to decline as a steady state self-perpetuating natural ecosystem is established.

10.0 PEFORMANCE STANDARDS

BBPRM would be restored in accordance with the PRM Plan such that it meets the goals and objectives listed in Section 2.0. The following performance standards would be used to measure the success of the restored and enhanced habitat:

- 70 percent areal coverage within designated wetland restoration areas, made up of a minimum of five different vegetative species.
- Up to 5 percent relative cover of nuisance, invasive, noxious, and exotic species.
- Site would be restored in accordance with the PRM Plan such that it meets wetland criteria as described in the 1987 Corps of Engineers Wetland Delineation Manual (the 1987 Manual) as well as the November 2010 Regional Supplement for the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region Version 2.0. Performance Standards.

Wetland reestablishment and enhancement areas would be considered successful if after 2 growing seasons, and after the initial construction activities on-site to restore hydrology commence, the PRM site meets the performance standards. If restored and enhanced wetlands fail to meet the performance standards by the 3rd growing season following the start of restoration activities, then additional planting of approved species and maintenance would be required until performance standards are met.

11.0 MONITORING REQUIREMENTS

The monitoring reports would include data sufficient for comparison to the performance standards found in Section 10.0 of this BBPRMP. JMBL shall also include in these reports, a discussion of all activities which took place at the PRM.

11.1 Monitoring Methodology

Permanent vegetative plots would be established along 11 evenly-spaced transects throughout the PEM area. A permanent marker, consisting of a 5ft t-post encased in a 10-foot PVC pipe, would be installed at each of the 48 (2m x 2m) vegetative plots. The plots would be tied in with a GPS to ensure correct placement for the life of the PRM. The linear survey transects and vegetative plots would be established following the completion of all internal dirt work and a baseline vegetation survey would be conducted at or near

the end of the first growing season. Percent cover data would be collected using a 2m x 2m quadrat constructed of PVC. The quadrat would be placed with the northwest corner touching the permanent marker and the quadrat sides facing 180 degrees due south and 90 degrees due east. All of this information would be provided in the as-built report.

Monitoring events would collect the following information from each 2m x 2m vegetative plot: 1) date time-frame (begin/end date); 2) name of each species present 3) identification on whether that species is native, non-native, invasive/exotic 4) identification of the wetland status of each species present according to the following categories - Obligate Wetland (OBL), Facultative Wetland (FACW), Facultative (FAC), Facultative Upland (FACU), or Obligate Upland (UPL); and 5) the percent cover of each species present. In addition, the following information would be documented: 1) the average percent cover of native species; 2) the average percent cover of non-native species; 3) the average percent cover of invasive/exotic species; and 4) the average percent cover of species per each wetland status. All monitoring locations would be illustrated on a map supplied to the USACE as part of the annual report.

Throughout each monitoring event, ground level photographs (digital images) would be taken at each vegetative sampling plot. Using the vegetative plot marker as the central point, photographs would be oriented toward the following two compass directions: North and South. These photographs would be included as an attachment to each monitoring report and each photograph would be labeled with the date, plot/station identifier, and the compass direction for that photograph.

11.2 Monitoring Report Requirements and Timing

An as-built report would be submitted within 60 days following completion of all work required. Year 0 is considered the year of commencement of PRM restoration and enhancement activities. Monitoring would commence the following growing season, after the completion of all on-site work. Monitoring would be conducted in the spring of Years 1-5 using the guidelines in Section 11.1 of this BBPRMP. Monitoring will continue if in year 5 all performance standards are not meet. This “if necessary” monitoring would continue until all performance standards are meet and will follow the requirements outlined in Section 11.2.2.

11.2.1 Baseline: As-Built

An as-built report would be submitted within 60 days following completion of all work required. The as-built report would describe in detail the work performed, and provide at a minimum the following information:

1. POST CONSTRUCTION SURVEY: A survey showing finished grades and plantings with written documentation, plan view, and cross-sectional drawings of all construction and establishment work implemented.
2. VEGETATION PLOT ESTABLISHMENT DATA: 1) date time-frame (begin/end date); 2) the average percent coverage of native species in all plots; 2) the average percent coverage of non-native species in all plots; and the 4) average percent coverage of invasive/exotic species in all plots.
3. OVERVIEW: Detailed descriptions of site preparation, planting procedures, etc.

11.2.2 Monitoring Years 1-5

Monitoring would be conducted in Years 1-5, in the spring of each monitoring year using the guidelines in Section 11.1 of this BBPRMP. All annual reports at minimum would provide the following information:

1. FOLLOW-UP CONSTRUCTION: A description of the condition of any applicable hydrology altering features (culverts, ditches, plugs, etc.) and a general discussion of hydrologic conditions at monitoring stations.
2. VEGETATION COMMUNITY: A summary of the outcome of the vegetative community data collected, which would reference the raw data and statistics in an attachment to the monitoring report. This summary would include, but is not limited to, the following information: 1) date time-frame (begin/end date) of the monitoring event; 2) the average percent coverage per species in all plots; 3) the average percent coverage of native species in all plots; 3) the average percent coverage of non-native species in all plots; 4) the average percent coverage of invasive/exotic species in all plots; 5) the average percent coverage of species per wetland status; and 6) an evaluation on whether this data shows that the vegetative success criteria have been met.
3. VISUAL QUALITATIVE EVALUATION: A summary of the details of the visual qualitative observations performed on the PRM. If additional documentation is collected to substantiate these observations, this information would be included in that documentation as an attachment to the monitoring report and would include references to that attachment in the summary of this information.

12.0 LONG-TERM MANAGEMENT PLAN

After the PRM has met all performance standards, long-term management would be needed to ensure the sustainability of the resource. Freeport LNG or its assignee would be the responsible party for long-term management of the PRM and will fund the maintenance activities through an escrow account. The amounted needed to insure long term financial assurance is included in attachment G, which includes taxes, monitoring, burning cost and possible legal fees. To ensure long-term sustainability of the resource, Freeport LNG or its assignee would burden the property with a perpetual conservation servitude. This servitude will be held by U.S. Land Conservancy (see attachment D). The conservation easement would protect the site from any activities that would diminish the quality of restored wetlands on the site. No structures are proposed or would be necessary to assure hydrologic or vegetative restoration.

13.0 ADAPTIVE MANAGEMENT PLAN

Ecological restoration projects are site specific and multiple endpoints are possible owing to the stochastic nature inherent in ecological processes, and the potential influence of offsite human activities. For these reasons, a written report/written request for information could be submitted for review; and upon consultation with the Corps of Engineers and commenting agencies, could lead to: a change in restoration strategy, modified objectives, and adjustments to performance standards and monitoring protocols at any time prior to full project establishment. Once the report is sent to the Corps of Engineers, they would consult with the commenting agencies and provide approval/denial

in writing of the written report/written request for information submitted. This adaptive management plan process will ensure flexibility for successful long-term performance of the site.

14.0 FINANCIAL ASSURANCES

Short-term and long-term financial assurances in the form of two separate escrow accounts would be put in place within 90 days of permit issuance. The short-term escrow will hold the total value of construction and establishment until two performance standards are meet. The first reduction of escrow will take place with the submittal of as-built drawings after construction, reducing the escrow by the amounted projected for construction. The escrow account will be reduced and closed after meeting vegetative establishment performance standard, releasing the projected establishment cost.

To ensure that sufficient funds are available to provide for the perpetual maintenance and protection of the PRM, a “Long-Term Maintenance and Protection” escrow account would be established. This account would be administered by a federally-insured depository that is “well capitalized” or “adequately capitalized” as defined in Section 38 of the Federal Deposit Insurance Act. The Long Term Maintenance and Protection escrow will be created and initially funded with $92,000 to cover long term cost such as taxes, invasive species control, prescribed burns and “if necessary” maintenance and legal cost. The details of these two accounts are included in Attachment G.

15.0 REFERENCES

Code of Federal Regulations, Title 33, Parts 325 and 332 and Title 40, Part 230, as published on pages 19594-19704 in the Federal Register dated 10 April 2008.

United States Department of Agriculture – Natural Resources Conservation Service, Web Soil Survey, Brazoria County, Texas, Retrieved December 2010. http://soils.usda.gov/survey/online_surveys/texas/index.html

United States Department of Agriculture – Natural Resources Conservation Service, PLANTS Database – USDA PLANTS, Retrieved June 2009.

How's the Water? Rep. Houston-Galveston Area Council, 2015. Print. Clean Rivers Program. Basin Highlights Report

EPA. PRIMARY DISTINGUISHING CHARACTERISTICS OF LEVEL III ECOREGIONS OF THE CONTINENTAL UNITED STATES. Tech. no. September, 2013. Print.

Allain, L., M. Vidrine, V.Grafe, C. Allen and S. Johnson, Paradise Lost?: The Coastal Prairie of Texas and Louisiana, U.S. Fish & Wildlife Service and U.S. Geological Survey

Smeins, F. E., D. D. Diamond, and C. W. Hanselka. Natural Grasslands Introduction And Western Hemisphere. Amsterdam-London-New York-Tokyo: Elsevier, 1991. Print. Ch. 13 Coastal Prairie

Collins, M.E. and R.J. Kuehl (2001) Organic Matter Accumulation and Organic Soils in Richardson, J.L and M.J. Vepraskas (eds.) Chapter 6, Wetland Soils. Genesis, Hydrology, Landscapes and Classification. pp. 137-162. Boca Raton, London, New York: CRC Press.

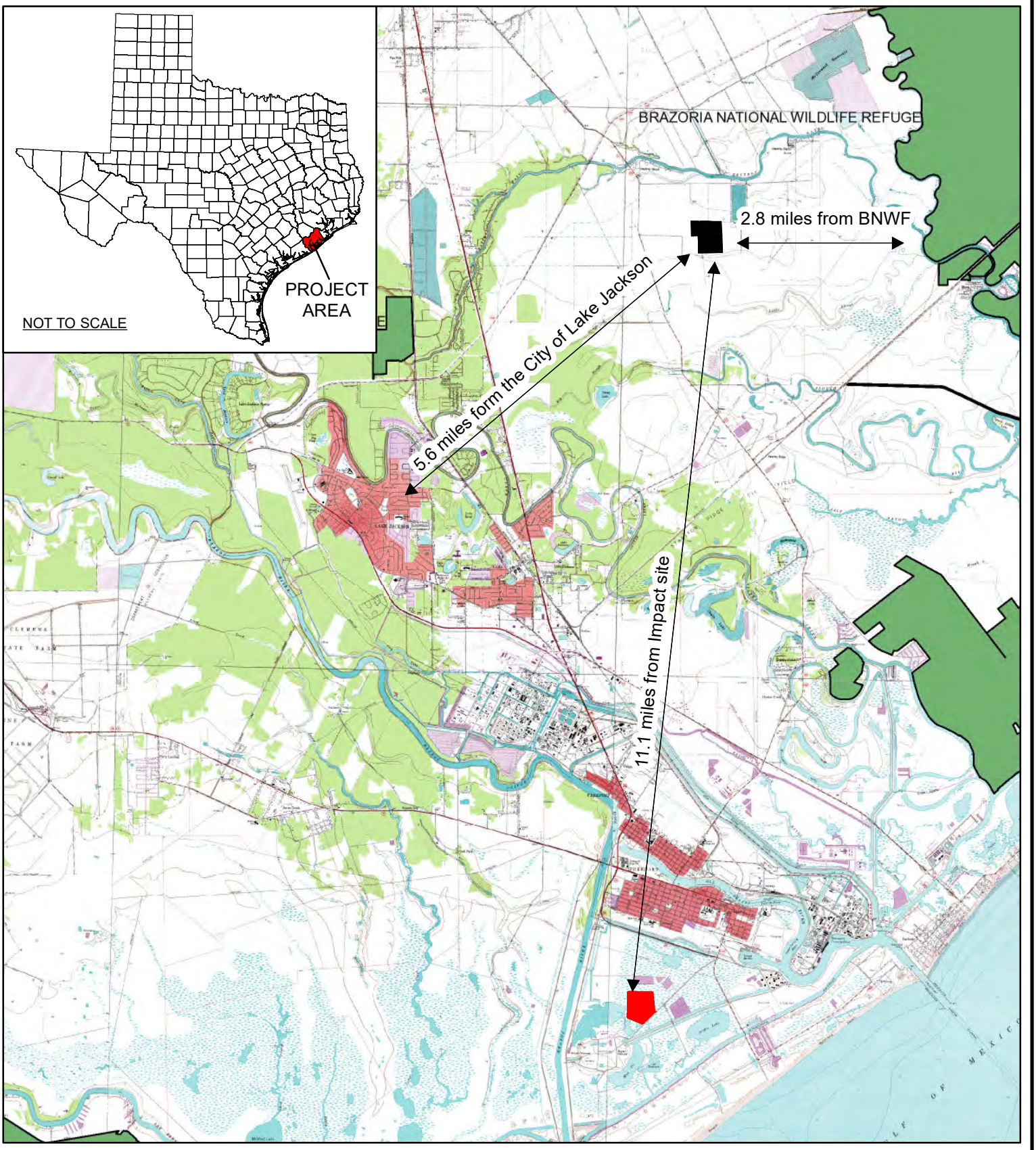
Ryan, Molly. "Boom times on the Bay: Dow, Other Firms Fuel Development South of Houston." 21 Mar. 2014. Web. 22 Mar. 2016.

Omernik, J., & Griffith, G. (2013). Ecoregions of Texas (EPA). Retrieved from http://www.eoearth.org/view/article/152207

Griffith, G.E., Bryce, S.A., Omernik, J.M., Comstock, J.A., Rogers, A.C., Harrison, B., Hatch, S.L., and Bezanson, D., 2004, Ecoregions of Texas (color poster with map, descriptive text, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:2,500,000).

Sanchez, Jennifer, Joseph Lujan, Monica Kimbrough, and Corol Torrex. Texas Mid-coast National Wildlife Refuge Complex Draft Comprehensive Conservation Plan and Environmental Assessment. Brazoria,TX: Texas Mid-coast National Wildlife Refuge Complex, 2012. Print. Brazoria, Fort Bend, Matagorda and Wharton Counties, Texas

Attachment A: Maps and Figures



Legend

- BBPRM Boundry (120.5 acres)
- LTDMPA Boundary

0 1 2 3 4

Miles

N

PROPOSED BASTROP BAYOU PRM

VICINITY EXHIBIT

BRAZORIA COUNTY, TEXAS

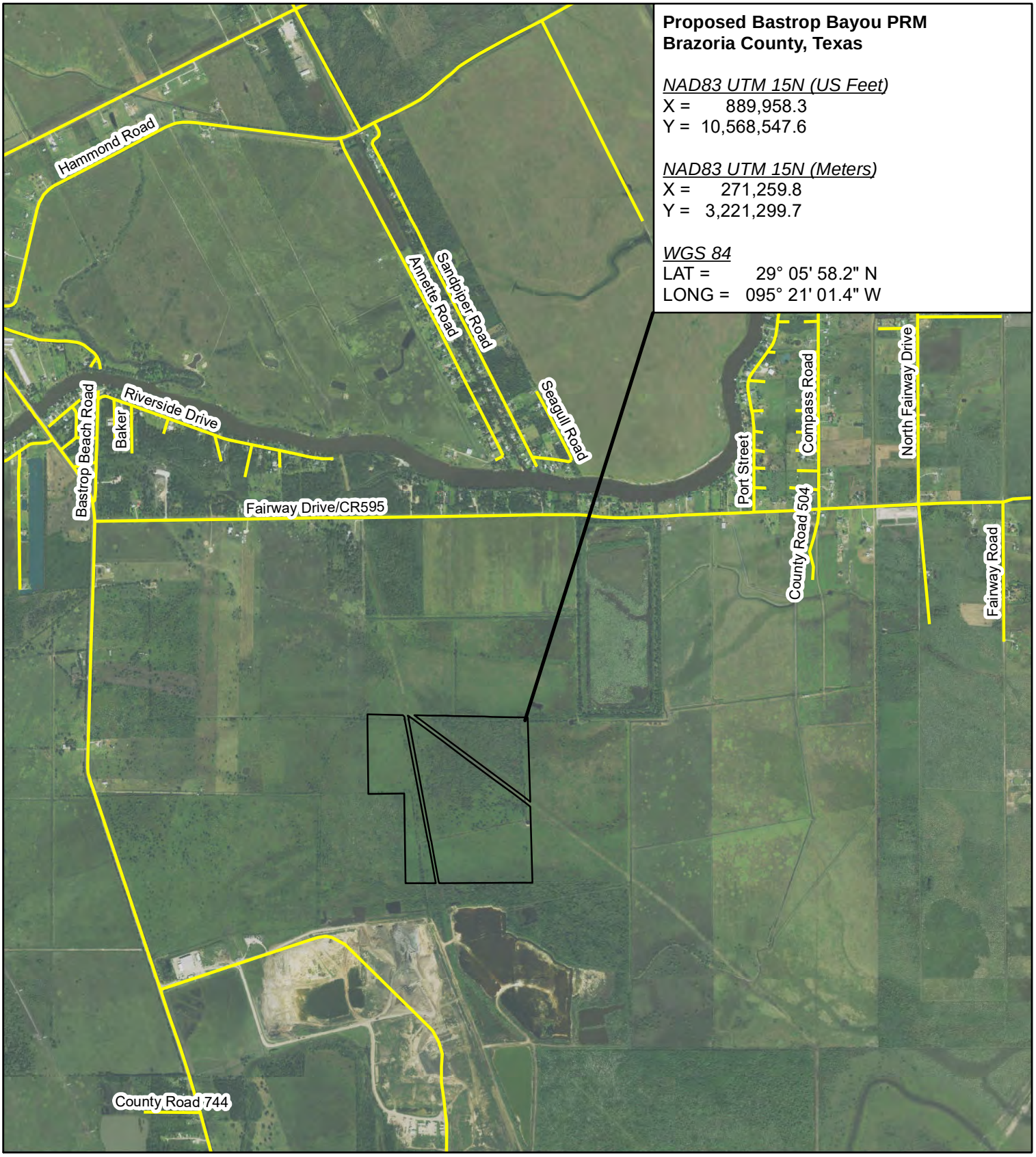
Drawing No.:

Date: 05/09/2018 Author: JKP

FIGURE 1

JMB Companies, Inc.

Document Path: N:\Mitigation Banks\Texas\Batrop Bayou PRM Freeport\Mapping\GIS Projects (.MXD)\7.22.2019_update\Figure_1_BBPRM_Vicinity.mxd



Legend

- BBPRM Boundry (120.5 acres)
- Brazoria County Roads

0 1,000 2,000 3,000 4,000

Feet

N

PROPOSED BASTROP BAYOU PRM

BOUNDARY W/ 2014 AERIAL IMAGERY EXHIBIT

BRAZORIA COUNTY, TEXAS

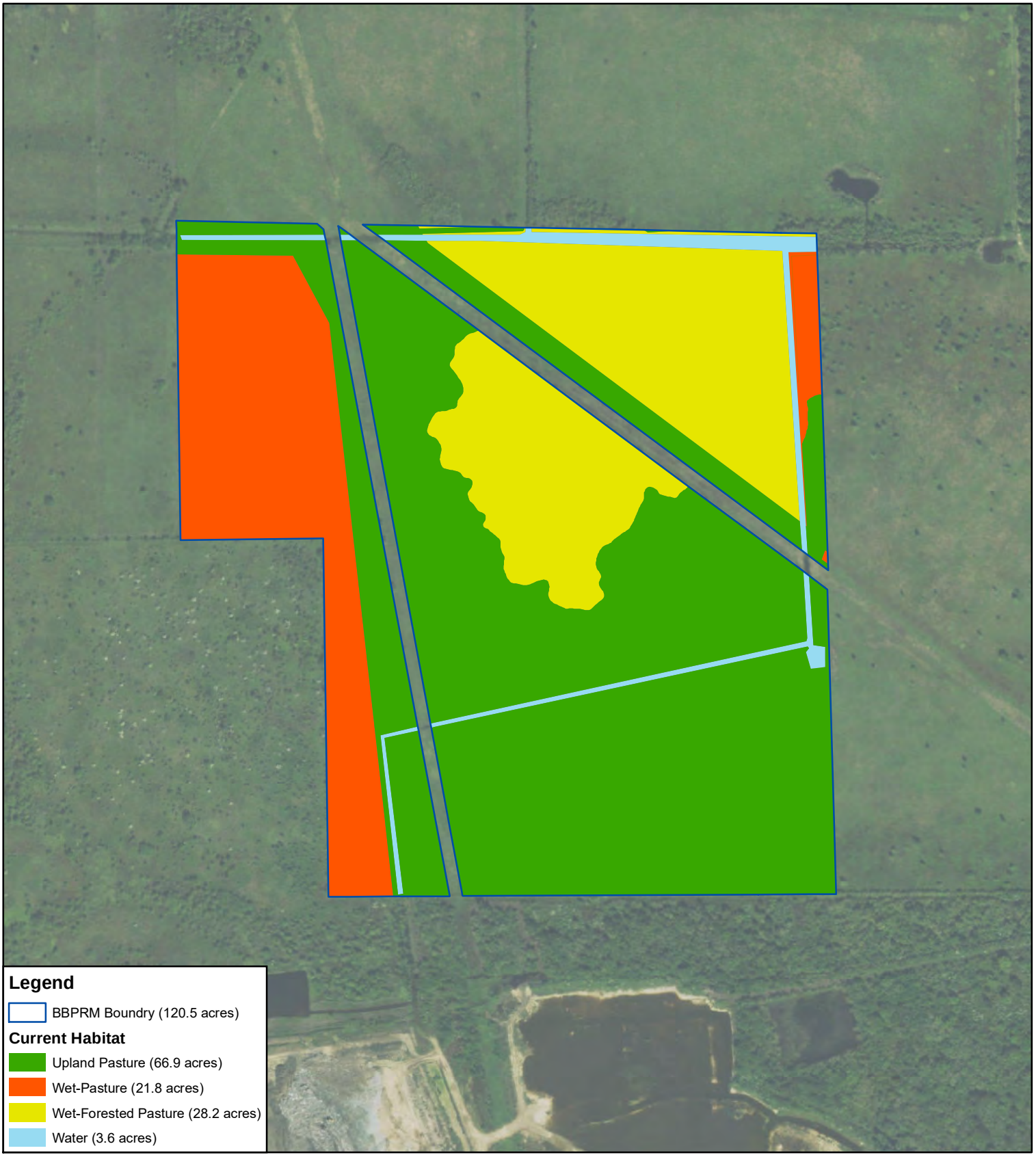
Drawing No.:

Date: 05/09/2018 Author: JKP

FIGURE 2

JMB Companies, Inc.

