

**HERBACEOUS WETLAND**

**PERMITTEE RESPONSIBLE MITIGATION PLAN  
SABINE LAKE WATERSHED (HUC 12040201)**

**GARNER JUNCTION PROJECT (SWG-2019-00599)**

**JEFFERSON COUNTY, TEXAS**

Prepared for

**CHEVRON PHILLIPS CHEMICAL COMPANY LP**



**September 13, 2019**

PREPARED BY:

**DELTA LAND SERVICES, LLC**

1090 CINCLARE DRIVE | PORT ALLEN, LA 70767 | OFFICE (225)343-3900 | FAX (225)343-3200

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## **1.0 Introduction**

Delta Land Services, LLC (DLS) presents this herbaceous (PEM) Permittee Responsible Mitigation Plan (PRMP) for the compensation of proposed permanent impacts to 6.59 acres of palustrine emergent (PEM) wetlands associated with unavoidable impacts within the Sabine Lake watershed as presented in the U.S. Army Corps of Engineers (USACE) permit SWG-2019-00599 (“Permit”). Chevron Phillips Chemical Company LP (CP Chem), proposes the construction of a new valve, trap, and switching station (referred to as Garner Junction) approximately 1.0 mile east of the intersection of Garner Road and Charlie Richards Lane (hereinafter referred to as the Garner Junction Project). Garner Junction will house mainline isolation valves and pig traps as well as switching stations (to switch products between lines) and a pressure reducing station. Garner Junction will connect existing and future pipeline infrastructure to improve operability and reliability throughout the region. The Project will require one permanent access road (PAR-01). The majority of the access road is existing and will require minor modifications; however, a portion of the road will require improvements such as widening and the addition of gravel. This PRMP addresses the compensation for the permanent loss of PEM wetlands as a result of the proposed Garner Junction and access road.

The Project’s PRMP will offset PEM wetland impacts in the Sabine Lake Subbasin (Hydrologic Unit Code [HUC] 12040201). Ecologically, the impacts are located within the Western Gulf Coast Plain Level III Ecoregion and the Northern Humid Gulf Coastal Prairies Level IV Ecoregion (Seaber et al. 1987, Griffith et al. 2007, EPA 2012) [Attachment A, Figure 1]. More specifically, the centerpoint of the Project wetland impacts being offset by this PRMP is located at latitude 29.903062° North and longitude -94.123093° West (North American Datum [NAD83]).

The preparation of this PRMP was guided by USACE regulations for compensatory mitigation for losses of aquatic resources, codified in 33 CFR § 332. More specifically, the elements of the PRMP were designed to satisfy the requirements of 33 CFR § 332.4(c)(2)-(14). DLS, acting as the mitigation provider for the Permittee under this PRMP, will implement, monitor, and provide long-term management of the Permittee Responsible Mitigation Area (PRMA) set forth in this Plan as described in 33 CFR § 332.3(l).

The assessment of impacts and the proposed PRMA restoration utilized the CESWG Riverine Herbaceous/Shrub Interim Hydrogeomorphic (iHGM) model (Attachment B). The PRMA is located in the Lower Sabine HUC (12010005) [Attachment A, Figure 1]. A 1:1.5 ratio (i.e., impact function to mitigation function ratio) is utilized to determine the mitigation requirements since impacts and the mitigation solution are located in adjoining adjacent 8-digit HUCs. The proposed PEM wetland mitigation restoration acreage is 16.0 acres; additionally, 0.1 acre of relict non-wetland pimple (mima) mound will be restored, and 0.1 acre of upland buffer will be preserved.

### **1.1 Mitigation Property Location**

The 16.2-acre PRMA is located in Orange County, Texas within the Lower Sabine Subbasin and located in the Western Gulf Coast Plain Level III and the Northern Humid Gulf Coastal Prairies Level IV Ecoregions (Seaber et al. 1987, Griffith et al. 2007, EPA 2012). The PRMA is located approximately 4.3 miles southwest of Orange and approximately 22.2 miles northeast of the impact

site. The approximate centerpoint of the PRMA is Latitude 30.07535° N and Longitude 93.806717° W (UTM 422251.57 E, 3327409.10 N).

To access the PRMA by automobile, from the intersection of Business State Highway (SH) 87 and Business U.S. Highway (US) 90 Orange, Texas, head west/south on US 90/SH87 for approximately 2.3 miles. Turn right (west) onto FM 105/Orangefield Road and continue for approximately 1.44 miles, at this location, there is an access gate leading south into the PRMA.

## **1.2 Property Ownership and Responsible Party Qualifications**

This section describes DLS's qualifications to successfully complete the proposed PRMA. Ironwood Holdings, LLC owns the PRMA and the property encompassing the PRMA. Ironwood Holdings is a land holding subsidiary of DLS. DLS will act as the mitigation agent/provider for the PRMA. As the mitigation provider, DLS is a land management and restoration company whose technical staff includes Certified Wildlife Biologists, Professional Wetland Scientists, Certified Foresters, and Certified Ecological Restoration Practitioners. In addition, DLS has construction specialists experienced in wetland construction activities such as heavy equipment operation, vegetation establishment, herbicide application, and contractor management.

DLS currently operates 15 approved wetland mitigation banks (Banks) and 5 approved amendments within four USACE Districts totaling 7,925.7 acres which include 43,044.9 linear feet of stream restoration. These Districts include Vicksburg (MVK), New Orleans (MVN), Fort Worth (SWF), and SWG. In addition to the Banks referenced above, DLS serves as the Responsible Party for the establishment and maintenance of 3,468.1 acres of wetlands and 8,251.0 linear feet of stream on twenty-nine (29) other approved permittee responsible mitigation areas within the MVN, MVK and SWG Districts.

## **1.3 Description of the Property**

The PRMA consists of a regularly formed tract that is connected to Coon Bayou and its floodplain via a drainage ditch (Attachment A, Figure 2). The PRMA perimeter coordinates are shown below in Table 1 beginning at the northwest corner and proceeding clockwise.

**Table 1. Perimeter Coordinates for the PRMA**

Latitude		Longitude		Latitude		Longitude	
-93.80573309	° W	30.07423993	° N	-93.80557611	° W	30.07657171	° N
-93.80576748	° W	30.07424164	° N	-93.80557824	° W	30.07654021	° N
-93.80870547	° W	30.07438837	° N	-93.80559576	° W	30.07627991	° N
-93.80868806	° W	30.07479287	° N	-93.80561136	° W	30.07604821	° N
-93.80868234	° W	30.07514009	° N	-93.80561847	° W	30.07594259	° N
-93.80867976	° W	30.07529673	° N	-93.80562632	° W	30.07582596	° N
-93.80864702	° W	30.07610498	° N	-93.80565481	° W	30.07540284	° N
-93.80848823	° W	30.07615941	° N	-93.80565774	° W	30.07535919	° N
-93.80754155	° W	30.07628333	° N	-93.8057294	° W	30.07429485	° N
-93.8056058	° W	30.07656735	° N	-93.80573309	° W	30.07423993	° N

\* Coordinates begin in the northwest corner and proceed clockwise.

#### **1.4 Recorded Liens, Encumbrances, Easements, Servitudes or Restrictions**

There are no known recorded liens, encumbrances, easements, servitudes or other surface restrictions applicable to the PRMA.

#### **1.5 Mineral Management Plan**

Valuable mineral resources may exist under the land within the Conservation Easement of the PRMA; however, the subsurface mineral rights for the property are not currently owned by Ironwood Holdings, LLC (landowner). One 400-foot x 400-foot drill reserve area was excluded from the restoration acreage on the PRMA (Appendix A, Figure 3). If mineral extraction were to occur on the tract, the mineral owner has agreed to use the designated surface location, which was agreed upon by the surface owner and the mineral estate. Outside the designated surface location, the mineral owner has waived surface rights.

If the designated surface locations could not be used, then in coordination with the Conservation Easement, Ironwood would put in place a Mineral Management Plan (MMP). The Conservation Easement is discussed in detail below in Section 4.0. Recognizing that surface landowners in the State of Texas cannot wholly control a subsurface mineral holder's access to those minerals, the Permittee and Ironwood have developed an MMP to reduce the risk of negatively affecting the ecological success of the PRMA. The Permittee's agent and landowner have reviewed this language and potential activity with the Conservation Easement Holder, Texas Land Conservancy and the MMP would include the following elements:

- a. All drilling activities must be conducted in a manner that minimizes adverse environmental impacts. The driller/operator will be required to develop a written best management practices plan for the drilling operations.
- b. All drilling activities shall comply with applicable regulatory requirements including those under Section 404 of the Clean Water Act.

- c. Any drilling equipment will be limited to existing access paths and non-waters of the United States.
- d. If accessing the site and conducting activities only in non-clean water act jurisdictional areas is infeasible for the mineral rights holder, the driller/operator will work in coordination with the Permittee, landowner, Conservation Easement Holder, and adjacent landowners to reach a mutually agreeable drilling site and access route.
- e. For any wetland acreage impacted by drilling activities within the PRMA, the appropriate number of FCUs/credits, as determined by a functional assessment conducted by the driller/operator on the impacted wetland acreage, will be purchased by the driller/operator from an approved bank or an appropriate PRM will be executed.
- f. The driller/operator must restore impacted areas to pre-existing conditions as soon as practicable following initiation of drilling activities.

Additionally, a surface use agreement with the driller/operator would be developed prior to any mineral development activity. The Permittee and landowner shall notify the CESWG as soon as practicable prior to any attempt by the driller/operator to develop any subsurface mineral resource from under the PRMA.

## 2.0 Goals and Objectives

The goals of this PRMP are to restore<sup>1</sup> (rehabilitate<sup>2</sup>) 9.3 acres of PEM wetlands and re-establish<sup>3</sup> 6.7 acres of PEM wetlands located in the Lower Sabine Watershed (Figure 3). Additionally, 0.1 acre of non-wetland pimple mounds will be restored, and 0.1 acre of upland buffer would be preserved.

To meet the goals of PEM restoration, the objectives will consist of the following:

- permanent cessation of cattle grazing;
- rehabilitate the existing wetlands through the removal and control of pasture and invasive grasses (e.g., Bermuda grass [*Cynodon dactylon*], invasive species (e.g., Chinese tallowtree [*Triadica sebifera*],<sup>4</sup> Chinese privet [*Ligustrum sinense*], Japanese privet [*L. japonicum*], etc.), and other species as listed by [texasinvasives.org](http://texasinvasives.org) database;
- rehabilitate wetland hydrology for PEM wetlands by reconnecting the PRMA to the Coon Bayou floodplain via a naturalized ditch;

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<sup>1</sup> Restoration is defined in 33 CFR 332.2 as 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 tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.*

<sup>2</sup> Rehabilitation is defined in 33 CFR §332.2 as the *manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function but does not result in a gain in aquatic resource area.*

<sup>3</sup> Re-establishment is defined in 33 CFR § 332.2 as the *manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.*

<sup>4</sup> The aforementioned and subsequent plant scientific nomenclature is from Lichvar et al. (2016).

