# APPENDIX G: WETLANDS/WATERS OF THE US

**G1: Wetland Delineation** 

G2: Wetland Value Assessment Methodology and Assumptions

# **G1: Wetland Delineation**

**Auxiliary Areas** 

# WATERS OF THE UNITED STATES DELINEATION REPORT

# Mid Barataria Sediment Diversion Auxiliary Areas Plaquemines Parish, LA



Prepared for

The Coastal Protection and Restoration Authority (CPRA)

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- Appendix B Photographic Documentation

### 1.0 Introduction

The following report summarizes the waters of the United States (U.S.) determination and delineation conducted on the approximately 606-acre Mid Barataria Sediment Diversion Auxiliary Area wetland delineation project located in Plaquemines Parish, Louisiana. The overall project site is bordered to the east by the Mississippi River; to the west by a protection levee, open water, and marsh; and bordered to the north and south by undeveloped property (Figure 1). The project area encompasses the 8 units and corresponding acreage listed below (Figure 2):

- 1. Pump station70 acres
- 2. Siphon north 116 acres
- 3. Siphon south 100 acres
- 4. Hwy 23 north43 acres
- 5. Hwy 23 south 65 acres
- 6. Rail north 37 acres
- 7. Rail south24 acres
- 8. Supplemental (2019) 151 acres

"Jurisdictional waters" shall mean wetlands, ponds, streams, and other waterways that are regulated by federal, state, or regional agencies. Wetlands with "jurisdictional status" are waters of the U.S. as defined by Section 404 of the Clean Water Act (CWA). These types of wetlands are regulated by the United States Army Corps of Engineers (USACE) and the United States Environmental Protection Agency (EPA). Several classes of water bodies are subject to federal jurisdiction under the CWA, including traditional navigable waters (TNWs); non-navigable tributaries of TNWs that are relatively permanent waters (RPWs); and wetlands that directly abut RPWs (USACE 2007).

The regulations specify that tributaries to waters of the U.S. should be considered waters of the U.S. In the absence of adjacent wetlands, lateral jurisdiction over non-tidal waters extends to the ordinary high water mark. The definition of the ordinary high water mark is "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." (Federal Register 2000)

In Louisiana, there is no state or regional agency that interprets jurisdictional waters differently from the federal agency for the types of activities contemplated herein; therefore, for purposes of this investigation, jurisdictional waters are those regulated by the USACE pursuant to Section 404 of the Clean Water Act.

## 2.0 Methods

### 2.1 Overview

The waters of the U.S. determination and delineation followed the on-site routine field procedures as outlined in the *1987 Corps of Engineers Wetlands Delineation Manual and subsequent Regulatory Guidance Letters (RGL)* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region Version 2.0* (USACE 2010). The *Wetlands Delineation Manual* outlines three criteria for delineating a feature as a wetland: hydrology, hydric soils, and hydrophytic vegetation. A feature must satisfy all three criteria to be classified as a wetland. This investigation involved collection and review of pertinent background information, followed by an on-site survey and delineation to meet the objectives of the study.

This on-site field investigation was conducted to determine the presence of jurisdictional waters of the U.S. that occur within the project area. Tetra Tech wetland scientists reviewed the U.S. Geological Survey (USGS) DOQQ maps (USGS 2015) and the Plaquemines Parish Soil Survey (NRCS 2017) prior to the initiation of fieldwork to identify the potential extent of jurisdictional waters of the U.S. located within the project area. USACE jurisdiction was evaluated using the methodologies prescribed in the USACE *Jurisdictional Determination Form Instruction Guidebook*, including the December 2, 2008, Corps/EPA revised Rapanos guidance (USACE and USEPA 2008).

A field investigation was conducted by Tetra Tech wetland scientists between February 27, 2018 to March 8, 2018, and September 20, 2019 to verify the extent of jurisdictional waters of the U.S. located within the project area. A total of 27 Wetland Delineation Data Forms – Atlantic and Gulf Coastal Plain Region Version 2.0, as approved by Headquarters, USACE 11/10, were completed within the project area (Appendix A). These data forms contain information regarding the presence, or absence, of hydric soils, hydrophytic vegetation, and wetland hydrology. Photographs were taken throughout the site to document dominant vegetative communities and general site conditions. Wetland boundaries were recorded utilizing a handheld global positioning system. A georeferenced wetland delineation boundary suitable for overlay onto project maps and aerial photographs was created using ArcMap 10.4 (Environmental Systems Research Institute, Inc., Redlands, CA) mapping software (Figures 3-12). Photographs taken within the project area during the field efforts are presented in Appendix B. Specific methods for characterizing and evaluating the soils, vegetation, and hydrologic indicators within the plant communities, are described below.

### 2.2 Vegetation

The USACE defines hydrophytic vegetation as the community of macrophytes that occurs in areas where inundation or soil saturation is either permanent or of sufficient frequency and duration to exert a controlling influence on the plant species present (USACE 2014). Vegetation strata within a plot are sampled separately when evaluating indicators of hydrophytic vegetation. Plant species in the Atlantic and Gulf Coastal Plain Region Version 2.0 are recorded as one of the four following strata:

1. Tree Stratum – Woody plants, excluding woody vines, 3 in (7.6 cm) or larger diameter at breast height (DBH), regardless of height.

2. Sapling/Shrub Stratum – Woody plants, excluding woody vines, less than 3 in (7.6 cm) DBH and greater than 3.28 ft. (1 meter) tall.

3. Herb Stratum - All herbaceous (non-woody) plants, regardless of size, and woody species less than approximately 3.28 ft. (1 meter) tall.

4. Woody Vines – All woody vines greater than 3.28 ft. (1 meter) tall. (USACE 2010).

Dominant vegetation was sampled by visual estimation or percent cover of vegetation layers to determine the presence of hydrophytic vegetation at each sample location. The dominance test is the basic hydrophytic vegetation indicator to be applied to wetlands in the coastal plain. Plant communities meet hydrophytic vegetation criteria if greater than 50 percent of the dominant species from all strata are Obligate Wetland, Facultative Wetland, or Facultative as designated in USACE National Wetland Plant List – 2014 State Lists (USACE 2014). Wetland indicator status is assigned to plant species as follows:

- OBL: Occur almost always in wetlands (estimated probability >99%).
- FACW: Usually occur in wetlands (estimated probability 67% 99%).
- FAC: Equally likely to occur in wetlands or non-wetlands (estimated probability 34% 66%).
- FACU: Usually occur in uplands (estimated probability 67% 99%).
- UPL: Occur almost always in uplands (estimated probability >99%).

### 2.3 Soils

Hydric soils are formed from being saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation as defined by the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS 1998). Soils data are gathered from digging a hole to a depth of approximately 16-inches, or depth to refusal at each sample location, and then examining the extracted soil profile to determine if positive hydric soils indicators were present. Information recorded on the wetland delineation data forms included soil colors (hue, value, and chroma as per the 2000 revised edition of the Munsell Color Chart), size, abundance, and depth of mottles, as well as the soil texture. Hydric soil criteria were determined when soil samples indicated a matrix chroma of two or less in mottled soils or a matrix chroma of one or less in unmottled soils. Soil texture was determined using the "texture by feel" analysis.

# 2.4 Hydrology

Wetland hydrology is determined by the sum total of wetness characteristics in the area that are inundated or have saturated soils for a sufficient duration to support hydrophytic vegetation (USACE 1987). Each sample plot was examined for wetland hydrology indicators, and indicators were recorded if present in the sample plot. A sample plot will meet wetland hydrology criteria if one primary indicator is present, or if the plot shows the presence of two or more secondary hydrology indicators. Primary wetland hydrology indicators include but are not limited to: surface water, high water table, saturation, water marks, sediment deposits, and drift deposits. Examples of secondary indicators include but are not limited to: surfaces, drainage patterns, FAC-Neutral Test.

## 3.0 Delineation Results

The approximately 606-acre Mid Barataria Sediment Diversion Auxiliary Area wetland delineation project located in Plaquemines Parish, Louisiana is described in the following sections in terms of soil, vegetation, and hydrologic characteristics.

### 3.1 Site Description

The project area is comprised of approximately 606 acres of undeveloped property. The portions of the project site located west of LA Highway 23 primarily consist of pasture/grazing land. The remaining project area located east of LA Highway 23 is comprised of dense wooded areas with intermittent clearings from local outdoor activities. The majority of the surveyed area is located within fast lands of the USACE – New Orleans Division Polder Oakville to St. Jude, which is bounded by the New Orleans to Venice/Non-Federal Levee and the Mississippi River Levee. The polder is drained by the Wilkinson Pump station, which has a receiving canal that borders the back levee. The overall project site is bordered to the east by the Mississippi River; to the west by a protection levee, open water, and marsh; and bordered to the north and south by undeveloped property (Figure 1). The project area encompasses the 8 units and corresponding acreage listed below (Figure 2):

- 1. Pump station 70 acres
- 2. Siphon north 116 acres
- 3. Siphon south 100 acres
- 4. Hwy 23 north 43 acres
- 5. Hwy 23 south 65 acres
- 6. Rail north 37 acres
- 7. Rail south 24 acres
- 8. Supplemental (2019) 151 acres

### 3.2 Vegetation

The vegetation found in the project area consists mainly of various tree, shrub, and vine species located east of Highway 23 and primarily various herbaceous species located west of Highway 23. Dominant and common species found in the project area includes:

Quercus virginiana, Quercus nigra, Acer negundo, Triadica sebifera, Liquidambar styraciflua, Sabal minor, Morella cerifera, Carya aquatica, Acer rubrum, Smilax laurifolia, Vitis rotundifolia, Toxicodendron radicans, Toxicodendron pubescens, Ampelopsis arborea, Baccharis halimifolia, Rubus trivialis, Rubus sp., Lonicera japonica, Salix nigra, Celtis laevigata, Callicarpa americana, Ligustrum sinense, Juncus effusus, Eleocharis palustris, Eleocharis montevidensis, Eleocharis sp., Spartina patens, Trifolium repens, Cynodon dactylon, Polygonum pensylvanicum, Solidago sempervirens, Ambrosia trifida, Helenium autumnale, Vigna luteola, Hydrocotyle prolifera, Andropogon glomeratus, Allium vineale, Dryopteris ludoviciana, Carex sp., Cirsium vulgare, and Ampelopsis arborea.

### 3.3 Soils

According to the NRCS Web Soil Survey (NRCS 2018a, 2019) and Plaquemines Parish Soil Survey (NRCS 2018a), soil occurring within the project area include: Cancienne silt loam, 0 to 1 percent slopes; Cancienne silty clay loam, 0 to 1 percent slopes; Carville, Cancienne, and Schriever soils, frequently flooded; Clovelly muck, 0 to 0.2 percent slopes, very frequently flooded; Harahan clay, 0 to 1 percent slopes; Lafitte-Clovelly association, 0 to 0.2 percent slopes, very frequently flooded; Lafitte muck, 0 to 0.2 percent slopes, very frequently flooded; Westwego clay, 0 to 0.5 percent slopes (Figures 13-19). All soils occurring within the project area are listed as hydric soils (NRCS 2018b). The hydric soil indicators found during the investigation were depleted matrix. A brief description of each series is below:

#### Cancienne series

The Cancienne series consists of very deep, level to gently undulating, somewhat poorly drained mineral soils that are moderately slowly permeable. These soils formed in loamy and clayey alluvium. They are on high and intermediate positions on natural levees and deltaic fans of the Mississippi River and its distributaries. Slopes range from 0 to 3 percent. Cancienne soils are on natural levee positions on the alluvial plain of the lower Mississippi River and its distributaries.

#### Carville

The Carville series consists of very deep, somewhat poorly drained, moderately permeable soils that formed in recent loamy alluvium. These soils are on nearly level to very gently sloping natural levee positions on flood plains, mainly along the Mississippi River and its distributaries. Slopes range from 0 to 2 percent.

### Clovelly series

The Clovelly series consists of very deep, very poorly drained, very slowly permeable soils. These soils formed in moderately thick accumulations of herbaceous organic material overlying very fluid clayey alluvial sediments. These soils are on broad coastal marshes that are nearly continuously flooded with brackish water. Slope ranges from 0 to 0.2 percent. Clovelly soils are on intermediate or brackish marshes that border saline bays, saline marshes, or open Gulf waters. They flood frequently or very frequently with intermediate or brackish water during high tides.

### Harahan series

The Harahan series consist of very deep, poorly drained, very slowly permeable soils. They formed in moderately thick firm clayey alluvium overlying fluid clayey sediments. These soils are on broad backswamp positions on the lower Mississippi River flood plain. Slopes range from 0 to 1 percent. These soils are protected from flooding by levees, and are artificially drained by pumps. Harahan soils are in artificially drained backswamp positions on the lower Mississippi River and its distributaries. They formed from fluid, alluvial clays that were artificially altered by man to become firm and form a solum in the upper 20 to 40 inches. Elevations are about sea level to 1 or 2 feet below sea level.

### Lafitte series

The Lafitte series consists of very deep, very poorly drained, moderately rapidly permeable organic soils in the Gulf Coast Marsh (MLRA 151) and the Eastern Gulf Coast Flatwoods (MLRA 152A)

Major Land Resource Areas. They formed in herbaceous plant remains over mineral sediments in intermediate and brackish marshes in the extreme lower Mississippi River Delta and coastal areas. Lafitte soils are in large areas of intermediate to brackish marshes in the extreme lower Mississippi River delta and coastal areas. They commonly adjoin large brackish water lakes. Elevation is typically one foot above mean sea level to about 3 feet below. Lafitte soils formed in herbaceous plant remains that overlie mineral sediments.

### Schriever series

The Schriever series consists of very deep, poorly drained, very slowly permeable soils that formed in clayey alluvium. These soils are on the lower parts of natural levees and in backswamp positions on the lower Mississippi River alluvial plain. Slope is dominantly less than 1 percent but ranges up to 3 percent.

### Westwego series

The Westwego series consist of deep, poorly drained, very slowly permeable soils. They formed in semifluid clayey alluvium and organic material that dried and shrank irreversibly in the upper part as the result of artificial drainage. These soils are on broad, drained former swamps along the lower Mississippi River and its distributaries. Slopes range from 0 to 0.5 percent. These soils are protected from flooding by a system of levees and are artificially drained by pumps. Westwego soils are on drained areas between the natural levees and marsh. The landscape was semifluid clayey swamps and swamp-marsh transition prior to reclamation. Elevations are generally 2 or 3 feet below sea level.

### 3.4 Hydrology

The majority of the project site has localized drainage to the ditches located throughout all the project areas. A brief description of the local hydrology for each site is listed below. The hydrology indicators observed during the field investigation, located at the data points, included; surface water, high water table, saturation, iron deposits, water-stained leaves, oxidized rhizospheres on living roots, presence of reduced iron, surface soil cracks, FAC-neutral test, sparsely vegetated concave surface, and drainage patterns.

### Pump station

The hydrology of the pump station site is dissected by a levee/road and canal located to the east of the levee. All areas east of the levee drain west toward the canal through local man-made drainage ditches, with minimal localized drainage to isolated wetlands. The area located west of the levee has localized drainage to the surrounding marsh in the vicinity of Chenier Traverse Bayou. This area partially includes lands that were re-created by river sediments as part of the BA-39, Bayou Dupont project (indicated by point DP 13, Figure 4).

### Siphon north

The hydrology of the siphon north site has localized drainage to man-made ditches located throughout the site, primarily flowing westward to the levee canal located along the western boundary of the site.

#### Siphon south

The hydrology of the siphon south site has localized drainage to man-made ditches located throughout the site, primarily flowing westward to the levee canal located along the western boundary of the site. The site is also dissected by 2 larger canals which appear to be used to control water levels south and west of the canals. The majority of the site seems to be used as a waterfowl hunting area which water is held purposely.

#### Hwy 23 north and south

The primary hydrology of the Highway 23 sites has localized drainage to man-made ditches located throughout the site and along the highway, flowing to larger canals located in the northern and southern portions of the project sites with minimal localized drainage to isolated wetlands located within the site.

#### Rail north

The hydrology of the rail north site is dissected by a road and man-made ditch running primarily east to west. The area north of the ditch has localized drainage to man-made ditches throughout the area with additional localized drainage to wetlands located within the site. The area south of road flows primarily toward Highway 23 through man-made ditches with additional localized drainage to wetlands throughout the site.

#### Rail south

The hydrology of the rail south site has localized drainage to man-made ditches located along the levee on the eastern side of the project site with additional localized drainage to wetlands located within the site.

#### Supplemental (2019)

The hydrology of the supplemental site is dissected by Highway 23, levee roads and man-made ditches running primarily northwest to southeast. The area east and north of Highway 23 has localized drainage to man-made ditches throughout the area with additional localized drainage to wetlands located within the site. The area west and south of Highway 23 has localized drainage to man-made ditches located throughout the site, primarily flowing westward to the levee canal located along the western boundary of the site. The site is also dissected by 2 larger canals which appear to be used to control water levels south and west of the canals.

### 4.0 Conclusion

This waters of the United States (U.S.) determination and delineation for the approximately 606acre Mid Barataria Sediment Diversion Auxiliary Area wetland delineation project located in Plaquemines Parish, Louisiana project area followed the on-site routine field procedures as outlined in the 1987 Corps of Engineers Wetlands Delineation Manual and subsequent Regulatory Guidance Letters (RGL) (USACE 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region Version 2.0 (USACE 2010). Results of the field investigation indicate the presence of approximately 253 acres of wetlands within the project area. A Waters of the U.S. data map that includes the approximate location of data points and the delineated wetland areas of the property can be found in Figures 3-12. A table summarizing the wetland acreage is listed below:

Site Number	Site Name	Total Acreage (acres)	Wetland Acreage (acres)
1	Pump station	70	31.1
2	Siphon north	116	50.3
3	Siphon south	100	89.7
4	Hwy 23 north	43	4.3
5	Hwy 23 south	65	18.9
6	Rail north	37	14.4
7	Rail south	24	11
8	Supplemental (2019)	151	33.2

The USACE, under the Clean Water Act, Section 404 and the Rivers and Harbor Act, Section 10 is authorized to make the final determination of the location and extent of jurisdictional wetlands and jurisdictional waters on this property, respectively. Use of this report should recognize the subjectivity associated with studies of this type and the limitations of the methods required by the 1987 Corps of Engineers Wetlands Delineation Manual.