Document Path: N:\Mitigation Banks\Texas\Batrop Bayou PRM Freeport\Mapping\GIS Projects (.MXD)\7.22.2019_update\Figure_2_BBPRM_Boundary.mxd



PROPOSED BASTROP BAYOU PRM

CURRENT HABITAT/LAND USE EXHIBIT

BRAZORIA COUNTY, TEXAS

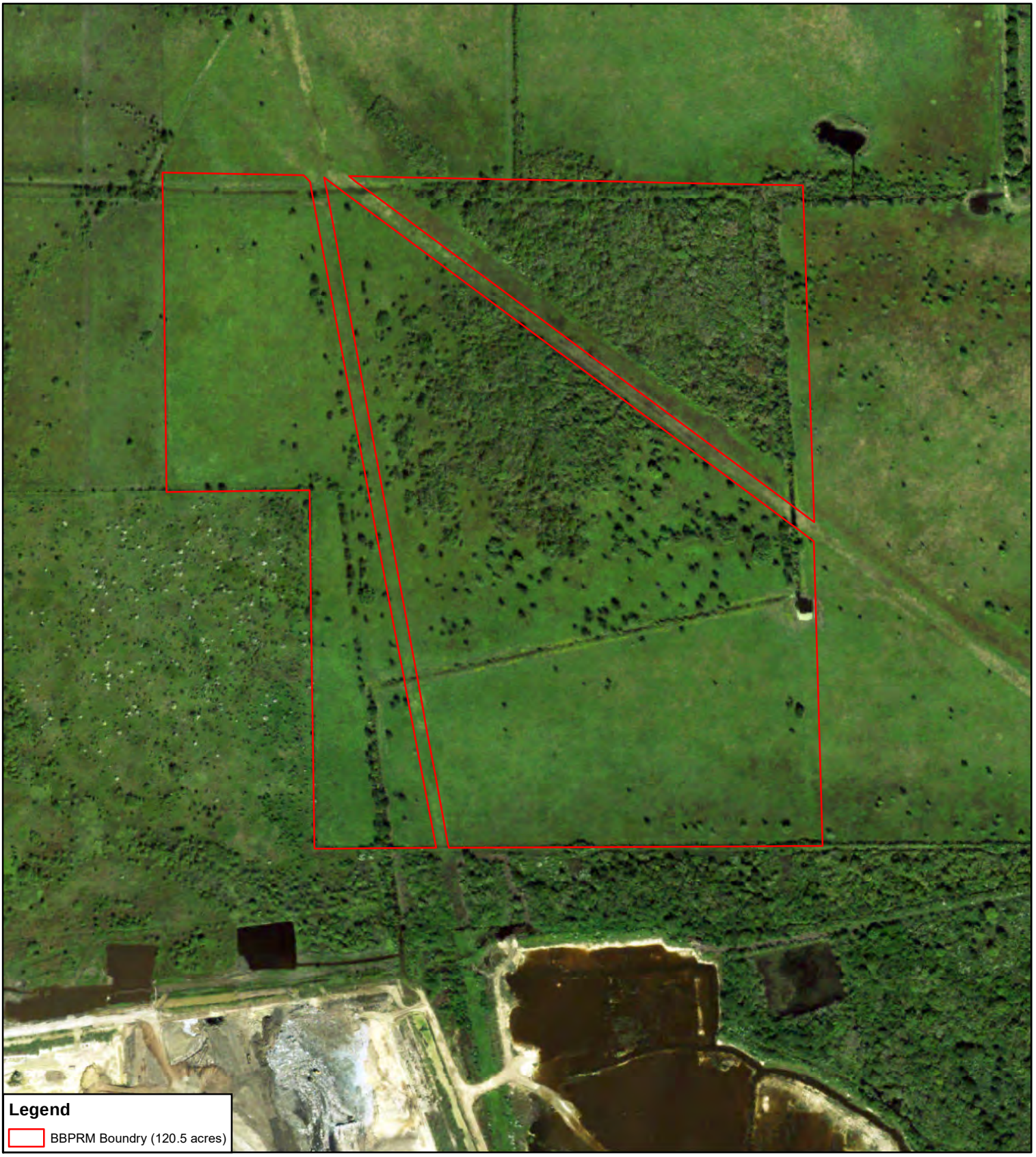
Drawing No.:

Date: 05/09/2018 Author: JKP

FIGURE 3

JMB Companies, Inc.

Document Path: N:\Mitigation Banks\Texas\Batrop Bayou PRM Freeport\Mapping\GIS Projects (.MXD)\7.22.2019_update\Figure_3_BBPRM_Habitat_LandUse.mxd



0 250 500 750 1,000
Feet

N

PROPOSED BASTROP BAYOU MITIGATION BANK

2014 NATURAL COLOR IMAGERY

BRAZORIA COUNTY, TEXAS

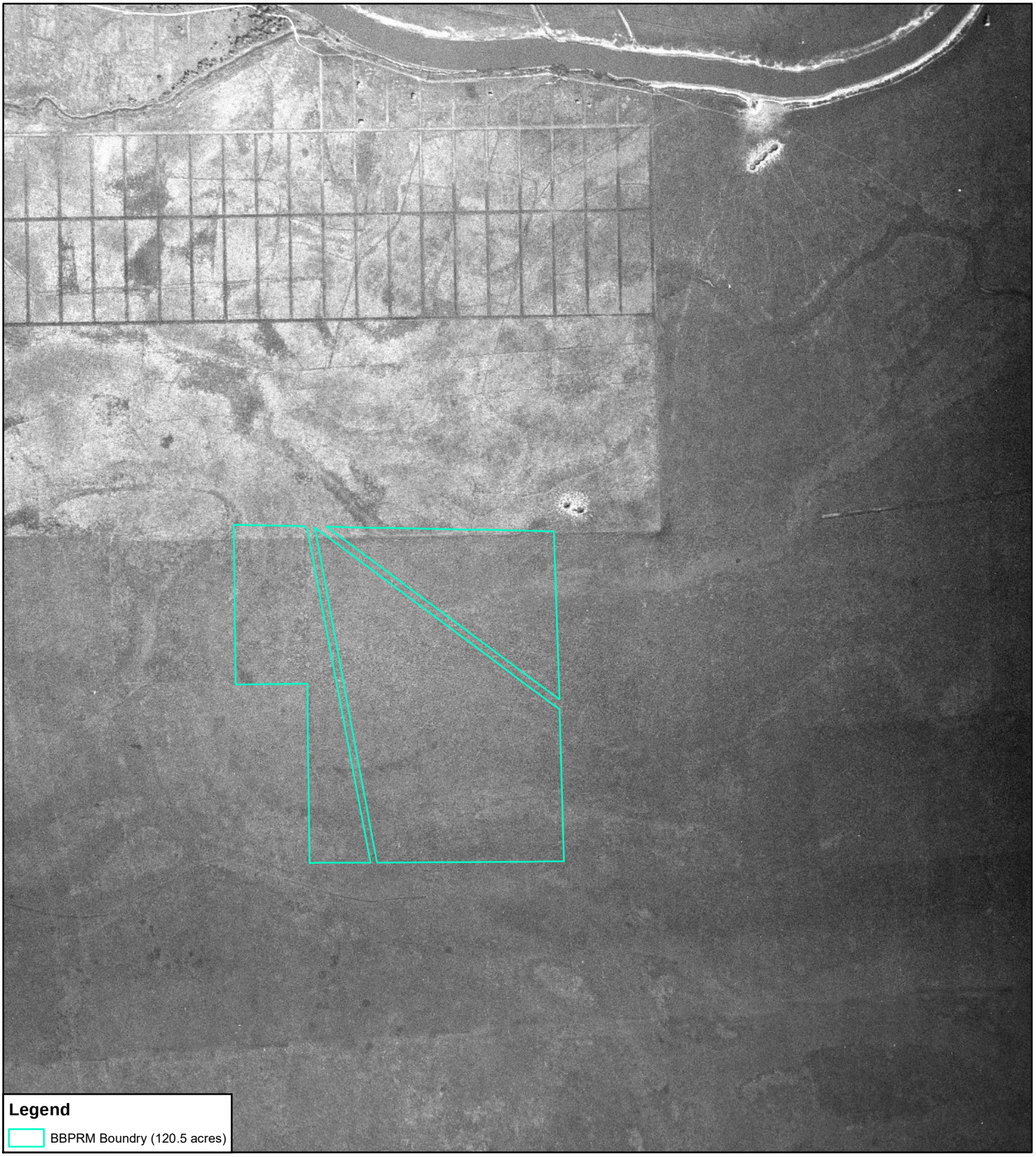
Drawing No.:

Date: 05/10/2018 Author: JKP

FIGURE 4

JMB
JMB Companies, Inc.

Document Path: N:\Mitigation Banks\Texas\Batrop Bayou PRM Freeport\Mapping\GIS Projects (.MXD)\7.22.2019_update\Figure_4_BBPRM_2014_NCAerial.mxd



0 500 1,000 1,500 2,000
Feet

N

PROPOSED BASTROP BAYOU PRM

1930 AERIAL IMAGERY EXHIBIT

BRAZORIA COUNTY, TEXAS

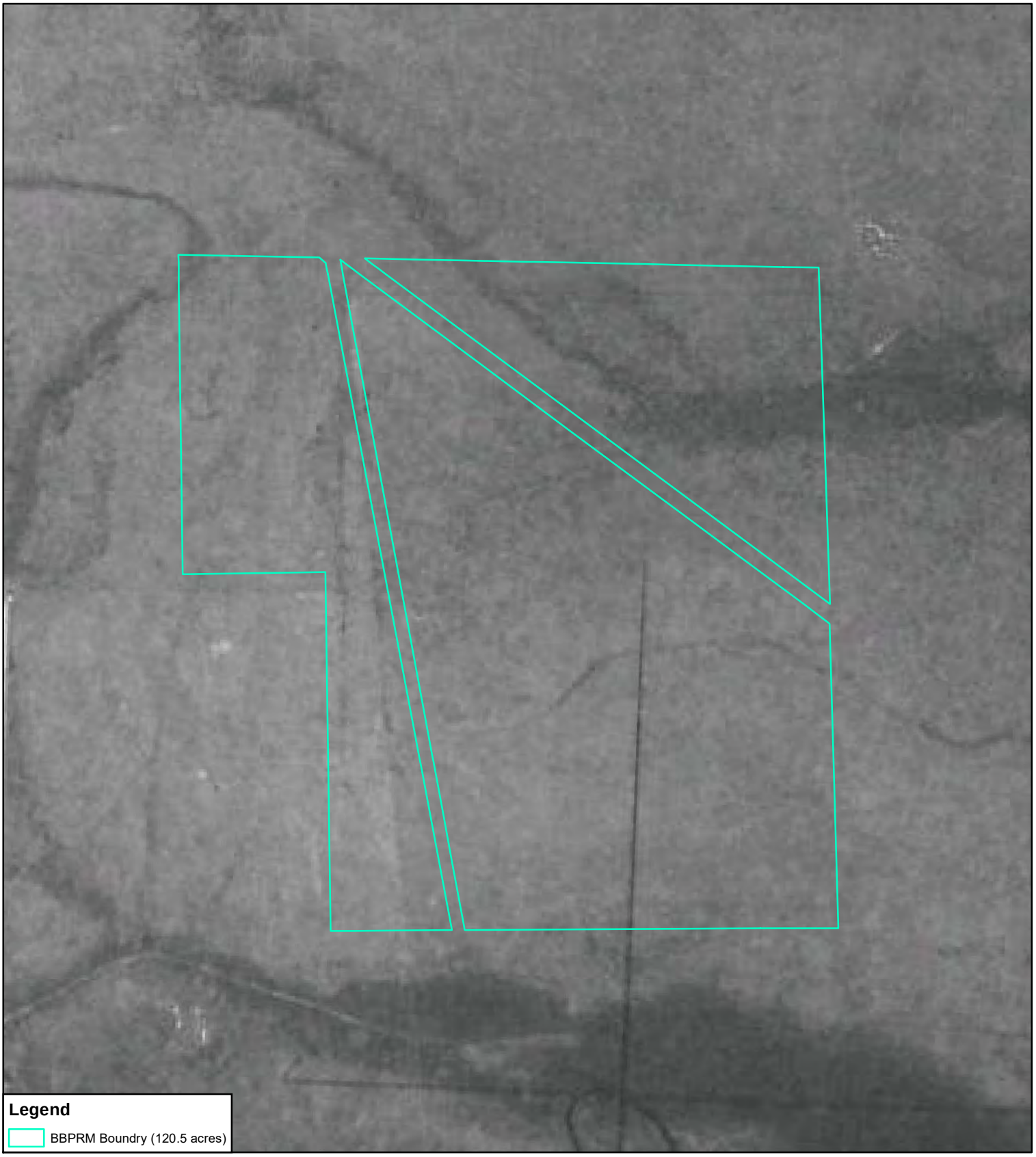
Drawing No.:

Date: 05/10/2018 Author: JKP

FIGURE 5

JMB Companies, Inc.

Document Path: N:\Mitigation Banks\Texas\Batrop Bayou PRM Freeport\Mapping\GIS Projects (.MXD)\7.22.2019_update\Figure_5_BBPRM_1930_Aerial.mxd



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Feet

N

PROPOSED BASTROP BAYOU PRM

1944 AERIAL IMAGERY EXHIBIT

BRAZORIA COUNTY, TEXAS

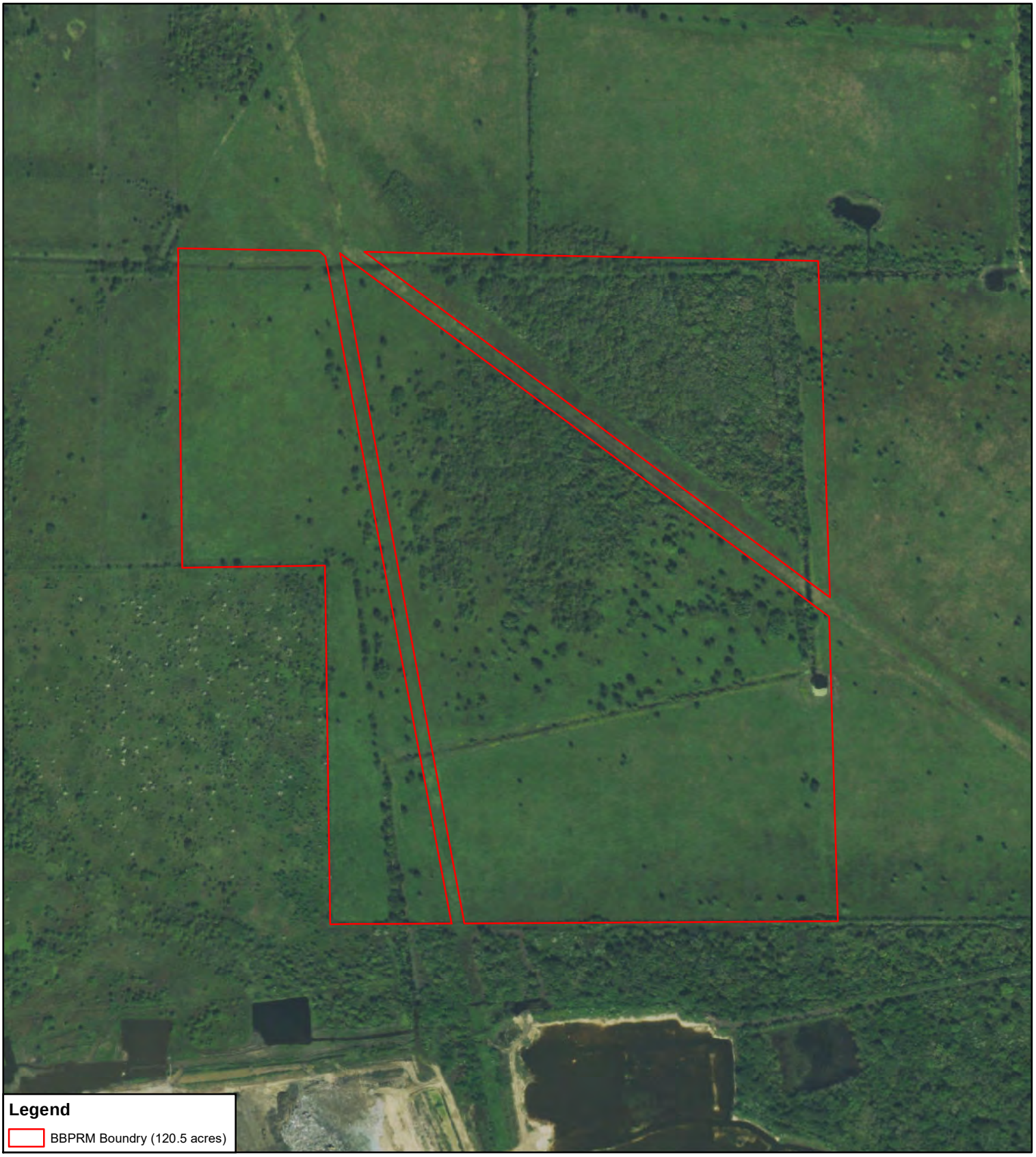
Drawing No.:

Date: 05/10/2018 Author: JKP

FIGURE 6

JMB Companies, Inc.

Document Path: N:\Mitigation Banks\Texas\Batrop Bayou PRM Freeport\Mapping\GIS Projects (.MXD)\7.22.2019_update\Figure_6_BBPRM_1944_Aerial.mxd



0 250 500 750 1,000
Feet

N

PROPOSED BASTROP BAYOU PRM

2014 AERIAL IMAGERY

BRAZORIA COUNTY, TEXAS

Drawing No.:

Date: 05/10/2018 Author: JKP

FIGURE 7

JMB
JMB Companies, Inc.

Document Path: N:\Mitigation Banks\Texas\Batrop Bayou PRM Freeport\Mapping\GIS Projects (.MXD)\7.22.2019_update\Figure_7_BBPRM_2014_Aerial.mxd

0 250 500 750 1,000
Feet

N

PROPOSED BASTROP BAYOU PRM

2009 CIR IMAGERY

BRAZORIA COUNTY, TEXAS

Drawing No.:

Date: 05/10/2018 Author: JKP

FIGURE 8

JMB Companies, Inc.

Document Path: N:\Mitigation Banks\Texas\Batrop Bayou PRM Freeport\Mapping\GIS Projects (.MXD)\7.22.2019_update\Figure_8_BBPRM_2009_CIRAerial.mxd

0 250 500 750 1,000
Feet

N

PROPOSED BASTROP BAYOU PRM

NATIONAL WETLAND INVENTORY EXHIBIT

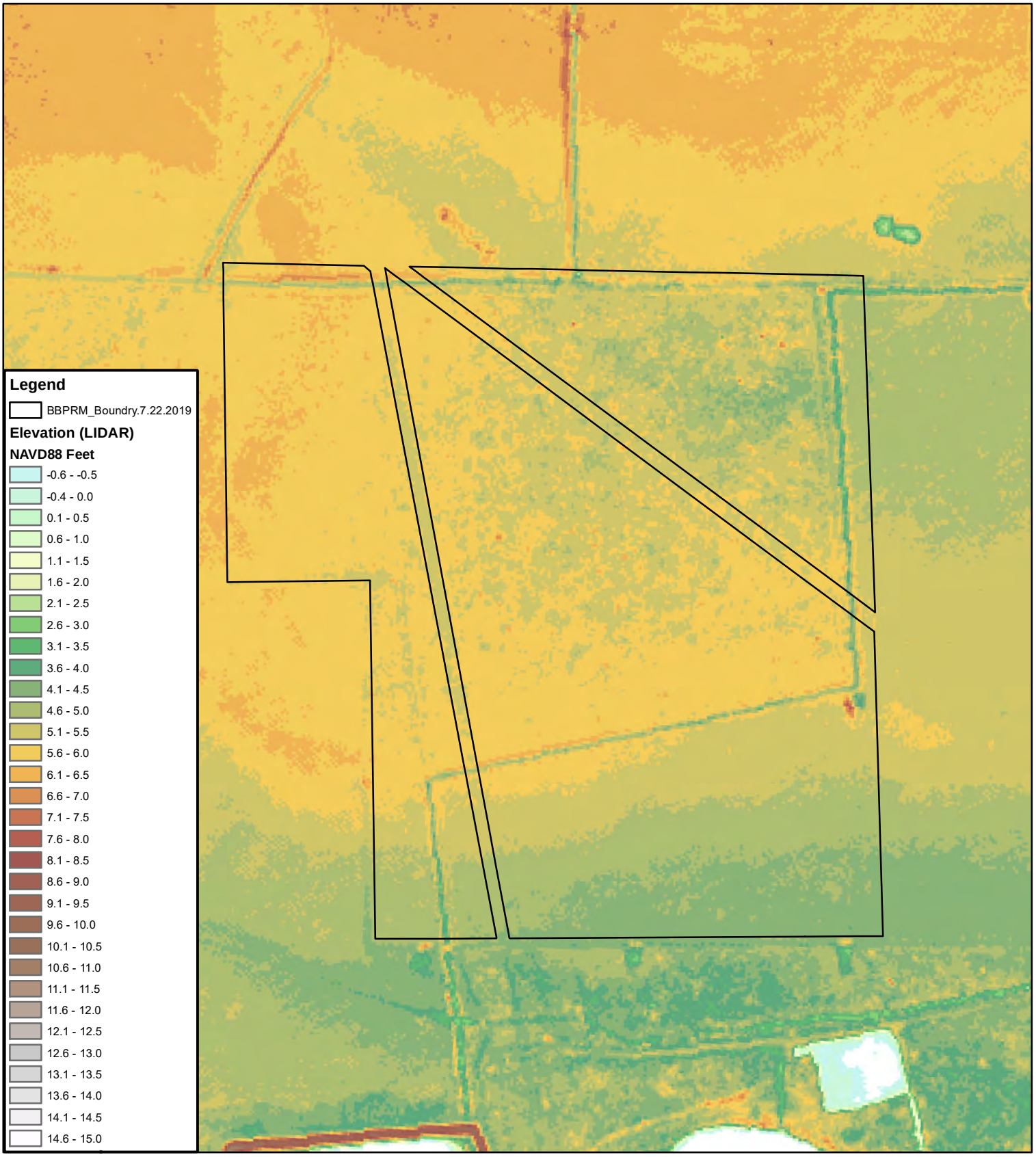
BRAZORIA COUNTY, TEXAS

Date: 05/10/2018 Author: JKP

FIGURE 9

JMB Companies, Inc.

Document Path: N:\Mitigation Banks\Texas\Batrop Bayou PRM Freeport\Mapping\GIS Projects (.MXD)\7.22.2019_update\Figure_9_BBPRM_NWI.mxd



0 250 500 750 1,000

Feet

N

PROPOSED BASTROP BAYOU PRM

ELEVATION/LIDAR EXHIBIT

BRAZORIA COUNTY, TEXAS

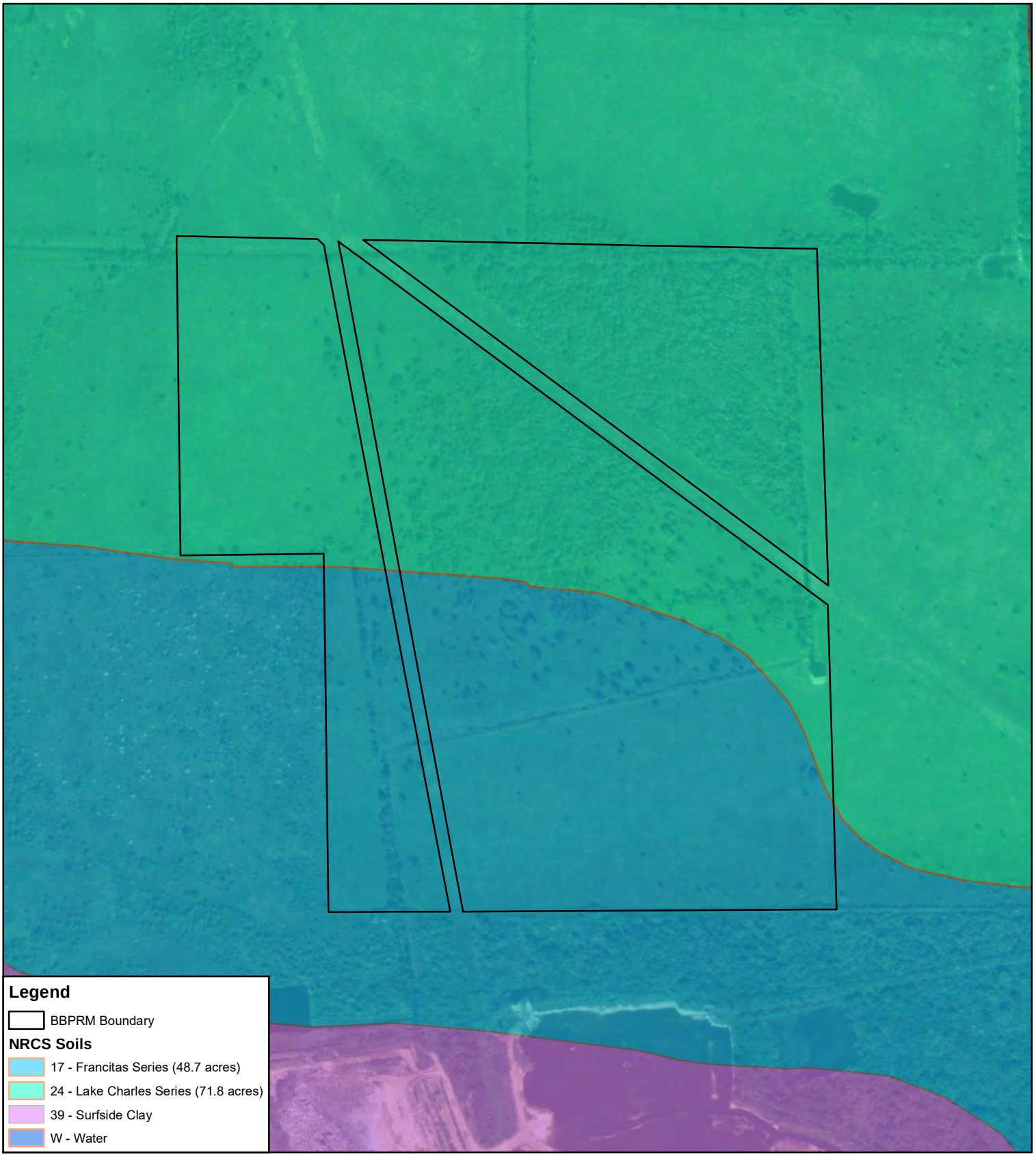
Drawing No.:

Date: 05/10/2018 Author: JKP

FIGURE 10

JMB Companies, Inc.