- re-establish PEM wetland hydrology on 6.7 acres through the filling/plugging of drainage ditches, leveling relic agricultural berms, and filling drainage laterals;
- rehabilitate the existing 9.3 acres of PEM wetlands through the seeding of native coastal prairie plant species;
- re-establish native herbaceous wetland vegetation in the 6.7 acres of PEM re-establishment through native plant material distribution;
- restore 0.1 acre of upland relict pimple mounds and preserve 0.1 acre of upland buffer;
- construct, establish, and provide long-term maintenance by establishing the appropriate financial escrow accounts; and
- protect the PRMA under a perpetual conservation easement.

Rehabilitating and re-establishing the PEM wetlands within the PRMA will enhance the wetland functions discussed in Section 2.1.

## **2.1 Aquatic Resource Type and Functions Restored**

Implementation of the proposed PRMP will rehabilitate 9.3 acres of PEM wetland and re-establish 6.7 acres of PEM wetland, within the Lower Sabine watershed. The PRMA will be restored to native PEM wetland conditions to offset impacts to aquatic resources associated with the permit described in Section 1.0. Additionally, 0.1 acre of relict non-wetland pimple mounds would be restored, and 0.1 acre of upland buffer would be preserved.

1. Physical - Temporary Storage and Detention of Surface Water (TSSW) – the restored wetlands will provide temporary water storage during rainfall events.
2. Biological - Maintenance of Plant and Animal Communities (MPAC) – the restored wetlands will serve as habitat for native wildlife and Nearctic-Neotropical migratory bird species and restore native herbaceous and shrub wetland plant communities.
3. Chemical - Removal and Sequestration of Elements and Compounds (RSEC) – the restored wetlands will remove sediments from surface water during periods of rainfall and runoff.

## **2.2 Watershed and Ecological Contributions**

The PRMA and impact site both drain to the Sabine Lake Watershed. The PRMA drains to Sabine Lake via Coon Bayou, Cow Bayou, and then the Sabine River (9.93 river miles). The impact site drains to Sabine Lake via an unnamed tributary to Taylor's Bayou and then to Taylor's Bayou (21.5 river miles). The PRMA and impact site both lie in the Coastal Plain physiographic province in the subtropical climate zone. The PRMA is located near Coon Bayou, which flows into Cow Bayou. Coon Bayou (Segment 0511B) is listed on the Texas Council of Environmental Quality's (TCEQ) 2016 Water Quality Impairments list for bacteria (Recreation Use) and depressed dissolved oxygen (TCEQ 2016). Additionally, TCEQ issued an implementation Plan for Total Maximum Daily Loads (TMDL) in Adams Bayou, Cow Bayou, and their tributaries (TCEQ 2015). The TMDL Implementation Plan identified Coon Bayou as not supporting aquatic life use or contact recreation. These waterbodies flow into Sabine Lake via the Sabine River and provide significant flow and watershed contributions to the Sabine Lake watershed. The TMDL plan listed



the following nonpoint source implementation strategies to help achieve water quality standards in the Orange County area (TCEQ 2015):

- Implement water quality best management practices (BMPs) for agricultural landowners (cattle grazing being the principal use);
- Protect riparian areas by managing land for wildlife; and
- Reduce feral hog populations.

The PRMA drains to Coon Bayou, which is a tributary of Cow Bayou. Implementation of the PRMP would eliminate agricultural uses (removing cattle) on the PRMA. The PRMA tract has been manipulated to move water offsite into Coon Bayou. The restored wetlands will increase onsite stormwater / floodwater storage by increasing the frequency and duration of inundation. This increase will allow sediments to settle in the plant community and slow the flow of stormwater entering Coon Bayou. Currently, cattle have access to agricultural ditches/waterbodies that flow directly into Coon Bayou. Cattle being present on the site has resulted in overgrazing, soil compaction, mineral fertilization, and excessive fecal bacteria (*Escherichia coli* [*E. coli*]). The cessation of cattle grazing, hydrology restoration, and native plant restoration will presumably help improve Coon Bayou water clarity, decrease nitrogen and phosphorous stream pollution, and reduce *E. coli* levels. Furthermore, soil compaction reduces plant community productivity by limiting / weakening root functions; thus, leading to poor infiltration rates and increase non-point source runoff into Coon Bayou. Native plant restoration will increase vertical plant structure within the PRMA and will increase the quality of wildlife habitat via the restoration of a native trophic structure (aquatic ecosystem), which does not exist under the current land use (i.e., non-native forage production and overgrazing). Lastly, as part of invasive species control, feral hogs will be controlled as part of invasive species removal. Thus, the restoration of the PRMA is consistent with the TMDL implementation plan that has been established for Cow Bayou, which is a subwatershed of the Lower Sabine and is located near the confluence with Sabine Lake. The PRMA is located in the study area/watersheds of the 2015 TMDL implementation plan, while Sabine Lake is located 2.5 miles downstream of the study area.

The existing conditions at the PRMA are degraded for the following reasons: historic grazing, historic farming, construction of drainage ditches and laterals designed to move water off the site, and the spread of nuisance and exotic plant species. The following functions would be improved and/or restored at the PRMA and contribute to the health of the ecologically significant Sabine River/Lake watershed:

- re-establish native vegetation, providing sustainable food sources for wildlife;
- provide increased native bird and pollinator habitat through the restoration of 16.0 acres of native wetland herbaceous communities;
- improve natural biological diversity through native plant restoration;
- improve water quality through the cessation of cattle grazing, reducing sediment loading in Coon Bayou and ultimately Cow Bayou;
- improve nonpoint source pollution through vegetation restoration and re-establishment of 6.7 acres of PEM wetlands; and

- improve floodwater attenuation through the removal of agricultural ditches and drainage laterals in 9.3 acres of existing wetlands and re-establishment of 6.7 acres of PEM wetlands.

The watersheds in which the impacts and the PRMA are situated have experienced industrial and residential growth in recent years due to the proximity of industrial areas in southeast Texas and southwest Louisiana. The Beaumont-Port Arthur Metropolitan Area is expected to add 12,600 jobs over the next five years. It is also expected that this metropolitan area will grow at an annual rate of 1.44 percent (Orange Leader 2018). The expected population growth combined with the limited amount of conserved lands in the Sabine watershed creates a need for additional conservation lands within the Sabine watershed.

Additionally, the PRMA is located in the portion of southeast Texas that exhibits high volumes of agricultural activity. Based on historical aerial photography review, the site has been extensively farmed and grazed at least since the 1940's. Restoring and protecting the property in perpetuity would prevent future cattle grazing and provide long-term site protection.

### **3.0 Site Selection**

CP Chem conducted a mitigation credit availability screening to determine if mitigation credits were available to compensate for impacts associated with the proposed Project. At the time of permit application submittal, the USACE Regulatory In-Lieu Fee and Bank Information Tracking System (RIBITS) indicated that Daisetta Swamp Mitigation Bank does not have the proper credit type (non-forested/herbaceous credits) to offset the Project impacts. No other approved banks or in-lieu fee programs service the Sabine Lake watershed. Therefore, since no approved bank or an approved in-lieu fee program exists, the Permittee proceeded with a strategy of pursuing an offsite PRM under and in accordance with 33 CFR § 332.3(b). An onsite PRM is not feasible due to the lack of available land; the proposed Project is a valve, trap, and switching station setting located on private land; the adjacent land is not available for a PRM.

The PRM and Project site are not located in the same 8-digit HUC, however both areas drain to Sabine Lake. All approved mitigation banks within the CESWG have service areas that span multiple watersheds (8-digit HUCs). Bank service areas are often comprised of watersheds that are interconnected within the same Level III and Level IV Ecoregions. For impacts outside the primary service area, a 1.5 multiplier is applied. The 2008 Mitigation Rule also allows for impacts to be offset in adjacent watersheds with a PRM, if ecologically justified. The ecological justification for offsetting impacts at a PRM site within the Lower Sabine area as follows:

1. Impacts, as well as the PRM site, are located in the same Level III and Level IV Ecoregions (Western Gulf Coastal Plain and the Northern Humid Gulf Coastal Prairies Level IV Ecoregions).
2. HUC boundaries are often drawn following the drainage patterns in the upper portions of the watershed, and the boundaries are drawn based on small breaks on the landscape and not to the true watershed or floodplain boundaries, which is the case for the Lower Sabine watershed in southern Orange County. As watersheds merge near coastal confluences, the

boundaries often become diffuse, with watersheds often exchanging floodwaters and tidal waters near 8-digit HUC boundaries. In the general vicinity of the PRMA, both floodwaters and the ebb and flow of tidal water crosses the Sabine Lake and Lower Sabine watershed boundaries.

3. The PRMA is located approximately 6.1 miles from the north shoreline of Sabine Lake and the impact site is located approximately 12.0 miles from the western shore of Sabine Lake. Additionally, there is no major ridge or rise in the elevation from the PRMA to Sabine Lake. Cow Bayou's floodplain, which drains to Sabine Lake via the Sabine River, is the only contributing factor to any separation of the watersheds.
4. The Cow Bayou confluence with the Sabine River is only 2.5 miles north of the Sabine Lake. Additionally, Cow Bayou floodwaters have crossed over the Sabine Lake watershed boundary during storm events, providing a watershed connection.
5. Floodplains are shared and cross HUC boundaries (Lower Sabine and Sabine Lake) at this location, further proving a hydrologic connection.
6. Ecologically, the impact site and PRMA are similar for the following reasons:
  - a. the PRMA and impact site are located in a similar position on the landscape; coastal prairie with an elevation of approximately 11 feet;
  - b. both sites are largely underlain by Aris soils;
  - c. both sites are located in historic rice fields; and
  - d. both sites generally slope to Sabine Lake; and
7. Similar to a mitigation bank, a 1.5 multiplier would be applied to impacts in the adjacent watershed, providing for a larger mitigation footprint.

The restoration activities at the PRMA are consistent with the watershed rule for the following reasons: the PRMA ultimately drains a shorter distance to the impacted watershed than the impact site, the PRMA contributes to the goals of an established watershed plan that benefits the impacted watershed, and the PRMA and impact sites are situated in a similar ecological position on the landscape.

The nature and location of the PRMA within the landscape provides a high degree of confidence for successful restoration. The PRMA is highly suitable and restorable as functional PEM habitat. The sustainable hydrology of the restored PEM will be driven by rainfall, overbank flooding, and localized watershed runoff (re-established sheet flow from the north). Therefore, hydrologic rehabilitation and re-establishment will utilize natural processes (passive water flow) and will not rely on active water management (i.e., pumping, diversion, impoundment or removal of water through artificial means from a river, stream, or reservoir).