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   Environmental Protection Agency (USEPA), U.S. Fish and Wildlife Service (USFWS), and U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS), Washington, D.C.
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- U.S. Army Corps of Engineers (USACE). 2014. 2014 National Wetland Plant List State Lists, Louisiana. Accessed November 27, 2017 http://rsgisias.crrel.usace.army.mil/NWPL/
- U.S. Geological Survey (USGS). 2015 Color Aerial Photographs.

FIGURES

# Figure 1: Vicinity Map: Proposed Mid-Baratatia Sediment Diversion Project, Plaquemines Parish, LA











# Figure 2: Site Location: Proposed Mid-Baratatia Sediment Diversion Project, Plaquemines Parish, LA











### Figure 3: Wetland Delineation: Proposed Mid-Baratatia Sediment Diversion Project, Plaquemines Parish, LA











# Figure 4: Wetland Delineation: Site 1, Pump Station Proposed MBSD Project, Plaquemines Parish, LA





# Figure 5: Wetland Delineation: Site 2, Siphon North Proposed MBSD Project, Plaquemines Parish, LA





XF

### Figure 6: Wetland Delineation: Site 3, Siphon South Proposed MBSD Project, Plaquemines Parish, LA







1,000

# Figure 7: Wetland Delineation: Site 4, Highway 23 North Proposed MBSD Project, Plaquemines Parish, LA



Legend			
Project Boundary			
<ul> <li>Data Point</li> </ul>			
Wetland (approx. 4.32 acres)			
🔲 Upland			
Levee			





# Figure 8: Wetland Delineation: Site 5, Highway 23 South Proposed MBSD Project, Plaquemines Parish, LA









# Figure 9: Wetland Delineation: Site 6, Rail North Proposed MBSD Project, Plaquemines Parish, LA



Legend				
Project Boundary				
<ul> <li>Data Point</li> </ul>				
Wetland (approx. 14.22 acres)				
Upland				
Levee				





# Figure 10: Wetland Delineation: Site 7, Rail South Proposed MBSD Project, Plaquemines Parish, LA









# Figure 11: Wetland Delineation: Supplemental, Eastern Proposed MBSD Project, Plaquemines Parish, LA









# Figure 12: Wetland Delineation: Supplemental, Western Proposed MBSD Project, Plaquemines Parish, LA









- Figure 13: Soil Map: Site 1, Pump Station 90° 1'0" W
- Proposed MBSD Project, Jefferson and Plaquemines Parishes, LA



USDA

100

400

Map projection: Web Mercator Corner coordinates: WGS84

50

200

200

800

\_\_\_Feet 1200

\_\_Meters 300

29° 39' 46" N

90° 0'26" W



Soil Map-Jefferson Parish, Louisiana, and Plaguemines Parish, Louisiana

#### MAP LEGEND

#### **MAP INFORMATION**

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.



# Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CE	Clovelly muck, 0 to 0.2 percent slopes, very frequently flooded	12.2	15.6%
LA	Lafitte-Clovelly association, 0 to 0.2 percent slopes, very frequently flooded	17.5	22.3%
W	Water	8.7	11.1%
Subtotals for Soil Survey Area		38.5	49.0%
Totals for Area of Interest		78.5	100.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CE	Clovelly muck, 0 to 0.2 percent slopes, very frequently flooded	3.1	3.9%
Со	Cancienne silty clay loam, 0 to 1 percent slopes	20.5	26.1%
На	Harahan clay, 0 to 1 percent slopes	12.1	15.4%
LF	Lafitte muck, 0 to 0.2 percent slopes, very frequently flooded	0.4	0.5%
W	Water	4.0	5.1%
Subtotals for Soil Survey Area		40.0	51.0%
Totals for Area of Interest		78.5	100.0%



Natural Resources Conservation Service Web Soil Survey National Cooperative Soil Survey

MAP LEGEND		MAP INFORMATION	
Area of Interest (AOI) Area of Interest (AOI)	<ul><li>Spoil Area</li><li>Stony Spot</li></ul>	The soil surveys that comprise your AOI were mapped at 1:24,000.	
Soils Soil Map Unit Polygons Soil Map Unit Lines Soil Map Unit Points Special <b>Point Features</b> Blowout ⊠ Borrow Pit Clay Spot Closed Depression Gravel Pit	<ul> <li>Very Stony Spot</li> <li>Very Stony Spot</li> <li>Wet Spot</li> <li>Other</li> <li>Special Line Features</li> <li>Water Features</li> <li>Streams and Canals</li> <li>Transportation</li> <li>Rails</li> <li>Interstate Highways</li> <li>US Routes</li> </ul>	<ul> <li>Warning: Soil Map may not be valid at this scale.</li> <li>Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.</li> <li>Please rely on the bar scale on each map sheet for map measurements.</li> <li>Source of Map: Natural Resources Conservation Service Web Soil Survey URL: Coordinate System: Web Mercator (EPSG:3857)</li> <li>Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts</li> </ul>	
<ul> <li>Landfill</li> <li>Lava Flow</li> <li>Lava Flow</li> <li>Marsh or swamp</li> <li>Mine or Quarry</li> <li>Miscellaneous Water</li> <li>Perennial Water</li> <li>Rock Outcrop</li> <li>Saline Spot</li> <li>Sandy Spot</li> </ul>	Major Roads Local Roads Background Aerial Photography	<ul> <li>distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.</li> <li>This product is generated from the USDA-NRCS certified data a of the version date(s) listed below.</li> <li>Soil Survey Area: Plaquemines Parish, Louisiana Survey Area Data: Version 12, Oct 4, 2017</li> <li>Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.</li> <li>Date(s) aerial images were photographed: Mar 29, 2010—Ma 31, 2010</li> </ul>	
<ul> <li>Sandy Spot</li> <li>Severely Eroded Spot</li> <li>Sinkhole</li> <li>Slide or Slip</li> <li>Sodic Spot</li> </ul>		The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.	



# Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Со	Cancienne silty clay loam, 0 to 1 percent slopes	63.6	49.4%
На	Harahan clay, 0 to 1 percent slopes	44.8	34.8%
W	Water	4.1	3.2%
Ww	Westwego clay, 0 to 0.5 percent slopes	16.1	12.6%
Totals for Area of Interest		128.6	100.0%





USDA Natural Resources

Conservation Service

MAP LEGEND		MAP INFORMATION	
Area of Interest (AOI) Area of Interest (AOI)	<ul><li>Spoil Area</li><li>Stony Spot</li></ul>	The soil surveys that comprise your AOI were mapped at 1:24,000.	
Soils Soil Map Unit Polygons Soil Map Unit Lines Soil Map Unit Points Special <b>Point Features</b> Blowout ⊠ Borrow Pit Clay Spot Closed Depression Gravel Pit	<ul> <li>Very Stony Spot</li> <li>Very Stony Spot</li> <li>Wet Spot</li> <li>Other</li> <li>Special Line Features</li> <li>Water Features</li> <li>Streams and Canals</li> <li>Transportation</li> <li>Rails</li> <li>Interstate Highways</li> <li>US Routes</li> </ul>	<ul> <li>Warning: Soil Map may not be valid at this scale.</li> <li>Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.</li> <li>Please rely on the bar scale on each map sheet for map measurements.</li> <li>Source of Map: Natural Resources Conservation Service Web Soil Survey URL: Coordinate System: Web Mercator (EPSG:3857)</li> <li>Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts</li> </ul>	
<ul> <li>Landfill</li> <li>Lava Flow</li> <li>Lava Flow</li> <li>Marsh or swamp</li> <li>Mine or Quarry</li> <li>Miscellaneous Water</li> <li>Perennial Water</li> <li>Rock Outcrop</li> <li>Saline Spot</li> <li>Sandy Spot</li> </ul>	Major Roads Local Roads Background Aerial Photography	<ul> <li>distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.</li> <li>This product is generated from the USDA-NRCS certified data a of the version date(s) listed below.</li> <li>Soil Survey Area: Plaquemines Parish, Louisiana Survey Area Data: Version 12, Oct 4, 2017</li> <li>Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.</li> <li>Date(s) aerial images were photographed: Mar 29, 2010—Ma 31, 2010</li> </ul>	
<ul> <li>Sandy Spot</li> <li>Severely Eroded Spot</li> <li>Sinkhole</li> <li>Slide or Slip</li> <li>Sodic Spot</li> </ul>		The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.	


Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
На	Harahan clay, 0 to 1 percent slopes	96.1	88.9%
LF	Lafitte muck, 0 to 0.2 percent slopes, very frequently flooded	5.4	5.0%
W	Water	6.6	6.1%
Totals for Area of Interest		108.1	100.0%



Area of Interest (AOI)       Soil Area       The soil surveys that comprise your AOI were mapped at 1:24,000.         Soils       Soil Map Unit Polygons       Wery Stony Spot         Soil Map Unit Polygons       Wery Stony Spot       Soil Map Unit Polygons       Wery Stony Spot         Soil Map Unit Polygons       Wery Stony Spot       Soil Map Unit Polygons       Were Spot         Soil Map Unit Points       Other       Special Line Features       Special Line Features         Special Point Features       Strams and Canals       Stramsportation       Sourseptation         Reading Gravel Pit       Fails       Survey are based on the Web Mercator (EPSG:3857)         Reading Gravel Pit       Waria Photography       Major Roads         Lava Flow       Background       Soil Map Codes         Mire or Quarry       Mise claneous Water       Soil Map Codes         Mise or Quarry       Mise or Quarry       Aerial Photography         Mise or Quarry       Aerial Photography       Soil Map Code (as space allows) for map scales 1:50,000 or larger.         Sain Spot       Saine Spot       Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.         Descence or differse protection or other base map on which the soil lines were compiled and digitized probaby differs from the background in the scale or approtection the scale or appon which the soil lines were compiled and dig	MAP L	EGEND	MAP INFORMATION
Soils       Soil Map Unit Polygons       Very Story Spot       Warning: Soil Map may not be valid at this scale.         Soil Map Unit Polygons       Very Story Spot       Enlargement of maps beyond the scale of mapping and accuracy of soil mapping and accuracy	Area of Interest (AOI) Area of Interest (AOI)	<ul><li>Spoil Area</li><li>Stony Spot</li></ul>	The soil surveys that comprise your AOI were mapped at 1:24,000.
<ul> <li>Landfill</li> <li>Local Roads</li> <li>Lava Flow</li> <li>Background</li> <li>Marsh or swamp</li> <li>Merial Photography</li> <li>Mine or Quarry</li> <li>Miscellaneous Water</li> <li>Perennial Water</li> <li>Rock Outcrop</li> <li>Saline Spot</li> <li>Sandy Spot</li> <li>Sandy Spot</li> <li>Severely Eroded Spot</li> <li>Marsh or swamp</li> <li>Marsh or swamp</li> <li>Marsh or swamp</li> <li>Marsh or swamp</li> <li>Merial Photography</li> <li>Aerial Photography</li> <li>Aerial Photography</li> <li>Aerial Photography</li> <li>Aerial Photography</li> <li>Mine or Quarry</li> <li>Miscellaneous Water</li> <li>Soil Survey Area: Plaquemines Parish, Louisiana Survey Area Data: Version 12, Oct 4, 2017</li> <li>Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.</li> <li>Date(s) aerial images were photographed: Mar 29, 2010–Mar 31, 2010</li> <li>The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background minor minor</li> </ul>	Soils Soil Map Unit Polygons Soil Map Unit Lines Soil Map Unit Lines Special <b>Point Features</b> Blowout Blowout Clay Spot Clay Spot Closed Depression Sravel Pit Sont	⊘     Very Stony Spot       ♥     Wet Spot       △     Other       ✓     Special Line Features       ✓     Streams and Canals       Transportation       +++     Rails       ✓     Interstate Highways       ✓     US Routes	<ul> <li>Warning: Soil Map may not be valid at this scale.</li> <li>Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.</li> <li>Please rely on the bar scale on each map sheet for map measurements.</li> <li>Source of Map: Natural Resources Conservation Service Web Soil Survey URL: Coordinate System: Web Mercator (EPSG:3857)</li> <li>Maps from the Web Soil Survey are based on the Web Mercato projection, which preserves direction and shape but distorts</li> </ul>
imagery displayed on these mans. As a result, some minor	<ul> <li>Landfill</li> <li>Lava Flow</li> <li>Lava Flow</li> <li>Marsh or swamp</li> <li>Mine or Quarry</li> <li>Miscellaneous Water</li> <li>Perennial Water</li> <li>Rock Outcrop</li> <li>Saline Spot</li> <li>Sandy Spot</li> <li>Severely Eroded Spot</li> </ul>	Local Roads Local Roads Aerial Photography	<ul> <li>distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.</li> <li>This product is generated from the USDA-NRCS certified data a of the version date(s) listed below.</li> <li>Soil Survey Area: Plaquemines Parish, Louisiana Survey Area Data: Version 12, Oct 4, 2017</li> <li>Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.</li> <li>Date(s) aerial images were photographed: Mar 29, 2010—Ma 31, 2010</li> <li>The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background</li> </ul>



Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Co	Cancienne silty clay loam, 0 to 1 percent slopes	83.1	97.1%
На	Harahan clay, 0 to 1 percent slopes	2.5	2.9%
Totals for Area of Interest	·	85.5	100.0%





MAP L	EGEND	MAP INFORMATION
Area of Interest (AOI) Area of Interest (AOI)	<ul><li>Spoil Area</li><li>Stony Spot</li></ul>	The soil surveys that comprise your AOI were mapped at 1:24,000.
Image: minipageArea of Interest (AOI)SoilsSoil Map Unit PolygonsImage: minipageSoil Map Unit PolygonsImage: minipageSoil Map Unit LinesImage: minipageSoil Map Unit PointsImage: minipageBlowoutImage: mi	Image: Constraint of the constr	<ul> <li>1:24,000.</li> <li>Warning: Soil Map may not be valid at this scale.</li> <li>Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.</li> <li>Please rely on the bar scale on each map sheet for map measurements.</li> <li>Source of Map: Natural Resources Conservation Service Web Soil Survey URL: Coordinate System: Web Mercator (EPSG:3857)</li> <li>Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.</li> <li>This product is generated from the USDA-NRCS certified data at of the version date(s) listed below.</li> <li>Soil Survey Area: Plaquemines Parish, Louisiana Survey Area Data: Version 12, Oct 4, 2017</li> <li>Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.</li> <li>Date(s) aerial images were photographed: Mar 29, 2010—Mar 31, 2010</li> </ul>
<ul> <li>Severely Eroded Spot</li> <li>Sinkhole</li> <li>Slide or Slip</li> <li>Sodic Spot</li> </ul>		The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.



Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Cm	Cancienne silt loam, 0 to 1 percent slopes	26.0	63.8%
Со	Cancienne silty clay loam, 0 to 1 percent slopes	14.7	36.2%
Totals for Area of Interest	•	40.8	100.0%





Area of Interest (AOI)       Soil Area       The soil surveys that comprise your AOI were mapped at 1:24,000.         Soils       Soil Map Unit Polygons       Wery Stony Spot         Soil Map Unit Polygons       Wery Stony Spot       Soil Map Unit Polygons       Wery Stony Spot         Soil Map Unit Polygons       Wery Stony Spot       Soil Map Unit Polygons       Were Spot         Soil Map Unit Points       Other       Special Line Features       Special Line Features         Special Point Features       Strams and Canals       Stramsportation       Sourseptation         Reading Gravel Pit       Fails       Survey are based on the Web Mercator (EPSG:3857)         Reading Gravel Pit       Waria Photography       Major Roads         Lava Flow       Background       Soil Map Codes         Mire or Quarry       Mise claneous Water       Soil Map Codes         Mise or Quarry       Mise or Quarry       Aerial Photography         Mise or Quarry       Aerial Photography       Soil Map Code (as space allows) for map scales 1:50,000 or larger.         Sain Spot       Saine Spot       Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.         Descence or differse protection or other base map on which the soil lines were compiled and digitized probaby differs from the background in the scale or approtection the scale or appon which the soil lines were compiled and dig	MAP L	EGEND	MAP INFORMATION
Soils       Soil Map Unit Polygons       Very Story Spot       Warning: Soil Map may not be valid at this scale.         Soil Map Unit Polygons       Very Story Spot       Enlargement of maps beyond the scale of mapping and accuracy of soil mapping and accuracy	Area of Interest (AOI) Area of Interest (AOI)	<ul><li>Spoil Area</li><li>Stony Spot</li></ul>	The soil surveys that comprise your AOI were mapped at 1:24,000.
<ul> <li>Landfill</li> <li>Local Roads</li> <li>Lava Flow</li> <li>Background</li> <li>Marsh or swamp</li> <li>Merial Photography</li> <li>Mine or Quarry</li> <li>Miscellaneous Water</li> <li>Perennial Water</li> <li>Rock Outcrop</li> <li>Saline Spot</li> <li>Sandy Spot</li> <li>Sandy Spot</li> <li>Severely Eroded Spot</li> <li>Marsh or swamp</li> <li>Marsh or swamp</li> <li>Marsh or swamp</li> <li>Marsh or swamp</li> <li>Merial Photography</li> <li>Aerial Photography</li> <li>Aerial Photography</li> <li>Aerial Photography</li> <li>Aerial Photography</li> <li>Mine or Quarry</li> <li>Miscellaneous Water</li> <li>Soil Survey Area: Plaquemines Parish, Louisiana Survey Area Data: Version 12, Oct 4, 2017</li> <li>Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.</li> <li>Date(s) aerial images were photographed: Mar 29, 2010–Mar 31, 2010</li> <li>The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background minor minor</li> </ul>	Soils Soil Map Unit Polygons Soil Map Unit Lines Soil Map Unit Lines Special <b>Point Features</b> Blowout Blowout Clay Spot Clay Spot Closed Depression Sravel Pit Sont	⊘     Very Stony Spot       ♥     Wet Spot       △     Other       ✓     Special Line Features       ✓     Streams and Canals       Transportation       +++     Rails       ✓     Interstate Highways       ✓     US Routes	<ul> <li>Warning: Soil Map may not be valid at this scale.</li> <li>Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.</li> <li>Please rely on the bar scale on each map sheet for map measurements.</li> <li>Source of Map: Natural Resources Conservation Service Web Soil Survey URL: Coordinate System: Web Mercator (EPSG:3857)</li> <li>Maps from the Web Soil Survey are based on the Web Mercato projection, which preserves direction and shape but distorts</li> </ul>
imagery displayed on these mans. As a result, some minor	<ul> <li>Landfill</li> <li>Lava Flow</li> <li>Lava Flow</li> <li>Marsh or swamp</li> <li>Mine or Quarry</li> <li>Miscellaneous Water</li> <li>Perennial Water</li> <li>Rock Outcrop</li> <li>Saline Spot</li> <li>Sandy Spot</li> <li>Severely Eroded Spot</li> </ul>	Local Roads Local Roads Aerial Photography	<ul> <li>distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.</li> <li>This product is generated from the USDA-NRCS certified data a of the version date(s) listed below.</li> <li>Soil Survey Area: Plaquemines Parish, Louisiana Survey Area Data: Version 12, Oct 4, 2017</li> <li>Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.</li> <li>Date(s) aerial images were photographed: Mar 29, 2010—Ma 31, 2010</li> <li>The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background</li> </ul>



Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Cm	Cancienne silt loam, 0 to 1 percent slopes	39.2	98.0%
Со	Cancienne silty clay loam, 0 to 1 percent slopes	0.6	1.6%
CV	Carville, Cancienne, and Schriever soils, frequently flooded	0.2	0.4%
Totals for Area of Interest	·	40.0	100.0%



**Conservation Service** 

Web Soil Survey National Cooperative Soil Survey

MAP L	EGEND	MAP INFORMATION
Area of Interest (AOI) Area of Interest (AOI) Soils Soil Map Unit Polygons	<ul> <li>Spoil Area</li> <li>Stony Spot</li> <li>Very Stony Spot</li> <li>Wet Spot</li> </ul>	The soil surveys that comprise your AOI were mapped at 1:24,000. Please rely on the bar scale on each map sheet for map measurements.
Soil Map Unit Lines Soil Map Unit Points Special Point Features Blowout Borrow Pit Clay Spot	<ul> <li>Other</li> <li>Special Line Features</li> <li>Water Features</li> <li>Streams and Canals</li> <li>Transportation</li> <li>Rails</li> </ul>	Web Soil Survey URL: Coordinate System: Web Mercator (EPSG:3857) Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.
<ul> <li>Closed Depression</li> <li>Gravel Pit</li> <li>Gravelly Spot</li> <li>Landfill</li> <li>Lava Flow</li> </ul>	<ul> <li>Interstate Highways</li> <li>US Routes</li> <li>Major Roads</li> <li>Local Roads</li> </ul>	<ul> <li>This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.</li> <li>Soil Survey Area: Plaquemines Parish, Louisiana Survey Area Data: Version 14, Sep 11, 2019</li> <li>Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.</li> </ul>
<ul> <li>Marsh or swamp</li> <li>Mine or Quarry</li> <li>Miscellaneous Water</li> <li>Perennial Water</li> <li>Rock Outcrop</li> </ul>	Aerial Photography	Date(s) aerial images were photographed: Dec 31, 2009—Dec 10, 2017 The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.
<ul> <li>Saline Spot</li> <li>Sandy Spot</li> <li>Severely Eroded Spot</li> <li>Sinkhole</li> <li>Slide or Slip</li> <li>Sodic Spot</li> </ul>		

	<b>.</b>		
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Cm	Cancienne silt loam, 0 to 1 percent slopes	27.3	18.1%
Со	Cancienne silty clay loam, 0 to 1 percent slopes	32.3	21.3%
CV	Carville, Cancienne, and Schriever soils, frequently flooded	4.8	3.1%
На	Harahan clay, 0 to 1 percent slopes	67.4	44.6%
LF	Lafitte muck, 0 to 0.2 percent slopes, very frequently flooded	0.3	0.2%
W	Water	12.6	8.3%
Ww	Westwego clay, 0 to 0.5 percent slopes	6.5	4.3%
Totals for Area of Interest	·	151.1	100.0%

## APPENDIX A FIELD DATA SHEETS

Project/Site: Site 3 - Siphon South (MBSD)	City/County: Belle C	hasse, Plaquemines	Sampling Date: 27 February 2018
Applicant/Owner: CPRA		State: LA	Sampling Point: 1
Investigator(s): Benjamin Richard	Section, Township, R	ange: S17 - T16S - R24	IE
Landform (hillslope, terrace, etc.): leveed pasture	Local relief (concave,	convex, none): none	Slope (%): 0-1%
Subregion (LRR or MLRA). MLRA 151	9.645107	Long89.983791	Datum: NAD 83 UTM 16N
Soil Map Unit Name: Harahan clay, 0-1% slopes		NWI classific	cation: N/A
Are climatic / hydrologic conditions on the site typical for this time	of vear? Yes 🗸 No	(If no. explain in R	emarks.)
Are Vegetation Soil or Hydrology signific	cantly disturbed? Are	"Normal Circumstances"	present? Yes 🗸 No
Are Vegetation Soil or Hydrology natura	lly problematic?		urs in Remarks )
SUMMARY OF FINDINGS – Attach site map sho	wing sampling point	locations. transects	, important features, etc.
			, <b>,</b> ,,,,
Hydrophytic Vegetation Present? Yes <u>Ves</u> No <u>Ves</u> No	Is the Sample	ed Area	/
Wetland Hydrology Present? Yes ✓ No	within a Wetl	and? Yes 💙	No
Remarke:			
HYDROLOGY			
Wetland Hydrology Indicators:		Secondary Indica	ators (minimum of two required)
Primary Indicators (minimum of one is required; check all that a	pply)	Surface Soil	Cracks (B6)
Surface Water (A1)	a (B13)	Sparsely Ve	getated Concave Surface (B8)
High Water Table (A2) Mari Deposits	s (B15) <b>(LRR U)</b>	Drainage Pa	tterns (B10)
U Saturation (A3) Hydrogen Sul	IIIde Odor (C1)	ts (C3) Dry-Season	Ines (B16) Water Table (C2)
Sediment Deposits (B2) $\square$ Presence of E	Reduced Iron (C4)	Cravfish Bur	rows (C8)
Drift Deposits (B3)	Reduction in Tilled Soils (C6	) Saturation V	isible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Irface (C7)	Geomorphic	Position (D2)
Iron Deposits (B5)	n in Remarks)	Shallow Aqu	itard (D3)
Inundation Visible on Aerial Imagery (B7)		FAC-Neutral	Test (D5)
Water-Stained Leaves (B9)	T	Sphagnum r	noss (D8) <b>(LRR T, U)</b>
Field Observations:	a haa).		
Water Table Present? Yes No V Depth (in	ches):		
Saturation Present? Ves No ✓ Depth (in	nches):	etland Hydrology Prese	nt? Yes No
(includes capillary fringe)	icites).	retiand right logy rieser	
Describe Recorded Data (stream gauge, monitoring well, aerial	photos, previous inspectior	ns), if available:	
Remarks:			

Sampling Point: 1

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30' radius ) 1.	% Cover	Species?	Status	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2				Total Number of Dominant
3				Species Across All Strata: <u>3</u> (B)
4				Percent of Deminant Species
5				That Are OBL, FACW, or FAC: $2/3 = 66.67\%$ (A/B)
6				
7				Prevalence Index worksheet:
8				Total % Cover of:Multiply by:
		= Total Co	ver	OBL species $\frac{1}{4}$ $x = \frac{1}{2}$
50% of total cover:	20% of	total cover		FACW species $\frac{1}{x^2}$ $x^2 = \frac{2}{x^2}$
Sapling/Shrub Stratum (Plot size: 15' radius				FAC species $\frac{1}{x^3}$ $x^3 = \frac{3}{x^3}$
1.				FACU species <u>1</u> x 4 = <u>4</u>
2				UPL species $\underline{0}$ x 5 = $\underline{0}$
3				Column Totals: <u>4</u> (A) <u>10</u> (B)
4				$P_{111} = 25$
5				Prevalence index = $B/A = \frac{10/4 = 2.5}{2}$
· · · · · · · · · · · · · · · · · · ·				Hydrophytic Vegetation Indicators:
7				☐ 1 - Rapid Test for Hydrophytic Vegetation
<i>1</i>				2 - Dominance Test is >50%
8				3 - Prevalence Index is ≤3.0 <sup>1</sup>
		= I otal Co	ver	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover:	20% of	total cover	:	
Herb Stratum (Plot size: 5 radius )	40	V	FACU	<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. Cynodon dactylon	40	Y	FACU	be present, unless disturbed or problematic.
2. Juncus errusus		Y	OBL	Definitions of Four Vegetation Strata:
3. Andropogon glomeratus	30	Y	FACW	Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or
4. Ranunculus sardous	10	N	FAC	more in diameter at breast height (DBH), regardless of
5				height.
6				Sapling/Shrub – Woody plants, excluding vines, less
7				than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10				Woody vine All woody vines greater than 2.28 ft in
11				height.
12.				
	100	= Total Co	ver	
50% of total cover: <sup>50</sup>	20% of	total cover	- 20	
Woody Vine Stratum (Plot size: 15' radius )				
1				
2				
3				
<u> </u>				
J		- Total Ca		Hydrophytic Vegetation
EQ0/ of total action	200/ of			Present? Yes <u>No</u>
50% of total cover:	20% 0	total cover	·	
Remarks: (If observed, list morphological adaptations be	IOW).			

Brofilo Doco	ription. (Decoribed	o the den	th pooded to decu	mont the	indiantar	or confirm	the abconce	of indicators )
Profile Desc	ription: (Describe)	the dep	th needed to docul	ment the	Indicator	or contirm	n the absence	of indicators.)
(inches)	Color (moist)	%	Color (moist)	<u>x Feature</u> %	<u>es</u> Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-10	10YR 3/1		10YR 5/8	30	RM	Μ	clay	
10-12	10YR 2/1						organic	
12-18	10YR 2/1		10YR 4/6	25	RM	Μ	clav	
						·		
						·		
<sup>1</sup> Type: C=Co	oncentration, D=Depl	etion, RM	=Reduced Matrix, M	S=Maske	d Sand Gi	ains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
Hydric Soil I	ndicators: (Applica	able to all	LRRs, unless othe	rwise no	ted.)		Indicators	for Problematic Hydric Soils <sup>3</sup> :
Histosol	(A1)		Polyvalue Be	elow Surfa	ace (S8) <b>(I</b>	_RR S, T, U	J) <u> </u> 1 cm N	Auck (A9) (LRR O)
	oipedon (A2)		Thin Dark Su	urface (SS	)) (LRR S,	T, U)		Muck (A10) (LRR S)
	n Sulfide (A4)			ed Matrix	(F1) <b>(EK</b>	(0)		ont Floodplain Soils (F19) (I RR P. S. T)
Stratified	Layers (A5)		Depleted Ma	trix (F3)	()		Anoma	alous Bright Loamy Soils (F20)
Organic	Bodies (A6) (LRR P,	T, U)	Redox Dark	Surface (	F6)		(MLI	RA 153B)
🔲 5 cm Mu	cky Mineral (A7) (LR	R P, T, U)	Depleted Da	rk Surfac	e (F7)			arent Material (TF2)
Muck Pro	esence (A8) (LRR U)	)	Redox Depre	essions (F	-8)		U Very S	Shallow Dark Surface (TF12)
1 cm Mu	ck (A9) (LRR P, T)	<i></i>	Marl (F10) (L	_RR U)			U Other	(Explain in Remarks)
	Below Dark Surface	e (A11)			) (MLRA 1	51) (IBB O B	T) <sup>3</sup> India	potors of hydrophytic vegetation and
	ark Sunace (A12) airie Redox (A16) <b>(N</b>	II RA 150	$\square$ Iron-Mangan	iese Mass		LKK U, P, ' II)	(I) Indic	ators of hydrophytic vegetation and
Sandy M	lucky Mineral (S1) <b>(L</b>	RR O. S)	Delta Ochric	(F17) <b>(M</b>	LRA 151)	, 0)	unl	ess disturbed or problematic.
Sandy G	leyed Matrix (S4)	-,-,	Reduced Ve	rtic (F18)	(MLRA 1	50A, 150B)	1	
Sandy R	edox (S5)		Piedmont Flo	odplain \$	Soils (F19)	(MLRA 14	19A)	
Stripped	Matrix (S6)		Anomalous E	Bright Loa	amy Soils (	F20) <b>(MLR</b>	A 149A, 153C	, 153D)
Dark Sur	face (S7) (LRR P, S	, T, U)					1	
Restrictive L	ayer (if observed):							
Type:	-h )-						Undain Call	
Deptn (Inc	cnes):						Hydric Soll	Present? Yes <u>•</u> No
Remarks:								

Project/Site: Site 3 - Siphon South (MBSD)	City/County: Belle	Chasse, Plaquemines	Sampling Date: 27 February 2018			
Applicant/Owner: CPRA		State: LA	Sampling Point: 2			
Investigator(s): Benjamin Richard	Section, Township,	Range: S17 - T16S - R24	IE			
Landform (hillslope, terrace, etc.): leveed pasture	Local relief (concave	e, convex, none): none	Slope (%): 0-1%			
Subregion (LRR or MLRA); MLRA 151	29.644153	Lona: -89.985199	Datum: NAD 83 UTM 16N			
Soil Map Unit Name: Harahan clay, 0-1% slopes		NWI classific	cation: N/A			
Are climatic / hydrologic conditions on the site typical for this tir	ne of vear? Yes 🗸 No	o (If no. explain in R	emarks.)			
Are Vegetation . Soil . or Hydrology sign	ificantly disturbed? A	re "Normal Circumstances" r	present? Yes 🗸 No			
Are Vegetation Soil or Hydrology nati	rally problematic?	f needed explain any answe	urs in Remarks )			
SUMMARY OF FINDINGS – Attach site map sh	owing sampling poin	t locations, transects	, important features, etc.			
Hudrophytic Vegetation Breaght? Veg. V						
Hydrophydre vegetation Present? Yes ✓ No	Is the Samp	led Area	/			
Wetland Hydrology Present? Yes <u>√</u> No	within a Wet	tland? Yes_♥	No			
Remarks:	I					
HYDROLOGY						
Wetland Hydrology Indicators:		Secondary Indica	ators (minimum of two required)			
Primary Indicators (minimum of one is required; check all that	apply)	Surface Soil	Cracks (B6)			
Surface Water (A1)	una (B13)	Sparsely Ve	getated Concave Surface (B8)			
High Water Table (A2)	Sits (B15) <b>(LKK U)</b> Sulfido Odor (C1)		tterns (B10)			
Water Marks (B1)	hizospheres along Living Rc	(C3) Dry-Season	Water Table (C2)			
Sediment Deposits (B2)	of Reduced Iron (C4)	Crayfish Bur	rows (C8)			
Drift Deposits (B3)	Reduction in Tilled Soils (C	6) <u></u> Saturation V	isible on Aerial Imagery (C9)			
Algal Mat or Crust (B4)	Surface (C7)	Geomorphic	Position (D2)			
□ Iron Deposits (B5) □ Other (Exp	lain in Remarks)	Remarks)				
Inundation Visible on Aerial Imagery (B7)		✓ FAC-Neutral Test (D5)				
Field Observations:			1055 (D6) (LKK 1, 0)			
Surface Water Present? Yes No ✓ Depth	(inches):					
Water Table Present? Yes No Depth	(inches):					
Saturation Present? Yes No _ ✓ Depth	(inches):	Wetland Hydrology Preser	nt? Yes 🖌 No			
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aeri	ial photos, previous inspectio	ons) if available:				
Remarks:						