Document Path: N:\Mitigation Banks\Texas\Batrop Bayou PRM Freeport\Mapping\GIS Projects (.MXD)\7.22.2019_update\Figure_10_BBPRM_LIDAR.mxd



0 250 500 750 1,000
Feet

N

PROPOSED BASTROP BAYOU PRM

NRCS SOILS EXHIBIT

BRAZORIA COUNTY, TEXAS

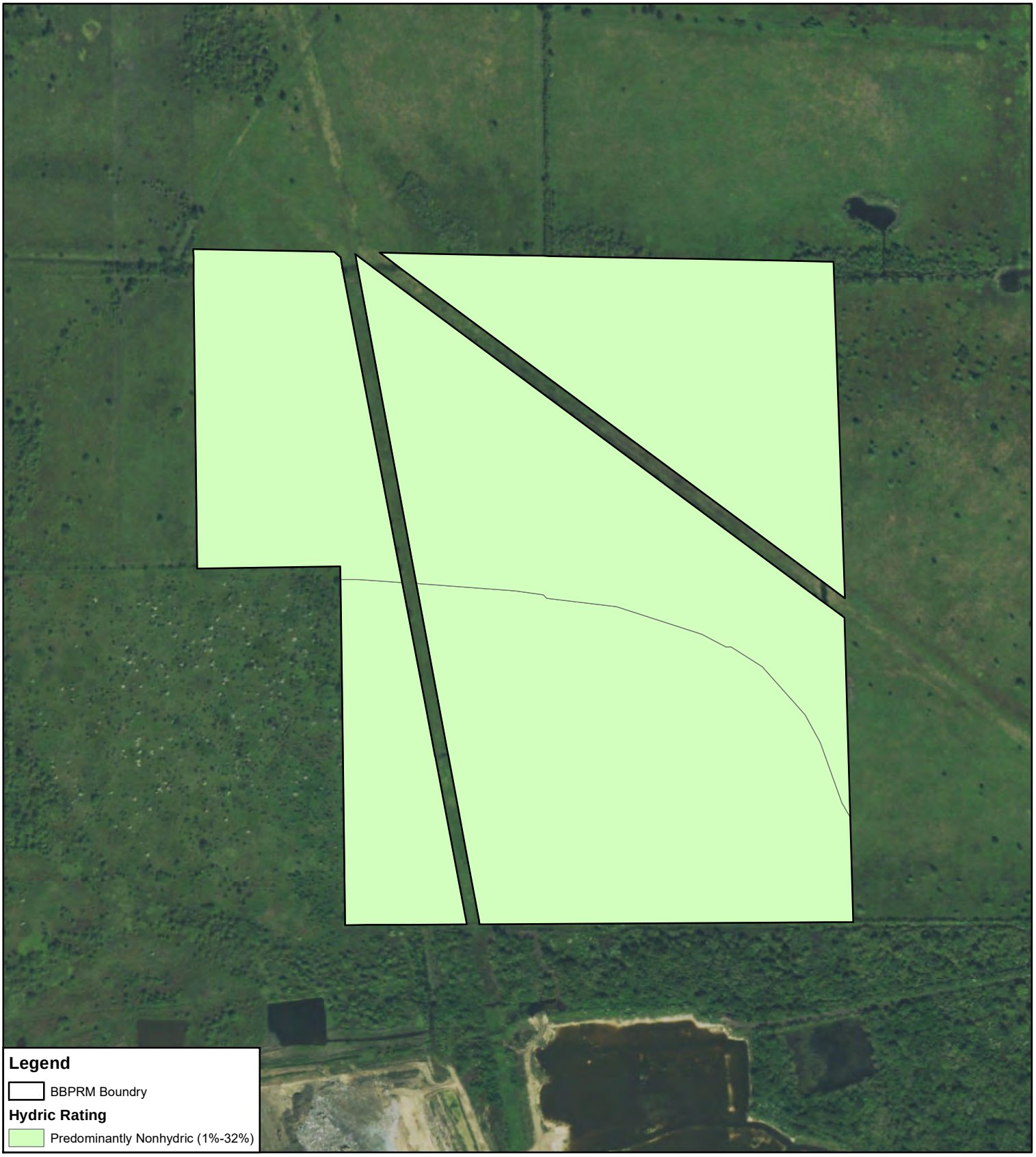
Drawing No.:

Date: 05/10/2018 Author: JKP

FIGURE 11

JMB Companies, Inc.

Document Path: N:\Mitigation Banks\Texas\Batrop Bayou PRM Freeport\Mapping\GIS Projects (.MXD)\7.22.2019_update\Figure_11_BBPRM_Soils.mxd



0 250 500 750 1,000
Feet

N

PROPOSED BASTROP BAYOU PRM

NRCS HYDRIC SOIL RATING EXHIBIT

BRAZORIA COUNTY, TEXAS

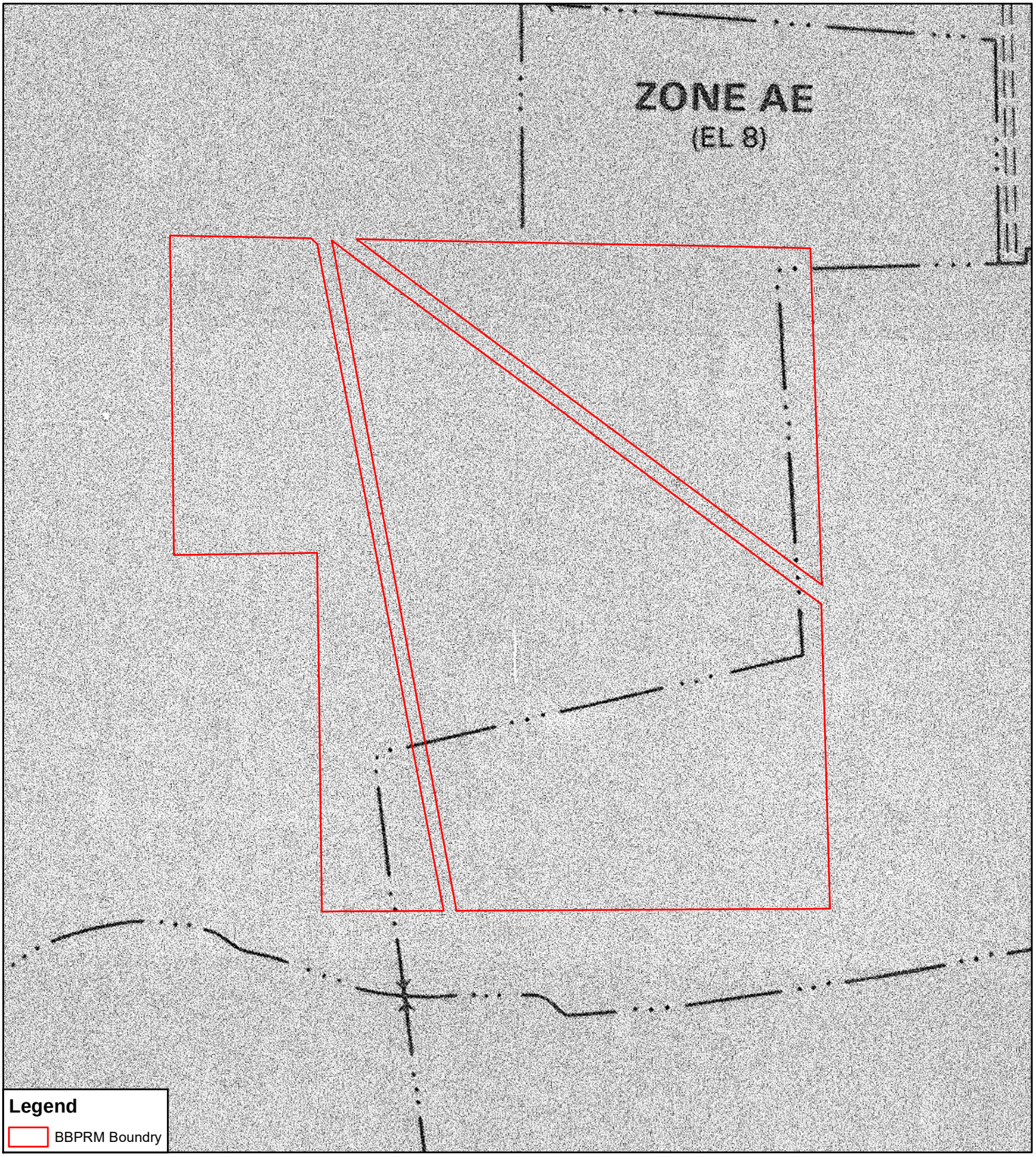
Drawing No.:

Date: 05/10/2018 Author: JKP

FIGURE 12

JMB Companies, Inc.

Document Path: N:\Mitigation Banks\Texas\Batrop Bayou PRM Freeport\Mapping\GIS Projects (.MXD)\7.22.2019_update\Figure_12_BBPRM_Hydric_RatingKP.mxd



0 250 500 750 1,000
Feet

N

PROPOSED BASTROP BAYOU PRM

FLOOD INSURANCE RATE MAP EXHIBIT

BRAZORIA COUNTY, TEXAS

Date: 05/10/2018 Author: JKP

FIGURE 13

JMB
JMB Companies, Inc.

Document Path: N:\Mitigation Banks\Texas\Batrop Bayou PRM Freeport\Mapping\GIS Projects (.MXD)\7.22.2019_update\Figure_13_BBPRM_FIRM.mxd

0 375 750 1,125 1,500
Feet

N

PROPOSED BASTROP BAYOU PRM

MONITORING EXHIBIT

BRAZORIA COUNTY, TEXAS

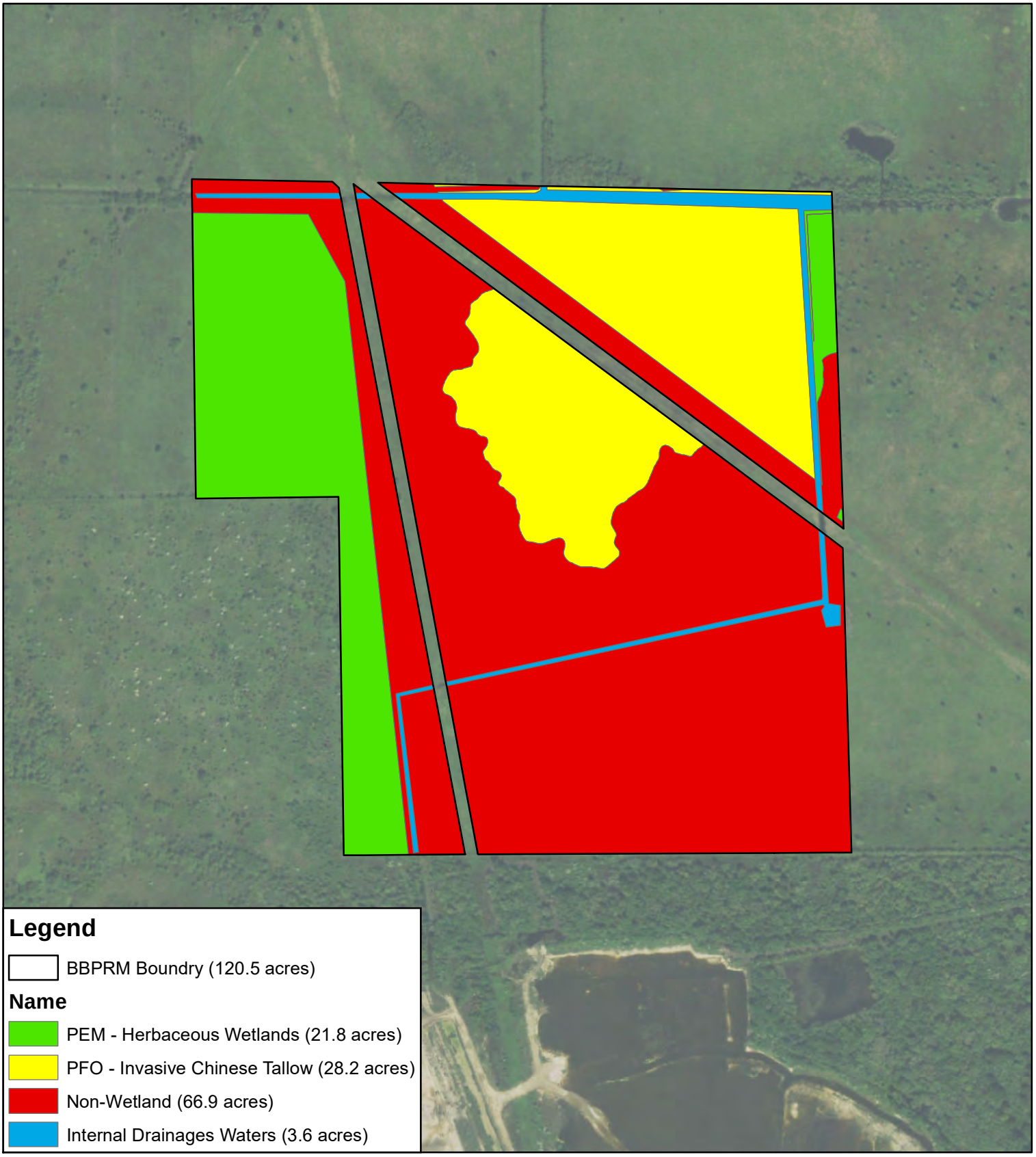
Drawing No.:

Date: 05/09/2018 Author: JKP

FIGURE 14

JMB Companies, Inc.

Document Path: N:\Mitigation Banks\Texas\Batrop Bayou PRM Freeport\Mapping\GIS Projects (.MXD)\7.22.2019_update\Figure_14_BBPRM_Monitoring.mxd



0 250 500 750 1,000
Feet

N

PROPOSED BASTROP BAYOU PRM

WETLAND TYPE EXHIBIT

BRAZORIA COUNTY, TEXAS

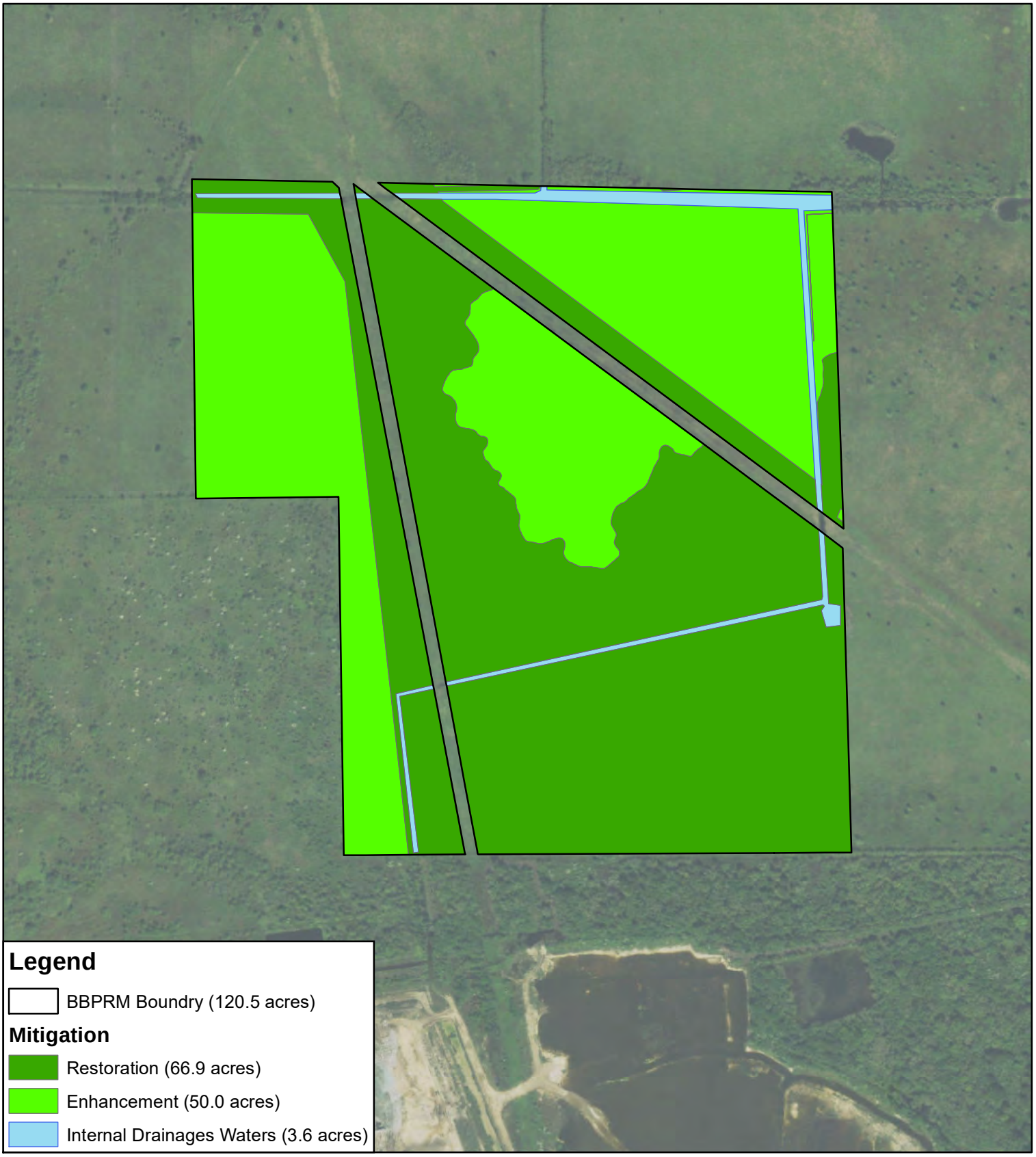
Drawing No.:

Date: 05/09/2018 Author: JKP

FIGURE 15

JMB Companies, Inc.

Document Path: N:\Mitigation Banks\Texas\Batrop Bayou PRM Freeport\Mapping\GIS Projects (.MXD)\7.22.2019_update\Figure_15_BBPRM_WetlandType.mxd



0 250 500 750 1,000
Feet

N

PROPOSED BASTROP BAYOU PRM

MITIGATION TYPE EXHIBIT

BRAZORIA COUNTY, TEXAS

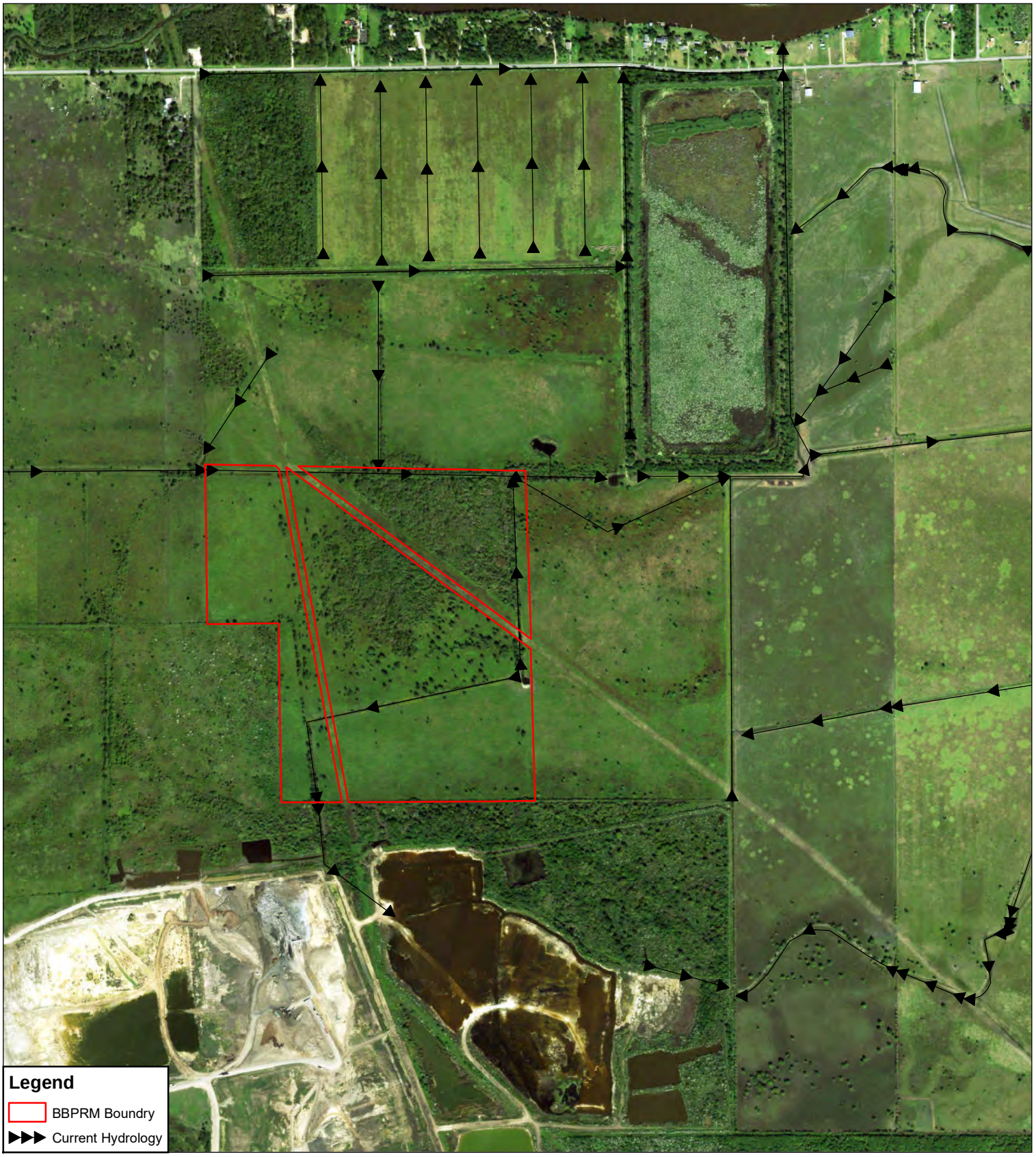
Drawing No.:

Date: 05/09/2018 Author: JKP

FIGURE 16

JMB Companies, Inc.