#### **4.0 Site Protection Instrument**

Ironwood Holdings, LLC (Landowner) will place a perpetual conservation easement covering the PRMA to a Conservation Easement Holder (Holder) in accordance with Chapter 183, Subchapter A of the Texas Natural Resources Code. Pursuant to 33 CFR § 332.7(a)(5), the Landowner, acting through the Permittee, will seek USACE Galveston District (CESWG) approval of the conservation easement instrument either in advance of or concurrently with the

commencement of the permitted activity. Upon Permit approval, the Landowner will record the conservation easement in the real property records of Orange County.

As contemplated in 33 CFR § 332.7(a)(1), the conservation easement instrument will establish the right of the Holder to enforce site protections and provide the resources necessary to monitor and enforce these site protections to the extent practicable. In addition, pursuant to 33 CFR § 332.7(a)(2), to the extent appropriate and practicable, the conservation easement instrument will prohibit incompatible uses that might otherwise jeopardize the objectives of the compensatory mitigation project. Furthermore, in accordance with 33 CFR § 332.7(a)(3), the conservation easement instrument will contain a provision requiring 60-day advance notification to the CESWG district engineer before any action is taken to void or modify the easement, including the transfer of title to another party.

Texas Land Conservancy has been identified as the Holder for the conservation easement (Attachment C). Texas Land Conservancy is a non-profit conservation organization that is accredited by the National Land Trust Alliance and is a member of the Texas Land Trust Council. Texas Land Conservancy will conduct annual inspections to verify that there are no activities occurring on the PRMA which are inconsistent with the purpose of preserving the conservation values of the restored area.

After recordation in the real property records of Orange County, a copy of the recorded conservation easement, clearly showing the book, page, and date of filing, will be provided to the CESWG. In addition to the regular reporting, compliance with the terms and conditions of the easement will be verified by the Holder annually by field monitoring and reporting. Upon execution of the conservation easement previously described, the Holder will hold and enforce the conservation easement placed on the PRMA, protecting the site in perpetuity as a PEM wetland conservation site. The Permittee will also be responsible for protecting lands contained in the PRMA in perpetuity in accordance with the terms of the conservation easement and PRMP, unless the lands are transferred or sold to a state or federal resource agency or non-profit conservation organization pursuant to 33 CFR § 332.7(d)(1).

## **5.0 Mitigation Area Baseline Information**

The PRMA currently consists of agricultural land use, primarily cattle grazing. Following the guidelines of the U. S. Army Corps of Engineers 1987 Wetland Delineation Manual (USACE 1987) and U.S. Army Corps of Engineers Regional Supplement for the Atlantic and Gulf Coastal Plain (AGCP Regional Supplement; USACE 2010), wetland delineation data was collected from the entire tract. The delineation identified approximately 9.3 acres of potentially jurisdictional wetlands. The wetland delineation encompassing the 16.2-acre PRMA is included as Attachment D. The wetland restoration portion of the PRMA is situated in an area identified as wetland with positive wetland indicators for all three criteria, except in the re-establishment areas which have been altered through agricultural activities such as, relict rice field berms, and spoil from drainage ditches.

## **5.1 Land Use**

### **5.1.1 Historical Land Use**

The historical sources of surface hydrology within the PRMA were most likely precipitation, sheet runoff, minor stream flooding, microrelief ponding, and seasonally perched water tables, which have sustained a predominance of hydric soils (NRCS 2019). Based on aerial imagery, it appears that the PRMA had been rice fields from the 1940's to 1995 (Attachment E). From 1995 to present day, the land use was transitioned from rice farming to cattle grazing (Attachment E).

### **5.1.2 Current Land Use**

The majority of the land in the vicinity of the PRMA is used for agricultural production (e.g., livestock or commodity crops, etc.). The PRMA is currently being grazed and have been colonized with pioneer herbaceous species (feral pasture). Additionally, the overgrazing has virtually eliminated the vertical structure of the grass species and reduced ground cover, exposing soil at the surface. Since the cessation of rice farming, drainage improvements, such as drainage laterals, have been installed to move water into Coon Bayou or agricultural ditches that drain to Coon Bayou.

## **5.2 Soils**

The Natural Resources Conservation Service (NRCS) mapped two soil types within the PRMA boundaries, Aris-Spindletop complex, 0 to 1 percent slopes and Anahuac-Aris complex, 0 to 1 percent slopes, rarely flooded (Attachment A, Figure 2). Aris soil series comprises 60% and 30% of the two soil complexes, respectively. Aris soils are located primarily on flats with an ecological site description of Lowland. Aris is considered a hydric soil by the NRCS. Spindletop soil series comprises 35% of the Aris-Spindletop complex and is also located on flats with an ecological site description of Loamy Prairie. Spindletop is considered a non-hydric soil by the NRCS. Anahuac soil series comprises 60% of the Anahuac-Aris complex and is also located on point bars with an ecological site description of Loamy Prairie. Anahuac is considered a non-hydric soil by the NRCS. Depleted Matrix (F3) was the dominate hydric soil indicator observed across the PRMA during the wetland delineation. Generally, the silty clay soils that underlain the PRMA are dense and allow for moderate groundwater flow.

## **5.3 Hydrology**

Within the PRMA, the slight downward sloping topography ( $\leq 1\%$  slope) and moderately drained soils cause runoff to be slow to moderate, flowing from northeast to southwest.

A large portion (9.3 acres) of the PRMA remain saturated for periods sufficient to support wetland hydrology. The two most common primary wetland hydrology indicators observed were oxidized rhizospheres (C3) and saturation (A3). The two most dominant secondary wetland hydrology indicators observed were crayfish burrows (C8) and Geomorphic Position (D2) [Attachment D].

A naturalized drainage ditch flows just north of the PRMA boundary carries stormwater from the

site to Coon Bayou (Attachment A, Figures 2 and 4). Currently, a berm along the north boundary of the PRMA separate the wetland areas from the ditch. Precipitation runoff is collected in the existing herbaceous wetlands, which will hold surface water until it slowly percolates downward. Numerous relict agricultural berms restrict natural sheet flow across the site (Attachment A, Figure 4).

## 5.4 Vegetation

The PRMA consists primarily of open habitat that has been grazed with Chinese tallow shrub encroachment along with other woody species on the relict rice berms. The site remained primarily open with agricultural production from the 1940's to 2004. After 2004 woody encroachment invaded the site, particularly Chinese tallow.

The herbaceous wetland portions of the PRMA are dominated by the following species: sand spikerush (*Eleocharis montevidensis*), small spikerush (*Eleocharis minima*), seedbox (*Ludwigia palustris*), Cherokee sedge (*Carex cherokeensis*), and sawtooth blackberry (*Rubus argutus*). Chinese tallow seedlings and saplings are scattered throughout the PEM rehabilitation areas.

The palustrine shrub scrub (PSS) wetland portions of the PRMA are dominated by Chinese tallow with scattered individual stems of yaupon (*Ilex vomitoria*), wax myrtle (*Morella cerifera*), and redcedar (*Juniperus virginiana*). Common ground cover species include laurel greenbrier (*Smilax laurifolia*), muscadine (*Vitis rotundifolia*), peppervine (*Nekemias arborea*), and sand spikerush.

In the non-wet pasture/shrub vegetation community, Bermudagrass is a dominant or co-dominant species, while other species, such as little bluestem, southern dewberry (*Rubus trivialis*), and smut grass (*Sporobolus indicus*) are present. Common shrubs include yaupon (*Ilex vomitoria*), trifoliolate orange (*Poncirus trifoliata*), and Chinese tallow.

## 6.0 Determination of Compensatory Mitigation Requirement

The Permittee and DLS used the hydrogeomorphic approach to assess the functions of impacted wetlands versus the functions of restored wetlands associated with the Project. Specifically, the SWG Riverine Herbaceous/Shrub iHGM model is used to calculate the number of lost functions at the impact site and the number of functions proposed to be generated at the PRMA. This model uses several variables to assess three main functions that best describe and measure both shrub and herbaceous wetland health in the region:

1. Physical - Temporary Storage and Detention of Surface Water
2. Biological - Maintenance of Plant and Animal Communities
3. Chemical - Removal and Sequestration of Elements and Compounds

Perennial Environmental Services, the Permittee's consultant, provided iHGM summary data for the impact site shown below in Table 2. DLS provided the baseline iHGM data and proposed functional lift for the PRMA. For each impacted wetland and the wetland restoration portion of the PRMA (16.0 acres), the model variables are scored to determine the functional capacity index (FCI) and then multiplied by the acreage to determine functional capacity units (FCU). Each restoration type (rehabilitation and re-establishment) are assessed a baseline iHGM FCI score;

then, the FCI scores are projected (“the lift”) for Year 5 based on the proposed restoration activities. Attachment B provides the iHGM baseline and lift data for each wetland restoration type within the 16.0-acre wetland restoration footprint. Wetland impacts will be offset at a 1:1.5 ratio, since the impacts and proposed PRMA are located in adjacent 8-digit HUC watersheds. Only wetland restoration acreages are included in the iHGM calculations; the buffer and relic pimple mound restoration areas are not included in the iHGM assessment.

**Table 2. PEM Wetland Impacts by Function**

Function	Impact FCUs	Out-of-Watershed Multiplier	Total FCU Compensation Requirement
<b>TSSW (Physical)</b>	3.69	1.5	5.535
<b>MPAC (Biological)</b>	4.06	1.5	6.09
<b>RSEC (Chemical)</b>	2.72	1.5	4.08

Per Table 3 below and consistent with the national “no net loss” policy, the PRMA will provide overall net increase in each wetland function.

**Table 3. Wetland Impacts and Wetland Mitigation Summary by Function**

Impact/Restoration	Acreage	TSSW FCUs	MPAC FCUs	RSEC FCUs
<b>PEM Impacts Summary</b>				
PEM Impacts with 1.5 Multiplier	6.59	5.535	6.09	4.08
<b>PEM Mitigation Summary</b>				
PEM Rehabilitation	9.3	3.051	2.325	2.015
PEM Re-establishment	6.7	3.021	5.025	3.305
<b>Subtotal</b>	<b>16.0</b>	<b>6.071</b>	<b>7.350</b>	<b>5.320</b>
<i><b>Net Gain in Acreage/Function</b></i>	<i><b>9.41</b></i>	<i><b>0.536</b></i>	<i><b>1.26</b></i>	<i><b>1.24</b></i>

The PEM iHGM workbooks include an iHGM summary table (Attachment B, Table 1), and the spreadsheet models for the total PRMA Lift. There are two herbaceous/shrub workbooks (rehabilitation and re-establishment), which include the PRMA baseline (Year 0) and PRMA Year 5 lift.