Sam	olina	Point:	2
ouin	PIIIIG		

	Absolute	Dominan	t Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30' radius )	<u>% Cover</u>	<u>Species</u>	<u>Status</u>	Number of Dominant Species
1.				That Are OBL, FACW, or FAC: $^2$ (A)
2			·	
2.		·	·	Total Number of Dominant
3		·	·	Species Across All Strata: (B)
4		·	·	Percent of Dominant Species
5		·	·	That Are OBL, FACW, or FAC: $2/3 = 66.67\%$ (A/B)
6		·		Development in development of
7				Prevalence Index worksneet:
8				Total % Cover of:Multiply by:
		= Total Co	ver	OBL species x 1 =
50% of total cover:	20% 0	f total cove	r	FACW species x 2 =
Sopling/Shrub Stratum (Plot size: 15' radius	20/00			FAC species x 3 =
				FACU species x 4 =
1		·	·	UPL species $x 5 =$
2		·	·	
3		·		Column rotals (A) (B)
4				Prevalence Index = B/A =
5				Hydrophytic Vegetation Indicators:
6.			·	
7				1 - Rapid Test for Hydrophytic Vegetation
7				2 - Dominance Test is >50%
8			·	3 - Prevalence Index is ≤3.0 <sup>1</sup>
		= Total Co	ver	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover:	20% o	of total cove	r:	
Herb Stratum (Plot size: 5' radius )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. Cynodon dactylon	60	Y	FACU	be present, unless disturbed or problematic.
2 Ranunculus sardous	30	Y	FAC	Definitions of Four Vegetation Strata:
<ul> <li>Alternanthera philoxeroides</li> </ul>	30	Y	OBL	
4		·	·	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
4		. <u> </u>	·	more in diameter at breast height (DBH), regardless of beight
5		·	·	hoight.
6				Sapling/Shrub – Woody plants, excluding vines, less
7		·	. <u> </u>	than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8		<u></u>	<u> </u>	Herb – All berbaceous (non-woody) plants, regardless
9.				of size, and woody plants less than 3.28 ft tall.
10				
11		·	·	Woody vine – All woody vines greater than 3.28 ft in
40			·	neight.
12	100			
	120	= Total Co	ver	
50% of total cover: 60	20% o	of total cove	r: <u>24</u>	
Woody Vine Stratum (Plot size: 15' radius )				
1				
2.				
3		·	·	
		·	·	
4		. <u> </u>	·	
5			·	Hydrophytic
		= Total Co	ver	Vegetation Present? Voc No
50% of total cover:	20% o	of total cove	r:	Present? res v No
Remarks: (If observed, list morphological adaptations be	low).			
	,			

SUL
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SUL								
Profile Desc	ription: (Describe to	o the dep	th needed to docum	ent the	indicator	or confirm	n the absence	of indicators.)
Depth (inchoo)	Matrix	0/	Redox	Feature	es Turca <sup>1</sup>	1.00 <sup>2</sup>	Toyturo	Demorko
<u>(inches)</u> 0-8	10YR 3/1	70	7 5YR 3/4	30	RM	M	<u>clav</u>	Remarks
8-10	10YR 2/1		1.011(0,1	00			organic	
10-16	10VP 4/1		10VR 5/8	20	PM		clay	
10-10	1011( 4/1		1011 3/6	20			ciay	
						·		
<sup>1</sup> Type: C=C	oncentration, D=Deple	tion, RM=	Reduced Matrix, MS	=Maske	d Sand Gr	ains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
Histosol Histosol Black Hi Hydroge Stratified Organic Stratified Organic 5 cm Mu Muck Pr 1 cm Mu Depleted Thick Da Coast P Sandy M Sandy R Stripped	(A1) pipedon (A2) stic (A3) an Sulfide (A4) d Layers (A5) Bodies (A6) (LRR P, 1) ack (A9) (LRR P, 1) d Below Dark Surface ark Surface (A12) rairie Redox (A16) (Mi fucky Mineral (S1) (LF Belyed Matrix (S4) tedox (S5) Matrix (S6)	T, U) R P, T, U) (A11) LRA 1504 RR O, S)	<ul> <li>Polyvalue Bel</li> <li>Thin Dark Sur</li> <li>Loamy Mucky</li> <li>Loamy Gleyed</li> <li>Depleted Mati</li> <li>Redox Dark S</li> <li>Depleted Darl</li> <li>Redox Depres</li> <li>Marl (F10) (Li</li> <li>Depleted Och</li> <li>Iron-Mangane</li> <li>Umbric Surface</li> <li>Delta Ochric (</li> <li>Reduced Vert</li> <li>Piedmont Floo</li> <li>Anomalous Bi</li> </ul>	ow Surfa face (SS Mineral d Matrix rix (F3) Gurface ( Surface Ssions (F <b>RR U)</b> ric (F11) ese (F13) F17) <b>(M</b> ic (F18) odplain S right Loa	ace (S8) (I ace (S8) (I (LRR S, (F1) (LRF (F2) F6) e (F7) F8) ) (MLRA 1 (RR P, 1 LRA 151) (MLRA 15 Soils (F19) amy Soils (	_RR S, T, F T, U) ₹ O) ₹ O) \$ (LRR O, P 7, U) \$ 60A, 150B 9 (MLRA 14 \$ 720) (MLF	U) 1 cm N 2 cm N 2 cm N Reduce Piedm Anoma (MLi Red P Very S Other , T) <sup>3</sup> Indice we' unl A9A) RA 149A, 153C	Muck (A9) <b>(LRR O)</b> Muck (A10) <b>(LRR S)</b> ced Vertic (F18) <b>(outside MLRA 150A,B)</b> nont Floodplain Soils (F19) <b>(LRR P, S, T)</b> alous Bright Loamy Soils (F20) <b>RA 153B)</b> "arent Material (TF2) Shallow Dark Surface (TF12) (Explain in Remarks) cators of hydrophytic vegetation and tland hydrology must be present, less disturbed or problematic.
Dark Su	rface (S7) (LRR P, S,	T, U)					1	
Type:	_ayer (If observed):							
Depth (in	ches):						Hydric Soil	Present? Yes No
Remarks:							ingune con	

Project/Site: Site 3 - Siphon South (MBSD)	City/County: Belle Chasse, Plaquemines Sampling Date: 27 February 2018
Applicant/Owner: CPRA	State: LA Sampling Point: 3
Investigator(s): Benjamin Richard	Section, Township, Range: S6 - T16S - R25E
Landform (hillslope, terrace, etc.): leveed pasture	Local relief (concave, convex, none): <u>none</u> Slope (%): <u>0-1%</u>
Subregion (LRR or MLRA): MLRA 151 Lat: 29.64	6764 Long: -89.979097 Datum: NAD 83 UTM 16N
Soil Map Unit Name: Harahan clay, 0-1% slopes	NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of ye	ear? Yes 🗸 No (If no, explain in Remarks.)
Are Vegetation . Soil . or Hydrology significantly	disturbed? Are "Normal Circumstances" present? Yes 🗸 No
Are Vegetation . Soil . or Hydrology naturally pr	oblematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing	y sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present?       Yes ✓       No         Hydric Soil Present?       Yes ✓       No         Wetland Hydrology Present?       Yes ✓       No         Remarks:       Image: Comparison of the second	Is the Sampled Area within a Wetland? Yes <u>Ves</u> No
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
L Surface Water (A1) Aquatic Fauna (B1	3) Sparsely Vegetated Concave Surface (B8)
Saturation (A3)	Ddor (C1) Moss Trim Lines (B16)
Water Marks (B1)	eres along Living Roots (C3) Dry-Season Water Table (C2)
Sediment Deposits (B2)	ced Iron (C4) Crayfish Burrows (C8)
Drift Deposits (B3)	tion in Tilled Soils (C6) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	(C7) Geomorphic Position (D2)
Iron Deposits (B5)	(emarks) Shallow Aquitard (D3)
Inundation Visible on Aerial Imagery (B7)	IFAC-Neutral Test (D5) Sphagpum mass (D8) (I PP T 11)
Field Observations:	
Surface Water Present? Yes No ✓ Depth (inches	i):
Water Table Present? Yes No 🗸 Depth (inches	
Saturation Present? Yes No Depth (inches	): Wetland Hydrology Present? Yes <u>✓</u> No
(includes capillary fringe) Describe Recorded Data (stream dauge, monitoring well, aerial photo	os previous inspections), if available:
Remarks:	

Sampling Point: <u>3</u>

201 as dive	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 radius )	% Cover	Species?	Status	Number of Dominant Species
1	·			That Are OBL, FACW, or FAC: $2$ (A)
2	·			Total Number of Dominant
3	·			Species Across All Strata: <u>3</u> (B)
4	·			Percent of Dominant Species
5	·			That Are OBL, FACW, or FAC: $2/3 = 66.67\%$ (A/B)
6				Prevalence Index worksheet:
7				Total % Cover of: Multiply by:
8	·			
		= Total Cov	ver	
50% of total cover:	20% of	total cover	:	ACW species X2 =
Sapling/Shrub Stratum (Plot size: 15' radius )				FACt species $x 3 = $
1				FACO species         x 4 =           UDL species         x 5
2				$OPL species \underline{\qquad} x \ 5 = \underline{\qquad} (A)$
3				Column Totals: (A) (B)
4				Prevalence Index = $B/A =$
5				Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7				$\boxed{2}$ - Dominance Test is >50%
8				$\square$ 3 - Prevalence Index is <3.0 <sup>1</sup>
		= Total Cov	ver	$\square$ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover:	20% of	total cover	:	
Herb Stratum (Plot size: 5' radius )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. Cynodon dactylon	60	Y	FACU	be present, unless disturbed or problematic.
2. Hydrocotyle prolifera	25	Y	OBL	Definitions of Four Vegetation Strata:
3. Alternanthera philoxeroides	30	Y	OBL	
4.				Iree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH) regardless of
5	·			height.
6	·			Sanling/Shrub Woody plants evoluting vines loss
7				than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8				
9				of size, and woody plants less than 3.28 ft tall.
10				
11	·			Woody vine – All woody vines greater than 3.28 ft in
12	·			neight.
12.	115	– Total Ca		
50% of total cover: 57.5	20% of	total cover	. 23	
Weedy Vine Stretum (Plot size: 15' radius	20 /0 01		·	
1	·			
2	·			
S	·			
4	·			
5	·			Hydrophytic Vocatotion
500/ // /			/er	Present? Yes No
50% of total cover:	20% of	total cover	: <u></u>	
Remarks: (If observed, list morphological adaptations belo	ow).			

Profile Desc	ription: (Describe t	o the depth	n needed to docun	nent the	indicator	or confirm	n the absence o	of indicators.)
Depth	Matrix		Redox	x Feature	es1	. 2	_	
(inches)								Remarks
0-8	10YR 3/1		7.5YR 4/6	30	RIVI	IVI	clay	
8-11	10YR 5/1		7.5YR 4/6	35	RM	Μ	clay	
11-16	10YR 2/1		10YR 5/8	25	RM	Μ	clay	
1					- <u> </u>			
Type: C=Co	oncentration, D=Depl	etion, RM=F	Reduced Matrix, MS	S=Maske	d Sand Gr	ains.	Location: F	PL=Pore Lining, M=Matrix.
				wise no	(00)	<b>DD 0 T</b>		
	(A1)		Thin Dark Su	IOW SUITE	ace (58) (I a) <i>(</i> IPP S	.RR 5, 1, 1 T 11)		uck (A9) (LRR O)
	stic (A3)			/ Mineral	(F1) (LRF	1, 0) ? O)		d Vertic (F18) (outside MLRA 150A.B)
	n Sulfide (A4)		Loamy Gleve	d Matrix	(F2)	,		nt Floodplain Soils (F19) <b>(LRR P. S. T)</b>
Stratified	Layers (A5)		Depleted Mat	rix (F3)				ous Bright Loamy Soils (F20)
🔲 Organic	Bodies (A6) (LRR P,	T, U)	Redox Dark S	Surface (	F6)		(MLR	A 153B)
🔲 5 cm Mu	icky Mineral (A7) <b>(LR</b>	R P, T, U)	Depleted Dar	k Surface	e (F7)		Red Par	rent Material (TF2)
Muck Pr	esence (A8) (LRR U)		Redox Depre	ssions (F	-8)		L Very Sh	allow Dark Surface (TF12)
1 cm Mu	ick (A9) <b>(LRR P, T)</b>	( <b>.</b> )	Marl (F10) (L	RR U)			U Other (E	Explain in Remarks)
	Below Dark Surface	e (A11)		nric (F11)	(MLRA 1	51) '' DD O D	<b>T</b> ) <sup>3</sup> lassling	
	ark Sunace (A12) airie Redox (A16) <b>(M</b>	RA 150A)			(IRR P 1		, I) INUICA wotla	acts of hydrophylic vegetation and
Sandy M	lucky Mineral (S1) (I	RR 0. S)	Delta Ochric	(F17) <b>(M</b>	(EKK 1, 1 I RA 151)	, 0)	unles	ss disturbed or problematic
Sandy G	ileved Matrix (S4)		Reduced Ver	tic (F18)	(MLRA 15	0A, 150B)	)	
Sandy R	edox (S5)		Piedmont Flo	odplain §	Soils (F19)	(MLRA 1	, 49A)	
Stripped	Matrix (S6)		Anomalous B	right Loa	my Soils (	F20) (MLF	RA 149A, 153C,	153D)
Dark Su	rface (S7) <b>(LRR P, S</b>	, T, U)						
Restrictive I	_ayer (if observed):							
Type:								
Depth (ind	ches):						Hydric Soil F	Present? Yes V No
Remarks:								

Project/Site: Site 3 - Siphon South (MBSD)	City/County: Belle Chasse, Plaquemines Sampling Date: 27 February 2018
Applicant/Owner: CPRA	State: LA Sampling Point: 4
Investigator(s): Benjamin Richard	Section, Township, Range: S6 - T16S - R25E
Landform (hillslope, terrace, etc.): leveed pasture	_ocal relief (concave, convex, none): none Slope (%): 0-1%
Subregion (LRR or MLRA): MLRA 151 Lat: 29.644	835 Long: -89.978391 Datum: NAD 83 UTM 16N
Soil Map Unit Name: Harahan clay, 0-1% slopes	NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year	ar? Yes 🗸 No (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly of	disturbed? Are "Normal Circumstances" present? Yes No
Are Vegetation , Soil , or Hydrology naturally pro	blematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing	sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present?       Yes _ ✓       No         Hydric Soil Present?       Yes _ ✓       No         Wetland Hydrology Present?       Yes _ ✓       No         Remarks:       Image: No       Image: No	Is the Sampled Area within a Wetland? Yes <u>No</u>
HYDROLOGY Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
Surface Water (A1)	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)	(LRR U) Drainage Patterns (B10)
Saturation (A3)	dor (C1) Moss Trim Lines (B16)
U Water Marks (B1) U Oxidized Rhizosphe	res along Living Roots (C3)
Sediment Deposits (B2)	$\frac{1}{2} \operatorname{Crayfish} \operatorname{Burrows} (C8)$
Drift Deposits (B3)	on in Tilled Soils (C6) Saturation Visible on Aerial Imagery (C9)
$\square$ Algal Mat of Clust (B4) $\square$ Thin Muck Surface	(C7) <u>C</u> Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7)	FAC-Neutral Test (D5)
Water-Stained Leaves (B9)	Sphagnum moss (D8) (LRR T, U)
Field Observations:	
Surface Water Present? Yes No Depth (inches)	
Water Table Present? Yes No Depth (inches)	
Saturation Present? Yes No Depth (inches):	Wetland Hydrology Present? Yes <u>V</u> No
Describe Recorded Data (stream gauge, monitoring well, aerial photos	s, previous inspections), if available:
Remarks:	

Sampling Point: 4

201 as dive	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum     (Plot size: 30 radius )       1.    )	% Cover	Species	Status	Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)
2				Total Number of Dominant
3				Species Across All Strata: (B)
4				Dereent of Deminent Species
5				That Are OBL, FACW, or FAC: $3/4 = 75\%$ (A/B)
6				、 ,
7				Prevalence Index worksheet:
8				I otal % Cover of: Multiply by:
		= Total Co	ver	OBL species x 1 =
50% of total cover:	20% of	total cove	r:	FACW species x 2 =
Sapling/Shrub Stratum (Plot size: 15' radius )				FAC species x 3 =
1				FACU species x 4 =
2				UPL species x 5 =
3				Column Totals: (A) (B)
4				Prevalence Index = B/A =
5				Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7				2 - Dominance Test is >50%
8				3 - Prevalence Index is ≤3.0 <sup>1</sup>
		= Total Co	ver	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover:	20% of	total cove	r:	
Herb Stratum (Plot size: 5' radius )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. Cynodon dactylon	50	Y	FACU	be present, unless disturbed or problematic.
2. Hydrocotyle prolifera	25	Y	OBL	Definitions of Four Vegetation Strata:
3. Juncus effusus	25	Υ	OBL	<b>Tree</b> – Woody plants, excluding vines, 3 in (7.6 cm) or
4. Vigna luteda	25	Υ	FACW	more in diameter at breast height (DBH), regardless of
5				height.
6				Sapling/Shrub – Woody plants, excluding vines, less
7				than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10				Woody vine - All woody vines greater than 3.28 ft in
11				height.
12				
	125	= Total Co	ver	
50% of total cover: 62.5	20% of	total cove	r: 25	
Woody Vine Stratum (Plot size: 15' radius )				
1				
2				
3				
4				
5				Hydrophytic
		= Total Co	ver	Vegetation
50% of total cover:	20% of	total cove	r:	Present? Yes Ves No
Remarks: (If observed, list morphological adaptations belo	ow).			1
wet pasture				