Document Path: N:\Mitigation Banks\Texas\Batrop Bayou PRM Freeport\Mapping\GIS Projects (.MXD)\7.22.2019_update\Figure_16_BBPRM_MitigationType.mxd



0 500 1,000 1,500 2,000
Feet

N

PROPOSED BASTROP BAYOU PRM

CURRENT HYDROLOGY

BRAZORIA COUNTY, TEXAS

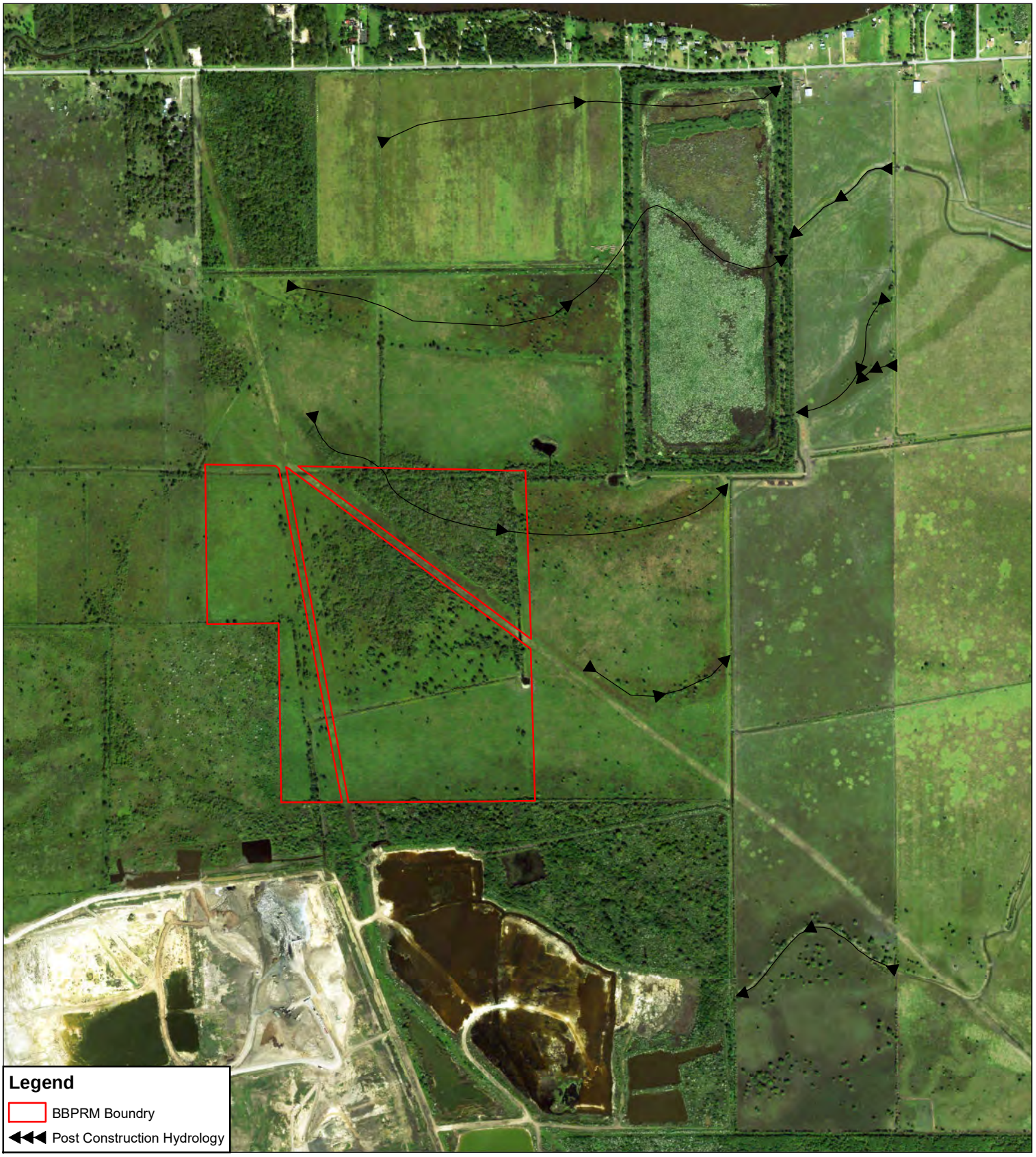
Drawing No.:

Date: 05/10/2018 Author: JKP

FIGURE 17

JMB
JMB Companies, Inc.

Document Path: N:\Mitigation Banks\Texas\Batrop Bayou PRM Freeport\Mapping\GIS Projects (.MXD)\7.22.2019_update\Figure_17_BBPRM_Current_Hyodrology.mxd



0 500 1,000 1,500 2,000
Feet

N

PROPOSED BASTROP BAYOU PRM

PROPOSED HYDROLOGY

BRAZORIA COUNTY, TEXAS

Drawing No.:

Date: 05/10/2018 Author: JKP

FIGURE 18

JMB
JMB Companies, Inc.

Document Path: N:\Mitigation Banks\Texas\Batrop Bayou PRM Freeport\Mapping\GIS Projects (.MXD)\7.22.2019_update\Figure_18_BBPRM_Current_Hyodrology.mxd

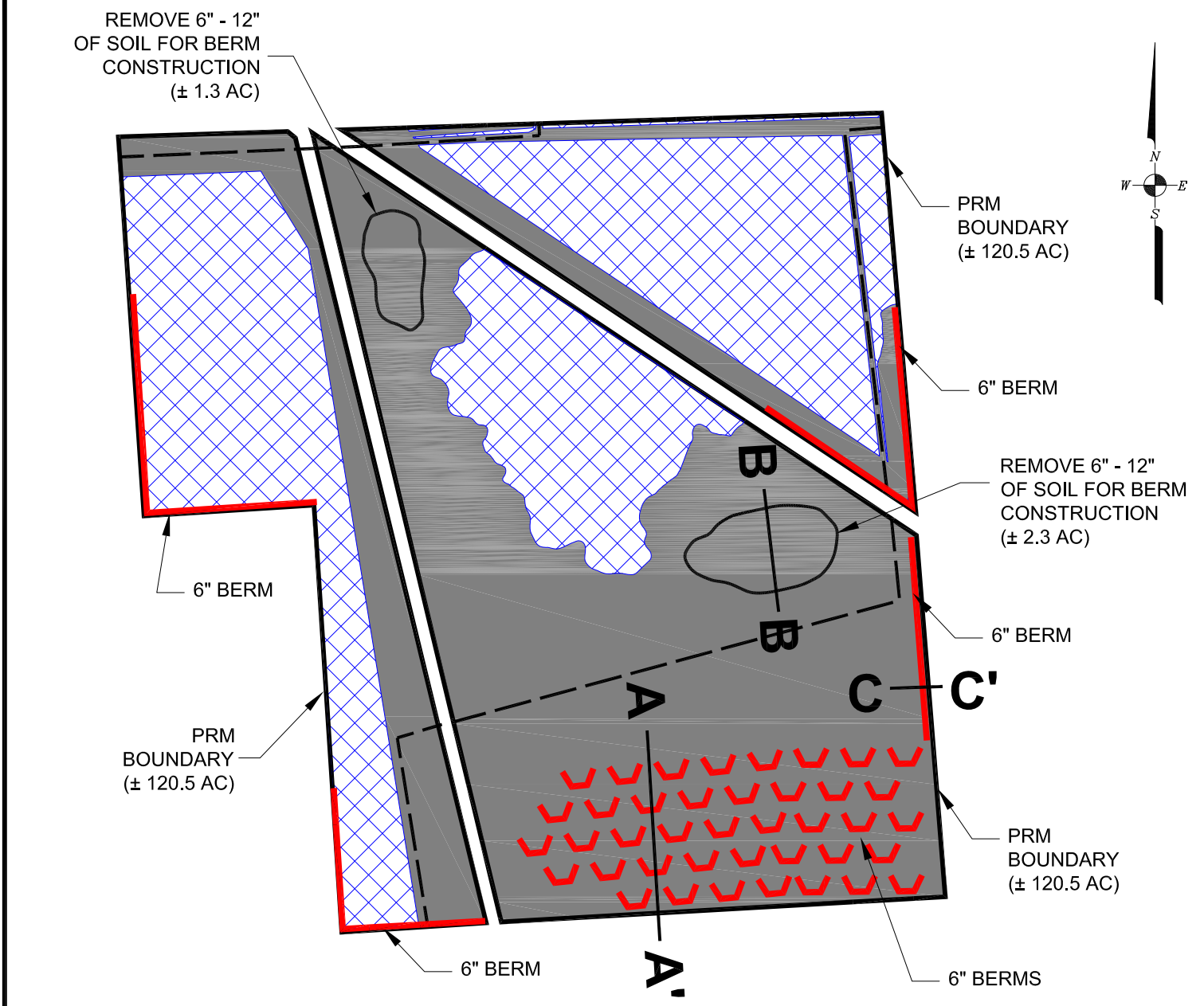
Attachment B: IHGM Worksheet

Proposed Mitigation: 50 acres of Enhancement and 66.9 acres of Restoration

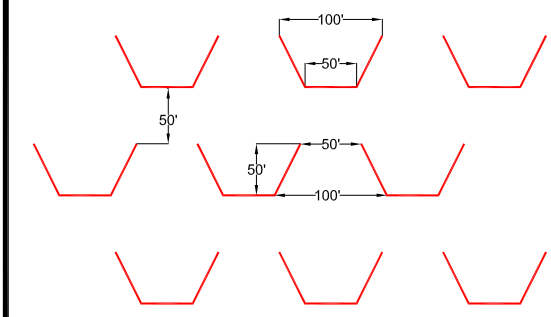
Proposed 110.1 acres of Impacts with 120.5 acres of Permittee Responsible Mitigation

		FCI Values			FCU Values		
Wetland Type	Acreage	Physical (TSSW)	Biological (MPAC)	Chemical (RSEC)	Physical (TSSW)	Biological (MPAC)	Chemical (RSEC)
PEM	106.41	0.314	0.533	0.303	33.41	56.72	32.24
PSS	3.68	0.308	0.5	0.327	1.13	1.84	1.20
Open Water	2.82						
Total	**110.09**				**34.55**	**58.56**	**33.45**
Enhancement	50.0	0.236	0.246	0.172	11.78	12.3	8.6
Restoration	66.9	0.650	0.720	0.407	43.47	48.2	27.25
Other Waters	3.6						
Total PRM	**120.5**				**55.25**	**60.5**	**35.85**
Net gain					**20.70**	**1.94**	**2.40**

Attachment C: Construction Drawings



DETAIL OF 6" BERMS



EXISTING DITCH TO BE FILLED

EXISTING WETLANDS TO BE ENHANCED (49.85 ACRES)

WETLAND RESTORATION AREA (70.65 ACRES)

PROPOSED BERM

0 500 1000 2000

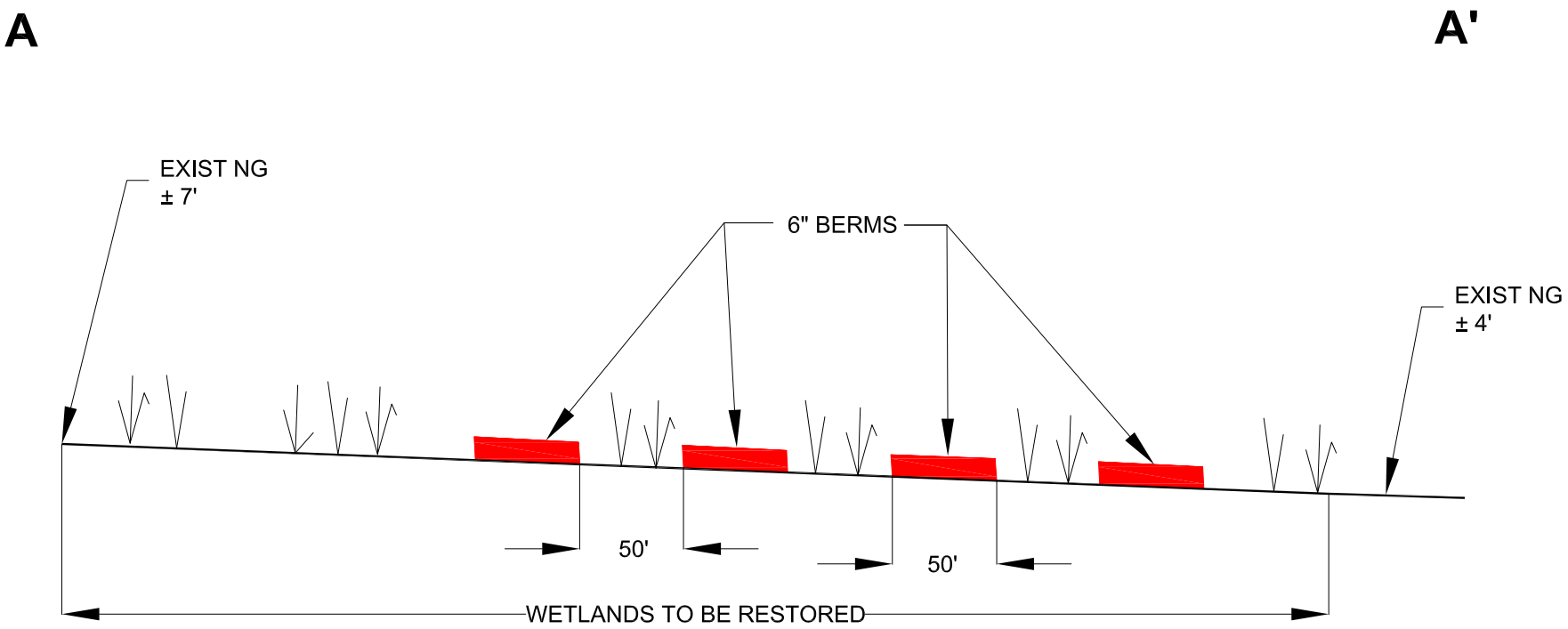
SCALE (Feet)

PROPOSED MITIGATION BANK PLAN VIEW

PROJECT #: 10081
FOR: BASTROP BAYOU MITIGATION BANK
LOCATION: PROPOSED BASTROP BAYOU MITIGATION BANK BRAZORIA COUNTY, TEXAS

REVISIONS:
July 31, 2019 by MBaker

BERG OLIVER ASSOCIATES, INC.
ENVIRONMENTAL SCIENCE & LAND USE CONSULTANTS
14701 ST. MARY'S LANE, SUITE 400 HOUSTON, TX 77079
PHONE (281) 589-0898 http://www.bergoliver.com



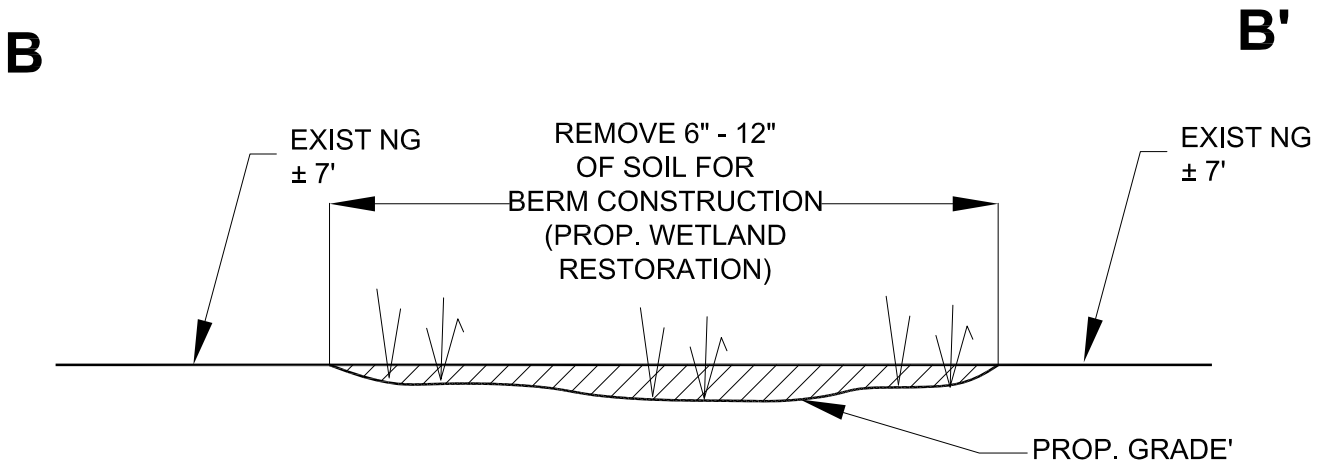
PROPOSED MITIGATION BANK
CROSS SECTION A–A'

PROJECT #: 10081
FOR: BASTROP BAYOU MITIGATION BANK
LOCATION: PROPOSED BASTROP BAYOU MITIGATION BANK
BRAZORIA COUNTY, TEXAS

REVISIONS:
July 31, 2019 by MBaker

BERG OLIVER ASSOCIATES, INC.
ENVIRONMENTAL SCIENCE & LAND USE CONSULTANTS
14701 ST. MARY'S LANE, SUITE 400 HOUSTON, TX 77079
PHONE (281) 589-0898 http://www.bergoliver.com

EXISTING CONDITIONS



POST-CONSTRUCTION

PROPOSED MITIGATION BANK
CROSS SECTION B–B'

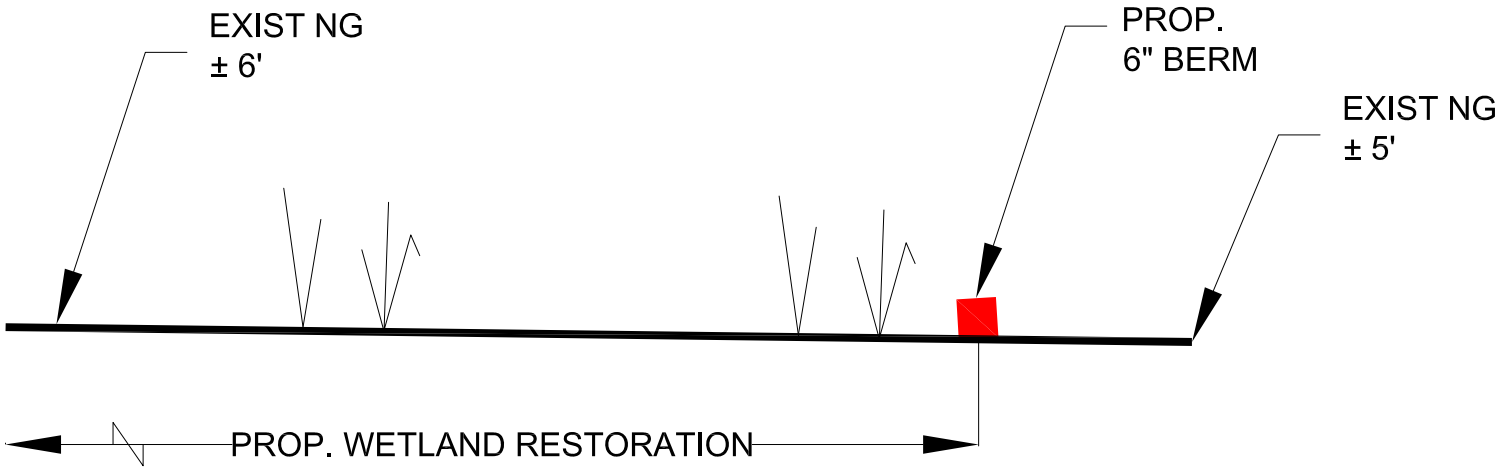
PROJECT #: *10081*
FOR: *BASTROP BAYOU MITIGATION BANK*
LOCATION: *PROPOSED BASTROP BAYOU MITIGATION BANK*
BRAZORIA COUNTY, TEXAS

REVISIONS:
July 31, 2019 by MBaker

BERG OLIVER ASSOCIATES, INC.
ENVIRONMENTAL SCIENCE & LAND USE CONSULTANTS
14701 ST. MARY'S LANE, SUITE 400 HOUSTON, TX 77079
PHONE (281) 589-0898 http://www.bergoliver.com

C

C'



PROPOSED MITIGATION BANK
CROSS SECTION C–C'

PROJECT #: 10081
FOR: BASTROP BAYOU MITIGATION BANK
LOCATION: PROPOSED BASTROP BAYOU MITIGATION BANK
BRAZORIA COUNTY, TEXAS

REVISIONS:
July 31, 2019 by MBaker

BERG OLIVER ASSOCIATES, INC.
ENVIRONMENTAL SCIENCE &
LAND USE CONSULTANTS
14701 ST. MARY'S LANE, SUITE 400 HOUSTON, TX 77079
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Attachment D: Conservation Holder and Servitude

U.S. LAND CONSERVANCY

4520 South Sherwood Forest Blvd. Suite 104-373, Baton Rouge, LA 70816
(225) 772-5923 --- lmccauley@uslandconservancy.org

June 7, 2018

JMB Land Company
203 West Main Street
Franklin, Louisiana 70538

Re: Engagement Letter for Holding Conservation Easement for Bastrop Bayou (Freeport LNG PRM) site in Brazoria County, Texas

Dear Mr. Walters:

U.S. Land Conservancy, Inc. (USLC) appreciates the opportunity to present JMB Land Co. (JMB) and its affiliates, with this engagement letter, for holding a Conservation Easement for the subject property in Brazoria County, Texas (see Attachment).

Qualifications

USLC is a 501(c)(3) non-profit organization (as defined in Section 170(h) of the Internal Revenue Code of 1986), dedicated to the conservation and stewardship of native habitats. USLC is a member of the Land Trust Alliance (LTA) and operates in accordance with the Land Trust Standards and Practices as set forth by the LTA. USLC currently holds conservation easements on more than 14,000 acres.

Scope of Services

1) USLC will act as Holder of Conservation Easement for the Bastrop Bayou (Freeport LNG PRM) site:

USLC will monitor this property to ensure compliance with the Conservation Easement (draft copy attached). If a violation is discovered, USLC will attempt resolve the issue with Landowner or adjacent Landowner. If an acceptable resolution cannot be reached, legal action will be taken to enforce the provisions of the Conservation Easement.

- **Monitoring is conducted on an annual basis,**
- **An on-site inspection is conducted per the provisions of the Conservation Easement,**
- **Visits are coordinated with landowner where possible,**
- **Annual reports are sent to CESWG, and**

- **Violations are promptly communicated to the landowner.**

USLC's financial liability will be capped at the amount of the Conservation Easement fee.

Indemnification

USLC agrees to protect, defend, indemnify, and hold harmless the JMB, its officers, directors, employees, or their invitees, from and against all claims, demands, and causes of action of every kind and character without limit and without regard to the cause or causes thereof or the negligence or fault (active or passive) of any party or parties including the sole, joint or concurrent negligence of the JMB, any theory of strict liability and defect of premises (whether or not preexisting the date of this Contract), arising in connection herewith in favor of USLC, its employees, contractors (or their employees), or invitees on account of bodily injury, death, or damage to property.

JMB agrees to protect, defend, indemnify, and hold harmless USLC, its officers, directors, employees, or their invitees, from and against all claims, demands, and causes of action of every kind and character without limit and without regard to the cause or causes thereof or the negligence or fault (active or passive) of any party or parties including the sole, joint or concurrent negligence of USLC, any theory of strict liability, any professional liability, and defect of premises (whether or not pre-existing the date of this Contract), arising in connection herewith in favor of the JMB, its employees, contractors (or their employees), or invitees on account of bodily injury, death or damage to property.

With respect to any claims not elsewhere covered under the provisions of this Indemnity, each party agrees, to the extent of its negligence or fault, to indemnify and hold harmless the other against all claims, damages or losses due to personal injury, death, or property damage, to the extent that its negligence or fault causes the personal injury, death, or property damage.

Notwithstanding anything else contained herein to the contrary, neither party shall be liable to the other for any consequential or indirect damages including but not limited to loss production, loss of profits, or business interruption, howsoever caused and even if due to the negligence of either party.

Dispute Resolution

Any dispute concerning a question of fact in connection with the work not disposed of by agreement between the parties hereto shall be referred to in writing to a conflict resolution committee composed of authorized representatives of parties subject to this contract for review, discussion and resolution without the need for formal proceedings. If parties do not reach an agreement to resolve their differences by these informal proceedings, the dispute shall proceed to mediation (refer to AIA Document 8511-2001).

In the event the parties to this agreement are unable to reach a settlement of any dispute through a mediation process, then such dispute may, with the consent of

both parties, be settled by binding arbitration in accordance with the rules of the American Arbitration Association current as of the date of this agreement. If arbitration is pursued, the decision of the arbitrator shall be final and conclusive.

Compensation
USLC's cost to conduct the tasks listed in the "Scope of Services" will be as follows:

USLC will act as Holder of Conservation Easement for the Bastrop Bayou (Freeport LNG PRM) site - $_____

Authorization
USLC indicates acceptance of all above stated agreement terms by signature below. JMB can also indicate acceptance of the above agreement by signing below and returning a copy to USLC.

USLC appreciates the opportunity to present this engagement letter and looks forward to working with the JMB. If you have any questions, please feel free to contact me at (225) 772-5923 or lmccauley@uslandconservancy.org.

Sincerely,

Leonard McCauley
President

ACCEPTED BY: _____
Signature

_____
Title

_____
Date

CONSERVATION EASEMENT AGREEMENT

THE STATE OF TEXAS §
§ KNOW ALL PERSONS BY THESE PRESENTS:
COUNTY OF § BRAZORIA §

This Conservation Easement Agreement (this "Agreement") is executed as of _____ (the "Effective Date"), by and between JMB Land Co., LP ("Grantor"), and U.S. Land Conservancy ("Grantee").