## 7.0 Mitigation Work Plan

### 7.1 Hydrology Restoration

Prior to the commencement of mitigation work, cattle grazing activities will cease. In the current condition, the majority (65.5%) of the PRMA has self-sustaining wetland hydrology, unless altered by berm construction, as indicated by the data collected from the wetland delineation.

Following the cessation of cattle grazing, the relict agricultural berms that block sheet flow from

northeast to southwest across the tract will be removed (Attachment A, Figures 5 and 6A – 6D). Additionally, the north south drainage ditch will be filled to increase saturation and inundation. Small drainage laterals that are moving water to the onsite drainages will be filled or rendered ineffective; this will help re-establish wetland hydrology to the 6.7 acres of PEM re-establishment (Attachment A, Figures 5 and 6A – 6D). The berm along the east-west drainage ditch to the north will be breached to re-establish a hydrologic connection; a low plug/lip will remain in the breach as to not drain the rehabilitated and re-established wetlands. Additionally, the drainage ditch just south of the PRMA will be filled to further aid in wetland hydrology re-establishment and rehabilitation (Attachment A, Figure 5). After removal of relict berms, the PRMA will be disked multiple times, if needed to 1) reduce surface soil compaction and 2) eliminate competition from pasture grasses. Disking may also only occur in select locations dependent on micro-areas that exhibit high soil compaction. Due to inherent problems of disking during wet periods on wet soils, this work will be planned during dry periods in the late summer and fall.

## **7.2 Restoration of Plant Community**

Based on aerial photography woody encroachment of primarily Chinese tallow occurred in 2004 when cropping ceased. Initial Chinese tallow control will consist of herbicide applications and mechanical control. Once removed, remaining, or germinating Chinese tallow will be spot treated as necessary during the initial, interim, and long-term management periods. If present, larger native oak trees will be avoided during restoration efforts. To supplement the existing herbaceous cover, a seed mixture of native herbaceous species will be purchased from local plant material producers located in southeast Texas or within the Gulf Coastal Plain region. The seed planting mix will consist of commercially available facultative or wetter herbaceous species (e.g., switchgrass [*Panicum virgatum*], gamagrass [*Tripsacum floridanum*], brownseed paspalum [*Paspalum plicatulum*], rattlesnake master [*Eryngium yuccifolium*], slender blazing star [*Liatris acidota*], etc.). Seed broadcasting will occur immediately after cattle removal. In the southeast Texas coastal plain, prescribed fire is a natural tool to control woody encroachment, control nuisance/exotic species, and to maintain a diverse herbaceous-shrub ecosystem. Burning will be conducted to select for fire tolerant native herbaceous species and control woody encroachment of Chinese tallow. Controlled burning will occur during favorable conditions for safety and smoke management (e.g., wind direction, wind speed). The initial burn will be applied when an adequate fuel supply (litter) is available and may occur during any season in Year 0 to Year 3. By Year 5, long-term management will consist of spot-treating with herbicides to control species such as Chinese tallow and prescribed fire on a three to five year schedule to control woody and herbaceous fire-intolerant, invasive species. The Permittee/DLS will select a Certified and Insured Commercial Burn Manager (Burn Manager) licensed by the Texas Department of Agriculture.

## **7.3 Buffer Preservation and Pimple Mound Preservation**

Within the Buffer preservation areas, non-native/invasive species areas will be controlled (hack and squirt method). The relict pimple mounds will be restored to an herbaceous community through the removal of woody vegetation and seeding of native herbaceous species similar to the wetland portions of the site.



## **8.0 Maintenance Plan**

The PRMA will be monitored and maintained by the Permittee. The Permittee will commit to restore the wetland functions and maintain wetland habitats in accordance with the provisions in this PRMP, which includes submitting project plans, annual monitoring reports, and adaptive management contingencies for the PRMA. Upon reaching long-term performance standards, prescribed fire and herbicide spot treatments will continue to be utilized to manage and maintain the site.

## **9.0 Performance Standards**

The following outlines the performance standards for the PRMA with a native, facultative or wetter, PEM community and the control of invasive species within the PRMA. The non-credit generating buffer and pimple restoration areas will only have an invasive species performance standard.

### **9.1 Initial Success Criteria (Year 1)**

#### **9.1.1 Hydrology**

The PRMA ground surface elevations must be conducive to the re-establishment of PEM vegetation and the maintenance of hydric soil characteristics. All alterations of the natural topography that have affected the duration and coverage of surface water will have been removed or otherwise rendered ineffective as discussed in Section 7.1. Hydrology success criteria apply only to the wetland rehabilitation and re-establishment areas.

#### **9.1.2 Vegetation**

By Year 1, vegetative monitoring data will establish the following criteria:

- The PRMA is seeded with appropriate, commercially available, facultative or wetter herbaceous species;
- herbaceous vegetation will exhibit a minimum of 60% absolute cover of facultative or wetter species;
- invasive species cover will represent less than 10% absolute cover; and
- tree strata<sup>5</sup> will represent less than 5% absolute cover of the PEM restoration areas.

### **Buffer Preservation and Pimple Mound Restoration**

Within the buffer and pimple mound restoration areas, non-native/invasive species areas will not exceed 10% cover following Year 1 construction.

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<sup>5</sup> All references to strata are as defined in the AGCP Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coast Plan Region (Version 2.0). USACE 2010.

## **9.2 Interim Success Criteria (Year 3)**

### **9.2.1 Hydrology**

By Year 3 or two years following attainment of the one-year performance criteria, site hydrology for the re-establishment mitigation area will be restored such that the PRMA meets the wetland hydrology criterion as described in the 1987 Manual (USACE 1987) and AGCP Regional Supplement. Re-establishment areas will be reanalyzed in Year 5 to ensure these areas are still meeting wetland hydrology criterion. The rehabilitation area will continue to meet wetland hydrology criterion. Data demonstrating the presence of wetland hydrology will be collected and submitted to the CESWG in the monitoring report.

### **9.2.2 Vegetation**

By Year 3, vegetative monitoring data will establish the following criteria:

- exclusive of invasive species, herbaceous vegetation will exhibit a minimum of 70% absolute cover of facultative or wetter species;
- invasive species will represent less than 5% absolute cover; and
- tree strata will represent less than 5% absolute cover of the PEM restoration areas.

## **Buffer Preservation and Pimple Mound Restoration**

Within the buffer and pimple mound restoration areas, non-native/invasive species areas will not exceed 7% cover following Year 3.

## **9.3 Long-term Success Criteria (Year 5)**

### **9.3.1 Hydrology**

By Year 5 and beyond, four years following successful attainment of the Year 1 performance criteria, the PRMA will meet the wetland criterion for site vegetation, soils and hydrology as described in the 1987 Manual and the AGCP Regional Supplement.

### **9.3.2 Vegetation**

By Year 5, vegetative monitoring data will establish the following criteria:

- exclusive of invasive species, herbaceous plants will exhibit a minimum of 90% absolute cover;
- 60% of restored vegetation will exhibit FACW or obligate wetland plant indicator status;
- invasive species cover will represent less than 5% absolute cover; and
- tree strata will represent less than 4% absolute cover of the PEM restoration areas.

## **Buffer Preservation and Pimple Mound Restoration**

Within the buffer and pimple mound restoration areas, non-native/invasive species areas will not exceed 5% cover following Year 5.

### **10.0 Monitoring and Reporting Protocols**

#### **10.1 Monitoring**

The Permittee agrees to perform all work necessary to monitor the site to demonstrate compliance with the success criteria established in Section 9.0. The Permittee will monitor the site in Year 1, Year 3, and Year 5 during the growing season through achievement of the long-term success criteria using monitoring protocols described in this Section. The Permittee will collect data on the percent cover and type of herbaceous and shrub vegetation to ensure successful establishment of a hydrophytic plant community and collect data on hydrologic conditions as necessary to document evidence of wetland hydrology in accordance with the performance standards listed in Section 9.0. Hydrology will be monitored based on the methods described in the 1987 Manual and 2010 AGCP Regional Supplement. Wetland hydrology conditions will be documented on a monitoring datasheet and presented in the subsequent monitoring report. Documentation will include descriptions of the upper 12 inches of the soil profile sufficient to demonstrate hydric soil properties and the presence of hydric soil indicators.

Immediately after initial construction, baseline plot data will be collected. DLS will use a stratified-random sampling method to establish approximately one, 1/20<sup>th</sup>-acre continuous monitoring plot per 5 acres (4 total), a minimum one within each restoration type (rehabilitation and re-establishment). Thereafter, the plots will be surveyed for 5 years or until the PRMA successfully meets or exceeds established long-term criteria. The location of each monitoring plot will be identified, recorded, and reported by Global Positioning System (GPS) coordinates for each plot center. A map depicting the location of the monitoring stations with a listing of the station coordinates will be provided with the as-built report.

Station sampling will occur following plant material distribution to establish baseline data and then annually through Year 5. If Year 5 monitoring indicates the site is not meeting long-term success criteria, annual monitoring will continue until the Year 5 criteria is met for at least three consecutive years. The survey of the monitoring stations will provide fixed locations to evaluate percent cover of herbaceous and shrub vegetation.

#### **10.2 As-built Report**

The As-built Report will be submitted to the CESWG within 90 days following completion of all the work required to restore the PRMA. In detail, the As-built Report will describe the completed hydrologic work within the re-establishment area and an estimated tally of planted stems by species within the re-establishment area. Species re-establishment (seed distribution) will be reported and include the following information: species list, seed source, existing percent ground cover by species, and total percent ground cover. No significant deviation from the mitigation work plan described in Section 7.0 will occur without prior approval from the CESWG. If

deviation does occur, the As-built Report will include a summary of the CESWG coordination and a description of and reasons for any approved deviation.

### **10.3 Initial and Interim Success Criteria Reporting**

Monitoring reports will be submitted to the CESWG by December 15 of the year performance / success criteria monitoring is required (i.e., as-built report, Year 1, Year 3, and Year 5). Each monitoring report will include data sufficient for comparison to the performance standards. The Permittee should also include a discussion of all activities, which took place at the site since the previous monitoring effort. At a minimum, monitoring reports should include the following listed information.