Profile Desc	ription: (Describe t	o the dept	h needed to docun	nent the	indicator	or confirm	n the absence of	indicators.)
Depth	Matrix		Redox	k Feature	es			
(inches)	Color (moist)		Color (moist)	%	Type'		Texture	Remarks
0-6	10YR 3/1		7.5YR 4/6	25	RM	M	clay	
6-8	10YR 2/1		7.5YR 4/6				organic	
8-16	10YR 5/1		7.5YR 4/6	35	RM	Μ	clay	
1							2	
Type: C=Co	ncentration, D=Depl	etion, RM=	Reduced Matrix, MS	S=Maske	d Sand Gr	ains.	Location: P	L=Pore Lining, M=Matrix.
					(CO)/I	прети		ok (AQ) (I BB Q)
	(AT) vinedon (A2)		Thin Dark Su	rface (SC	ace (56) (L a) (I RR S	.KK 5, 1, U T 11)	$D_2 \text{ cm Mu}$	ck (A9) (LRR O)
Black Hi	stic (A3)			/ Mineral	(F1) (LRF	R O)		Vertic (F18) (outside MLRA 150A.B)
	n Sulfide (A4)		Loamy Gleye	d Matrix	(F2)	,	Piedmon	t Floodplain Soils (F19) <b>(LRR P, S, T)</b>
Stratified	Layers (A5)		Depleted Mat	rix (F3)	· · ·		Anomalo	us Bright Loamy Soils (F20)
Organic	Bodies (A6) (LRR P,	T, U)	Redox Dark S	Surface (	F6)		(MLRA	153B)
5 cm Mu	cky Mineral (A7) <b>(LR</b>	R P, T, U)	Depleted Dar	k Surface	e (F7)		Red Pare	ent Material (TF2)
Muck Pr	esence (A8) <b>(LRR U)</b>		Redox Depre	ssions (F	-8)		U Very Sha	allow Dark Surface (TF12)
	ck (A9) <b>(LRR P, T)</b>	(	Marl (F10) (L	RR U)		= 4 )	U Other (E)	xplain in Remarks)
	Below Dark Surface	e (A11)		nric (F11)	(MLRA 1	51) 1 DD O D	T) <sup>3</sup> Indiaat	are of hydrophytic vegetation and
	airie Redox (A12)	I RA 150A		ce (F13)		LKK U, F, ' II)	wetlar	ad hydrology must be present
Sandy M	lucky Mineral (S1) <b>(L</b>	RR O. S)	Delta Ochric	(F17) <b>(M</b>	LRA 151)	, 0)	unless	s disturbed or problematic.
Sandy G	leyed Matrix (S4)	···· -, -,	Reduced Ver	tic (F18)	(MLRA 15	60A, 150B)	)	
Sandy R	edox (S5)		Piedmont Flo	odplain \$	Soils (F19)	(MLRA 14	49A)	
Stripped	Matrix (S6)		Anomalous B	right Loa	my Soils (	F20) <b>(MLR</b>	RA 149A, 153C, 1	53D)
Dark Su	face (S7) (LRR P, S	, T, U)						
Restrictive L	ayer (if observed):							
Type:	(h)							
Depth (Inc	nes):						Hydric Soli Pr	resent? Yes No
Remarks:								

Project/Site: Site 2 - Siphon North (MBSD)	City/County: Belle	Chasse, Plaquemi	nes Sampling Date	28 February 2018	
Applicant/Owner: CPRA	· · · <u> </u>	<sub>State:</sub> LA	Sampling Point	<sub>t:</sub> 5	
Investigator(s); Benjamin Richard	Section, Township,	Range: S16 - T16S	- R24E		
Landform (billslope, terrace, etc.): leveed pasture	Local relief (concav	e, convex, none). No	ne Sk	ope (%). 0-1%	
Subregion (LRB or MLRA). MLRA 151	52835	-89.98884	0 1	NAD 83 UTM 16N	
Soil Map Unit Name: Cancienne silty clay loam, 0-1% slopes		NWI c	classification: N/A	atum.	
Are climatic / hydrologic conditions on the site typical for this time of yo	ear? Yes 🗸 N	o (lf no, expla	ain in Remarks.)		
Are Vegetation , Soil 🗸 , or Hydrology significantly	y disturbed? A	re "Normal Circumsta	ances" present? Yes	✓ No	
Are Vegetation . Soil . or Hydrology naturally pr	roblematic? (l'	f needed, explain anv	answers in Remarks.)		
SUMMARY OF FINDINGS – Attach site map showing	g sampling poin	t locations, tran	sects, important	features, etc.	
Hydrophytic Vegetation Present?       Yes No         Hydric Soil Present?       Yes No         Wetland Hydrology Present?       Yes No         Remarks:       Yes No	Is the Samp within a We	led Area tland? Ye	rs No∕	_	
Wetland Hydrology Indicators:		Secondar	v Indicators (minimum (	of two required)	
Primary Indicators (minimum of one is required: check all that apply)	1		ce Soil Cracks (B6)	<u>si two required)</u>	
Surface Water (A1)	13)		selv Vegetated Concave	- Surface (B8)	
High Water Table (A2)	5) (LRR U)		Drainage Patterns (B10)		
Saturation (A3)	Odor (C1)	Moss	Trim Lines (B16)		
Water Marks (B1)	heres along Living Ro	oots (C3) 🔲 Dry-S	eason Water Table (C2	<u>2)</u>	
Sediment Deposits (B2)	ced Iron (C4)	Crayfi	ish Burrows (C8)		
Drift Deposits (B3)	ction in Tilled Soils (C	C6)			
Algal Mat or Crust (B4)	e (C7)	Geom	orphic Position (D2)		
Iron Deposits (B5)	Remarks)		Dw Aquitard (D3)		
Water-Stained Leaves (B9)			anum moss (D8) (LRR	T. U)	
Field Observations:			<u>g</u>	., .,	
Surface Water Present? Yes No _ ✓ Depth (inches	s):				
Water Table Present? Yes No Depth (inches	s):				
Saturation Present? Yes No Depth (inches	s):	Wetland Hydrology	Present? Yes	No	
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial phot	tos, previous inspection	ons), if available:			
Remarks:					

Sampling Point: <u>5</u>

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 radius )	<u>% Cover</u>	Species?	Status	Number of Dominant Species
1				That Are OBL, FACW, or FAC: (A)
2				Total Number of Dominant
3		·		Species Across All Strata: <u>3</u> (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: $1/3 = 33\%$ (A/B)
6				Prevalence Index worksheet:
7				Total % Cover of: Multiply by:
8				OBL species $0$ $x = 0$
		= Total Cov	er	FACW species $0$ $x_2 = 0$
50% of total cover:	20% of	total cover		FAC species $1$ $x_3 = 3$
Sapling/Shrub Stratum (Plot size: 15 Tadius )				FACU species $\frac{2}{x}$ $x = \frac{8}{x}$
1		·		$\begin{array}{c} 1100 \text{ optimes} \\ 1101 \text{ species} \\ 0 \\ 1101 \text{ species} \\ 0 \\ 101 \text{ species} \\ 101  speci$
2				Column Totals: $3$ ( $\Delta$ ) 11 (B)
3				
4				Prevalence Index = $B/A = \frac{11/3 = 3.67}{2}$
5				Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7				2 - Dominance Test is >50%
8				$\square$ 3 - Prevalence Index is $\leq 3.0^1$
		= Total Cov	rer	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover:	20% of	total cover	·	
Herb Stratum (Plot size: 5' radius )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. Cynodon dactylon	60	Y	FACU	be present, unless disturbed or problematic.
2. Trifolium repens	50	Y	FACU	Definitions of Four Vegetation Strata:
3				<b>Trac</b> Woody plants, excluding vines, 2 in (7.6 cm) or
4				more in diameter at breast height (DBH), regardless of
5.				height.
6.	_			Sanling/Shrub – Woody plants, excluding vines, less
7.	_			than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8.	_			Harb All borbaccous (non woody) plants, regardless
9.				of size, and woody plants less than 3.28 ft tall.
10.	_			
11.				<b>Woody vine</b> – All woody vines greater than 3.28 ft in height
12				noight.
	110	- Total Cov	er	
50% of total cover: 55	20% of	total cover	22	
Weedy Vine Stretum (Plot eize: 15' radius	2070 01		·	
Rubus spp.	20	Y	FAC	
		<u> </u>		
2				
3				
4				
5	20			Hydrophytic
10	20	= Total Cov	ver	Present? Yes No
50% of total cover: 10	20% of	total cover	4	
Remarks: (If observed, list morphological adaptations be	low).			

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Profile Desc	ription: (Describe t	o the depth	needed to docum	nent the	indicator	or confirm	n the absence	of indicators.)
Depth	Matrix		Redox	k Feature	s			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-12	10YR 3/2	-	7.5YR 4/6	10	RM	Μ	clay	
12-16	10YR 4/1		10YR 5/8	15	D	М	sand	
					-			
					· · · · · · · · · · · · · · · · · · ·	·		
						·		
<sup>1</sup> Type: C=Co	oncentration. D=Depl	etion. RM=F	Reduced Matrix. MS	S=Maske	d Sand Gr	ains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix,
Hydric Soil	ndicators: (Applica	ble to all L	RRs, unless other	wise not	ed.)		Indicators	for Problematic Hydric Soils <sup>3</sup> :
	(Δ1)			low Surfa	, 11 (82) and	RRSTI		
	vinedon (A2)		Thin Dark Su	rface (S9			$\int \frac{1}{2} \operatorname{cm} M$	luck (A10) (I BB S)
Black Hi	stic (A3)			/ Mineral	(F1) (I RF	2 O)		ed Vertic (F18) (outside MI RA 150A B)
	n Sulfide (A4)		Loamy Gleve	d Matrix	(F2)	,		ont Floodplain Soils (F19) (LRR P. S. T)
	Lavers (A5)		Depleted Mat	rix (F3)	(• =)		Anoma	lous Bright Loamy Soils (F20)
	Bodies (A6) (LRR P.	T. U)	Redox Dark S	Surface (I	F6)		(MLR	RA 153B)
5 cm Mu	icky Mineral (A7) (LR	R P. T. U)	Depleted Dar	k Surface	e (F7)			arent Material (TF2)
Muck Pr	esence (A8) (LRR U)	, , -,	Redox Depre	ssions (F	-8)		U Very S	hallow Dark Surface (TF12)
1 cm Mu	ick (A9) (LRR P, T)		Marl (F10) (L	RR U)	- /		Other (	Explain in Remarks)
Depleted	Below Dark Surface	(A11)	Depleted Och	, nric (F11)	(MLRA 1	51)		,
Thick Da	ark Surface (A12)	( )	Iron-Mangane	ese Mass	es (F12) (	LRR O, P,	T) <sup>3</sup> Indic	ators of hydrophytic vegetation and
Coast P	rairie Redox (A16) (M	LRA 150A)	Umbric Surfa	ce (F13)	(LRR P, 1	, U)	wet	and hydrology must be present,
Sandy N	lucky Mineral (S1) (L	RR O, S)	Delta Ochric (	(F17) <b>(M</b> I	LRA 151)		unle	ess disturbed or problematic.
Sandy G	leyed Matrix (S4)		Reduced Ver	tic (F18)	(MLRA 1	50A, 150B)	)	
Sandy R	edox (S5)		Piedmont Flo	odplain S	Soils (F19)	(MLRA 14	49A)	
Stripped	Matrix (S6)		Anomalous B	right Loa	my Soils (	F20) (MLR	RA 149A, 153C,	, 153D)
Dark Su	rface (S7) (LRR P, S,	, T, U)						
Restrictive I	_ayer (if observed):							
Туре:								
Depth (ind	ches):		<u> </u>				Hydric Soil	Present? Yes 🖌 No
Remarks:	,							
p	otential spoil m	naterial						
	•							

Project/Site: Site 2 - Siphon North (MBSD)	City/County: Belle	Chasse, Plaquemines	Sampling Date: 28 February 2018
Applicant/Owner: CPRA		State: LA	Sampling Point: 6
Investigator(s): Benjamin Richard	Section, Township	, Range: S16 - T16S - R2	4E
Landform (hillslope, terrace, etc.): leveed pasture	Local relief (conca	ve, convex, none): none	Slope (%): 0-1%
Subregion (I RR or MI RA). MLRA 151	29.652094	Long: -89.985550	Datum: NAD 83 UTM 16N
Soil Map Unit Name: Harahan clay, 0-1% slopes		NWI classifi	cation: N/A
Are climatic / hydrologic conditions on the site typical for this t	ime of year? Yes 🗸 N	lo (If no explain in I	Remarks )
Are Vegetation Soil or Hydrology sig	inite of year. The is	Are "Normal Circumstances"	present? Ves V No
Are Vegetation, our hydrology sig			present: res no
Are vegetation, Soli, or Hydrology hat	urally problematic? (	ir needed, explain any answ	ers in Remarks.)
SUMMARY OF FINDINGS – Attach site map sl	nowing sampling poir	nt locations, transect	s, important features, etc.
Hydrophytic Vegetation Present?       Yes No         Hydric Soil Present?       Yes No         Wetland Hydrology Present?       Yes No	✓     Is the Samp       ✓     within a We	pled Area etland? Yes	No
HYDROLOGY			
Wetland Hydrology Indicators:		Secondary Indic	ators (minimum of two required)
Primary Indicators (minimum of one is required; check all that	at apply)	Surface Soi	l Cracks (B6)
Surface Water (A1)	auna (B13)	Sparsely Ve	egetated Concave Surface (B8)
High Water Table (A2)	osits (B15) <b>(LRR U)</b>	Drainage Pa	atterns (B10)
Saturation (A3)	Sulfide Odor (C1)	🔲 Moss Trim I	_ines (B16)
Water Marks (B1)	Rhizospheres along Living R	oots (C3)	Water Table (C2)
Sediment Deposits (B2)	of Reduced Iron (C4)	Crayfish Bu	rrows (C8)
Drift Deposits (B3)	on Reduction in Tilled Soils (	C6) <u> C6</u> Saturation \	/Isible on Aerial Imagery (C9)
$\square$ Algai Mat of Crust (B4) $\square$ Thin Much	Sufface (C7)		uitard (D3)
Inundation Visible on Aerial Imagery (B7)	Jain in Kenaks)		al Test (D5)
Water-Stained Leaves (B9)			moss (D8) <b>(LRR T, U)</b>
Field Observations:			
Surface Water Present? Yes No _✓ Depth	n (inches):		
Water Table Present? Yes No Depth	n (inches):		
Saturation Present? Yes No ✓ Depti	n (inches):	Wetland Hydrology Prese	nt? Yes No 🗡
(Includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, ae	rial photos, previous inspect	ions), if available:	
Remarks:			

Sampling Point: <u>6</u>

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 radius )	% Cover	Species?	Status	Number of Dominant Species
1				That Are OBL, FACW, or FAC: (A)
2				Total Number of Dominant
3				Species Across All Strata: $2$ (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: $0/2 = 0\%$ (A/B)
0				Prevalence Index worksheet:
/				Total % Cover of:Multiply by:
δ		Tatal Ca		OBL species x 1 =
E00/ of total action			ver	FACW species x 2 =
50% of total cover:	20% 01	total cove	:	FAC species x 3 =
Sapling/Shrub Stratum (Plot size: 19 radius )				FACU species x 4 =
1				UPL species x 5 =
2				Column Totals: (A) (B)
3				(-)
4				Prevalence Index = B/A =
5				Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7				2 - Dominance Test is >50%
8				$\Box$ 3 - Prevalence Index is $\leq 3.0^1$
		= Total Co	ver	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover:	20% of	total cove	:	
Herb Stratum (Plot size: 5' radius )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. Cynodon dactylon	50	Y	FACU	be present, unless disturbed or problematic.
2. Trifolium repens	50	Y	FACU	Definitions of Four Vegetation Strata:
3. Lolium perenne	20	Ν	FACU	<b>Tree</b> – Woody plants, excluding vines 3 in (7.6 cm) or
4				more in diameter at breast height (DBH), regardless of
5				height.
6				Sapling/Shrub – Woody plants, excluding vines, less
7				than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8	<u> </u>			Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10		_		Weedy vine All weedy vince greater than 2.28 ft in
11.				height.
12.	_			
	120	= Total Co	ver	
50% of total cover: <sup>60</sup>	20% of	total cove	- 24	
Woody Vine Stratum (Plot size: 15' radius )				
1				
2				
3				
4				
5				
- 5	20	- Total Ca		Hydrophytic Vegetation
50% of total covor: 10	20% of		. 4	Present? Yes No
Demonitory //f abaamuad lint membral arised adaptations had	20 % 01	IUIAI COVE	·	
Remarks: (II observed, list morphological adaptations bel	ow).			
dead Ambrosia trifida				

Profile Desc	ription: (Describe t	o the dep	th needed to docum	ent the	indicator	or confirm	n the absence	of indicators.)
Depth	Matrix		Redox	Feature	es1	. 2		
(inches)	Color (moist)	<u>%</u>	Color (moist)	<u>%</u>			<u>Texture</u>	Remarks
0-12	10YR 4/2		10YR 6/8	15	RIVI	IVI	clay	
12-16	10YR 4/1		10YR 5/8	15	D	Μ	clay	
							<u> </u>	
<u>.</u>				. <u> </u>				
<sup>1</sup> Type: C=Co	oncentration, D=Depl	etion, RM=	Reduced Matrix, MS	=Maske	d Sand Gr	ains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
Hydric Soil I	ndicators: (Applica	able to all	LRRs, unless other	wise no	ted.)			for Problematic Hydric Soils":
	(A1)		Polyvalue Bel	ow Surfa	ace (S8) <b>(L</b>	.RR S, T, I	U) <u> </u>	luck (A9) <b>(LRR O)</b>
	olpedon (A2)		I I hin Dark Su	face (SS	) (LRR S,	1, U)		luck (A10) (LRR S)
	n Sulfide (A4)			d Matrix	(F1) <b>(LKF</b> (F2)	(0)		ont Floodplain Soils (F19) (I RR P S T)
	Lavers (A5)		Depleted Mat	rix (F3)	(1 2)			lous Bright Loamy Soils (F20)
	Bodies (A6) (LRR P.	T. U)	Redox Dark S	Surface (	F6)		(MLR	RA 153B)
5 cm Mu	cky Mineral (A7) (LR	R P, T, U)	Depleted Darl	k Surfac	e (F7)		Red Pa	arent Material (TF2)
Muck Pr	esence (A8) (LRR U)	)	Redox Depres	ssions (F	-8)		U Very SI	hallow Dark Surface (TF12)
🔲 1 cm Mu	ck (A9) (LRR P, T)		Marl (F10) (LI	RR U)			D Other (	Explain in Remarks)
Depleted	Below Dark Surface	e (A11)	Depleted Och	ric (F11)	) <b>(MLRA 1</b>	51)		
Thick Da	ark Surface (A12)		Iron-Mangane	ese Mass	ses (F12) (	LRR O, P	, T) <sup>3</sup> Indica	ators of hydrophytic vegetation and
Coast Pr	airie Redox (A16) (M	ILRA 1504	N) 📙 Umbric Surfac	ce (F13)	(LRR P, T	', U)	wetl	land hydrology must be present,
Sandy M	lucky Mineral (S1) (L	RR 0, S)	Delta Ochric (	(F17) <b>(M</b>	LRA 151)		unle	ess disturbed or problematic.
Sandy G	leyed Matrix (S4)		Reduced Vert	tic (F18)	(MLRA 15	60A, 150B)	)	
Sandy R	edox (S5)			odplain S	Solls (F19)		49A)	4520)
	Matrix (S6)	T II)	Anomalous B	right Loa	amy Solis (	F20) (MLF	ka 149A, 153C,	, 153D)
Restrictive L	aver (if observed):	, 1, 0)						
Type:								
Depth (inc	ches):						Hydric Soil	Present? Yes No
Remarks:	,						-	
ро	otential spoil m	naterial						