Recitals:

A. Grantor is the record owner of fee simple title to certain parcels of real property consisting of _____ acres located and situated in Brazoria County, Texas and more particularly described in **Exhibit "A"** (legal description of the "Property") attached hereto and made a part hereof. The Property is also referenced in Permit No. SWG-2008-00___ Compensatory Mitigation Plan dated _____ and entitled _____. Title to the surface estate is described in a commitment for title insurance (the "Commitment") previously received by Grantee and a title insurance policy (the "Policy") to be issued pursuant to the commitment and to be received by Grantee in conjunction with this conveyance.

B. Grantee is qualified to hold a conservation easement, and is a charitable, not-for-profit or educational corporation, association, or trust, qualified under Section 501(c)(3) and Section 170(h) of the Internal Revenue Code of 1986, as amended, the purposes or powers of which include one or more of the Purposes described in **Recital D** below.

C. The preservation of the Property is a condition of the Department of the Army Section 404/10 Project Number _____, authorization dated _____, or a revision thereof (the "Permit"), and attached hereto as **Exhibit "B"**. The Permittee Responsible Mitigation Plan ("PRMP") attached hereto as **Exhibit "C"** requires certain restrictions to be placed on the Property in order to provide compensation for unavoidable adverse impacts to waters of the United States. It is the intent of this Agreement and the Conservation Easement (as hereinafter defined) granted herein to assure that the Property will be retained and maintained forever in the vegetative and hydrologic condition described in the success criteria of the PRMP. Any activities not included in the PRMP that may be conducted on the Property and that will affect the vegetative and hydrologic conditions outlined in the success criteria of the PRMP must be approved in writing by the United States Army Corps of Engineers (the "USACE"), Galveston District, Regulatory Branch, prior to initiation. The Conservation Easement granted by this Agreement is created pursuant to the Texas Uniform Conservation Easement Act of 1983 contained in Chapter 183 of the Texas Natural Resources Code.

D. The primary conservation value of the Property is its wetlands feature (the "Conservation Value"), and the primary purpose of the Conservation Easement is the preservation and enhancement of the wetlands feature on the Property in accordance with the PRMP. Additional purposes of the Conservation Easement include but are not limited to the following (the "Purposes"):

(a) Serving as a mitigation area or mitigation bank pursuant to the regulation and guidelines of the United States Environmental Protection Agency ("EPA") and the USACE promulgated under authority of Section 404 of the Clean Water Act (33 USC § 1344, et seq.) and Section 10 of the Rivers and Harbors Act of 1899 (33 USC § 403, et seq.).

Any uses of the Property that may impair or interfere with these Purposes of the Conservation Easement are expressly prohibited.

E. The preservation of the Property is a condition of the Permit and is required to mitigate for unavoidable adverse impacts to waters of the United States. Grantor and Grantee agree that third-party rights of enforcement shall be held by the USACE, Galveston District, and any successor agencies, and that such rights are in addition to, and do not limit, the rights of enforcement under the Permit. Notwithstanding any provision to the contrary herein, Grantee is not responsible for monitoring, performing or enforcing any obligations under the PRMP; rather, the role of Grantee is to enforce the specific obligations imposed hereunder on Grantee and the specific restrictions imposed on the Property under this Agreement.

F. The following Exhibits are attached to this Conservation Easement and incorporated by reference:

Exhibit A Legal Description of the Property

Exhibit B U.S. Army Corps of Engineers Permit

Exhibit C Permittee Responsible Mitigation Plan

Exhibit D Baseline Documentation Report

Agreement:

NOW THEREFORE, for good and valuable consideration paid by Grantee, the receipt and legal sufficiency of which are hereby acknowledged by Grantor, and in consideration of the covenants, mutual agreements and conditions herein contained, Grantor has TRANSFERRED, BARGAINED, GRANTED, SOLD, CONVEYED, ASSIGNED, SET OVER and DELIVERED, and by these presents does TRANSFER, BARGAIN, GRANT, SELL, CONVEY, ASSIGN, SET OVER and DELIVER, to Grantee a conservation easement on, over, under, across, along and through the Property on the terms set forth herein, together with all other rights reasonably necessary or desirable to accomplish the objectives of the PRMP and the rights granted under this Agreement (the "Conservation Easement"), subject to the following terms, reservations, covenants, limitations and exceptions:

1. **Duration of Easement**. The Conservation Easement shall be perpetual. The Conservation Easement is an easement in gross, runs with the land, and is enforceable by Grantee against Grantor, and Grantor's successors, assigns, lessees, agents, and licensees.

2. **Property Description**. In addition to the metes and bounds legal description of the Property set forth in **Exhibit "A"** and incorporated herein by reference for all purposes are metes and bounds surveys of the Property by a Texas Registered Professional Land Surveyor. In connection with the application for the Permit, Grantor has previously provided to the USACE a copy of a wetland survey map which delineates all waters of the United States, including wetlands, within the Property. In addition to the wetland survey, Grantor has also provided photographs of the Property.

3. **Present Condition of the Property**. Neither Grantor, its agents, assigns, successors, or personal representatives, nor any purchasers, lessees, or other users of the Property may use, disturb, or allow through intent or negligence, the use or disturbance of the Property in any manner that is inconsistent with the Purposes of the Conservation Easement, unless specifically provided for in the PRMP. The wetlands and other aquatic resources of the Property, and its current use and state of improvement, are more specifically described in the Baseline Documentation Report, prepared by Grantee and acknowledged by the Grantor and Grantee to be complete and accurate as of the date hereof, **Exhibit D**. Both Grantor and Grantee have copies of this report. It will be used by the parties to ensure that any future changes in the use of the Property will be consistent with the terms of this Conservation Easement. However, this report is not intended to preclude the use of other evidence to establish the present condition of the Property if there is a controversy over its use.

4. **Prohibited Activities**. Any activity on, or use of, the Property inconsistent with the Purposes of the Conservation Easement or as stated within the PRMP is prohibited. The Property shall be preserved in its natural condition and restricted from any development that would impair or interfere with the Conservation Value of the Property. Without limiting the generality of the foregoing, the following activities and uses are expressly prohibited, restricted, or reserved as indicated hereunder, unless specifically provided for in the PRMP:

(a) Vegetation: Grantor may remove diseased, invasive or non-native trees, shrubs, or plants; cut and mow firebreaks and existing road rights-of-way; and remove trees, shrubs, or plants to accommodate maintenance of permitted improvements or other uses expressly permitted under the terms of this Agreement. Grantor may remove potentially invasive plants from the Property for habitat management purposes consistent with the intent of this Agreement. Except as necessary for activities expressly permitted, there shall be no farming, tilling, or destruction and removal of native vegetation on the Property. There shall be no planting of invasive or potentially invasive non-native plant species anywhere on the Property. Grantor will provide a list of potentially invasive species upon request. Control of any noxious vegetation species will utilize the approved treatment and application of treatment as outlined according to the U.S. Department of Agriculture and the Texas Extension Services.

(b) Predator and Nuisance Species Control: Grantor shall have the right to control, destroy, or trap predatory, exotic, invasive, and problem animals that pose a material threat to people, livestock, other animals, or habitat conditions in accordance with applicable state and federal laws and requirements. Grantor will, in good faith, manage invasive species as expressly allowed in the PRMP.

(c) Uses: No residential or industrial activity shall be conducted upon the Property. There shall be no storing or dumping of soil, trash, ashes, garbage, waste, abandoned vehicles, appliances, machinery, or hazardous substances, or toxic or hazardous waste, or any placement of underground or aboveground storage tanks or other materials on the Property that may negatively impact or be detrimental to the Property or to the surface or subsurface waters of the Property. Livestock animals and grazing operations shall be allowed on the Property except as prohibited or restricted by the PRMP. Any right of passage on, through or across the Property for any activity or use set forth in this paragraph is also prohibited.

(d) Subdivision: The Property may not be further divided, subdivided, or partitioned.

(e) Topography: There shall be no change in the topography of the Property except as expressly provided in the PRMP. There shall be no surface mining, filling, excavating, grading, dredging, mining or drilling upon the Property, and there shall be no removing of topsoil, peat, sand, gravel, rock, minerals or other materials from the Property except to restore natural topography or drainage patterns.

(f) Soil or Water Degradation: There shall be no use of, or the conducting of any activity on, the Property that causes or is likely to cause soil degradation, erosion, depletion or pollution of, or siltation on, any surface or subsurface waters of the Property. There shall be no change to the surface or subsurface hydrology of the Property in any manner. There shall be no diking, draining, dredging, channeling, filling, leveling, pumping, impounding, or related activities, or altering or tampering with water control structures or devices, or disruption or alteration of the restored, enhanced, or created drainage patterns. In addition, diverting or causing or permitting the diversion of surface or underground water into, within or out of the Property by any means, removal

of wetlands, polluting or discharging into waters, springs, seeps, or wetlands, or use of pesticide or biocides is prohibited, unless specifically provided for in the PRMP.

(g) Construction: There shall be no constructing or placing of any building, mobile home, asphalt or concrete pavement, billboard or other advertising display, antenna, utility pole, tower, conduit, line, pier, landing, dock, or any other permanent structure or facility. As provided in the PRMP, man-made structures on the Property in connection with the repair, maintenance, or replacement (but not expansion) of any structures and other improvements located on the Property as of the Effective Date of this Agreement are allowed. Grantor shall have the right to maintain, renovate, and repair existing buildings, structures, fences, pens, wells, dams and reservoirs, utilities, soft-surface roads, and other improvements, and in the event of their destruction, to reconstruct any such existing improvement with another of similar size, function, capacity, location, and material.

(h) Roads: There shall be no construction of roads, trails, or walkways on the Property, nor any enlargement or widening of any existing roads, trails, or walkways or any other rights of way on the Property. Grantor reserves the right to improve or modify roads in order to maintain access to the Property. Maintenance of existing roads shall be limited to removal of dead vegetation, necessary pruning or removal of obstructing trees and plants, and/or application of permeable materials (e.g., sand, gravel, and crushed stone) as necessary to correct or prevent erosion. In the event that it becomes necessary, Grantor reserves the right to construct a new road to provide access to the Property.

(i) Waters: Unless specifically provided for in the PRMP, there shall be no polluting, altering, manipulating, depleting or extracting of surface or subsurface water (including, but not limited to, ponds, creeks or other water courses) or any other water bodies on the Property. Furthermore, unless specifically stated in the PRMP, there shall be no conducting or (to the extent in Grantor's control) allowing any entity or person to conduct activities on the Property that would be detrimental to water purity or that would alter the natural water level or flow in or over the Property (including, but not limited to, damming, dredging or construction in any free flowing water body, or any manipulation or alteration of natural water courses, fresh water lake and pond shores, marshes or other water bodies). It is understood that with respect to the prohibited activities set forth in this Section 4(i), Grantor may not and will not engage in any such prohibited activities on the Property.

(j) Vehicles: Use of vehicles shall be limited to access to the site for monitoring, maintenance, fire protection/emergency action, or other approved activities, as specified in the PRMP. Off road vehicular access is expressly prohibited.

(k) Easements: There shall be no voluntary granting or conveying of any easements on, over, under, across, along or through the Property, including, but not limited to, access easements and utility easements, other than easements conveyed in lieu of condemnation which do not diminish the Conservation Purposes; provided, however, that pursuant to this Agreement and in order to access the Property to take such actions which are consistent with this Agreement and the Permit, Grantee and the USACE have the right of pedestrian and vehicular ingress and egress to and from the Property.

(l) Signage: Construction or placement of any signs, billboards, or other advertising displays on the Property is not permitted, except that signs whose placement, number, and design do not significantly diminish the scenic character of the Property may be placed to state the name and address of the Property and the names of persons living on the Property, to advertise or regulate

permitted on-site activities, to advertise the Property for sale or rent, to post the Property to control unauthorized entry or use, or to identify the property as being protected by this Agreement.

(m) Development Rights: No development rights that have been encumbered or extinguished by this Agreement or the Conservation Easement granted herein shall be transferred pursuant to a transferable development rights scheme or cluster development arrangement or otherwise.

(n) Hunting: Grantor and Grantor's lessees and guests may conduct hunting, fishing or trapping activities in accordance with appropriate federal, state and local laws and restrictions that conform to terms of this Agreement and the Permit and Mitigation Plan. Grantor may expressly construct hunting blinds, the size, design, location, and number of which shall be governed by the terms of the PRMP.

(o) Dumping: There shall be no dumping or storing of any material, such as trash, wastes, ashes, sewage, garbage, scrap material, sediment discharges, oil and petroleum by-products, leached compounds, toxic materials or fumes, or any "hazardous substances" (as hereinafter defined). For the purposes of this paragraph, the phrase "hazardous substances" shall be defined as in the federal Comprehensive Environmental Response, Compensation and Liability Act (42 U.S.C. 9601 et seq.) and/or a substance whose manufacture, processing, distribution in commerce, use, possession, or disposal is banned, prohibited, or limited pursuant to the federal Toxic Substances Control Act (15 U.S.C. 2601 et seq.).

(p) Other Prohibitions: Any other use of, or activity on, the Property which is inconsistent with the Purposes of the Conservation Easement granted herein, the preservation of the Property in its natural condition, or the protection of its Conservation Value, is prohibited.

5. **Rights Reserved to Grantor**. Grantor expressly reserves for itself, its successors and assigns, the right of access to and the right of continued use of the Property for all purposes not inconsistent with this Agreement and the Conservation Easement granted herein, including, but not limited to, the right to quiet enjoyment of the Property, the rights of ingress and egress with respect to the Property, the right to fence the Property and to prohibit public access thereto, and the right to the right to sell, transfer, gift or otherwise convey the entire Property, provided such sale, transfer, or gift conveyance is subject to the terms of, and shall specifically reference, the Conservation Easement. Except as may be expressly provided otherwise in this Agreement, neither this Agreement nor the Conservation Easement granted herein in any way limits, restricts or in any way affects any property of Grantor other than the Property, including without limitation, any property adjacent to, surrounding or near the Property. The rights conveyed by this Agreement and the Conservation Easement granted herein do not constitute a conveyance of a fee interest in the Property, nor of any of the mineral rights therein and thereunder. The rights retained by Grantor as set forth in this Section 5 are referred to hereinafter as the "Reserved Rights."

6. **Rights of Grantee**. Grantee or its authorized representatives, successors, and assigns, and the USACE, shall have the right to enter the Property at all reasonable times for the purpose of inspecting the Property to determine if Grantor or any of its successors and assigns is complying with the terms, conditions, restrictions, and Purposes of this Agreement. The easement rights granted herein do not include any public access rights, which shall be prohibited. Nothing construed herein shall constitute an agreement by USACE to indemnify, defend or hold harmless either party, or any of the above-listed parties, from and against any liability, loss, cost or damage.

7. **Liens and Taxes**. Grantor shall keep the Property free of any and all liens, including, without limitation, liens arising out of any work performed for, materials furnished to, or obligations

incurred by Grantor. Grantor shall pay before delinquency all taxes, assessments, fees, and charges of whatever description levied on or assessed against the Property by competent authority, and shall upon written request by Grantee furnish Grantee with satisfactory evidence of payment. Other than as specified herein, this Agreement is not intended to impose any legal or other responsibility on Grantee, or in any way affect any existing obligation of Grantor as owner of the Property. Among other things, this shall apply to:

(a) Taxes: Grantor shall continue to be solely responsible for payment of all taxes and assessments levied against the Property. If Grantee is ever required to pay any taxes or assessments on its interest in the Property, Grantor will reimburse Grantee for the same within thirty (30) days after Grantor's receipt of written notice from Grantee, which shall include evidence reasonably acceptable to Grantor of any taxes paid by Grantee.

(b) Upkeep, Maintenance and Compliance: Grantor shall continue to be solely responsible for the upkeep and maintenance of the Property, to the extent it may be required by law. Grantee shall have no obligation for the upkeep or maintenance of the Property. Grantor shall continue to be responsible for compliance with all applicable laws and restrictions.

8. **Liability, Indemnification and Insurance**. GRANTOR, ITS SUCCESSORS AND ASSIGNS, SHALL RELEASE, INDEMNIFY, DEFEND AND HOLD HARMLESS GRANTEE FROM AND AGAINST ANY AND ALL CLAIMS, CAUSES, DAMAGES, LIABILITY AND RELATED EXPENSES (INCLUDING WITHOUT LIMITATION ATTORNEYS' FEES AND COURT COSTS) (COLLECTIVELY, "DAMAGES") ARISING OUT OF OR RELATED TO (i) PERSONAL INJURY OR DEATH THAT OCCURS ON THE PROPERTY, (ii) PROPERTY DAMAGE THAT OCCURS ON THE PROPERTY, OR (iii) A DEFAULT BY GRANTOR IN ITS OBLIGATIONS HEREUNDER OR THE ENFORCEMENT BY GRANTEE OF THE PROVISIONS OF THIS AGREEMENT (COLLECTIVELY, THE "INDEMNIFIED MATTERS"), EXCEPT TO THE EXTENT THE NEGLIGENT ACTS OR OMISSIONS OF GRANTEE ARE THE SOLE CAUSE OF THE DAMAGES AS DETERMINED BY A COURT. NOTWITHSTANDING THE FOREGOING, ANY ACTS, OMISSIONS OR DECISIONS OF GRANTEE, WHETHER DEEMED NEGLIGENT OR NOT, THAT ARE UNDERTAKEN IN GOOD FAITH IN THE ENFORCEMENT OR ATTEMPTED ENFORCEMENT OF THE PROVISIONS OF THIS AGREEMENT SHALL NOT BE EXCLUDED FROM THE INDEMNIFIED MATTERS.

GRANTOR WARRANTS TO GRANTEE THAT GRANTOR HAS NO ACTUAL KNOWLEDGE OF THE STORAGE, TRANSPORTATION, USE, PRESENCE, RELEASE OR THREATENED RELEASE OF HAZARDOUS OR TOXIC SUBSTANCES, MATERIALS, OR WASTES IN, ON OR UNDER THE PROPERTY AND GRANTOR HEREBY PROMISES TO HOLD HARMLESS, DEFEND AND INDEMNIFY GRANTEE AGAINST ALL LITIGATION, CLAIMS, DEMANDS, PENALTIES, LIABILITIES, AND DAMAGES AND EXPENSES, INCLUDING, BUT NOT LIMITED TO FINES, COURT COSTS AND REASONABLE ATTORNEYS' FEES, ARISING FROM OR CONNECTED WITH THE STORAGE, TRANSPORTATION, USE, PRESENCE, OR RELEASE BY GRANTOR OF HAZARDOUS OR TOXIC WASTE MATERIALS IN, ON OR UNDER THE PROPERTY OR VIOLATION OF FEDERAL, STATE, OR LOCAL ENVIRONMENTAL LAWS. WITHOUT LIMITING THE FOREGOING, NOTHING IN THIS AGREEMENT SHALL BE CONSTRUED AS GIVING RISE TO ANY RIGHT OR ABILITY IN GRANTEE, NOR SHALL GRANTEE HAVE ANY RIGHT OR ABILITY, TO EXERCISE PHYSICAL OR MANAGERIAL CONTROL OVER THE DAY-TO-DAY OPERATIONS OF THE PROPERTY, OR OTHERWISE TO BECOME AN OPERATOR WITH RESPECT TO THE PROPERTY WITHIN THE MEANING OF THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT OF 1980, AS AMENDED.

In addition, Grantor warrants that Grantee is and will continue to be named as an additional insured on Grantor's liability insurance policy covering the Property. Such policy shall be issued by an insurance company qualified to do business in the State of Texas, and rated A or better (having a financial size category of X or better) by Best's Insurance Rating Service (or similar rating service), with policy limits of not less than $2,000,000 per occurrence/$5,000,000 aggregate, or such greater amount as may become customary for similar operations and properties in Brazoria County, Texas, unless Grantor and Grantee mutually agree in good faith that some other levels of coverage are sufficient. Grantor shall provide to Grantee a certificate evidencing such insurance upon the Effective Date hereof, and each time such policy renews. Upon Grantee's written request, Grantor shall provide Grantee with a copy of the insurance policy.

9. **Enforcement**.

(a) Notice of Breach: In the event of a breach of this Agreement by Grantor, Grantee, any third party or any third party working for or under the direction of Grantor or Grantee, Grantor, Grantee and the USACE shall be notified within thirty (30) days by the party or parties to this Agreement with awareness and/or notice of said breach. If the USACE becomes aware of a breach of this Agreement, the USACE will notify Grantee and Grantor of the breach certified correspondence.

(b) Correction of Breach: Grantor shall have sixty (60) days after receipt of such notice to undertake actions that are reasonably calculated to correct the conditions constituting the breach. If the conditions constituting the breach are corrected in a timely and reasonable manner, no further action shall be warranted or authorized. If the conditions constituting the breach are such that more than sixty (60) days are required to cure the breach, Grantor shall not be in default hereunder if Grantor undertakes the cure of such breach during the sixty (60) day period following notice of the breach and diligently pursues the cure of the breach to completion. Failure by Grantor within sixty (60) days after receipt of such notice (i) to begin good faith efforts to cure where completion of such action cannot be reasonably accomplished within sixty (60) days, (ii) to initiate such other corrective action of such violation as appropriate in the circumstances and as may be reasonably requested by Grantee, or (iii) to diligently pursue a cure once commenced, shall entitle Grantee to: (I) bring an action at law or in equity in a court of competent jurisdiction to enforce this Agreement; (II) require actions to be taken in order to effect the restoration of the Property to a condition substantially similar to that which existed immediately prior to such violation; (III) seek to enjoin any violation by temporary or permanent injunction; and (IV) recover reasonable damages arising from such violation, and recover all reasonable costs and expenses of enforcing the terms of this Agreement against Grantor, including but not limited to reasonable attorney's fees. Notwithstanding the foregoing, Grantee reserves the immediate right, without notice, to obtain a temporary restraining order, injunctive relief or other appropriate relief if the breach of any provision of this Agreement is materially impairing or would irreversibly or otherwise materially impair the benefits to be derived from the Conservation Easement. Grantor and the Grantee acknowledge that under such circumstances, damage to the Conservation Values would be irreparable and remedies at law will be inadequate. The rights and remedies of Grantee provided hereunder shall be in addition to, and not in lieu of, all other rights and remedies available to Grantee in connection with the Conservation Easement. The costs of a breach of this Agreement and the costs of any correction or restoration, including the Grantee's expenses, court costs and reasonable attorneys' fees, shall be paid by Grantor. The USACE shall have a contingent right to enforce the terms and conditions of this Agreement if Grantee fails to enforce the terms and conditions of this Agreement.

(c) Forbearance: Any forbearance or failure on the part of Grantee or the USACE to exercise its rights in the event of a violation shall not be deemed or construed to be a waiver of

either Grantee's or the USACE's rights hereunder. Forbearance or failure to enforce any covenant or provision hereof shall not discharge or invalidate such covenant or provision or any other covenant, condition, or provision hereof or affect the right of Grantee and the USACE to enforce the same in the event of a subsequent breach or default.

(d) No Action Against Grantor: Nothing contained in this Agreement shall be construed to entitle Grantee to bring any action against Grantor for any injury to or change in the Property, or for any violation of any covenant or provision of this Agreement, resulting from any action taken in good faith by Grantor under emergency conditions which are not caused by Grantor, to prevent, abate, or mitigate significant injury to life or significant and permanent damage or harm to the Property resulting from any of such causes.

Nothing contained in this Agreement shall be construed to entitle Grantee to bring any action against Grantor for any injury to or change in the Property resulting from causes beyond Grantor's control, including, without limitation, acts of trespassers, acts by governmental agencies or officials, fire, flood, storm, earth movement, or major tree, plant, animal, or insect disease, wildfire, or from any prudent action taken by Grantor intended to mitigate injury to the Property resulting from such causes. Notwithstanding the foregoing, nothing herein shall preclude Grantor's and Grantee's rights to pursue any third party for damages to the Property from vandalism, trespass, or any other illegal act or violation of this Agreement. Grantor and Grantee agree that in the event of damage to the Property from acts beyond Grantor's control, if Grantor and Grantee agree that it is desirable that the Property be restored, Grantor may attempt to restore the Property in accordance with the PRMP.

10. **Approval by Grantee; Notice**.