- 1) Purpose and goals of mitigation site.
- 2) Brief summary of mitigation strategy/actions.
- 3) Date mitigation action commenced
- 4) Dates of site inspections and summary of any issues of note
- 5) Dates and description of maintenance activities
  - a) identify measures to eradicate exotic/invasive species and document results of these efforts
- 6) Summary of observations and measurements
  - a) digital images taken from ground level at the monitoring station to document the overall conditions
  - b) a description of the general condition of the plant community and a discussion of likely causes for deficiency
  - c) a general discussion of hydrologic conditions at the monitoring stations
  - d) a description of wildlife usage at the monitoring stations, including any herbivory problems if applicable
  - e) a description of the generalized degree and distribution of exotic/invasive species
- 7) Assessment of success toward the performance standards or success criteria

### **11.0 Long-term Management Plan**

To ensure the long-term sustainability of the resource, the Permittee will perform maintenance and long-term management of the site. After long-term success of the PRMA has been achieved, these activities will be minimal as the project is designed to be a self-sustaining wetland with management activities limited primarily to items such as inspections, controlling invasive species (e.g., spot herbicide treatments), and boundary maintenance.

DLS will be the Long-term Steward charged with management and maintenance responsibilities once long-term success criteria in Section 9.0 are achieved. If DLS requests the option of appointing a different Long-term Steward in accordance with 33 CFR 332.7(d)(1), the appointment of such an entity must first be approved by the CESWG.

Once the long-term criteria are achieved, the estimated long-term, annual cost to maintain the PRMA is \$1,657.28 per year (Attachment F). To ensure sufficient long-term funding is available for perpetual maintenance and protection of the PRMA, the Permittee will establish a cash escrow “Long-term Land Management and Maintenance” (LTMM) endowment in the amount of \$47,350.86. The National Fish and Wildlife Foundation (NFWF) will manage the LTMM endowment. To structure the LTMM, the mitigation provider will enter an Endowment Agreement with NFWF. Accrued interest of the account shall be used for the administration, operation, maintenance, and/or other purposes that directly benefit the PRMA. The principal shall remain as part of the PRMA’s assets to ensure that sufficient funds are available should perpetual maintenance responsibilities be assumed by a third party.

## **12.0 Adaptive Management Plan**

An adaptive management plan for a compensatory mitigation project is generally described as a management strategy to address unforeseen changes in site conditions or other mitigation components of the mitigation project. Adaptive management plans facilitate the decision-making process for revising mitigation plans and instituting measures to address both foreseeable and unforeseeable circumstances that adversely affect mitigation success. An adaptive management plan, contingencies, and remedial responsibilities will be implemented if the compensatory mitigation project cannot be implemented in accordance with the approved mitigation plan or if monitoring or other information indicates that the compensatory mitigation project is not progressing towards meeting its performance standards as anticipated. If such circumstances arise, the Permittee must notify the CESWG as soon as possible. The notice will include an explanation for the changes or potential deficiency and will outline proposed specific practices and measures that will guide decisions for revising the PRMP if needed.

An adaptive management plan will consist of activities that are not normally performed as general maintenance. As the PRMA matures, the Permittee/DLS will monitor as required to ensure the project is meeting the performance standards. However, as the body of ecological restoration knowledge advances, novel methods may be incorporated to improve the overall project quality. Prior to implementation of a new technique or method, it will first be approved by the CESWG.

If monitoring reveals that initial, interim, or long-term success criteria have not been met or do not continue to be met after initially being satisfied, an adaptive management plan with contingencies and remedial responsibilities will be developed and implemented. In the event of a deficiency such as poor shrub survival, hydrology construction repairs, or invasive species encroachment, the Permittee shall provide a report that includes the implemented adaptive management plan to the CESWG. The report will provide an explanation for the deficiency, outline the implemented adaptive management practices, and provide a monitoring report to determine potential credit release revisions, if necessary.

If success criteria for a given monitoring period are not met, the Permittee will evaluate and implement adaptive management actions such as those outlined below. The listed potential management activities are not fully inclusive of suitable corrective measures to address any identified deficiencies at the site and do not consist of general maintenance activities such as

routine, invasive species control. The potential deficiencies described below are those most likely to occur on projects of this type and scale. Identification of these potential deficiencies and the timely application of adaptive management strategies is the Permittee's effort to remain in compliance with terms set in the PRMP and work plan. The Permittee will provide the CESWG with a report detailing the deficiency, strategy, and implemented techniques.

- Invasive species - If during routine monitoring or general observations, an invasive species such as Chinese tallow is encroaching on an area, the Permittee will implement an adaptive management strategy to remove / control the invasive species.
- Hydrology construction repairs - If during routine monitoring or general observations, wetland re-establishment areas are not meeting hydrology standards on account of erosion issues, the Permittee will take appropriate corrective measures for erosion abatement.

If the CESWG determines that the PRMA is at risk of not achieving the terms and intent of this PRMP, the CESWG will provide written notice to the Permittee that includes a detailed description of the non-compliance determination. The Permittee shall submit a written adaptive management plan to the CESWG for review and approval within forty-five (45) days of receiving written notice of non-compliance. The adaptive management plan shall identify the cause of the non-compliance, the necessary remedial measures, and a timeline for implementing said measures to bring the PRMA into compliance. To the extent practicable, the CESWG shall approve or disapprove the adaptive management plan within forty-five (45) days of receipt, provided sufficient information and acceptable measures are contained in the plan.

### **13.0 Financial Assurances**

The total financial exposure for construction and establishment of the PRMA is \$17,572.40. The construction and establishment financial assurances will be provided by a cash escrow or equivalent mechanism. The construction cost estimate with 5% contingency adjustment at Year 0 is \$9,219.00 (Attachment F). The PEM establishment cost estimate for Year 1 through Year 5 is \$8,353.40. To provide financial assurance protection during construction (Year 0) and establishment (Year 1 through Year 5) and per 33 CFR 332.3(n), DLS, as the Responsible Party shall establish a cash escrow or equivalent mechanism to protect the PRMA's mitigation assets in the event of non-compliance or PRMA failure ensuring that sufficient funds are available to a third party. As interim success and long-term success criteria are met, release milestone monies will be released to the Permittee or its designated agent, per the Establishment Cost Table in Appendix F.

## 14.0 References

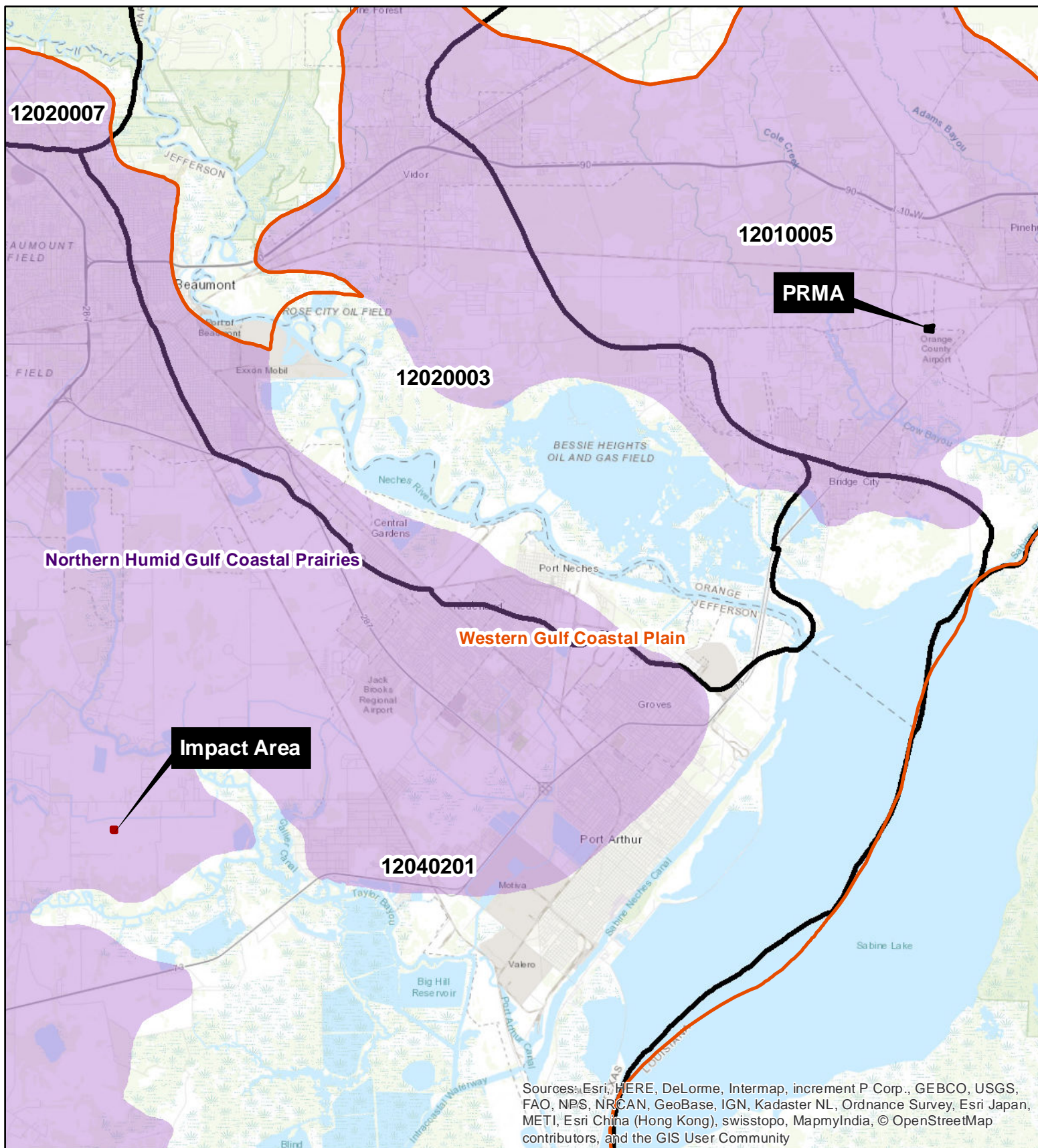
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## Attachment A. Figures

- Figure 1. Vicinity, Watershed, and Ecoregion Map
- Figure 2. USGS Topographic Map with Floodplain and Soils
- Figure 3. Mitigation Features Map
- Figure 4. Preconstruction Hydrology & Plan View
- Figure 5. Post Construction Hydrology & Plan View
- Figure 6A-D. Cross Sections