Project/Site: Site 2 - Siphon North (MBSD)	City/County: Belle	e Chasse, Plaquemines	Sampling Date: 28 February 2018				
Applicant/Owner: CPRA	0,. c	State: LA Sampling Point: 7					
Investigator(s). Benjamin Richard	Section, Townshir	Range: S16 - T16S - R2	4E				
Landform (hillslope, terrace, etc.): leveed pasture	Local relief (conca	ve. convex. none): none	Slope (%): 0-1%				
Subregion (LRR or MLRA). MLRA 151	29.649629	Long89.989404	Datum: NAD 83 UTM 16N				
Soli Mon Linit Name. Cancienne silty clay loam, 0-1% slo	Des	Long	icotion: N/A				
Are climatic / hydrologic conditions on the site typical for this tir	ne of year? Yes <u>•</u> I	No (If no, explain in i	Remarks.)				
Are Vegetation, Soil, or Hydrology sign	ificantly disturbed?	Are "Normal Circumstances"	present? Yes <u>V</u> No				
Are Vegetation, Soil, or Hydrology natu	Irally problematic?	(If needed, explain any answ	ers in Remarks.)				
SUMMARY OF FINDINGS – Attach site map sh	owing sampling poi	nt locations, transect	s, important features, etc.				
Hydrophytic Vegetation Present?       Yes No         Hydric Soil Present?       Yes No         Wetland Hydrology Present?       Yes No         Remarks:       Image: Constraint of the second sec	✓     Is the Sam       ✓     within a W	pled Area etland? Yes	No				
HYDROLOGY							
Wetland Hydrology Indicators:		Secondary Indic	ators (minimum of two required)				
Primary Indicators (minimum of one is required; check all that	t apply)	Surface Soi	l Cracks (B6)				
Surface Water (A1)	una (B13)	Sparsely Ve	egetated Concave Surface (B8)				
High Water Table (A2)	sits (B15) <b>(LRR U)</b>	🛄 Drainage Pa	atterns (B10)				
Saturation (A3)	Sulfide Odor (C1)	Odor (C1)					
│	hizospheres along Living F	heres along Living Roots (C3)					
Sediment Deposits (B2)	of Reduced Iron (C4)	Crayfish Bu	rrows (C8)				
	Reduction in Tilled Soils (	(C6) <u> Saturation</u>	/isible on Aerial Imagery (C9)				
	Surface (C7)	e (C7) Geomorphic Position (D2) Demorphic Position (D2)					
	Iain in Remarks)						
Field Observations:							
Surface Water Present? Yes No ✓ Depth	(inches):						
Water Table Present? Yes No ✓ Depth	(inches):						
Saturation Present? Yes No ✓ Depth	(inches):	Wetland Hydrology Prese	ent? Yes No 🖌				
Describe Recorded Data (stream gauge, monitoring well, aer	ial photos, previous inspec	tions), if available:					
	•						
Remarks:							

Sampling Point: 7

Tree Stratum (Plot size: 30' radius )       % Cover Species? Status       Number of Dominant Species         1.	A) B) A/B)
1.	A) B) 4/B)
2.	B) 4/B)
3.	B) A/B)
4.	A/B)
5.	A/B)
6.	
7.	
8.	
50% of total cover:       20% of total cover:       FACW species       x 2 =         FAC species       x 3 =	
FAC species x 3 =	
Sopling/Shrup Stratum (Plot cizo: 1) Idulus	
FACU species x 4 =	
2 Column Totals: (A)	(B)
3 Obtainin Fotalo (v)	(0)
4 Prevalence Index = B/A =	
5 Hydrophytic Vegetation Indicators:	
6 1 - Rapid Test for Hydrophytic Vegetation	
7 2 - Dominance Test is >50%	
$\mathbb{R}$	
= Total Cover $\square$ Decharactic Hudrachutic Versetion <sup>1</sup> (Furshin)	
50% of total cover: 20% of total cover:	
Herb Stratum (Plot aize: 5' radius	
Herb Stratum (Plot size. <u>- reade</u> ) Indicators of hydric soil and wetland hydrology mu	st
Trifelium repeas	
2. <u>Initial repenses</u> <u>50 I FACO</u> Definitions of Four Vegetation Strata:	
3 Tree – Woody plants, excluding vines, 3 in. (7.6 cr	ı) or
4 more in diameter at breast height (DBH), regardles	s of
5 height.	
6 Sapling/Shrub – Woody plants, excluding vines, I	ess
7 than 3 in. DBH and greater than 3.28 ft (1 m) tall.	
8 Herb – All berbaceous (non-woody) plants, regard	229
9. of size, and woody plants less than 3.28 ft tall.	000
11 Woody vine – All woody vines greater than 3.28 ft	ın
12	
50% of total cover: <u>55</u> 20% of total cover: <u>22</u>	
Woody Vine Stratum (Plot size: 15 radius )	
1	
2	
3	
4	
4	
4.	
4	
4	
4	
4	
4	
4.	
4.	

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Profile Desc	ription: (Describe	to the dept	n needed to docum	ent the	indicator	or confirm	n the absence	of indicators.)
Depth	Matrix		Redox	Feature	es			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-12	10YR 4/1		10YR 5/8	10	RM	Μ	clay	
12-18	10YR 5/1		10YR 5/8	30	RM	Μ	clay	
				·		·		
					_			
1						- <u></u>		
'Type: C=Co	oncentration, D=Dep	letion, RM=I	Reduced Matrix, MS	=Maske	d Sand G	rains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
Hydric Soli I	ndicators: (Applica	able to all L	RRS, unless other	wise no	tea.)			for Problematic Hydric Solis":
Histosol	(A1)			ow Surfa	ace (S8) <b>(</b> I	LRR S, T, I		Auck (A9) (LRR O)
	olpedon (A2)			tace (SS	) (LRR S,	, I, U) 7 O)		Auck (A10) (LRR S)
	STIC (A3)			d Motrix	(F1) <b>(LKI</b> (F2)	R ()		ed Vertic (F18) (outside MLRA 150A,B)
	I Sullide (A4)		Loanity Gleyed     Loanity Gleyed	riv (E3)	(ГZ)			Solis (F19) (LKK F, S, T)
	Bodies (A6) (I RR P	тш	Redox Dark S	urface (	F6)			
	cky Mineral (A7) (LR	R P. T. U)		k Surfac	e (F7)			arent Material (TF2)
	esence (A8) (LRR U	)	Redox Depres	ssions (F			Verv S	hallow Dark Surface (TF12)
1 cm Mu	ck (A9) (LRR P, T)	,	Marl (F10) (LF	RR U)	- /		Other (	(Explain in Remarks)
Depleted	Below Dark Surface	e (A11)	Depleted Och	ric (F11)	) (MLRA 1	51)		× • •
Thick Da	ark Surface (A12)		Iron-Mangane	ese Mas	ses (F12)	(LRR O, P	, T) <sup>3</sup> Indic	ators of hydrophytic vegetation and
Coast Pi	airie Redox (A16) <b>(N</b>	ILRA 150A)	) 🔲 Umbric Surfac	ce (F13)	(LRR P, 1	Г, U)	wet	land hydrology must be present,
Sandy M	lucky Mineral (S1) <b>(L</b>	.RR O, S)	Delta Ochric (	F17) <b>(M</b>	LRA 151)		unle	ess disturbed or problematic.
Sandy G	leyed Matrix (S4)		Reduced Vert	ic (F18)	(MLRA 1	50A, 150B)	)	
Sandy R	edox (S5)		Piedmont Floo	odplain \$	Soils (F19)	) <b>(MLRA</b> 14	49A)	
Stripped	Matrix (S6)	<b>T</b> 10	Anomalous Br	right Loa	amy Soils	(F20) <b>(MLF</b>	RA 149A, 153C	, 153D)
Dark Su	Tace (S7) (LRR P, S	, I, U)						
Turner	ayer (il observeu).							
Type:								
Depth (ind	ches):						Hydric Soil	Present? Yes <u>V</u> No
Remarks:								

Project/Site: Site 2 - Siphon I	North (MBSD)	Citv/C	<sub>county:</sub> Belle Chasse, F	Plaquemines	Sampling Date: 28 February 201
Applicant/Owner: CPRA			Sec	State: LA	Sampling Point: 8
Investigator(s): Benjamin Ric	hard	Sectio	on, Township, Range: S1	6 - T16S - R24	4E
Landform (hillslope, terrace, etc	): leveed pastur	e Local	relief (concave, convex, r	none): none	Slope (%): 0-1%
Subregion (LRR or MLRA). ML	.RA 151		Long: -8	39.989417	Datum: NAD 83 UTM 16
Call Man Linit Name. Cancien	ne siltv clav loarr		LONG	NIM/L close	Datum
Soil Map Unit Name:					
Are climatic / hydrologic conditio	ons on the site typic	al for this time of year? Y	′es <u>▼</u> No (I	If no, explain in H	Remarks.)
Are Vegetation, Soil	, or Hydrology	significantly distur	bed? Are "Normal	Circumstances"	present? Yes <u>*</u> No
Are Vegetation, Soil	, or Hydrology	naturally problema	atic? (If needed, e	xplain any answe	ers in Remarks.)
SUMMARY OF FINDING	S – Attach site	e map showing sam	pling point locatio	ns, transects	s, important features, etc.
Hydrophytic Vegetation Prese Hydric Soil Present? Wetland Hydrology Present?	nt? Yes Yes Yes	✓ No      ✓ No      ✓ No	Is the Sampled Area within a Wetland?	Yes 🖌	No
HYDROLOGY Wetland Hydrology Indicato				Secondary Indica	ators (minimum o <u>f two required)</u>
Primary Indicators (minimum o	of one is required; c	heck all that apply)		Surface Soil	Cracks (B6)
Surface Water (A1)		Aquatic Fauna (B13)		Sparsely Ve	detated Concave Surface (B8)
High Water Table (A2)		Marl Deposits (B15) (LRI	R U)	Drainage Pa	atterns (B10)
Saturation (A3)		Hydrogen Sulfide Odor (0	C1)	Moss Trim L	ines (B16)
Water Marks (B1)	님	Oxidized Rhizospheres a	long Living Roots (C3)	Dry-Season	Water Table (C2)
Sediment Deposits (B2)	님	Presence of Reduced Iro	n (C4)	Crayfish Bur	rows (C8)
Drift Deposits (B3)	님	Recent Iron Reduction in	Tilled Soils (C6)	Saturation V	isible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	H	Thin Muck Surface (C7)			Position (D2)
		Other (Explain in Remark	(S)		litard (D3)
Mater-Stained Leaves (B)	al imagery (مر)				
Field Observations:	3)				
Surface Water Present?	Yes No	✓ Depth (inches):			
Water Table Present?	Yes No	✓ Depth (inches):			
Saturation Present?	Yes ✓ No	Depth (inches): 15	Wetland H	ydrology Preser	nt? Yes 🖌 No
(includes capillary fringe)					<b>—</b> —
Describe Recorded Data (Sire	am gauge, moniton	ng well, aeriai priotos, pre	Wous inspections), ir avai	lable.	
Pamarka:					
Remains.					
Sam	pling	Point:	8		
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oum	pinig	i onit.			

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30' radius )	% Cover	Species?	Status	Number of Dominant Species
1.				That Are OBL, FACW, or FAC: $^3$ (A)
2				
2				Total Number of Dominant
S				Species Across All Strata: (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: $3/3 = 100\%$ (A/B
6				Dravalance Index worksheets
7				Prevalence index worksneet:
8				I otal % Cover of: Multiply by:
		= Total Co	ver	OBL species x 1 =
50% of total cover:	20% of	total cove	•	FACW species x 2 =
Sapling/Shrub Stratum (Plot size: 15' radius )	2070 0			FAC species x 3 =
				FACU species x 4 =
1				UPL species x 5 =
2				Column Totals: (A) (B)
3				
4				Prevalence Index = B/A =
5				Hydrophytic Vegetation Indicators:
6.				1 Papid Test for Hydrophytic Vegetation
7				
0				2 - Dominance Test is >50%
o				3 - Prevalence Index is ≤3.0'
		= Total Co	ver	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover:	20% of	total cove	:	
Herb Stratum (Plot size: 5' radius )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. Juncus effusus	60	Y	OBL	be present, unless disturbed or problematic.
2. Eleocharis palustris	20	Υ	OBL	Definitions of Four Vegetation Strata:
3 Solidago sempervirens	20	Y	FACW	
4				<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) o
				height.
5				
6				Sapling/Shrub – Woody plants, excluding vines, less
7				than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10.				Weedwine All weedwines greater than 2.20 ft in
11.				height
12				
12.	100	Total Ca		
<b>50%</b> of total array <b>50</b>	000/ 1		20	
50% of total cover: <u>50</u>	20% 01	total cove	20	
Woody Vine Stratum (Plot size: 15 Tadius )				
1				
2				
3				
4.				
5				the described is
		Total Ca		Hydrophytic Vegetation
			ver	Present? Yes No
50% of total cover:	20% of	total cove	:	
Remarks: (If observed, list morphological adaptations bel	ow).			

Profile Desc	ription: (Describe t	o the depth	needed to docum	nent the i	ndicator	or confirm	the absence of	indicato	ors.)		
Depth	Matrix		Redox	K Features	<u>s</u>	12	Tantana		D		
(Inches) 0-16	10VR 2/1		<u> </u>	20		<u>Loc</u>			Rema	rks	
0.10	1011(2/1		.011( 4/0	20							
							·				
<sup>1</sup> Type: C=Co	oncentration, D=Deple	etion, RM=R	educed Matrix, MS	=Masked	Sand Gr	ains.	<sup>2</sup> Location: PL	=Pore L	ining, M=	Matrix	
Hydric Soil I	ndicators: (Applica	ble to all LI	Rs, unless other	wise not	ed.)		Indicators for	r Proble	matic Hy	dric So	oils°:
	(A1)		Polyvalue Bel	low Surfa	ce (S8) <b>(L</b>	.RR S, T, U		k (A9) <b>(L</b> )			
Black His	stic (A3)			/ Mineral	(F1) (LRF	1, 0) 2 O)		Vertic (F	(LKK 3) (18) (outs	ide M	LRA 150A.B)
Hydroge	n Sulfide (A4)		Loamy Gleye	d Matrix (	F2)	,	Piedmont	Floodpla	ain Soils (	F19) <b>(</b>	LRR P, S, T)
Stratified	Layers (A5)		Depleted Mat	rix (F3)			L Anomalou	us Bright	Loamy S	oils (F	20)
Organic	Bodies (A6) (LRR P,	T, U)	Redox Dark S	Surface (F	6)		(MLRA	153B)			
5 cm Mu	cky Mineral (A7) <b>(LR</b>	R P, T, U)	Depleted Darl	k Surface	(F7)			nt Mater	ial (TF2)	(TE40	N
	ck (A9) <b>(I RR P. T)</b>		Marl (F10) (I	8810115 (F	0)		Other (Fx	now Darr	Remarks)		)
	Below Dark Surface	(A11)	Depleted Och	ric (F11)	(MLRA 1	51)			(emaine)		
Thick Da	ark Surface (A12)		Iron-Mangane	ese Mass	es (F12) <b>(</b>	LRR O, P,	T) <sup>3</sup> Indicato	ors of hyd	drophytic	vegeta	tion and
Coast Pr	airie Redox (A16) (M	LRA 150A)	Umbric Surfac	ce (F13) (	LRR P, T	, U)	wetlan	d hydrol	ogy must	be pre	sent,
Sandy M	lucky Mineral (S1) <b>(L</b> leved Matrix (S4)	RR 0, S)		(F17) <b>(IVIL</b> tic (F18) <b>(</b>	.RA 151) MI PA 15	0A 150B)	unless	disturbe	d or prob	lematio	с.
Sandy C	edox (S5)		Piedmont Flo	odplain S	oils (F19)	(MLRA 14	9A)				
Stripped	Matrix (S6)		Anomalous B	right Loar	my Soils (	, F20) <b>(MLR</b>	A 149A, 153C, 15	53D)			
Dark Sur	face (S7) <b>(LRR P, S</b> ,	, T, U)					1				
Restrictive L	ayer (if observed):										
Type:			_				Hudria Sail Br	000nt2	Vac		No
Depth (int							Hydric Soli Pre	esent	Tes	<u> </u>	
Remarks.											