(a) Acting in Good Faith: Grantor and Grantee shall cooperate and shall act reasonably and in good faith to arrive at agreement on any matter in connection with any determinations that are necessary to be made by them (either separately or jointly) under this Section 10.

(b) Grantee's Approval or Withholding of Approval: When Grantee's approval is required and has been requested by Grantor, or when Grantee has asserted a violation of this Agreement as to which a cure has been effected and Grantor requests a withdrawal of such assertion, Grantee shall grant or withhold its approval in writing, or issue such withdrawal, as the case may be, within ninety (90) days of receipt of Grantor's written request therefor. In the case of withholding of approval, Grantee shall notify Grantor in writing with reasonable specificity of the reasons for withholding of approval, and the conditions, if any, on which approval might otherwise be given. Failure of Grantee to respond in writing within such 90-day period shall be deemed to constitute written approval (or the issuance of a withdrawal, as aforesaid) by Grantee of any request submitted, provided that no such approval is for a matter contrary to the express terms of this Agreement.

(c) Specific Approvals: Whenever Grantee's approval is required herein as a condition for a use or activity, or for the location of proposed improvements, Grantor shall request such approval in writing and shall include therewith information identifying the proposed site with reasonable specificity, evidencing conformity with the requirements of the applicable paragraphs under which the right is reserved hereunder, and, when applicable, evidencing conformity with existing land use regulations. Grantee's approval shall not be granted if the proposed activity or use would diminish or impair the Conservation Value of the Property or would be inconsistent with the Purposes, and must take into account the following criteria:

1. the extent to which use of the site for the proposed activity would impair water quality.

(d) Reimbursement. Grantor agrees to reimburse Grantee for any expenditure Grantee may reasonably incur in connection with Grantee's performance under this Agreement except for regular annual monitoring, such reimbursement to include, but not be limited to, staff costs and reasonable review by appropriate professionals, within fifteen (15) days following Grantor's receipt of reimbursement a written notice from Grantee, together with appropriate supporting documentation and invoices.

11. **Duration**. The burdens of this Agreement and the Conservation Easement shall run with the Property and shall be enforceable against Grantor and all future interests in and to the Property in perpetuity. Grantor agrees that, without allowing a transfer or conveyance which is otherwise prohibited by this Agreement, the future transfer or conveyance of any interest in or to the Property shall at all times be subject and subordinate to the terms, conditions, restrictions and purposes of the Conservation Easement and a reference to this Agreement shall be included in each instrument of transfer or conveyance of any interest in or to the Property from and after the Effective Date; provided, however, that nothing in this Agreement shall be construed to in any way limit Grantor's ability to freely sell, convey, assign, or otherwise transfer the Property as a whole to any other person or entity, subject to this Conservation Easement.

12. **General Provisions**.

(a) Notices. Any notice, request for approval, or other communication required under this Agreement shall be sent by registered or certified mail, postage prepaid, to the following addresses (or such address as may be hereafter specified by notice pursuant to this paragraph):

To Grantor: JMB Land Company, LP

Russell Walters, Vice President

203 West Main St.

Franklin, LA 70538

(337) 522-7207

russell@jmbcompanies.com

To Grantee: U.S. Land Conservancy, Inc.

Leonard McCauley, President

PO Box 40345

Baton Rouge, LA 70835

(225) 772-5923

lmccauley@pangaeacc.com

To the USACE:

(b) Severability. In the event any provision of this Agreement is determined by the appropriate court to be void and unenforceable, all remaining terms shall remain valid and binding.

(c) Agreement Binding. The terms, covenants, and conditions of this Agreement shall be binding upon and shall inure to the benefit of Grantor, Grantee and their respective executors, administrators, heirs, legal representatives, successors and assigns. Notwithstanding the foregoing, Grantee not may assign (i) this Agreement, or (ii) any rights or interests in this Agreement, without the prior written approval of Grantor and the USACE.

(d) Warranty. Grantor warrants, covenants, and represents that it owns the Property in fee simple, including the authority to bind the mineral estate through ownership of mineral rights, executive rights or an alternative agreement with severed mineral owners which grantee shall be assigned the right to enforce, and that Grantor either owns all interests in the Property which may be impaired by the granting of the Conservation Easement or that there are no outstanding mortgages, tax liens, encumbrances, or other interests in the Property which have not been expressly subordinated to the Conservation Easement. Grantor further warrants that Grantee shall enjoy all of the benefits derived from and arising out of the Conservation Easement, and that Grantor will warrant and defend title to the Property against all persons claiming by, through or under Grantor, but not otherwise. In the event that a title defect, or a cloud or encumbrance on title not otherwise described in the title policy or the mineral report (the "Unrecorded Encumbrance") prohibits or restricts Grantee from fulfilling its obligations hereunder, or defeats the Conservation Value, then (i) Grantee shall notify Grantor in writing of such defect, cloud or encumbrance on title, (ii) Grantor will use reasonable efforts to cure such title defect, cloud or encumbrance on title at its sole expense, (iii) Grantee shall have no liability for its non-performance of obligations which was caused by such defect, cloud or encumbrance on title, and (iv) Grantor shall hold harmless and indemnify Grantee from any claims, causes, damages, liabilities and expenses, including attorneys' fees, incurred by Grantee and arising out of such title defect, cloud or encumbrance on title.

(e) Subsequent Transfers. Without allowing a transfer otherwise prohibited under this Agreement, Grantor agrees to incorporate the terms of this Agreement in any deed or other legal instrument that transfers any interest in all or any portion of the Property. Grantor agrees to provide written notice of such transfer at least thirty (30) days prior to the date of the transfer. Grantor and Grantee agree that the terms of this Agreement shall survive any merger of the fee and easement interests in the Property or any portion thereof and shall not be amended, modified or terminated without the prior written consent and approval of the USACE. Without in any way waiving or limiting the prohibition against subdivision set forth herein, any time all or part of the Property is conveyed by Grantor to any third party, (i) such conveyance shall be made expressly subject to the terms of this Agreement, (ii) Grantor shall reimburse Grantee for any costs Grantee may incur in connection with Grantee's review of such transfer to confirm its conformity with the provisions of this Agreement (the "Cost Reimbursement") The Cost Reimbursement must be paid within fifteen (15) days following Grantor’s receipt of a Cost Reimbursement notice from Grantee, together with applicable receipts and invoices. Grantee shall have the right to record a document, executed solely by Grantee, in the Real Property Records of Brazoria County, Texas, to put such third parties on notice of the requirements of this Section 12(e).

(f) Assignment or Transfer. The parties recognize and agree that the benefits of the Conservation Easement are in gross and assignable by Grantee; provided, however, that Grantee hereby covenants and agrees, that, in the event it transfers or assigns this Agreement, the organization receiving the interest will be a qualified holder under applicable state and federal law. Grantee further covenants and agrees that the terms of the transfer or assignment will be such that the transferee or assignee will be required to continue in perpetuity the Purposes described in this Agreement.

(g) Obligations of Ownership. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Nothing herein shall relieve Grantor of the obligation to comply with any federal, state, or local laws, regulations and permits that may apply to the Property in connection with the exercise by Grantor of the Reserved Rights.

(h) Extinguishment. In the event that changed conditions render impossible the continued use of the Property for the Purposes as contemplated by this Agreement, the Conservation Easement may only be extinguished, in whole or in part, by judicial proceeding in any court of competent jurisdiction.

(i) Eminent Domain.

(i) Whenever all or any part of the Property is taken in the exercise of eminent domain so as to substantially abrogate the restrictions imposed by this Agreement, Grantor and Grantee may join in appropriate actions at the time of such taking to recover the full value of the taking, and all incidental and direct damages due to the taking.

(ii) The Conservation Easement constitutes a real property interest immediately vested in Grantee. In the event that all or a portion of the Property is sold, exchanged, or involuntarily converted following an extinguishment of all or any portion of the Conservation Easement, or following the exercise of eminent domain, Grantee shall be entitled to the fair market value of the Conservation Easement. The parties stipulate that the fair market value of the Conservation Easement shall be determined by multiplying the fair market value of the Property unencumbered by the Conservation Easement (minus any increase in value after the Effective Date attributable to improvements) by the ratio of the value of the Conservation Easement as of the Effective Date to the value of the Property (without deduction for the value of the Conservation Easement) at the time of this grant. The values as of the Effective Date and as referenced in this Section 10 (i) (ii) shall be the values used, or which would have been used, to calculate a deduction for federal income tax purposes, pursuant to Section 170(h) of the Internal Revenue Code of 1986, as amended (whether eligible or ineligible for such a deduction). Grantee shall use its share of any proceeds in a manner consistent with the purposes of the Conservation Easement.

(j) Not Grant to USACE. Nothing herein shall constitute a grant of real property or proceeds to the USACE.

(k) Failure of Grantee. If at any time Grantee is unable or fails to enforce this Agreement, or if Grantee ceases to be a qualified grantee, and if within a reasonable period of time after the occurrence of any of such events, Grantee fails to make an assignment of its interest in accordance with this Agreement, then Grantee's interest shall become vested in another qualified grantee in accordance with and as provided by an appropriate and final, non-appealable proceeding in a court of competent jurisdiction.

(l) Amendment. This Agreement may be amended, but only in a writing signed by the parties hereto; provided, however, that such amendment does not affect the qualification of the Conservation Easement or the status of Grantee under any applicable laws, is consistent with the purposes of this

Agreement and the Purposes of the Conservation Easement granted herein, and does not conflict with the Permit or its related PRMP. Notice of such amendment shall be provided to the USACE.

TO HAVE AND TO HOLD the Conservation Easement for the purposes herein described, subject, however, to the matters herein set forth and to all matters of record with respect to the Property, unto Grantee, its successors and assigns, forever; and Grantor does hereby bind itself, its successors and assigns, to warrant and defend the Conservation Easement and the rights granted herein unto Grantee, its successors and assigns, against every person whomsoever lawfully claiming or to claim the same or any part thereof by, through or under Grantor, but not otherwise.

[SIGNATURE PAGE FOLLOWS]

EXECUTED and DELIVERED to be effective as of the Effective Date.

GRANTOR:

GRANTEE:

[ACKNOWLEDGMENTS FOLLOW]

STATE OF TEXAS §
§
COUNTY OF _____ §

This instrument was acknowledged before me on _____, 20__ by _____, on behalf of _____.

_____
Name:
Notary Public, State of Texas
My commission expires:_____

STATE OF TEXAS §
§
COUNTY OF _____ §

This instrument was acknowledged before me on _____, 20__ by _____, on behalf of _____.

_____
Name:
Notary Public, State of Texas
My commission expires:_____

After recording return to:

Exhibit A
to
Conservation Easement Agreement

Metes and Bounds Legal Description of the Property

[TO BE PROVIDED]

Exhibit B
to
Conservation Easement Agreement

U.S. Army Corps of Engineers Permit

[TO BE ATTACHED]

Exhibit C
to
Conservation Easement Agreement

Permittee Responsible Mitigation Plan

[TO BE PROVIDED]

Exhibit D
to
Conservation Easement Agreement

Baseline Documentation Report

[TO BE PROVIDED]

Attachment E: Water Budget

WETLAND WATER BUDGET ANALYSIS BASTROP BAYOU PERMITTEE RESPONSIBLE MITIGATION AREA

120.5 ± ACRES
FAIRWAY DRIVE & FARM-TO-MARKET ROAD 523
BRAZORIA COUNTY, TEXAS

PREPARED FOR

JMB LAND CO., LP

BERG◆OLIVER ASSOCIATES, INC.
ENVIRONMENTAL SCIENCE AND LAND USE CONSULTANTS
HOUSTON, TEXAS
REPORT NO: 10906N-PRM
AUGUST 2019

TABLE OF CONTENTS

SUMMARY

A Wetland Water Budget Analysis was performed for JMB Land Co., LP, on the 120.5 ± acre proposed Bastrop Bayou Permittee Responsible Mitigation Area, located southeast of the intersection of Fairway Drive and Farm-to-Market Road (FM) 523, in Brazoria County, Texas.

The subject property was evaluated for its hydrologic capacity to support the establishment of a wetland mitigation bank. Hydrologic conditions were assessed using interpretation of historical aerial photography, topographic maps and data, and climate data.

Topographical information published by the United States Geological Survey (USGS) and Light Detection and Ranging (LIDAR) data indicate a relatively flat landscape with historical storm-water runoff flowing generally east through the subject property into Bastrop Bayou. Several ditches and berms were identified on the property, directing drainage into man-made excavated basins to the north and south of the property. The Federal Emergency Management Agency (FEMA) floodplain maps indicate that the entire subject property lies within the mapped 100-year FEMA floodplain of Bastrop Bayou.

The United States Department of Agriculture (USDA) Web Soil Survey of Brazoria County was, for the most part, reasonably accurate in identifying the basic soil types on the property and within the surrounding drainage area as Lake Charles clay (24) and Francitas clay (17). Vegetation on the property consisted of mainly scrub-shrub and grasses. Average annual rainfall for this area over the past 20 years (1999-2019) was approximately 56 inches, and average temperatures ranged between 53 and 84˚F (11-29˚C). Currently, the majority of the potential water storage is being drained out rapidly by the ditches on-site.

Based on the results of this Wetland Water Budget Analysis, it is the professional opinion of BOA that the current water storage capacity of the proposed Bastrop Bayou Permittee Responsible Mitigation Area is currently sufficient for meeting the wetland criteria assuming even distribution. With the proposed modifications to ditches and berms on the property the water storage capacity will be more than sufficient to hold water year round in an average year. The proposed Mitigation Area currently has the potential to store enough water to meet the criteria of flooding or ponding for at least 14 consecutive days during the growing season. Further, the mitigation site has the potential to receive and maintain a net-positive water balance (average of 41 acre-feet of water per month) for the growing season. This estimate expresses the total water available per month, assuming that none of the water escapes through current existing outfalls/ditches, but keeping the primary ditch that runs through the northeast corner of the property for overflow drainage. Assuming equal distribution across the site, an average net water depth of 2.8 inches of water per month could be maintained across the site year-round.

In order to maintain appropriate water levels across the mitigation bank, modifications to the subject property will be necessary. Such modifications include limiting exit routes for water drainage to the north and south by filling some ditches on-site and potentially incorporating control structures.

BERG ◆ OLIVER ASSOCIATES, INC.
Environmental Science & Land Use Consultants
14701 St. Mary's Lane, Suite 400
Houston, Texas 77079
(281) 589-0898 fax: (281) 589-0007

WETLAND WATER BUDGET ANALYSIS
BASTROP BAYOU PERMITTEE RESPONSIBLE MITIGATION AREA

120.5 ± ACRES
FAIRWAY DRIVE & FARM-TO-MARKET ROAD 523
BRAZORIA COUNTY, TEXAS

INTRODUCTION

The study reported herein is a Wetland Water Budget Analysis for JMB Land Co., LP, on the 120.5 ± acre proposed Bastrop Bayou Permittee Responsible Mitigation Area, located southeast of the intersection of Fairway Drive and FM 523, in Brazoria County, Texas. (**Appendix A**).

AUTHORIZATION

This study was performed as authorized by Mr. Aaron Landry of JMB Land Co., LP.

SCOPE OF WORK

The objective of this Wetland Water Budget Analysis was to assess the hydrologic capacity of the proposed Bastrop Bayou Permittee Responsible Mitigation Area to support establishment of a wetland mitigation bank and to guide construction to meet suitable wetland criteria on the property and create a high functioning wetland. Wetland criteria are defined in accordance with Section 404 of the Clean Water Act and current regulations and policies of the U. S. Army Corps of Engineers (USACE). The following evaluations were performed for this project:

1. Hydrologic Conditions: Evaluation of existing and proposed hydrologic conditions through investigation of climate (temperature, rainfall, evapotranspiration, etc.), topography and soils with respect to wetland criteria outlined by the USACE.

METHODOLOGY/INVESTIGATIVE WORK

The Wetland Water Budget Analysis work consisted of reviewing published historical information and site reconnaissance. The following activities were undertaken to perform the analysis: 1) review United States Department of Agriculture (USDA)-Natural Resources Conservation Service (NRCS) county soil survey maps, descriptions, and structural characteristics; 2) review FEMA floodplain maps; 3) review United States Geological Survey (USGS) topographic maps; 4) review Light Detection and Ranging (LiDAR) data; 5) interpret current and historical aerial photography; 6) review current and historical precipitation and temperature data; and 7) review other relevant available data from JMB Land Co.

1. Soil Survey Evaluation:

Prior to site reconnaissance activities, the USDA Web Soil Survey of Brazoria County, Texas was reviewed to determine the types of soils that would most likely be present on the subject property and surrounding drainage area. Specifically, these soils were identified as Lake Charles clay (24) and Francitas clay (17).

Given the criteria and techniques employed by the NRCS, formerly known as the Soil Conservation Service, for the survey process, it was considered probable that the boundaries depicted on the survey could contain certain inaccuracies. The minimum mapping area for any given soil in the NRCS survey is ten (10) acres, with the probability of imprecise boundary delineation being relatively high. Therefore, previous wetland delineation soil descriptions were used to verify the primary soil textures on the subject property.

2. Topography and Drainage Area Evaluation:

Site reconnaissance also included observations of the general topography changes on the property and the location of landscape features such as depressions, ridges, and berms. These features could determine wetland presence or absence and their associated hydrological functions. Topography was evaluated by reviewing: 1) topographical information published by the USGS; 2) aerial photography; 3) LiDAR data; and 4) on-site observations. This evaluation was used to determine the watershed drainage area most likely to provide direct precipitation runoff to the proposed Mitigation Area, as well as the probable hydrologic flowpath and patterns within the subject property.

3. Floodplain Evaluation:

To assess the hydrological characteristics of the site, current published FEMA maps were evaluated to determine if the property lies within, or adjacent to, the 100 and/or 500-year floodplain. Due to the low topographic grades found on the Gulf Coast, periodic floods are common along rivers, creeks and bayous. These floods, along with rainfall, are primary sources of hydrology for wetlands located inland of immediate coastal areas. In addition to FEMA maps, probable hydrologic flowpath patterns and evidence of inundation and/or periods of saturation in potential wetland areas were evaluated on-site.

4. Aerial Photography:

Wetlands generally occur as historical features on the landscape and usually maintain their basic configurations and appearances over a long period of time. However, vegetation communities naturally progress through several stages of predominance as wetlands age and mature. Additionally, topographical and hydrological characteristics may be changed by natural processes or by man-induced alterations in or near wetland areas. While site reconnaissance remains essential to wetland hydrology identification, historical aerial photography can play a vital role in the evaluation of wetland features and the variations, which may occur over extended periods of time. Aerial photography was used in the evaluations made on the subject property. A variety of sources were used to provide aerial photographic coverage of the area, including large-scale infrared photographs, color photographs, and black and white photographs.

a. Infrared Photography: High-altitude infrared aerial photographs provide views of the subject property as a complete unit where areas and systems of high water content become more easily defined as darker features on aerial maps.

b. Color Photography: Color aerial photographs provide contrasts in shading from lower altitudes that can assist in the identification of vegetation patterns and development that should be verified in the field.

c. Methodology of Interpretation: Recent color photography was analyzed for vegetation patterns that might distinguish potential wetland areas. Those photograph was compared with infrared photography from 2009 and 1995.

5. Precipitation and Temperature:

Daily precipitation and temperature data from 1999 to 2019 for Angleton, Texas (GHCND: USW00012976; Lat/Long: 29.11069º N; -95.45895º W) was obtained from the National Oceanic and Atmospheric Administration (NOAA), National Center for Environmental Information (NCEI), Global Historical Climate Network (GHCN) (Menne et al., 2012). This station provided consistent data for the study period and can be considered typical for coastal southeast Texas. Daily precipitation and temperature data was summarized to obtain monthly data, and averaged across all years (1999-2019) to obtain a mean monthly value for each month. This data was used to calculate monthly precipitation, precipitation runoff, and evapotranspiration for use in calculating the overall water balance of the site. Temperature data from the GHCN was provided as minimum and maximum per day. Monthly minimum and maximum values were averaged to obtain monthly mean temperature. Yearly means were also calculated for use as summary statistics.

6. Wetland Water Budget Calculations:

The following equation was used to calculate average monthly water storage on the proposed Bastrop Bayou Permittee Responsible Mitigation Area:

$$\Delta Storage = [\ P + Q + SW_i + G_i\ ] - [\ ET + SW_o + G_o\ ]$$

$\Delta Storage$ = change in volume of water storage in wetland (acre-ft)
P = precipitation (acre-ft)
Q = precipitation runoff (acre-ft)
SW_i = surface water inflow (acre-ft)
G_i = groundwater inflow (acre-ft)
ET = evapotranspiration (acre-ft)
SW_o = surface water outflow (acre-ft)
G_o = groundwater outflow (acre-ft)

Groundwater inputs and outflow (G_i and G_o) were assumed to be negligible, due to the heavy clay soils dominating the subject property (USDA Web Soil Survey). These heavy clays allow for very little exchange of groundwater. Additionally, as no major channels were identified flowing into the site, surface water inflow (SW_i) was assumed to be absent. In order to estimate maximum available water storage on-site, surface water outflows (SW_o) were also assumed to be absent, though we know current site conditions contain many outflow locations.

Thus, the remaining equation used for this site-specific water budget was:

$$\Delta Storage = [\ P + Q\ ] - [\ ET\ ]$$

Precipitation (P)
Average monthly precipitation (P) was calculated by summing daily precipitation data for each month of each year, and then calculating the mean monthly precipitation for each month over 20 years (1996-2016).

Precipitation Runoff (Q)
Average monthly precipitation runoff (Q) was calculated using the following equation:

$$Q = \frac{(P - I_a)^2}{(P - I_a) + S}$$

Q = precipitation runoff (in)
P = precipitation in the form of rainfall (in)
S = potential maximum retention after runoff begins (in)
I_a = initial abstraction (in)

Potential maximum retention after runoff begins (S) must be less than P in order for measurable Q to exist. S was calculated using the following equation:

$$S = \frac{1000}{CN} - 10$$

CN = Curve Number

The Curve Number used in this equation was based on the following table from *Urban Hydrology for Small Watersheds, Technical Release 55* published by the USDA and NRCS. Curve Numbers are estimated based on the hydrologic condition, vegetation cover type, antecedent runoff condition (ARC), and Hydrologic Soil Group of the subject property. The cover type across the subject property and surrounding drainage area are comprised of a mixture of grasses and small trees previously or currently in use for agriculture. The vegetation ground cover was greater than seventy-five percent (75%), falling into the "Good" condition category. Southeast Texas is typically considered between ARC II (average runoff potential) and ARC III (high runoff potential) (USDA, 1990). In order to maintain a conservative precipitation runoff estimate, ARC II was used in this analysis. Given that the soils on the subject property and surrounding drainage area are classified as Hydrologic Soil Groups D (according to USDA-NRCS Web Soil Survey), the Curve Number of 84 was used (see Table 2-2c below).

Table 2-2c Runoff curve numbers for other agricultural lands [1]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. [2]	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. [3]	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 [4]	48	65	73
Woods—grass combination (orchard or tree farm). [5]	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. [6]	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 [4]	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

1 Average runoff condition, and $I_a = 0.2S$.
2 *Poor:* <50%) ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.
3 *Poor:* <50% ground cover.
Fair: 50 to 75% ground cover.
Good: >75% ground cover.
4 Actual curve number is less than 30; use CN = 30 for runoff computations.
5 CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.
6 *Poor:* Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.
Fair: Woods are grazed but not burned, and some forest litter covers the soil.
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

Initial abstraction (I_a) was estimated using the following relationship to S: $I_a = 0.2S$. This ratio was derived from the *USDA Texas Engineering Technical Note 210-18-TX5*, and is considered a conservative value to be used in estimating precipitation runoff. I_a accounts for losses due to water retention in depressions and water intercepted by vegetation, evaporation and infiltration.

Evapotranspiration (ET)

Evapotranspiration (ET) is calculated using a variety of different equations that each have benefits and drawbacks. Though the Penman-Monteith method is considered the global standard by the United Nations Food and Agriculture Organization (FAO), as outlined in the Irrigation and Drainage Paper no. 56 (Allen et al., 2006), accurate calculations using this method require precise estimates of many different variables, including solar radiation, soil heat flux density, wind speed, humidity, and vapor pressure. Though the Hargreaves-Samani equation is considered the second best option when available data is limited, this equation tends to significantly overestimate evapotranspiration in humid regions like the southeastern United States (Lu et al., 2005).