Garner Junction Project

## VICINITY MAP

TEXAS

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Approved : CB

Date : 9/11/2019

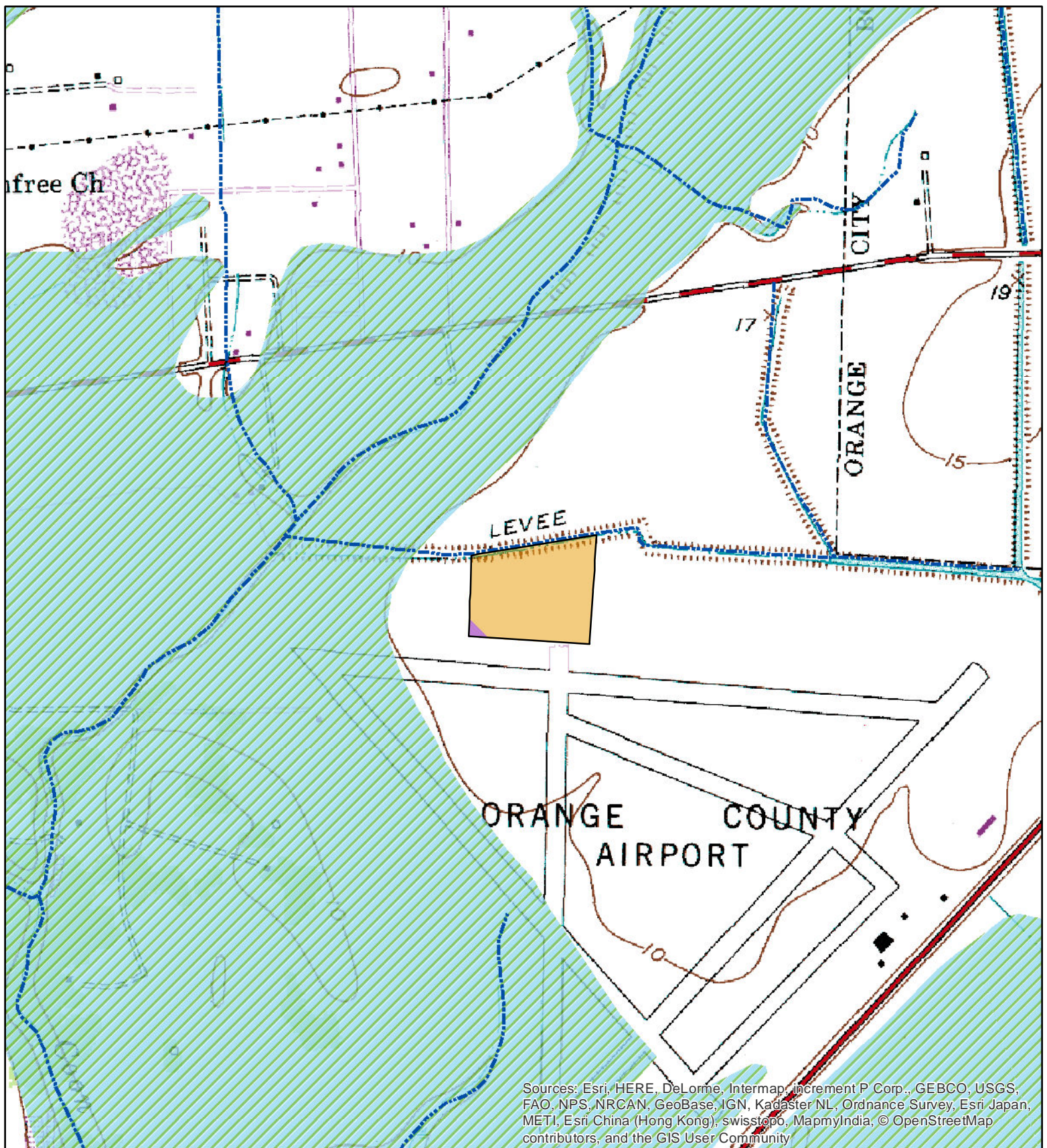
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FIGURE 1

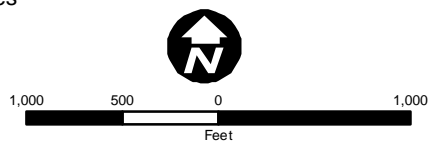






#### Legend

- PRMA (16.2 ac)
- AniA: Anahuac-Aris complex, 0 to 1 percent slopes, rarely flooded
- AspA: Aris-Spindletop complex, 0 to 1 percent slopes
- NHD Flowline
- FEMA 100-year Floodplain



Garner Junction Project

#### USGS TOPOGRAPHIC MAP

Orange County, TX

Created : TSC/ArcView10.4

Approved : CB

Date : 9/11/2019

Map # : F02\_Topo









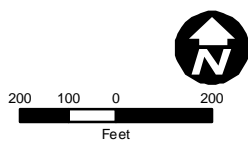
FIGURE 2





#### Legend

-  PRMA (16.2 ac)
-  Rehabilitation (9.3 ac)
-  Re-establishment (6.7 ac)
-  Non-wetland Pimple Mound Restoration (0.1 ac)
-  Buffer (0.1 ac)
-  Reserve



Garner Junction Project

#### MITIGATION FEATURES MAP

Orange County, TX

Created : TSC/ArcView10.4

Approved : CB

Date : 9/10/2019

Map # : F03\_MitigationFeatures

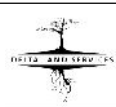
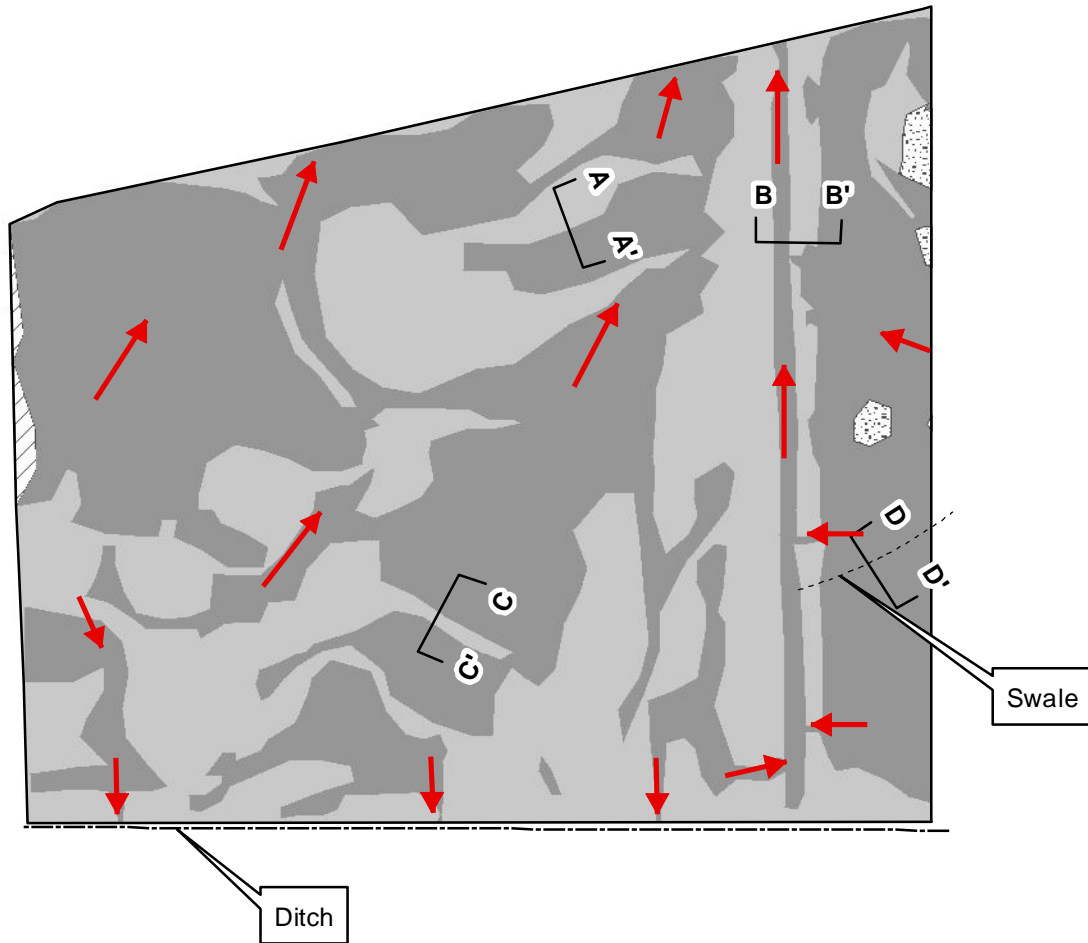
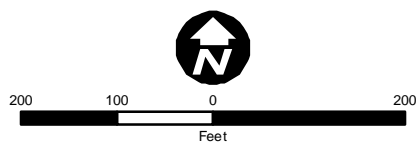


FIGURE 3



#### Legend

- PRMA (16.2 ac)
- Rehabilitation (9.3 ac)
- Re-establishment (6.7 ac)
- Non-wetland Pimple Mound Restoration (0.1 ac)
- Buffer (0.1 ac)