Project/Site: Site 2 - Siphon North (MBSD)	City/County: Belle Cha	asse, Plaquemines	Sampling Date: 28 February 2018
Applicant/Owner: CPRA		State: LA	Sampling Point: 9
Investigator(s): Benjamin Richard	Section, Township, Ran		4E
Landform (hillslope, terrace, etc.): leveed pasture	Local relief (concave, co	onvex, none): none	Slope (%): 0-1%
Subregion (LRR or MLRA): MLRA 151	9.649064	ona: -89.994721	Datum: NAD 83 UTM 16N
Soil Map Unit Name: Harahan clay, 0-1% slopes		NWI classifi	cation: N/A
Are climatic / hydrologic conditions on the site typical for this time	of year? Yes 🗸 No	(If no, explain in F	Remarks.)
Are Vegetation Soil or Hydrology signific	cantly disturbed? Are "N	Vormal Circumstances"	present? Yes 🗸 No
Are Vegetation Soil or Hydrology natural	lly problematic? (If per	aded explain any answe	ars in Remarks )
SUMMARY OF FINDINGS – Attach site map show	wing sampling point lo	ocations, transects	s, important features, etc.
Hydrophytic Vegetation Present? Yes No	/ Is the Sampled	Area	
Hydric Soil Present? Yes _ ✓ No	within a Wetland	d? Yes	No
Wetland Hydrology Present? Yes No			
Remarks:			
HYDROLOGY			
Wetland Hydrology Indicators:	I. A	Secondary Indica	ators (minimum of two required)
	oply)		Cracks (B6)
Surface Water (A1)     Aquatic Fauna     Aquatic Fauna     Marl Deposits	a (B13) (1945) <b>(1991))</b>	Drainage Pa	getated Concave Surface (B8)
High Water Table (A2)	fide Odor (C1)		inee (B16)
Water Marks (B1)	rospheres along Living Roots		Water Table (C2)
Sediment Deposits (B2)	Reduced Iron (C4)	Crayfish Bur	rrows (C8)
Drift Deposits (B3)	eduction in Tilled Soils (C6)	Saturation V	isible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	rface (C7)	Geomorphic	Position (D2)
Iron Deposits (B5)	n in Remarks)	Shallow Aqu	uitard (D3)
Inundation Visible on Aerial Imagery (B7)		FAC-Neutra	I Test (D5)
Water-Stained Leaves (B9)		🔟 Sphagnum r	moss (D8) <b>(LRR T, U)</b>
Field Observations:	ah a a).		
Surface water Present? Yes No Deptn (in	cnes):		
Water Table Present?     Yes     No     Depth (in       Seturation Present2     Yes     No     Vec	icnes):		
(includes capillary fringe)		liand Hydrology Prese	
Describe Recorded Data (stream gauge, monitoring well, aerial	photos, previous inspections)	, if available:	
Remarks:			

Sampling Point: 9

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 radius )	% Cover	Species?	Status	Number of Dominant Species
1				That Are OBL, FACW, or FAC: $\underline{\circ}$ (A)
2			·	Total Number of Dominant
3			. <u> </u>	Species Across All Strata: <u>2</u> (B)
4			·	Percent of Dominant Species
5			·	That Are OBL, FACW, or FAC: $0/2 = 0\%$ (A/B)
6			·	Prevalence Index worksheet:
7				Total % Cover of: Multiply by:
8				OBL species x 1 =
		= Total Cov	/er	FACW species x 2 =
50% of total cover:	20% of	total cover	:	FAC species x 3 =
Sapling/Shrub Stratum (Plot size: 15 Tadius )				FACU species x 4 =
1				$\frac{11}{12}$
2			·	Column Totals: (A) (B)
3				
4				Prevalence Index = B/A =
5				Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7				2 - Dominance Test is >50%
8				$\square$ 3 - Prevalence Index is $\leq 3.0^1$
		= Total Cov	/er	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover:	20% of	total cover	:	
Herb Stratum (Plot size: 5' radius )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. Cynodon dactylon	80	Υ	FACU	be present, unless disturbed or problematic.
2. Trifolium repens	30	Υ	FACU	Definitions of Four Vegetation Strata:
3. Oxalis corniculata	20	Ν	UPL	<b>Tree</b> Weady plants excluding vines 3 in (7.6 cm) or
4				more in diameter at breast height (DBH), regardless of
5.				height.
6.				Sapling/Shrub – Woody plants, excluding vines, less
7.				than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8.				Horb All borbaccours (non woody) plants, regardless
9.				of size, and woody plants less than 3.28 ft tall.
10.				
11.				Woody vine – All woody vines greater than 3.28 ft in height
12				holym
	130	- Total Cov	/er	
50% of total cover: 65	20% of	total cover	- 26	
Weedy Vine Stratum (Plot size: 15' radius	2078 01		•	
<u>woody vine Stratum</u> (Flot size. <u>*********</u> )				
1			·	
2				
3				
4			·	
5			·	Hydrophytic
		= Total Cov	/er	Present? Yes No
50% of total cover:	20% of	total cover	:	
Remarks: (If observed, list morphological adaptations be	low).			

Profile Desc	ription: (Describe	o the depth	needed to docum	ent the	indicator	or confirn	n the absence of	of indicato	rs.)	
Depth	Matrix		Redox	Feature	S		_			
(inches)	Color (moist)		Color (moist)	%	Type	Loc	Texture		Remarks	
0-10	10YR 2/1						clay			
10-18	10YR 3/1	1	0YR 5/8	30	RM	Μ	clay			
					·					
<sup>1</sup> Type: C=Co	oncentration, D=Dep	etion, RM=R	educed Matrix, MS	=Masked	d Sand Gr	ains.	<sup>2</sup> Location:	PL=Pore Li	ning, M=Matrix	Χ.
Hydric Soil I	ndicators: (Application)	able to all LI	RRs, unless other	wise not	ed.)		Indicators f	for Probler	natic Hydric S	Soils':
Histosol	(A1)		Polyvalue Bel	ow Surfa	ice (S8) <b>(L</b>	.RR S, T, I	U) <u> </u> 1 cm M	uck (A9) (L	RR O)	
Histic Ep	vipedon (A2)		Thin Dark Sur	face (S9	) (LRR S,	T, U)		uck (A10) (	LRR S)	
	stic (A3)			Mineral	(F1) <b>(LRF</b> (F2)	( O)		ed Vertic (F	18) <b>(outside N</b>	
	n Suinde (A4)		Loarny Gleyer     Loarny Gleyer	u Maliix ( riv (E3)	(FZ)			Int Flooupla	l namy Soils (F 19)	(LKK P, 3, 1)
	Bodies (A6) (I RR P	τ. υ)	Redox Dark S	Surface (F	-6)			A 153B)	Loanty Solis (I	20)
$\square$ 5 cm Mu	cky Mineral (A7) (LR	R P. T. U)		k Surface	e (F7)			rent Materi	al (TF2)	
	esence (A8) (LRR U	)	Redox Depres	ssions (F	8)		Verv St	nallow Dark	Surface (TF1)	2)
1 cm Mu	ck (A9) <b>(LRR P. T)</b>	,	Marl (F10) (LI	RR U)	0)		Other (	Explain in F	Remarks)	-/
Depleted	Below Dark Surface	e (A11)	Depleted Och	, ric (F11)	(MLRA 1	51)			,	
Thick Da	rk Surface (A12)		Iron-Mangane	ese Mass	es (F12) (	LRR O, P,	, <b>T)</b> <sup>3</sup> Indica	ators of hyd	rophytic veget	ation and
Coast Pr	airie Redox (A16) (N	ILRA 150A)	Umbric Surfac	ce (F13)	(LRR P, T	', U)	wetla	and hydrold	ogy must be pr	esent,
Sandy M	lucky Mineral (S1) <b>(L</b>	RR O, S)	Delta Ochric (	(F17) <b>(MI</b>	LRA 151)		unle	ss disturbe	d or problemat	ic.
Sandy G	leyed Matrix (S4)		Reduced Vert	tic (F18)	(MLRA 15	50A, 150B)	)			
Sandy R	edox (S5)		Piedmont Flor	odplain S	Soils (F19)	(MLRA 14	49A)			
	Matrix (S6)		Anomalous B	right Loa	my Soils (	F20) <b>(MLR</b>	RA 149A, 153C,	153D)		
Dark Sur	Tace (S7) (LRR P, S	, I, U)					1			
Type:	ayer (il observeu).									
Depth (inc	ches):		_				Hvdric Soil	Present?	Yes 🗸	No
Remarks:										
rtomanto.										

Project/Site: Site 2 - Siphon North (MBSD) City	y/County: Belle Chasse, Plaquemines Sampling Date: 28 February 2018
Applicant/Owner: CPRA	State: LA Sampling Point: 10
Investigator(s): Benjamin Richard Se	ction, Township, Range: S16 - T16S - R24E
Landform (hillslope, terrace, etc.): leveed pasture	cal relief (concave, convex, none): none Slope (%): 0-1%
Subregion (LRR or MLRA): MLRA 151 Lat: 29.64920	01 Long: -89.994624 Datum: NAD 83 UTM 16N
Soil Map Unit Name: Cancienne silty clay loam, 0-1% slopes	NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year?	? Yes No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly dis	sturbed? Are "Normal Circumstances" present? Yes 🗸 No
Are Vegetation . Soil . or Hydrology naturally proble	ematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing sa	ampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present?       Yes _ ✓ No         Hydric Soil Present?       Yes _ ✓ No         Wetland Hydrology Present?       Yes _ ✓ No         Remarks:       Image: Constraint of the second	Is the Sampled Area within a Wetland? Yes <u>Ves</u> No
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
High Water Table (A2)	→ RR U) LRR U)
Saturation (A3)	or (C1) Moss Trim Lines (B16)
Water Marks (B1)	s along Living Roots (C3)
Sediment Deposits (B2)	Iron (C4) Crayfish Burrows (C8)
	in Tilled Soils (C6)
Algal Mat or Crust (B4)	7) <u> </u>
Inundation Visible on Aerial Imagery (B7)	FAC-Neutral Test (D5)
Water-Stained Leaves (B9)	Sphagnum moss (D8) (LRR T, U)
Field Observations:	
Surface Water Present? Yes No _✓ Depth (inches):	
Water Table Present? Yes <u>✓</u> No Depth (inches): <u>1</u>	6
Saturation Present? Yes <u>√</u> No Depth (inches): <u>4</u>	Wetland Hydrology Present? Yes <u>V</u> No
Describe Recorded Data (stream gauge, monitoring well, aerial photos, p	previous inspections), if available:
Remarks:	

Sampling Point: <u>10</u>

	Absolute	Dominant Indicat	or Dominance Test worksheet:
Tree Stratum (Plot size: 30 radius )	% Cover	<u>Species?</u> Statu	S Number of Dominant Species
1		· ·	That Are OBL, FACW, or FAC: _1 (A)
2			Total Number of Dominant
3		·	Species Across All Strata: (B)
4		· ·	- Dereast of Deminent Species
5			— That Are OBL, FACW, or FAC: $1/1 = 100\%$ (A/B)
6			
7.			Prevalence Index worksheet:
8.			Total % Cover of:Multiply by:
		= Total Cover	OBL species x 1 =
50% of total cover:	20% c	of total cover:	FACW species x 2 =
Sapling/Shruh Stratum (Plot size: 15' radius )	2070 0		FAC species x 3 =
			FACU species x 4 =
l		· ·	UPL species x 5 =
2			Column Totals: (A) (B)
3		· ·	(-,
4			Prevalence Index = B/A =
5		·	Hydrophytic Vegetation Indicators:
6			— 1 - Rapid Test for Hydrophytic Vegetation
7			2 - Dominance Test is >50%
8			$-1$ $\overline{\Box}$ 3 - Prevalence Index is <3 0 <sup>1</sup>
		= Total Cover	$\square$ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover:	20% c	of total cover:	
Herb Stratum (Plot size: 5' radius )			
1 Juncus effusus	80	Y OBL	be present, unless disturbed or problematic.
2			Definitions of Four Vegetation Strata:
2		· ·	
		· ·	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
4		·	more in diameter at breast height (DBH), regardless of beight
5			
6		· ·	Sapling/Shrub – Woody plants, excluding vines, less
7		·	than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8			
9			of size, and woody plants less than 3.28 ft tall.
10			Woody vine All woody vince greater than 2.28 ft in
11.			height.
12			
	80	- Total Cover	—
50% of total cover: 40	20% c	$\frac{1}{10}$ f total cover: 16	
Weader)/inc. Strature (Dist size: 15' radius	20780		—
(Plot size. <u></u>			
1			—
2		·	_
3		· ·	
4			
5			– Hydrophytic
		= Total Cover	Vegetation
50% of total cover:	20% c	of total cover:	Present? Yes Ves No
Remarks: (If observed, list morphological adaptations bel	ow).		
	,		

Profile Desc	ription: (Describe t	o the depth	needed to docum	nent the	indicator	or confirm	n the absence o	of indicato	rs.)	
Depth	Matrix		Redox	k Feature	S					
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture		Remarks	
0-16	10YR 2/1	1	0YR 5/8	25	RM	Μ	clay			
					·					
·					·					
·					·					
<sup>1</sup> Type: C=C	oncentration, D=Depl	etion, RM=R	educed Matrix, MS	S=Masked	d Sand Gr	ains.	<sup>2</sup> Location: I	PL=Pore Li	ining, M=Matri	x.
Hydric Soil	Indicators: (Applica	ble to all LF	RRs, unless other	wise not	ed.)		Indicators f	or Probler	matic Hydric S	Soils <sup>3</sup> :
Histosol	(A1)		Polyvalue Be	low Surfa	ice (S8) <b>(L</b>	.RR S, T, l	<b>J) <u> </u> 1 cm M</b> ւ	uck (A9) <b>(L</b>	.RR O)	
Histic Ep	pipedon (A2)		Thin Dark Su	rface (S9	) (LRR S,	T, U)	2 cm Mi	uck (A10) <b>(</b>	(LRR S)	
Black Hi	stic (A3)		Loamy Mucky	/ Mineral	(F1) <b>(LRF</b>	R O)	Reduce	d Vertic (F	18) <b>(outside N</b>	ILRA 150A,B)
Hydroge	n Sulfide (A4)		Loamy Gleye	d Matrix	(F2)			nt Floodpla	ain Soils (F19)	(LRR P, S, T)
Stratified	d Layers (A5)		Depleted Mat	rix (F3)				ous Bright	Loamy Soils (I	=20)
	Bodies (A6) (LRR P,	T, U)	Redox Dark S	Surface (F	-6)			A 153B)		
	icky Mineral (A7) (LR	R P, T, U)	Depleted Dar	k Surface	∋ (⊢7)			rent Materi	al (TF2)	2)
	esence (A8) (LRR U)			SSIONS (F	8)			allow Dark		2)
	ICK (A9) <b>(LKK P, I)</b> 1 Below Dark Surface	(A11)		<b>KK U)</b> vric (E11)	(MI PA 1	51)		схріаін ін г	(emarks)	
	ark Surface (A12)			ese Mass	es (F12) (		T) <sup>3</sup> Indica	itors of hyd	Irophytic veget	ation and
Coast P	rairie Redox (A16) <b>(M</b>	LRA 150A)		ce (F13)	(LRR P. T	.U)	wetla	and hydrolo	pav must be pr	esent.
Sandy M	lucky Mineral (S1) (L	RR O, S)	Delta Ochric	(F17) <b>(MI</b>	_RA 151)	, -,	unles	ss disturbe	d or problemat	tic.
Sandy G	Bleyed Matrix (S4)		Reduced Ver	tic (F18)	(MLRA 15	60A, 150B)	)		·	
Sandy R	edox (S5)		Piedmont Flo	odplain S	Soils (F19)	(MLRA 14	49A)			
Stripped	Matrix (S6)		Anomalous B	right Loa	my Soils (	F20) (MLR	RA 149A, 153C,	153D)		
🔲 Dark Su	rface (S7) (LRR P, S,	, T, U)								
Restrictive I	_ayer (if observed):									
Туре:										
Depth (in	ches):						Hydric Soil F	Present?	Yes 🗸	No
Remarks:										

Project/Site: Site 1 - Pump Station (MBSD)	City/County: Be	elle Chasse, I	Plaquemines	Sampling Date:	6 March 2018
Applicant/Owner: CPRA		ç	<sub>State:</sub> LA	Sampling Point:	. 11
Investigator(s): Benjamin Richard	Section, Townsh	hip, Range: S	16 - T16S - R24	ŀΕ	
Landform (hillslope, terrace, etc.): none	Local relief (con	cave, convex,	<sub>none):</sub> none	Slo	pe (%): 0-1%
Subregion (LRR or MLRA). MLRA 151	29.660020	Long	90.010202	D	atum: NAD 83 UTM 16N
Soil Map Unit Name: Cancienne silty clay loam 0-1% slope	:S	Long	NWI classific	cation: N/A	
Are climatic / hydrologic conditions on the site typical for this time	e of year? Yes 🧹	No (	(If no, explain in R	emarks.)	
Are Vegetation , Soil , or Hydrology signifi	cantly disturbed?	Are "Normal	Circumstances"	present? Yes	✓ No
Are Vegetation Soil or Hydrology natura	ally problematic?	(If needed, e	xolain anv answe	rs in Remarks.)	
SUMMARY OF FINDINGS – Attach site map sho	wing sampling po	oint locatio	ons, transects	, important f	eatures, etc.
Hydrophytic Vegetation Present?       Yes No         Hydric Soil Present?       Yes No         Wetland Hydrology Present?       Yes No	──── Is the Sa ✓ within a	ampled Area Wetland?	Yes	No✓	_
Remarks:	<b>.</b>				
HYDROLOGY Wetland Hydrology Indicators:			Secondary Indica	ators (minimum o	f two required)
Primary Indicators (minimum of one is required; check all that a	pply)			Cracks (B6)	
High Water Table (A2)	s (B15) <b>(I RR U)</b>			tterns (B10)	Sunace (Bo)
Saturation (A3)	lfide Odor (C1)		Moss Trim L	ines (B16)	
U Water Marks (B1) Oxidized Rhi	zospheres along Living	g Roots (C3)	Dry-Season	Water Table (C2	)
Sediment Deposits (B2)	Reduced Iron (C4)		Crayfish Bur	rows (C8)	
Drift Deposits (B3)	Reduction in Tilled Soils	s (C6)	Saturation V	isible on Aerial In	nagery (C9)
Algal Mat or Crust (B4)	urface (C7)		Geomorphic	Position (D2)	
Iron Deposits (B5)	in in Remarks)		Shallow Aqu	itard (D3)	
Inundation Visible on Aerial Imagery (B7)			FAC-Neutral	Test (D5)	
Water-Stained Leaves (B9)			Sphagnum r	noss (D8) <b>(LRR</b> 1	Г, U)
Field Observations:					
Surrace Water Present? Yes No Depth (II	ncnes):	-			
Water Table Present? Yes No ▼ Depth (II	ncnes):	-	bedre te en Deserve		
Saturation Present? Yes No _ Depth (ii (includes capillary fringe)	nches):	Wetland H	lydrology Preser	nt? Yes	_ No <u>▼</u>
Describe Recorded Data (stream gauge, monitoring well, aerial	photos, previous inspe	ections), if avail	ilable:		
Remarks:					