ET was calculated using the Thornthwaite method based on monthly temperatures, which were summarized similarly to monthly precipitation values (see above). The Thornthwaite method was chosen as it requires only measurements of daylength (hours of sunlight) and temperature, the easiest, most widely available, and most reliable climate parameter (Shahidian et al., 2012). This method was used in order to estimate evapotranspiration most closely without significantly overestimating or underestimating, as both could negatively influence the analysis. A

study conducted in northwestern Ontario, Canada, recommended use of the Thornthwaite method due to its low percentage of error in estimations (Xu and Singh, 2001). A study conducted in the southeastern United States showed no significant difference between Thornthwaite estimates and the annual actual ET (AET, derived from watershed water balance) (Lu et. al., 2005).

Therefore, when estimating average annual ET across years, methods like the Thornthwaite method appear to be more representative of actual ET in this region of the world. The following equation was used to calculate ET (mm), which was then converted to inches for comparison with P and Q:

$$ET = 16[\frac{10T}{I}]^a$$

$$I = \sum_{j=1}^{12}[\frac{T_j}{5}]^{1.514}$$

$$a = 6.75x10^{-7}I^3 - 7.71x10^{-5}I^2 + 1.792x10^{-2}I + 0.49239$$

ET = monthly predicted evapotranspiration (mm)
T = mean monthly temperature (˚C)
T_j = mean monthly temperature during month j (˚C)

Calculated ET values were then converted into corrected ET values by accounting for daylength and number of days per month. In order to prevent underestimation of monthly ET, the maximum daylength was used for each month. Daylength data for Angleton, Texas in 2015 was obtained from the United States Naval Observatory, Astronomical Applications Department. The year 2015 was used in order to use the most recent data that included a complete year.

$$\text{Corrected ET} = ET(\frac{d}{12})(\frac{N}{30})$$

d = average daylight hours per day for the month
N = number of days in the month

Vegetation coefficients are often used in association with ET calculations in order to account for varying vegetation types. However, these coefficients reduce the total ET estimation, and the Thornthwaite method is already the lowest estimate of ET. Therefore, no vegetation coefficient was used in this analysis in order to maintain a more conservative water budget estimate.

Water Balance (ΔStorage)

Due to various drainage features current present on the site, the water budget was calculated to assume no inputs from runoff due to the redirection of this water through the ditch systems into Bastrop Bayou. Following planned grading activities, the mitigation area will receive additional runoff from the surrounding watershed but to provide a conservative baseline this study will only consider direct precipitation.

Individual Mitigation Cell budgets were calculated similarly to the overall budget. Q (in) was converted to acre-feet using the drainage area acreage. P (in) and ET (in) were converted to acre-feet using the proposed mitigation bank acreage. P and Q were considered positive contributions to the mitigation bank, while ET was considered a negative contribution. Therefore, the water balance was calculated as follows:

$$\text{Balance } (\Delta) = P + Q - ET$$

This final equation accounts for precipitation falling directly on the mitigation area, runoff entering the site from the surrounding drainage area (not included in this study), and evapotranspiration removing water from the mitigation area.

FINDINGS

1. Topography and Watershed Drainage

The proposed Bastrop Bayou Permittee Responsible Mitigation Area is located within the Austin-Oyster Watershed (HUC8: 12040205). Using USGS topographic maps and LiDAR data, the immediate drainage area of the proposed Bastrop Bayou Permittee Responsible Mitigation Area was determined to be approximately 120.5 acres. Topographical information published by the USGS and LiDAR data indicate a nearly level landscape with storm-water runoff flowing generally east through the subject property into Bastrop Bayou. A system of drainage ditches presently direct water north and south off the property. Such drainage features may be modified in order to prevent loss of water.

The FEMA floodplain maps indicate that the entire subject property lies within the mapped 100-year FEMA floodplain (Zone A) of Bastrop Bayou. Therefore, flooding from the Bastrop Bayou may occur during strong storm events, though these events will likely be infrequent.

Geology and Soils:

Geologically, the subject property is underlain by the Alluvium Formation. The Alluvium Formation is the youngest formation occurring in Brazoria County and crops out extensively around the Brazos River. This formation is characterized by clay, silt, and sand organic matter deposits. Alluvial deposits occur along the Brazos River, Trinity River, Neches River, and scattered along upland areas. Upper parts of the alluvial deposits consist of black silt, and beneath a later of yellow and gray silty sand combined with lentils of gravel and coarse sand.

The USDA Web Soil Survey of Brazoria County identified the basic soil types on the property as Lake Charles clay (24) and Francitas clay (17). In addition to the soil type, the representative Hydrologic Soil Groups were classified as Group D:

- Hydrologic Soil Group D is characterized by soils with very slow infiltration rate (high runoff potential) when thoroughly wet and a very slow rate of water transmission. Typically, these soils consist of clays with high shrink-swell potential and a high water table, soils with a claypan or clay layer near the surface, and shallow soils over a nearly impervious material.

The Lake Charles and Francitas clays consists of very deep, moderately well drained, very slowly permeable soils that formed in clayey sediments. These soils are on broad coastal prairies. They are cyclic soils and undisturbed areas have gilgai microrelief with microknolls 15 to 38 cm (6 to 15 in) higher than microdepressions. Distance from the center of the microknoll to the center of the microdepression ranges from 1.2 to 4.9 m (4 to 16 ft). The microknoll makes up about 20 percent, the intermediate or area between the knoll and depression about 60 percent, and the microdepression about 20 percent or less. The angle of the slickenside ranges from about 10 to 65 degrees from horizontal and tend to be more vertical in microknolls than in microdepressions. The amplitude of waviness between mollic colored matrix in the upper part of the solum and the higher value colors in the lower part ranges from 30 to 60 inches. When dry, the soils have cracks 1 to 5 cm (1/2 to 2 in) wide at the surface and extend to a depth of 30 cm (12 in) or more. Clay content varies between 45 and 60 percent. The parent material consists of clayey fluviomarine deposits of Late Pleistocene age. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is low. Both are classified as a hydric soil in Brazoria County, and therefore can often be associated with a 'wetland habitat.' The Hydrologic Soil Group for this soil is D.

2. Vegetation:

Vegetation communities were evaluated during site reconnaissance to determine the Curve Number to be used in precipitation runoff calculations. During the site visit, the proposed site was comprised of a mixture of grasses, shrubs and tallow woodlands. Based on aerial photography, the majority of the drainage area beyond the property boundary contains grassland. Most of these areas have been previously used for agricultural purposes, primarily cattle ranching. Given these observations, the Curve Number vegetation classification used for this analysis was most closely related to the pasture category.

3. Hydrologic Conditions:

In order for an area to the meet the standards of wetland criteria set forth by the USACE in the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (v.2), the location must be flooded or ponded, or have a water table within 12 inches of the soil surface, for at least 14 consecutive days during the growing season (5% of growing season) at least 5 out of every 10 years (50% minimum probability). The growing season, as defined by the last and first frost, typically lasts approximately 280 days in this area, from late February to early December; thus, March to November was used as the growing season in this study. Flooding or ponding is the preferred criteria for meeting these standards, and would provide greater credit availability of the site, in addition to higher quality wetlands. According to the USACE Hydrogeomorphic (HGM) model, maximum credits for flooding duration and frequency would be assigned if at least 80% of the wetland floods or ponds for at least 14 consecutive days in 5 out of 5 years (100% minimum probability). With these parameters in mind, the goal of the proposed wetland design is to create a high functioning wetland, supporting growth of desired wetland plants and associated wildlife.

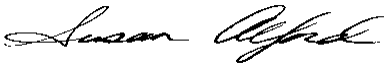
Based on the analysis of monthly water balance for the proposed Mitigation Area, direct precipitation on the property should supply substantial water resources to achieve this flooding/ponding goal if surface water outflows are reduced to prevent water loss. According to this study, the mitigation site has the potential to receive and maintain a net-positive water balance (average of 41 acre-feet of water per month) for the growing season. This estimate expresses the total water available per month, assuming that none of the water escapes through current existing outfall locations, but keeping the primary ditch that runs through the northeast corner of the property for overflow drainage. Assuming equal distribution across the site, an average net water depth of 2.8 inches of water per month could be maintained across the site year-round. However, due to differences in watershed contributions and elevation, equal distribution of water across the site is not likely to occur (Appendix A; Figure 1).

In order to maintain appropriate water levels across the mitigation bank, control structures may be constructed at the level of desired water depth in order to maintain an even distribution of desired water across the site.

CONCLUSIONS

Based on the results of this Wetland Water Budget Analysis, it is the professional opinion of BOA that the current water storage capacity of the proposed Bastrop Bayou Permittee Responsible Mitigation Area is currently sufficient for meeting the wetland criteria assuming even distribution. With the proposed modifications to ditches and berms on the property the water storage capacity will be more than sufficient to hold water year round in an average year. The proposed Mitigation Area currently has the potential to store enough water to meet the criteria of flooding or ponding for at least 14 consecutive days during the growing season. Further, the mitigation site has the potential to receive and maintain a net-positive water balance (average of 41 acre-feet of water per month) for the growing season. This estimate expresses the total water available per month, assuming that none of the water escapes through current existing outfalls/ditches, but keeping the primary ditch that runs through the northeast corner of the property for overflow drainage. Assuming relatively equal distribution across the site, an average net water depth of 2.8 inches of water per month could be maintained across the site year-round.

Respectfully,



Jeff Dunn
Project Manager
Berg♦Oliver Associates, Inc.

Susan Alford, REM
President
Berg♦Oliver Associates, Inc.

REFERENCES

Allen, Richard G, Luis S Pereira, Dirk Raes, and Martin Smith. 2006. Food and Agriculture Organization (FAO) Irrigation and Drainage Paper No. 56: Crop Evapotranspiration (guidelines for computing crop water requirements).

Lu, Jianbiao, Ge Sun, Steven G. McNulty, and Devendra M. Amatya. 2005. A comparison of six potential evapotranspiration methods for regional use in the southeastern United States. *Journal of the American Water Resources Association (JAWRA), 41*(3):621-633.

Menne, M.J., I. Durre, B. Korzeniewski, S. McNeal, K. Thomas, X. Yin, S. Anthony, R. Ray, R.S. Vose, B.E. Gleason, and T.G. Houston, 2012: Global Historical Climatology Network - Daily (GHCN-Daily), Version 3.22. NOAA National Climatic Data Center. <http://doi.org/10.7289/V5D21VHZ>

Shakib Shahidian, Ricardo Serralheiro, Jo o Serrano, Jos Teixeira, Naim Haie and Francisco Santos. 2012. Hargreaves and Other Reduced-Set Methods for Calculating Evapotranspiration. *Evapotranspiration - Remote Sensing and Modeling*, Dr. Ayse Irmak (Ed.), ISBN: 978-953-307-808-3, InTech, Available from: http://www.intechopen.com/books/evapotranspiration-remote-sensing-and-modeling/hargreaves-and-otherreduced-set-methods-for-calculating-evapotranspiration

State of New Jersey Department of Environmental Protection. Regionalized Water Budget Manual for Compensatory Wetland Mitigation Sites in New Jersey.

Texas Water Development Board. 2015. *Geologic Atlas of Texas*. <http://www.twdb.texas.gov/groundwater/aquifer/GAT/>.

Texas Water Resources Institute. 2016. Timeline of Droughts in Texas. Texas A&M AgriLife, Texas A&M University. <http://twri.tamu.edu/publications/txh2o/fall-2011/timeline-of-droughts-in-texas/>

United States Army Corps of Engineers (USACE). 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-10-20. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

United States Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS), Conservation Engineering Division. 1988. Urban Hydrology for Small Watersheds. Technical Release 55.

United States Department of Ariculture (USDA), Soil Conservation Service. 1990. Texas Engineering Technical Note 210-18-TX5.

United States Department of Agriculture (USDA), Soil Conservation Service. 1991. *Hydric Soils of the United States.* Soil Conservation Service. In Cooperation with the National Technical Committee for Hydric Soils, Washington D.C. < http://websoilsurvey.nrcs.usda.gov/app/>.

United States Naval Observatory, Astronomical Applications Department. 2015. Duration of Daylight/Darkness Table for One Year. <http://aa.usno.navy.mil/data/docs/Dur_OneYear.php>.

Vines, Robert. 1960. *Trees, Shrubs and Woody Vines of the Southwest.* Austin: University of Texas Press

APPENDIX A
AVERAGE YEAR WATER BALANCE FIGURE

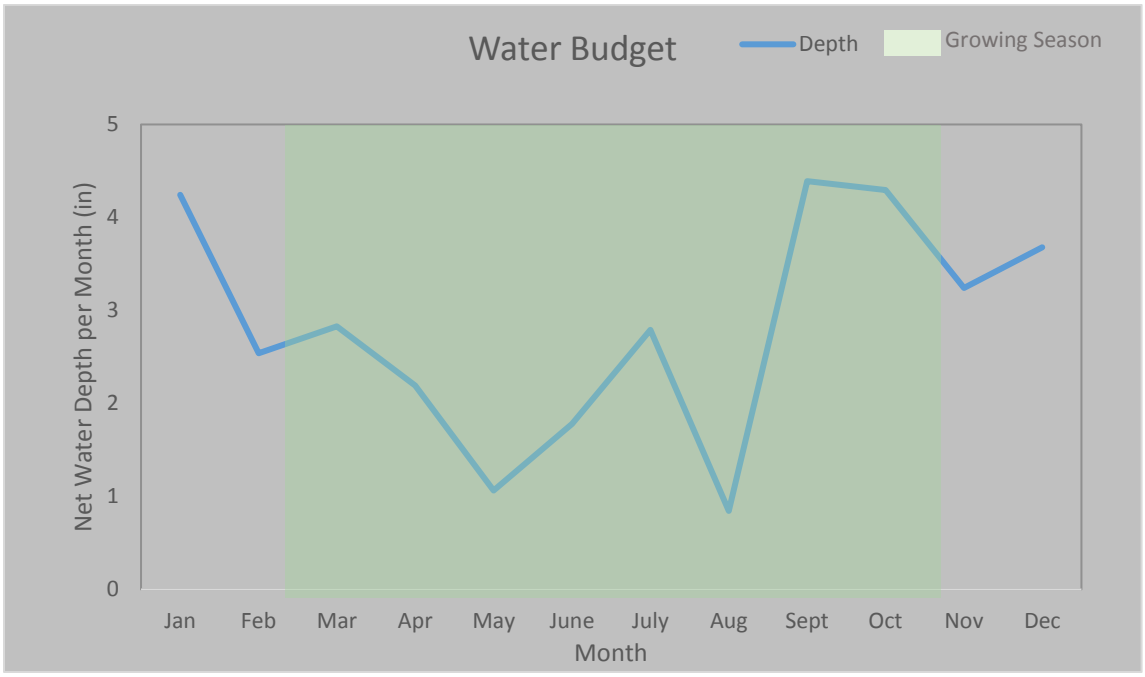


Figure 1. Average year net monthly and cumulative water depth for proposed Bastrop Bayou Permittee Responsible Mitigation Area, assuming modification of on-site ditches.

Attachment F: Evaluation Letter

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON TX 77553-1229

20 December 2016

REPLY TO
ATTENTION OF:
Regulatory Division

SUBJECT: SWG-2015-0305; Bastrop Bayou Mitigation Bank, Brazoria County, Texas

Mr. Aaron Landry
JMB Land Co., LP
2205 W. Pinhook, Suite 200
Lafayette, Louisiana 70508

Dear Mr. Landry:

This concerns the proposed Bastrop Bayou Mitigation Bank (BBMB), located south of Bastrop Bayou, southeast of the Farm to Market Road 523 and County Road 595 (Fairway Drive) Intersection, approximately 5.5 miles southeast of Angleton, Brazoria County, Texas. It can be depicted on the United States Geological Survey (USGS) OYSTER CREEK,, Texas; at. Latitude: 29.103° North; Longitude: -95.350° West.

Pursuant to 33 CFR 332.8 and Compensatory Mitigation for Wetland Losses of Aquatic Resources (73 Fed, Reg. 19594, 10 April 2008), we are providing this written initial evaluation letter for the BBMB. Based on our review of the Prospectus and comments received in response to the public notice, we have determined that the proposed bank has potential for providing appropriate compensatory mitigation for activities authorized by Department of the Army permits.

We are enclosing copies of the comment letters received. The comments represent concerns which could lead to a formal objection from one or more of the IRT members. We need your information to address the issues raised. The specific comments must be addressed and/or revised prior to submitting the DMBI for IRT coordination.

We understand that addressing these issues could require additional time and effort to evaluate. Therefore, if you cannot respond within 30 days, we will withdraw your application without prejudice, which will allow you the right to submit the information at a later date after these issues have been thoroughly addressed. The withdrawal would not penalize you in any way, but would help us in properly managing our workload.

We will be happy to meet with you to discuss these issues in further detail, and we look forward to working with you and the IRT on this proposal. If you have any questions, please reference file number SWG-2015-00305 and contact me, at the letterhead address, by telephone at 409-766-3946, or email at sam.watson@usace.army.mil.

Sincerely,

Sam J. Watson
Chair, Galveston District IRT

Copies Furnished w/Enclosures: Galveston District IRT

Attachment G: Escrow accounts calculation

JMB Partnership, LLC
Construction and Establishment Costs for Short Term Financial Assurance
Bastrop Bayou Project Specific Mitigation Project

		Year										
Herbaceous		1	2	3	4	5	6	7	8	9	10	Total
Total credit acres expected:	Acres											
Enhancement	49.85											
Restoration	70.65											
Upland Buffer to be planted												
Total acres	120.5											
Construction Costs	Per acre											$ -
Site Prep (clearing and ditch removal)	$ 500.00	$ 60,250										60,250
Tallow Aerial spraying	$ 125.00	$ 15,063										15,063
Seeding	$ 100.00	$ 12,050										12,050
Planting	$ 650.00	$ 78,325										78,325
Construction Costs Total		$ 165,688	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 165,687.50
Establishment Costs												
Prescribed Burn	$ 20.00	$ 2,410				$ 2,410						4,820
Invasive control -each	$ 25.00	$ 3,013		$ 3,013			$ 753					6,778
Monitor/ report (yr 1, 2 setup / asbuilt)	$ 20.00	$ 5,000	$ 2,410	$ 2,410	$ 2,410	$ 2,410	$ 2,410					17,050
Maintenance		1,000	1,000	1,000	1,000	1,000	1,000					6,000
Establishment Costs Total		$ 11,422.50	$ 3,410.00	$ 6,422.50	$ 3,410.00	$ 5,820.00	$ 4,163.13	$ -	$ -	$ -	$ -	$ 34,648.13
Total C&E Expenses		$ 177,110.00	$ 3,410.00	$ 6,422.50	$ 3,410.00	$ 5,820.00	$ 4,163.13	$ -	$ -	$ -	$ -	$ 200,335.63

Bastrop Bayou PRM Financial Assurance Amounts

Riverine Herbaceous

Gross Project Acreage 120.5

Re-establishment & Rehabilitation Mitigation Acreage 120.5

Short Term

Total Construction and Establishment Fund - Riverine Herbaceous		**$ 200,335.63**
Reduced after all work complete construction as-built approval	1	**$ 23,225.63**
Reduced after initial success achieved	2	**$ 19,815.63**
Reduced after long term success achieved	5	**$ -**

Long Term Maintenance and Protection to be provided by an escrow account:

Long Term Maintenance and Protection
Annual deposits Years 1 to 5

interest rates projected to be 3%

Inflation rated projected to be 2.1% Years 6 to 50

Year	Beginnning Balance	Deposits of Principle	Interest Rate	Interest Earned	Annualized Cost	Ending Balance	
1	$ -	$ 92,000.00	3%	$ -	$ -	$ 92,000.00	
2	$ 92,000.00		3%	$ 2,760.00	$ -	$ 94,760.00	
3	$ 94,760.00		3%	$ 2,842.80	$ -	$ 97,602.80	
4	$ 97,602.80		3%	$ 2,928.08	$ -	$ 100,530.88	
5	$ 100,530.88		3%	$ 3,015.93	$ -	$ 103,546.81	Fully funded
6	$ 103,546.81		3%	$ 3,106.40	$3,059.44		
	Total Deposits	**$ 92,000.00**					

Determining LT Escrow annualized costs adjusted for Inflation, and the Principal needed in LT Escrow to be fully funded for RIVERINE HERBACEOUS SYSTEMS.
Fill in those values in black (inflation rate, annualized amount, interest rate for escrow, and the amount of mitigation acres. Everything else auto calculates based on these values.)