#### Garner Junction Project PRECONSTRUCTION HYDROLOGY & PLAN VIEW

Orange County, TX

Created : TSC/ArcView10.4

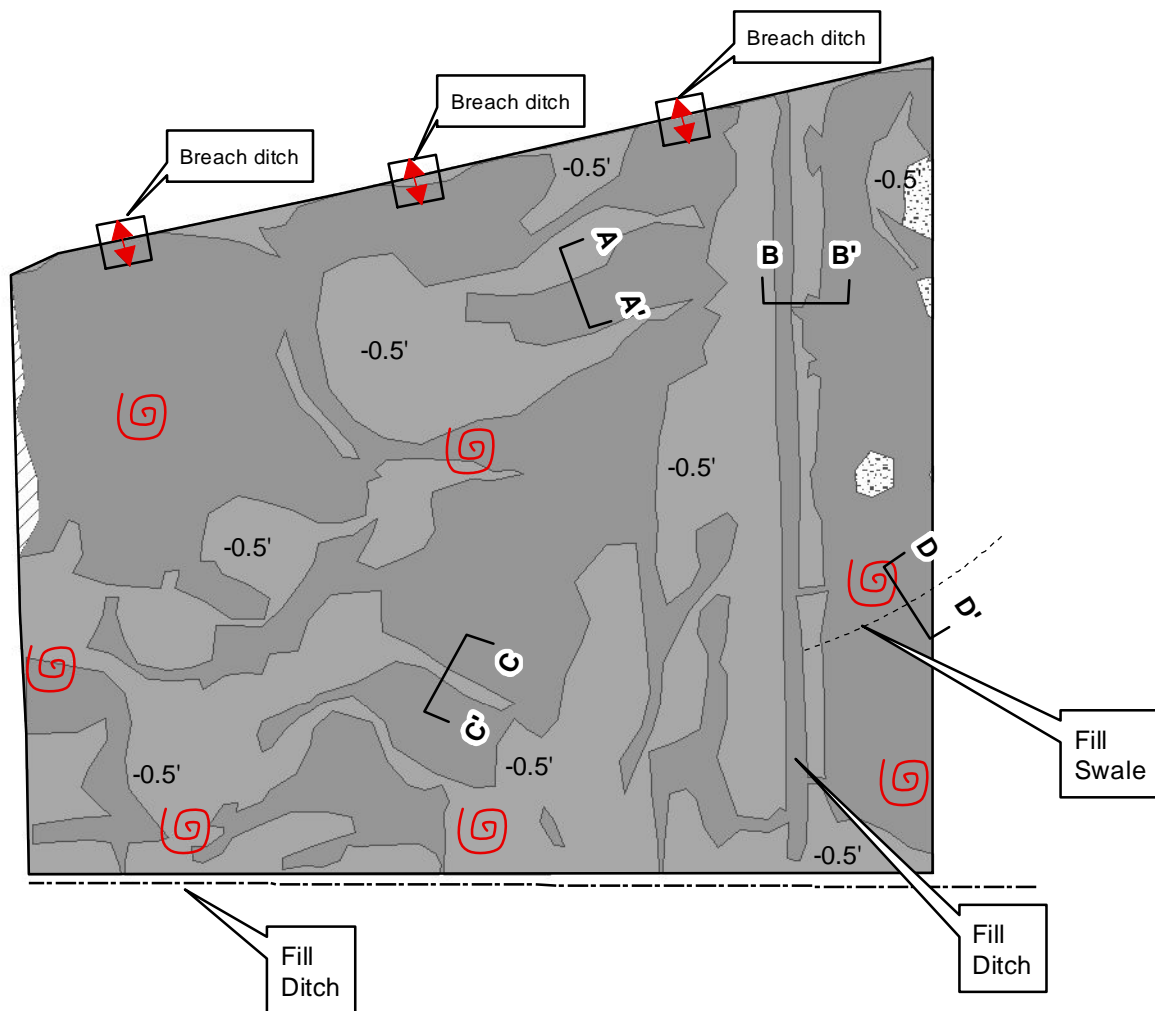
Approved : CB

Date : 9/11/2019

Map # : F04\_PreConstruction



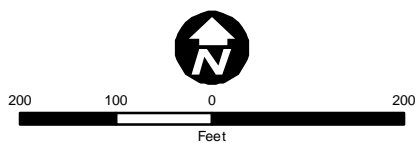
FIGURE 4



-0.5' Reduction in elevation to Re-establishment areas.  
Ditch breaches will reside 0.5' above surrounding elevation.

#### Legend

- PRMA (16.2 ac)
- Rehabilitation (9.3 ac)
- Re-establishment (6.7 ac)
- Non-wetland Pimple Mound Restoration (0.1 ac)
- Buffer (0.1 ac)



#### Garner Junction Project POST CONSTRUCTION HYDROLOGY & PLAN VIEW

Orange County, TX

Created : TSC/ArcView10.4

Approved : CB

Date : 9/11/2019

Map # : F05\_PostConstruction

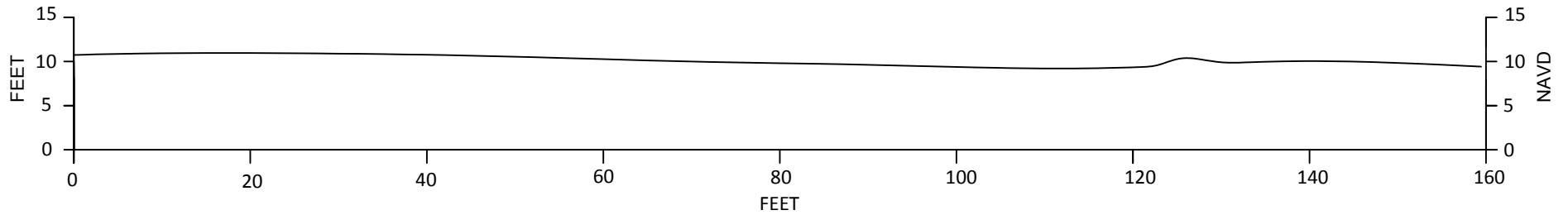


FIGURE 5

A

A'

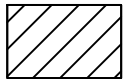
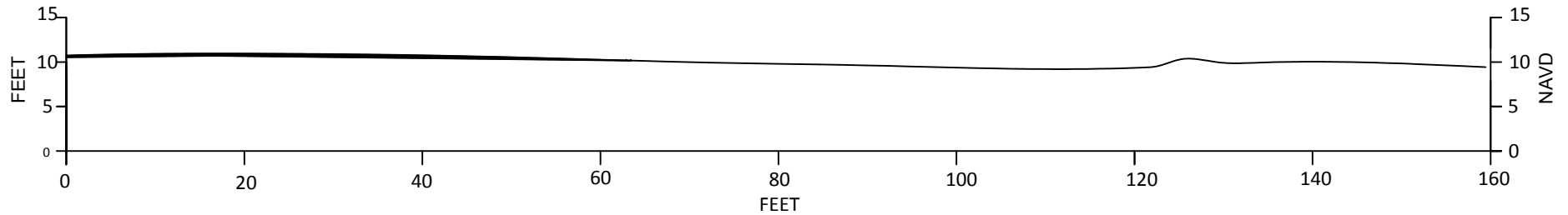
Existing Cross-Section A



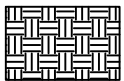
A

A'

Proposed Cross-Section A



Proposed Excavation



Proposed Earthen Fill

Garner Junction Project

CROSS SECTION A-A'

ORANGE COUNTY, TX

Created: TSC/AutoCAD

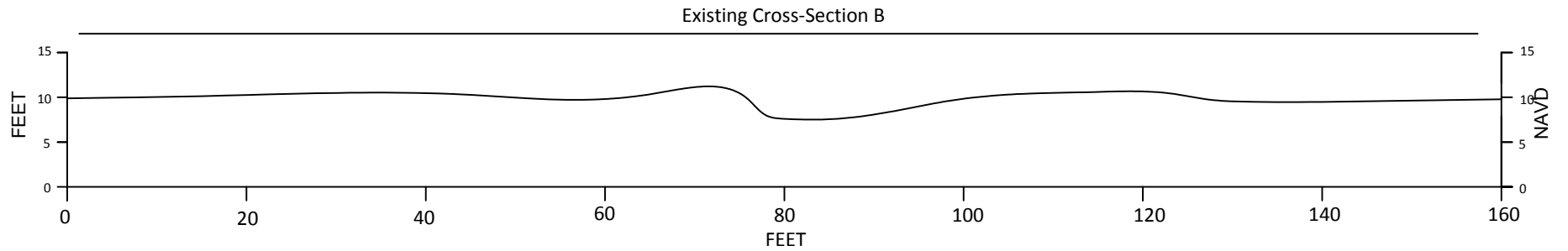
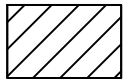
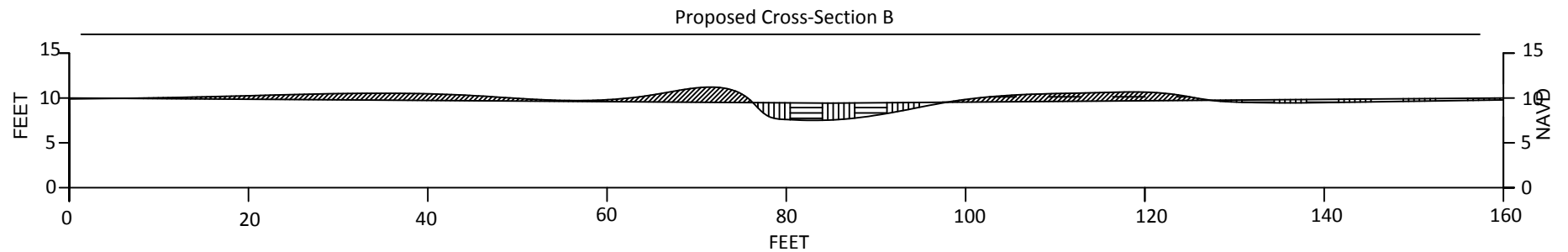
Approved: CB

Date: 08/05/2019

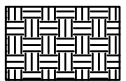
Dwg. No.: MA02\_XSECTIONS\_CHEVRON



Figure 1

**B****B'****B****B'**

Proposed Excavation



Proposed Earthen Fill

**Garner Junction Project****CROSS SECTION B-B'**

ORANGE COUNTY, TX

Created: TSC/AutoCAD

Approved: CB

Date: 08/05/2019

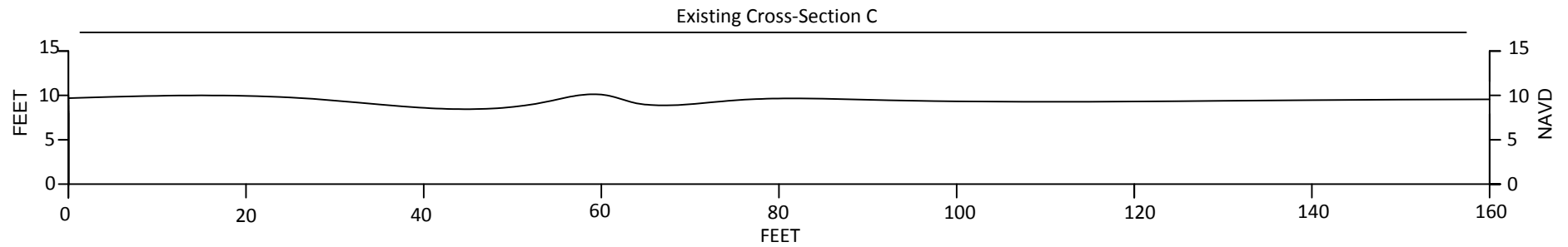
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**Figure 2**



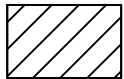
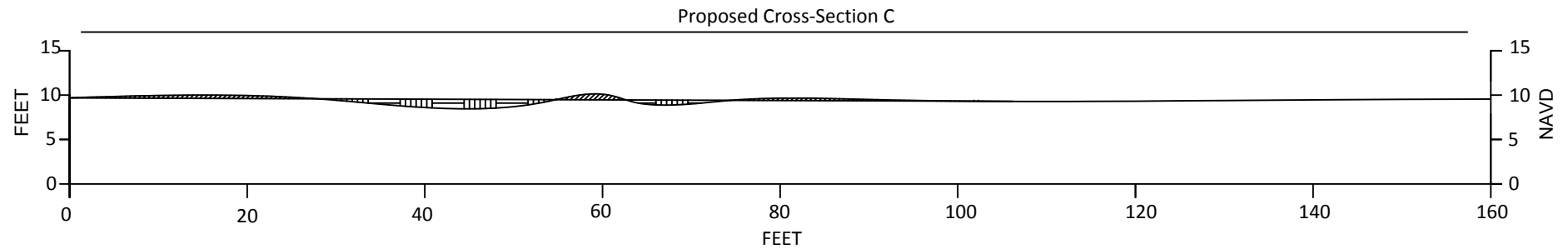
C

C'

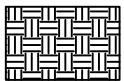


C

C'



Proposed Excavation



Proposed Earthen Fill

Garner Junction Project

CROSS SECTION C-C'