Description of Information to Provide	Enter the information requested in this column only	Description of Calculated Fields	Calculated Outcome
Inflation Rate	2.1		
Annualized Amount:	$1,867.97	Annualized Amount Adjusted for Inflation:	$3,059.44
Interest Rate for Escrow	3.0	By Year 5, the amount needed in Escrow:	$ 95,668.25
Amount of Mitigation Acres	120.5		

Long-Term Fund Annual Costs (Years5-50)	Unit	Unit Cost	Total Cost	Comments
Taxes (Annually) for 45 years	Acre (120.5 acres)	$1.60	$4,528.80	
Invasive Species Control (Spot Treatement)	Acre (120.5 acres)	$10.00	$12,050.00	10 times
Prescribed Burn	Acre (120.5 acres)	$20.00	$24,100.00	10 times
Maintenance and Miscellaneous	Acre (120.5 acres)	$5.00	$27,112.50	
Legal		$3.00	$16,267.50	
Total 50 year Long Term Cost (45 years expenditures)			***$84,058.80***	
Annualized Total (for 45 years)			***$1,867.97***	
Annualized Long Term Cost for years 6-50 Adjusted for 2.1% Inflation			***$3,059.44***	

Year	Beginning Balance	Annual Cost w 2.1% annual Inflation	Balance after cost	3% Interest Earned	Ending Balance
1	$ 85,000.00		$ 85,000.00	$ 2,550.00	$ 87,550.00
2	$ 87,550.00		$ 87,550.00	$ 2,626.50	$ 90,176.50
3	$ 90,176.50		$ 90,176.50	$ 2,705.30	$ 92,881.80
4	$ 92,881.80		$ 92,881.80	$ 2,786.45	$ 95,668.25
5	$ 95,668.25		$ 95,668.25	$ 2,870.05	$ 98,538.30
6	$ 98,538.30	$1,867.97	$ 96,670.33	$ 2,900.11	$ 99,570.44
7	$ 99,570.44	$1,907.20	$ 97,663.24	$ 2,929.90	$ 100,593.14
8	$ 100,593.14	$1,947.25	$ 98,645.89	$ 2,959.38	$ 101,605.26
9	$ 101,605.26	$1,988.14	$ 99,617.12	$ 2,988.51	$ 102,605.64
10	$ 102,605.64	$2,029.89	$ 100,575.75	$ 3,017.27	$ 103,593.02
11	$ 103,593.02	$2,072.52	$ 101,520.50	$ 3,045.61	$ 104,566.11
12	$ 104,566.11	$2,116.04	$ 102,450.07	$ 3,073.50	$ 105,523.57
13	$ 105,523.57	$2,160.48	$ 103,363.09	$ 3,100.89	$ 106,463.99
14	$ 106,463.99	$2,205.85	$ 104,258.14	$ 3,127.74	$ 107,385.88
15	$ 107,385.88	$2,252.17	$ 105,133.71	$ 3,154.01	$ 108,287.72
16	$ 108,287.72	$2,299.47	$ 105,988.25	$ 3,179.65	$ 109,167.90
17	$ 109,167.90	$2,347.76	$ 106,820.14	$ 3,204.60	$ 110,024.75
18	$ 110,024.75	$2,397.06	$ 107,627.69	$ 3,228.83	$ 110,856.52
19	$ 110,856.52	$2,447.40	$ 108,409.12	$ 3,252.27	$ 111,661.40
20	$ 111,661.40	$2,498.79	$ 109,162.60	$ 3,274.88	$ 112,437.48
21	$ 112,437.48	$2,551.27	$ 109,886.21	$ 3,296.59	$ 113,182.80
22	$ 113,182.80	$2,604.84	$ 110,577.95	$ 3,317.34	$ 113,895.29
23	$ 113,895.29	$2,659.55	$ 111,235.75	$ 3,337.07	$ 114,572.82
24	$ 114,572.82	$2,715.40	$ 111,857.42	$ 3,355.72	$ 115,213.15
25	$ 115,213.15	$2,772.42	$ 112,440.73	$ 3,373.22	$ 115,813.95
26	$ 115,813.95	$2,830.64	$ 112,983.31	$ 3,389.50	$ 116,372.81
27	$ 116,372.81	$2,890.08	$ 113,482.72	$ 3,404.48	$ 116,887.20
28	$ 116,887.20	$2,950.78	$ 113,936.43	$ 3,418.09	$ 117,354.52
29	$ 117,354.52	$3,012.74	$ 114,341.78	$ 3,430.25	$ 117,772.03
30	$ 117,772.03	$3,076.01	$ 114,696.02	$ 3,440.88	$ 118,136.90
31	$ 118,136.90	$3,140.61	$ 114,996.30	$ 3,449.89	$ 118,446.19
32	$ 118,446.19	$3,206.56	$ 115,239.63	$ 3,457.19	$ 118,696.82
33	$ 118,696.82	$3,273.90	$ 115,422.92	$ 3,462.69	$ 118,885.61
34	$ 118,885.61	$3,342.65	$ 115,542.96	$ 3,466.29	$ 119,009.25
35	$ 119,009.25	$3,412.84	$ 115,596.40	$ 3,467.89	$ 119,064.30
36	$ 119,064.30	$3,484.51	$ 115,579.78	$ 3,467.39	$ 119,047.18
37	$ 119,047.18	$3,557.69	$ 115,489.49	$ 3,464.68	$ 118,954.17
38	$ 118,954.17	$3,632.40	$ 115,321.77	$ 3,459.65	$ 118,781.43
39	$ 118,781.43	$3,708.68	$ 115,072.75	$ 3,452.18	$ 118,524.93
40	$ 118,524.93	$3,786.56	$ 114,738.37	$ 3,442.15	$ 118,180.52
41	$ 118,180.52	$3,866.08	$ 114,314.44	$ 3,429.43	$ 117,743.87
42	$ 117,743.87	$3,947.27	$ 113,796.60	$ 3,413.90	$ 117,210.50
43	$ 117,210.50	$4,030.16	$ 113,180.34	$ 3,395.41	$ 116,575.75
44	$ 116,575.75	$4,114.79	$ 112,460.96	$ 3,373.83	$ 115,834.78
45	$ 115,834.78	$4,201.20	$ 111,633.58	$ 3,349.01	$ 114,982.59
46	$ 114,982.59	$4,289.43	$ 110,693.16	$ 3,320.79	$ 114,013.95
47	$ 114,013.95	$4,379.51	$ 109,634.44	$ 3,289.03	$ 112,923.48
48	$ 112,923.48	$4,471.48	$ 108,452.00	$ 3,253.56	$ 111,705.56
49	$ 111,705.56	$4,565.38	$ 107,140.18	$ 3,214.21	$ 110,354.39
50	$ 110,354.39	$4,661.25	$ 105,693.13	$ 3,170.79	$ 108,863.93
		$137,674.66			
Annualized		$3,059.44			

Attachment H: Approved Jurisdictional Determination

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, GALVESTON DISTRICT
P. O. BOX 1229
GALVESTON, TEXAS 77553-1229

March 15, 2019

Compliance Branch

SUBJECT: **SWG-2015-00305** – JMB Land Company, LP, Approved Jurisdictional Determination, Approximate 721-Acre Site for Proposed Bastrop Bayou Mitigation Bank, Angleton, Brazoria County, Texas

Mr. Aaron Landry
JMB Land Company, LP
2205 West Pinhook, Suite 200
Lafayette, Louisiana 70508

Dear Mr. Landry:

This letter is in response to your October 5, 2017 request for an approved jurisdictional determination (AJD), for an approximate 721-acre tract for the proposed Bastrop Bayou Mitigation Bank. The subject site is located approximately 0.78 mile east and south of the intersection of County Road 523 and Fairway Drive in Angleton, Brazoria County, Texas (map enclosed).

Based on a review of the submitted information, additional off-side data, and information acquired during a May 4, 2017 site visit, we determined that the subject approximate 721-acre site contains waters of the United States (WOUS), specifically 191.2 acres of wetlands, 3.49 acres (7,687 linear feet) of tidal unnamed tributary, and 1.16 acre (2,430 linear feet) of non-tidal unnamed tributaries. The subject site WOUS are subject to jurisdiction under Section 404 of the Clean Water Act which regulates the discharge of dredged and/or fill material into WOUS, including navigable waters. In addition, the tidal tributaries are subject to jurisdiction under Section 10 of the Rivers and Harbors Act of 1899 which regulates any work in or affecting tidal waters. Therefore, a Department of the Army (DA) permit is required prior to the discharge of dredge and/or fill material into any WOUS, and/or any work in or affecting tidal waters. This approved JD is valid for 5 years from the notification letter date unless new information warrants a revision prior to the expiration date.

Areas of Federal Interests (federal projects, and/or work areas) may be located within the proposed project area. Any activities in these federal interest areas would also be subject to federal regulations under the authority of Section 14 of the Rivers and Harbors Act of 1899 (33 U.S.C. 408 - Section 408). Section 408 makes it unlawful for anyone to alter in any manner, in whole or in part, any work (ship channel, flood control channels, seawalls, bulkhead, jetty, piers, etc.) built by the United States unless it is authorized by the Corps of Engineers (i.e., Navigation and Operations Division).

This jurisdictional determination has been conducted to identify the limits of the United States Army Corps of Engineers (USACE) jurisdiction for the particular site identified in this request. However, this determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service prior to starting work.

This letter contains an approved jurisdictional determination for your subject site, which is valid for 5 years from the date of this letter unless new information warrants a revision prior to the expiration date. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeals Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal this determination, you must submit a completed RFA form to the Southwestern Division Office at the following address:

Mr. Elliott Carman
Administration Appeals Review Officer (CESWD-PD-O)
U.S Army Corps of Engineers
1100 Commerce Street, Suite 831
Dallas, Texas 75242-1317
Telephone: 469-487-7061; FAX: 469-487-7199

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete; that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within **60 days** of the date of the NAP. It is not necessary to submit an RFA form to the Division office if you do not object to the determination in this letter.

If you have questions concerning this matter, please reference file number **SWG-2015-00305** and contact me at the letterhead address or by telephone at 409-766-3016. To assist us in improving our service to you, please complete the survey found at http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0.

Sincerely,

Kevin Mannie
Project Manager, Compliance Branch

Enclosures

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: **JMB Land Company, LP**	File Number: **SWG 2015-00305**	**Date: 03/15/2019**
Attached is:		See Section below

	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
X	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/appeals.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

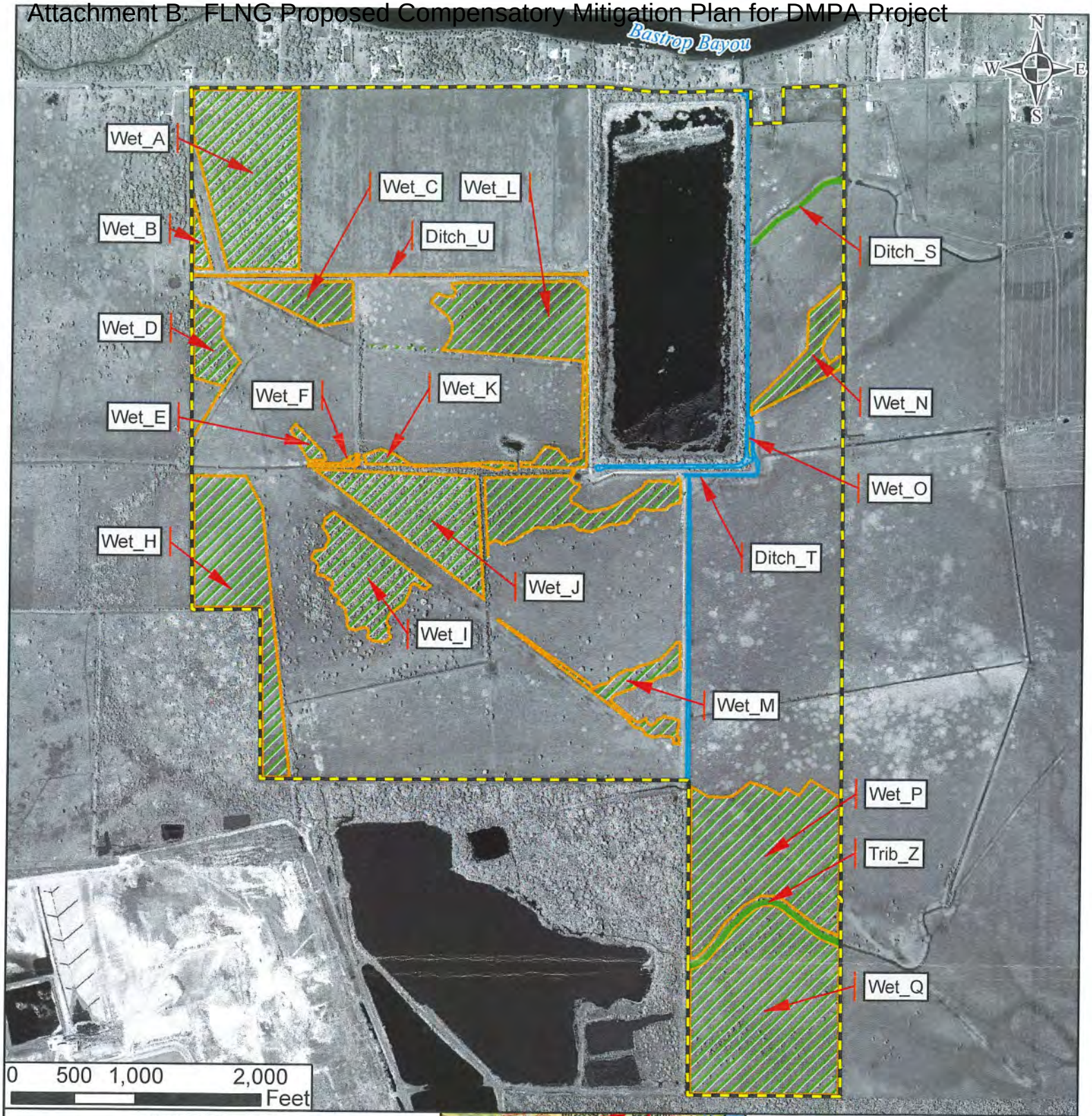
ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact: Mr. Kevin Mannie Project Manager CESWG-RD-C U.S. Army Corps of Engineers P.O. BOX 1229 Galveston, Texas 77553-1229 Telephone: 409-766-3016; Fax: 409-766-3931	If you only have questions regarding the appeal process you may also contact: Mr. Elliott Carman Administrative Appeals Review Officer (CESWD-PD-O) U.S. Army Corps of Engineers 1100 Commerce Street, Suite 831 Dallas , Texas 75242-1317 469-487-7061

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:	Telephone number:



SWG-2015-00305
JMB Land Company, LP
Bastrop Bayou Mitigation Bank
721-Acre Tract
Approved Jurisdictional Determination
Angleton, Brazoria County, Texas

Review_Area ~721 ac **Waters of the U.S.**

- Wetlands ~ 203.72 ac
- Tidal tributary ~ 3.49 ac
- Non-tidal tributary ~ 1.15 ac

Image Source: 26 April 2018, 0.5-meter Digital Globe High Resolution, Panchromatic

Note: Review Area reflects neither property boundary nor ownership

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 15 March 2019

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Galveston District, SWG-2015-00305, JMB Land Company, LP, Approved Jurisdictional Determination, Approximate 721-Acre Site for Proposed Bastrop Bayou Mitigation Bank, Angleton, Brazoria County, Texas

C. PROJECT LOCATION AND BACKGROUND INFORMATION:
State: Texas County/Parish: Brazoria City: Angleton
Center coordinates of site (lat/long in degree decimal format, NAD-83): Lat. See Table 1. ° N, Long. ° W;
Universal Transverse Mercator: UTM: 15N, See Table 1. N., E.,NAD: 83
Name of nearest water body: Bastrop Bayou
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Bastrop Bayou
Name of watershed or Hydrologic Unit Code (HUC): Austin-Oyster - 12040205
☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
☒ Office (Desk) Determination. Date: 26 February 2019
☒ Field Determination. Date(s): 05 May 2017

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [***Required***]
☒ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [***Required***]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
      ☒ TNWs, including territorial seas
      ☒ Wetlands adjacent to TNWs
      ☒ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
      ☐ Non-RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
      ☐ Impoundments of jurisdictional waters
      ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
      Non-wetland waters: 10,117 linear feet: width (ft) and/or 4.7 acres
      Wetlands: 191.2 acres

   c. **Limits (boundaries) of jurisdiction** based on: **1987 Delineation Manual.**
      Elevation of established OHWM (if known):

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
   Explain:

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW: Unnamed tidal tributaries to Bastrop Bayou

Summarize rationale supporting determination: The subject site unnamed tidal tributaries are subject to daily tidal ebb and flow. Therefore, per 33 CFR 329..4 the unnamed tidal tributaries to Bastrop Bayou are subject to Section 10 of the Rivers and Harbors Act of 1899. Per 33 CFR 328.4(b)(1) all Section 10 waters are jurisdictional under Section 404 of the Clean Water Act.

2. **Wetland adjacent to TNW**

Summarize rationale supporting conclusion that wetland is "adjacent": The subject site wetlands are reasonably close (neighboring) and therefore adjacent to Bastrop Bayou, a TNW. Therefore, per 33 CFR 328.3(a)(7) the subject site wetlands are subject to Section 404 of the Clean Water Act.

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, fill out Section III.D.2 and Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the water body[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the water body has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

(i) **General Area Conditions:**
Watershed size: **square miles**
Drainage area: **square miles**
Average annual rainfall: inches
Average annual snowfall: N/A inches

(ii) **Physical Characteristics:**
(a) Relationship with TNW:
☐ Tributary flows directly into TNW.
☐ Tributary flows through **Pick List** tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW.
Project waters are **Pick List** river miles from RPW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Project waters are **Pick List** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain:

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

Identify flow route to TNW[5]:
Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):
Tributary is: ☐ Natural
☐ Artificial (man-made). Explain:
☐ Manipulated (man-altered). Explain:

Tributary properties with respect to top of bank (estimate):
Average width: feet
Average depth: feet
Average side slopes: **Pick List**

Primary tributary substrate composition (check all that apply):
☐ Silts ☐ Sands ☐ Concrete
☐ Cobbles ☐ Gravel ☐ Muck
☐ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain:

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain:
Presence of run/riffle/pool complexes. Explain:
Tributary geometry: **Pick List**
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for: **Pick List**
Estimate average number of flow events in review area/year: **Pick List**
Describe flow regime:
Other information on duration and volume:
Surface flow is: **Pick List.** Characteristics:
Subsurface flow: **Pick List**. Explain findings:
☐ Dye (or other) test performed:

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):
☐ clear, natural line impressed on the bank
☐ changes in the character of soil
☐ shelving
☐ vegetation matted down, bent, or absent
☐ leaf litter disturbed or washed away
☐ sediment deposition
☐ water staining
☐ other (list):
☐ the presence of litter and debris
☐ destruction of terrestrial vegetation
☐ the presence of wrack line
☐ sediment sorting
☐ scour
☐ multiple observed or predicted flow events
☐ abrupt change in plant community
☐ Discontinuous OHWM.[7] Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
☐ High Tide Line indicated by:
☐ oil or scum line along shore objects
☐ fine shell or debris deposits (foreshore)
☐ physical markings/characteristics
☐ tidal gauges
☐ other (list):
☐ Mean High Water Mark indicated by:
☐ survey to available datum;
☐ physical markings;
☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain:
Identify specific pollutants, if known:

(iv) Biological Characteristics. Channel supports (check all that apply):

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.
[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the water body's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7] Ibid.

☐ Riparian corridor. Characteristics (type, average width):
☐ Wetland fringe. Characteristics:
☐ Habitat for:
  ☐ Federally Listed species. Explain findings:
  ☐ Fish/spawn areas. Explain findings:
  ☐ Other environmentally-sensitive species. Explain findings:
  ☐ Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:
Properties:
Wetland size: acres
Wetland type. Explain:
Wetland quality. Explain:
Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:
Flow is: **Pick List**. Explain:

Surface flow is: **Pick List**
Characteristics:

Subsurface flow: **Pick List**. Explain findings:
☐ Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:
☐ Directly abutting
☐ Not directly abutting
  ☐ Discrete wetland hydrologic connection. Explain:
  ☐ Ecological connection. Explain:
  ☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW
Project wetlands are **Pick List** river miles from TNW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Flow is from: **Pick List.**
Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) Chemical Characteristics:
Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:
Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):
☐ Riparian buffer. Characteristics (type, average width):
☐ Vegetation type/percent cover. Explain:
☐ Habitat for:
  ☐ Federally Listed species. Explain findings:
  ☐ Fish/spawn areas. Explain findings:
  ☐ Other environmentally-sensitive species. Explain findings:
  ☐ Aquatic/wildlife diversity. Explain findings:

3. **Characteristics of all wetlands adjacent to the tributary (if any)**
All wetland(s) being considered in the cumulative analysis: **Pick List**
Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☒ TNWs: 7,687 linear feet width (ft), Or, 3.49 acres.
   - ☒ Wetlands adjacent to TNWs: 191.2 acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☒ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: The unnamed non-tidal tributary to Bastrop Bayou displayed water in 15 out of 17 historic aerial photos between 2004 and 2018. The National Hydrographic Dataset identifies this feature as having perennial water flow. Therefore this feature is a relatively permanent water (RPW).
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

   Provide estimates for jurisdictional waters in the review area (check all that apply):
   - ☒ Tributary waters: 2,430 linear feet width (ft)
   - ☐ Other non-wetland waters: acres

   Identify type(s) of waters:

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
   - ☐ Water body that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional waters within the review area (check all that apply):

[8]See Footnote # 3.

☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres
Identify type(s) of waters:

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres

7. **Impoundments of jurisdictional waters.**[9]
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. **ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):**[10]
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain:
☐ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft)
☐ Other non-wetland waters: acres
Identify type(s) of waters:
☐ Wetlands: acres

[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] **Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.***

F. **NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):**

☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.

☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.

☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).

☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:

☐ Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource:

☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).

☐ Lakes/ponds: acres.

☐ Other non-wetland waters: acres. List type of aquatic resource:

☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. **SUPPORTING DATA. Data reviewed for JD (check all that apply -** checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Wetland delineation submitted by applicant.

☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.

☐ Office concurs with data sheets/delineation report.

☐ Office does not concur with data sheets/delineation report

☐ Data sheets prepared by the Corps:

☐ Corps navigable waters' study:

☒ U.S. Geological Survey Hydrologic Atlas: Austin-Oyster - 12040205

☐ USGS NHD data

☒ USGS 8 and 12 digit HUC maps

☐ Galveston District's Approved List of Navigable Waters

☒ U.S. Geological Survey map(s). Cite scale & quad name: Oyster Creek, Texas - 1943, 1947, and 1963.

☒ USDA Natural Resources Conservation Service Soil Survey. Citation: USDA National Cooperative Soil Survey (NCSS) Google Earth Layer (http://casoilresource.lawr.ucdavis.edu/soil_web/kml/mapunits.kml), accessed 01 February 2019.

☒ National wetlands inventory map(s). Cite name: Online USFWS NWI Google Earth Layer (http:// /www.fws.gov/wetlands/Data/Google-Earth.html), accessed 01 February 2019.

☐ State/Local wetland inventory map(s):

☒ FEMA/FIRM maps: Brazoria County Texas and Incorporated Areas, Panel Number 40839C0630H (06/05/1989). Flood Zone(s): AE.

☒ 100-year Floodplain Elevation is: 8 feet (National Geodectic Vertical Datum of 1929)

☒ Photographs: ☒ Aerial (Name & Date): 2008 Texas Orthoimagery Program (TOP), 0.5-meter Near Color (NC) / Color Infrared (CIR); 2016 National Agriculture Imagery Program (NAIP), 1.0-meter NC/CIR; Digital Globe 0.5-meter High-Resolution Aerial Imagery (23 November 2015, 30 August 2017, 26 April 2018, and 10 May 2018).

or ☐ Other (Name & Date):

☐ Previous determination(s). File no. and date of response letter:

☐ Applicable/supporting case law:

☐ Applicable/supporting scientific literature:

☒ Other information (please specify): U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA): National Centers for Environmental Information (NCEI), 9 December 2014 1/9 arc-second (3-meter) digital elevation model (DEM), North American Vertical Datum of 1988 (NAVD88).

B. **ADDITIONAL COMMENTS TO SUPPORT JD:** The subject site unnamed tidal tributary (Ditch T) to Bastrop Bayou is subject to tidal ebb and flow. Therefore, per 33 CFR 329.4 Ditch T is subject to Section 10 of the Rivers and Harbors Act of 1899. Per 33 CFR 328.4(b)(1) Section 10 waters are jurisdictional under Section 404 of the Clean Water Act.

The subject site wetlands are reasonably close (neighboring) and therefore adjacent to Bastrop Bayou, a TNW. Therefore, per 33 CFR 328.3(a)(7) the subject site wetlands are subject to Section 404 of the Clean Water Act.

The unnamed non-tidal tributaries to Bastrop Bayou (Ditches S and Z) display water in 14 and 15 out of 17, respectively, historic aerial photos between 2004 and 2018, and the National Hydrographic Dataset identifies Ditch Z as having perennial water flow. Therefore these features are relatively permanent waters (RPWs).

Table 1. Site	Latitude	Longitude	UTM Zone	UTM Easting	UTM Northing	Approximate Size (linear feet / acres)	Cowardin Classification	Regulatory Authority
Wetland A	29.106958	-96.297196	15N	270611.8	3222131.9	26.2 ac	PSS	404
Wetland B	29.105393	-95.358466	15N	270484.6	3221960.9	1.4 ac	PSS	404
Wetland C	29.104212	-95.355690	15N	270752.2	3221824.6	5.7 ac	PEM	404
Wetland D	29.102999	-95.358084	15N	270516.5	3221694.8	4.9 ac	PFO	404
Wetland E	29.100989	-95.355578	15N	270756.0	3221467.1	1. 1 ac	PFO	404
Wetland F	29.100693	-95.354543	15N	270856.1	3221432.3	0.07 ac	PFO	404
Wetland G	29.100592	-95.354772	15N	270833.5	3221421.5	0.08 ac	PFO	404
Wetland H	29.097767	-95.357139	15N	270596.8	3221113.0	20.4 ac	PEM	404
Wetland I	29.098093	-95.354059	15N	270897.4	3221143.2	11.6 ac	PFO	404
Wetland J	29.099528	-95.352586	15N	271044.0	3221299.4	16.2 ac	PFO	404
Wetland K	29.100713	-95.352590	15N	271046.2	3221430.7	1.7 ac	PFO	404
Wetland L	29.102048	-95.349799	15N	271320.9	3221573.3	32.4 ac	PEM	404
Wetland M	29.095871	-95.347360	15N	271544.7	3220883.9	6. 0 ac	PEM	404
Wetland N	29.103289	-95.343039	15N	271981.7	3221697.7	6. 1 ac	PEM	404
Wetland O	29.101417	-95.344455	15N	271839.7	3221493.0	0.13 ac	PEM	404
Wetland P	29.092190	-95.343786	15N	271884.5	3220468.9	30.9 ac	PEM	404
Wetland Q	29.088775	-95.343584	15N	271896.6	3220090.0	37.6 ac	PEM	404
Ditch S	29.106562	-95.343392	15N	271954.5	3222061.2	900 lf / 0.4 ac	R4SBC	404
Ditch T	29.101363	-95.345297	15N	271757.6	3221488.6	7,687 lf / 3.49ac	R4SBCx	10/404
Ditch U	29.104792	-95.353663	15N	270950.8	3221884.9	1.9 ac	PEM	404
Tributary Z	29.090579	-95.343705	15N	271888.8	3220290.2	1,530 lf / 0.8 ac	R2UBH	404