ORANGE COUNTY, TX

Created: TSC/AutoCAD

Approved: CB

Date: 08/05/2019

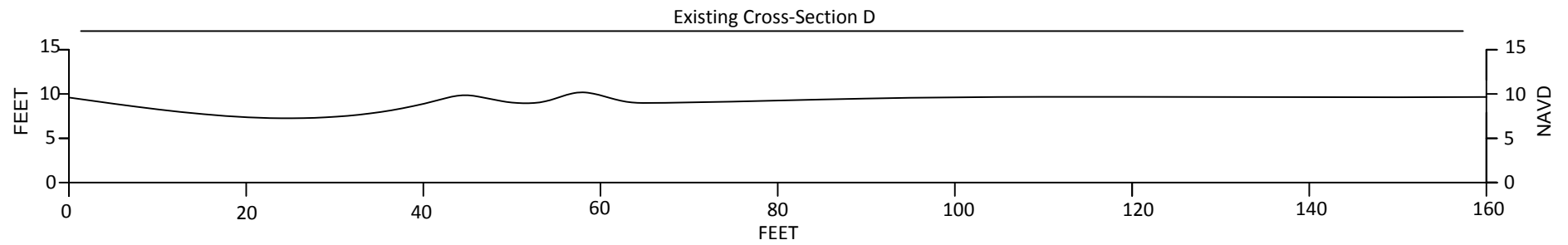
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Figure 3

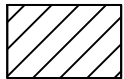
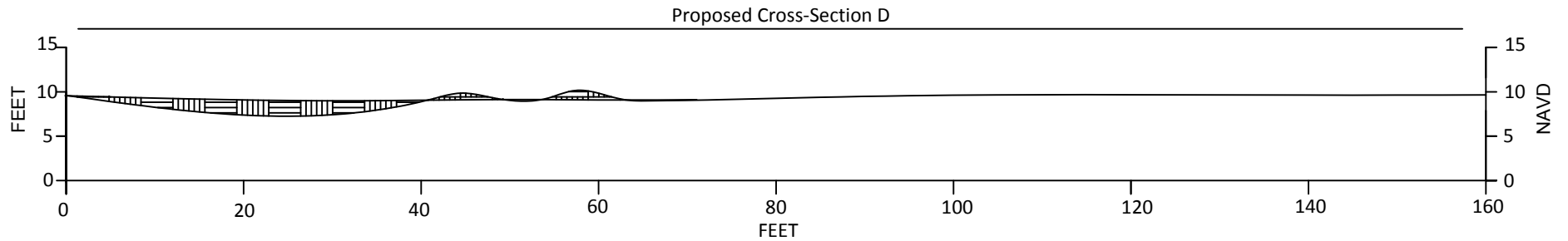
D

D'

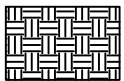


D

D'



Proposed Excavation



Proposed Earthen Fill

**Garner Junction Project**

**CROSS SECTION D-D'**

ORANGE COUNTY, TX

Created: TSC/AutoCAD

Approved: CB

Date: 08/05/2019

Dwg. No.: MA02\_XSECTIONS\_CHEVRON



**Figure 4**

Attachment B. Riverine Herbaceous/Shrub Hydrogeomorphic Interim Model Workbook

Table 1	iHGM Summary Table
Tables 2 - 3	Rehabilitation iHGM Baseline and Year 5 Lift Tables
Tables 4 - 5	Re-establishment iHGM Baseline and Year 5 Lift Tables

## Required Mitigation

**Table 1. Summary of Functional Capacity Unit (FCU) Lift by Year and by Restoration Type for the 16.0-acre PEM Rehabilitation/Re-establishment Area**

PEM/PSS PRM	Year 0 Baseline	Year 5 Lift	Net FCU Lift by Function
<b>9.3 Acres - PEM Rehab</b>			
Physical FCU	2.302	5.353	3.051
Biological FCU	3.875	6.200	2.325
Chemical FCU	3.379	5.394	2.015
<b>6.7 Acres - PEM Re-establishment</b>			
Physical FCU	0.000	3.021	3.021
Biological FCU	0.000	5.025	5.025
Chemical FCU	0.000	3.305	3.305
<b>Totals</b>			
<b>Physical FCU</b>			<b>6.071</b>
<b>Biological FCU</b>			<b>7.350</b>
<b>Chemical FCU</b>			<b>5.320</b>

**Table 2. Rehabilitation Year 0  
Riverine Herbaceous-Shrub iHGM**

<b>WAA ID: 1</b>		
<b>Acreage</b>	<b>9.3</b>	
<b>Variable</b>	<b>Index Value</b>	
Vdur: Duration of flooding	0.10	
Vfreq: Frequency of flooding	0.25	
Vtopo: Topography	0.40	
Vwood: Woody vegetation	0.25	
Vmid: Midstory (Shrub/sapling/woody vines)	0.25	
Vherb: Herbaceous layer	0.50	
Vconnect: Connectivity to other habitat types	0.50	
Vdetritus: Detritus	0.50	
Vredox: Redoximorphic process	1.00	
Vsorpt: Sorptive Soil Properties	1.00	

Physical FCI: Temporary Storage & Detention of Storage Water	0.248	
Biological FCI: Maintain Plant and Animal Community	0.417	
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.363	
Physical FCU: Temporary Storage & Detention of Storage Water	2.302	
Biological FCU: Maintain Plant and Animal Community	3.875	
Chemical FCU: Removal & Sequestration of Elements & Compounds	3.379	

\*Note: Chinese tallow was not included for woody vegetation since it is an invasive

**Table 3. Rehabilitation Year 5  
Riverine Herbaceous-Shrub iHGM**

<b>WAA ID: 1</b>		
<b>Acreage</b>	<b>9.30</b>	
<b>Variable</b>	<b>Index Value</b>	
Vdur: Duration of flooding	0.50	
Vfreq: Frequency of flooding	0.50	
Vtopo: Topography	0.70	
Vwood: Woody vegetation	0.25	
Vmid: Midstory (Shrub/sapling/woody vines)	0.25	
Vherb: Herbaceous layer	1.00	
Vconnect: Connectivity to other habitat types	0.75	
Vdetritus: Detritus	1.00	
Vredox: Redoximorphic process	1.00	
Vsorpt: Sorptive Soil Properties	1.00	

Physical FCI: Temporary Storage & Detention of Storage Water	0.576	
Biological FCI: Maintain Plant and Animal Community	0.667	
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.580	
Physical FCU: Temporary Storage & Detention of Storage Water	5.353	
Biological FCU: Maintain Plant and Animal Community	6.200	
Chemical FCU: Removal & Sequestration of Elements & Compounds	5.394	

**FCI Lift Year 5 - Year 0**

0.328

0.250

0.217

**Table 4. Re-establishment Year 0  
Riverine Herbaceous-Shrub iHGM**

<b>WAA ID: 2</b>		
<b>Acreage</b>	<b>6.7</b>	
<b>Variable</b>	<b>Index Value</b>	
Vdur: Duration of flooding	0.00	
Vfreq: Frequency of flooding	0.00	
Vtopo: Topography	0.00	
Vwood: Woody vegetation	0.00	
Vmid: Midstory (Shrub/sapling/woody vines)	0.00	
Vherb: Herbaceous layer	0.00	
Vconnect: Connectivity to other habitat types	0.00	
Vdetritus: Detritus	0.00	
Vredox: Redoximorphic process	0.00	
Vsorpt: Sorptive Soil Properties	0.00	
Physical FCI: Temporary Storage & Detention of Storage Water	0.000	
Biological FCI: Maintain Plant and Animal Community	0.000	
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.000	
Physical FCU: Temporary Storage & Detention of Storage Water	0.000	
Biological FCU: Maintain Plant and Animal Community	0.000	
Chemical FCU: Removal & Sequestration of Elements & Compounds	0.000	

**Table 5. Re-establishment Year 5  
Riverine Herbaceous-Shrub iHGM**

<b>WAA ID: 2</b>		
<b>Acreage</b>	<b>6.7</b>	
<b>Variable</b>	<b>Index Value</b>	
Vdur: Duration of flooding	0.25	
Vfreq: Frequency of flooding	0.50	
Vtopo: Topography	0.40	
Vwood: Woody vegetation	0.25	
Vmid: Midstory (Shrub/sapling/woody vines)	0.50	
Vherb: Herbaceous layer	1.00	
Vconnect: Connectivity to other habitat types	0.75	
Vdetritus: Detritus	0.50	
Vredox: Redoximorphic process	1.00	
Vsorpt: Sorptive Soil Properties	1.00	

Physical FCI: Temporary Storage & Detention of Storage Water	0.451	
Biological FCI: Maintain Plant and Animal Community	0.750	
Chemical FCI: Removal & Sequestration of Elements & Compounds	0.493	
Physical FCU: Temporary Storage & Detention of Storage Water	3.021	
Biological FCU: Maintain Plant and Animal Community	5.025	
Chemical FCU: Removal & Sequestration of Elements & Compounds	3.305	

**FCI Lift Year 5 - Year 0**

0.451

0.750

0.493



## Attachment C. Letter of Intent



# TEXAS LAND CONSERVANCY

*Protecting the Nature of Texas.*

Chad Butler  
Delta Land Services, LLC  
Texas Regulatory Manager  
6750 West Loop South, Suite 780  
Bellaire, TX 77401

August 14, 2019

Re: Letter of Intent for Holding a Conservation Easement

Dear Mr. Butler,

Thank you for the opportunity to collaborate on being a partner on the West Orange PEM Mitigation Area for offsetting impacts to a Chevron Pipeline Project. This proposed project is an excellent opportunity to establish a conservation area that will benefit future generations of Texans. Please accept this non-binding Letter of Intent by the Texas Land Conservancy ("TLC") to work toward placing a conservation easement on this property, which consists of 16.2 acres of land in Orange County, Texas (the "Property"), subject to the approval of TLC's Board of Directors. The easement(s) will likely

The required due diligence for this project would be as follows:

1. **Baseline Documentation Report:** Grantor to obtain a qualified baseline documentation report at its cost.
2. **Survey:** Grantor to obtain a current survey at its cost, which will be used to determine the total acreage and legal description of the Property.
3. **Title Policy:** Grantor to pay for the Title Policy premium.
4. **Title Review & Property Inspection:** Adequate time shall be permitted for title review and inspection of the property.
5. **Approval:** The completion of the conservation easement is subject to approval of TLC's Board of Directors.

This is a Letter of Intent and is not a binding agreement. This Letter of Intent represents the good faith intention of TLC to work towards the execution of a perpetual conservation easement in conjunction with the creation of the West Orange Mitigation Area.

Thank you for your consideration, and please do not hesitate to contact me if you have any questions.

Sincerely,

Mark Steinbach  
Executive Director