Sampling Point.	Sam	pling	Point:	1	1
-----------------	-----	-------	--------	---	---

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: <u>30' radius</u> )	% Cover	Species?	Status	Number of Dominant Species
1. Quercus virginiana	5	Y	FACU	That Are OBL, FACW, or FAC: 0 (A)
2.				
3				Total Number of Dominant
				Species Across All Strata (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: $0/3 = 0\%$ (A/B)
6				Brovelence Index workshoot
7				
8				I otal % Cover of: Multiply by:
	5	= Total Co	ver	OBL species x 1 =
50% of total cover: 2.5	20% of	total cove	·· 1	FACW species x 2 =
Conting/Shruh Stratum (Plat size: 15' radius	2070 01		·	FAC species x 3 =
Sapling/Shrub Stratum (Plot size: 10 radius )				FACU species x 4 =
1				
2				
3				Column Totals: (A) (B)
4.				Drovolonco Index P/A -
5				
6				Hydrophytic Vegetation Indicators:
0				1 - Rapid Test for Hydrophytic Vegetation
7				2 - Dominance Test is >50%
8				3 - Prevalence Index is ≤3.0 <sup>1</sup>
		= Total Co	ver	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover:	20% of	total cover	:	
Herb Stratum (Plot size, 5' radius				
A Ranunculus sardous	30	N	FAC	Indicators of hydric soil and wetland hydrology must
	50	v	FACU	
				Definitions of Four Vegetation Strata:
3. Iritolium repens	80	Ŷ	FACU	<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or
4		-		more in diameter at breast height (DBH), regardless of
5				height.
6.				Sanling/Shrub - Woody plants, excluding vines, less
7				than 3 in. DBH and greater than 3.28 ft (1 m) tall.
··				
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10				Woody vine – All woody vines greater than 3.28 ft in
11				height.
12.				
	160	= Total Co	ver	
50% of total cover: 80	20% of		. 32	
50% of total cover.	20% 01			
Woody Vine Stratum (Plot size: 13 radius )				
1				
2				
3.				
4				
o				Hydrophytic Venetation
		= Total Co	ver	Vegetation Present? Yes No
50% of total cover:	20% of	total cover	:	
Remarks: (If observed, list morphological adaptations below	ow).			
	,			

Profile Desc	ription: (Describe t	o the depth	needed to docum	nent the	indicator	or confirm	n the absence	of indicators.)
Depth	Matrix		Redox	Feature	S1	. 2	_	
(inches)	Color (moist)	<u>%</u>	Color (moist)	%	Type'	Loc	Texture	Remarks
0-4	101R 4/3						ciay	
4-18	10YR 5/1		'.5YR 4/6	30	RM	M	clay	
					<u> </u>			
					·			
					·			
<sup>1</sup> Turney 0, 0				Maalua			<sup>2</sup> 1 continue	DI Dava Lizina M. Matrix
Type: C=CC Hydric Soil I	ncentration, D=Depi ndicators: (Applica	etion, RIVI=F	RRs. unless other	wise not	ed.)	ains.	Location:	for Problematic Hydric Soils <sup>3</sup> :
	(A1)			low Surfa	ice (S8) <b>(I</b>	RRSTI		Auck (A9) (I BB O)
Histic Ep	vipedon (A2)		Thin Dark Sur	rface (S9	) (LRR S,	T, U)	2 cm N	Auck (A10) (LRR S)
Black His	stic (A3)		Loamy Mucky	Mineral	(F1) (LRF	(O)	Reduc	ed Vertic (F18) (outside MLRA 150A,B)
Hydroge	n Sulfide (A4)		Loamy Gleye	d Matrix (	(F2)		Diedmo	ont Floodplain Soils (F19) (LRR P, S, T)
Stratified	Layers (A5)		Depleted Mat	rix (F3)			L Anoma	alous Bright Loamy Soils (F20)
Organic	Bodies (A6) (LRR P,	T, U)	Redox Dark S	Surface (F	-6)			RA 153B)
5 cm Mu	cky Mineral (A7) (LR	R P, T, U)	Depleted Darl	k Surface	e (F7)			arent Material (TF2)
	esence (A8) (LRR U)		Redox Depres	SSIONS (F	8)			hallow Dark Surface (TF12)
	Below Dark Surface	(A11)		кк <b>О)</b> uric (F11)	(MIRA 1	51)		
Thick Da	rk Surface (A12)	(,)	Iron-Mangane	ese Mass	es (F12) (	LRR O, P,	T) <sup>3</sup> Indic	ators of hydrophytic vegetation and
Coast Pr	airie Redox (A16) (M	ILRA 150A)	Umbric Surfa	ce (F13)	(LRR P, T	, U)	wet	land hydrology must be present,
Sandy M	lucky Mineral (S1) <b>(L</b>	RR O, S)	Delta Ochric (	(F17) <b>(MI</b>	_RA 151)		unle	ess disturbed or problematic.
Sandy G	leyed Matrix (S4)		Reduced Vert	tic (F18)	(MLRA 15	0A, 150B)	)	
Sandy R	edox (S5)		Piedmont Flor	odplain S	Soils (F19)	(MLRA 14	19A)	
Stripped	Matrix (S6)	<b>T</b> 10	Anomalous B	right Loa	my Soils (	F20) <b>(MLR</b>	A 149A, 153C	, 153D)
Restrictive I	aver (if observed)	, 1, 0)						
Type:								,
Depth (inc	ches):		_				Hydric Soil	Present? Yes No
Remarks:								

Project/Site: Site 1 - Pump Station (MBSD)	City/County: Belle	Chasse, Plaquemines	Sampling Date: 6 March 2018
Applicant/Owner: CPRA		State: LA	Sampling Point: 12
Investigator(s): Benjamin Richard	Section, Township,	Range: S16 - T16S - R24	E
Landform (hillslope, terrace, etc.): <u>none</u>	Local relief (concav	e, convex, none): none	Slope (%): 0-1%
Subregion (LRR or MLRA): MLRA 151 Lat:	29.660051	Lona: -90.009738	Datum: NAD 83 UTM 16N
Soil Map Unit Name: Cancienne silty clay loam 0-1% slop	bes	NWI classific	ation: N/A
Are climatic / hydrologic conditions on the site typical for this tin	ne of vear? Yes 🗸 N	o (If no, explain in R	emarks.)
Are Vegetation Soil or Hydrology signi	ficantly disturbed?	re "Normal Circumstances" r	present? Yes 🗸 No
Are Vegetation Soil or Hydrology natu	rally problematic?	f needed, explain any answe	rs in Remarks.)
SUMMARY OF FINDINGS – Attach site map sho	owing sampling poin	t locations, transects	, important features, etc.
Hydrophytic Vegetation Present?       Yes No         Hydric Soil Present?       Yes No         Wetland Hydrology Present?       Yes No         Remarks:       Image: No No	Is the Samp	led Area tland? Yes_✔	/ No
HYDROLOGY		Soondon India	tors (minimum of two required)
Wetland Hydrology Indicators:	analy)	Secondary Indica	Creake (BC)
	appiy)		Cracks (B6)
Aquatic Fau	ina (B13) ito (B15) <b>(I DD II)</b>		terna (B10)
$\square Saturation (A3) \qquad \square Hydrogen S$	Sulfide Odor (C1)		ines (B16)
Water Marks (B1)	nizospheres along Living Ro	$\square$ MOSS THILE	Water Table (C2)
$\square$ Sediment Deposits (B2) $\square$ Presence of	f Reduced Iron (C4)	Cravfish Bur	rows (C8)
$\square$ Drift Deposits (B3) $\square$ Recent Iron	Reduction in Tilled Soils (C	(a) $(b)$ $(c)$	sible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Surface (C7)	Geomorphic	Position (D2)
Iron Deposits (B5)	ain in Remarks)	Shallow Aqu	itard (D3)
Inundation Visible on Aerial Imagery (B7)	,	FAC-Neutral	Test (D5)
Water-Stained Leaves (B9)		🔲 Sphagnum n	noss (D8) <b>(LRR T, U)</b>
Field Observations:			
Surface Water Present? Yes No Depth	(inches):		
Water Table Present? Yes No _✓ Depth	(inches):		
Saturation Present? Yes No ✓ Depth	(inches):	Wetland Hydrology Preser	nt? Yes _✔_ No
Describe Recorded Data (stream gauge, monitoring well, aeria	al photos, previous inspection	ons), if available:	
Remarks:			

Sampling Point: 12

	Absolute	Dominant	Indicator	Dominance Test worksheet:	
Tree Stratum (Plot size: 30' radius )	% Cover	Species?	Status	Number of Dominant Species	
1	·			That Are OBL, FACW, or FAC: $\frac{2}{}$ (A	4)
2	<u> </u>			Total Number of Dominant	
3				Species Across All Strata: 2 (B	3)
4				Deveent of Deminent Species	
5				That Are OBL, FACW, or FAC: $2/2 = 100\%$ (A	4/B)
6					. ,
7				Prevalence Index worksheet:	
8.				Total % Cover of: Multiply by:	
		= Total Cov	er	OBL species x 1 =	
50% of total cover:	20% of	total cover:		FACW species x 2 =	
Sapling/Shrub Stratum (Plot size: 15' radius )				FAC species x 3 =	
1				FACU species x 4 =	
1	·		<u> </u>	UPL species x 5 =	
2	·			Column Totals: (A)	(B)
3	- <u> </u>				. ,
4	·			Prevalence Index = B/A =	
5	·			Hydrophytic Vegetation Indicators:	
6	·			1 - Rapid Test for Hydrophytic Vegetation	
7				✓ 2 - Dominance Test is >50%	
8				$\boxed{\square}$ 3 - Prevalence Index is $\leq 3.0^1$	
		= Total Cov	er	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
50% of total cover:	20% of	total cover:			
Herb Stratum (Plot size: 5' radius )				<sup>1</sup> Indiantors of hydric soil and watland hydrology mus	ot
1 Ranunculus sardous	5	Ν	FAC	be present, unless disturbed or problematic.	51
2 Eleocharis palustris	90	Y	OBL	Definitions of Four Vegetation Strata	
3 Alternanthera philoxeroides	40	Y	OBL		
A.	·			<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm	) or
4				height.	5 01
5	·				
6	·			<b>Sapling/Shrub</b> – Woody plants, excluding vines, let	SS
7	·				
8				Herb - All herbaceous (non-woody) plants, regardle	ess
9	<u> </u>			of size, and woody plants less than 3.28 ft tall.	
10				Woody vine – All woody vines greater than 3.28 ft i	in
11	. <u> </u>			height.	
12					
	135	= Total Cov	er		
50% of total cover: 67.5	20% of	total cover:	27		
Woody Vine Stratum (Plot size: 15' radius					
1.					
2	·				
3	·				
а	·				
4	·				
5	·			Hydrophytic	
		= Total Cov	er	Present? Yes No	
50% of total cover:	20% of	total cover:	<u> </u>		
Remarks: (If observed, list morphological adaptations belo	ow).				

Drefile Dees	rintian. (Deceriha)	<u>a tha dant</u>	h needed to decum	ant tha	indicator	or confirm		of indicators )
Profile Desc	ription: (Describe t	o the dept	n needed to docum		indicator	or contin	n the absence	or indicators.)
Depth (inchos)	Color (moist)	0/	Color (moist)	K Feature %	Typo <sup>1</sup>	$1 \text{ oc}^2$	Toxturo	Bomarks
				/0	Type			
0-2							organic	
2-18	10YR 4/1		10YR 5/8	20	RM	М	clay	
	·	<u> </u>						
							. <u> </u>	
		<u> </u>						
<sup>1</sup> Type: C=Co	oncentration, D=Depl	etion, RM=	Reduced Matrix, MS	=Masked	d Sand G	rains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
Hydric Soil I	ndicators: (Applica	ble to all I	RRs, unless other	wise not	ed.)		Indicators	s for Problematic Hydric Soils <sup>3</sup> :
Histosol	(A1)		Polyvalue Bel	low Surfa	ace (S8) <b>(</b> I	LRR S, T, I	<b>U) <u> </u> 1 cm №</b>	Muck (A9) <b>(LRR O)</b>
Histic Ep	pipedon (A2)		Thin Dark Su	rface (S9	) (LRR S,	T, U)	2 cm M	Muck (A10) <b>(LRR S)</b>
Black Hi	stic (A3)		Loamy Mucky	/ Mineral	(F1) (LRI	R O)	L Reduc	ced Vertic (F18) (outside MLRA 150A,B)
Hydroge	n Sulfide (A4)		Loamy Gleye	d Matrix (	(F2)		L Piedm	nont Floodplain Soils (F19) (LRR P, S, T)
Stratified	I Layers (A5)		Depleted Mat	rix (F3)			L Anoma	alous Bright Loamy Soils (F20)
Organic	Bodies (A6) (LRR P,	T, U)	Redox Dark S	Surface (F	F6)		(ML	RA 153B)
🔲 5 cm Mu	cky Mineral (A7) (LR	R P, T, U)	Depleted Dar	k Surface	e (F7)		L Red P	Parent Material (TF2)
Muck Pr	esence (A8) (LRR U)		Redox Depre	ssions (F	8)		L Very S	Shallow Dark Surface (TF12)
1 cm Mu	ck (A9) <b>(LRR P, T)</b>		<u> </u>	RR U)			Cther	(Explain in Remarks)
Depleted	Below Dark Surface	e (A11)	Depleted Och	ric (F11)	(MLRA 1	51)		
Thick Da	ark Surface (A12)		Iron-Mangane	ese Mass	ses (F12)	(LRR O, P	, <b>T)</b> <sup>3</sup> India	cators of hydrophytic vegetation and
Coast Pr	airie Redox (A16) (M	LRA 150A	) 📙 Umbric Surfa	ce (F13)	(LRR P, 1	Г, U)	we	tland hydrology must be present,
Sandy M	lucky Mineral (S1) (L	RR O, S)	Delta Ochric (	(F17) <b>(MI</b>	LRA 151)		unl	ess disturbed or problematic.
Sandy G	leyed Matrix (S4)		Reduced Ver	tic (F18)	(MLRA 1	50A, 150B	)	
Sandy R	edox (S5)		Piedmont Flo	odplain S	Soils (F19)	) <b>(MLRA</b> 14	49A)	
Stripped	Matrix (S6)		Anomalous B	right Loa	my Soils	(F20) <b>(MLF</b>	RA 149A, 153C	C, 153D)
Dark Su	face (S7) <b>(LRR P, S</b> ,	, T, U)						
Restrictive L	ayer (if observed):							
Туре:								/
Depth (inc	ches):						Hydric Soil	l Present? Yes 💙 No
Remarks:								

Project/Site: Site 1 - Pump Station (MBSD)	City/County: Belle C	hasse, Plaquemines	Sampling Date: 6 March 2018
Applicant/Owner: CPRA		State: LA	Sampling Point: 13
Investigator(s); Benjamin Richard	Section, Township, R	ange: S50 - T16S - R24	1E
Landform (hillslope, terrace, etc.); NONE	Local relief (concave.	convex. none); none	Slope (%): 0-1%
Subregion (LRR or MLRA). MLRA 151	8678	Long: -90.012892	Datum: NAD 83 UTM 16N
Soil Map Linit Name: Clovelly muck, 0-0.2% slopes, very freque	ntly flooded	NWI classific	eation: E2EM1P5
Are climatic / hydrologic conditions on the site typical for this time of yo	Nor2 Voc 🗸 No	(If no, ovalain in P	Pomarka )
Are Vegetetion Soil and are hydrology conditions on the site typical for this time of ye	disturbed?		
Are Vegetation, Soil, or Hydrology significantly	ulsiulded? Ale		
Are vegetation, Soli, or Hydrology naturally pro		needed, explain any answe	ers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing	sampling point	locations, transects	s, Important features, etc.
Hydrophytic Vegetation Present?       Yes        ✓       No         Hydric Soil Present?       Yes        ✓       No         Wetland Hydrology Present?       Yes        ✓       No	Is the Sample within a Wetla	ed Area and? Yes_ <b>_</b> ✔	No
Remarks:			
potentially spoil or fill material			
Wetland Hydrology Indicators:		Secondary Indica	ators (minimum of two required)
Primary Indicators (minimum of one is required: check all that apply)		Surface Soil	Cracks (B6)
Surface Water (A1)	3)	Sparsely Ve	getated Concave Surface (B8)
High Water Table (A2)	5) (LRR U)	Drainage Pa	tterns (B10)
Saturation (A3)	Ddor (C1)	Moss Trim L	ines (B16)
Water Marks (B1) Oxidized Rhizosph	eres along Living Roo	ts (C3) 🔲 Dry-Season	Water Table (C2)
Sediment Deposits (B2)	ced Iron (C4)	🔲 Crayfish Bur	rows (C8)
Drift Deposits (B3)	tion in Tilled Soils (C6	) 📃 Saturation V	isible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	(C7)	Geomorphic	Position (D2)
Iron Deposits (B5)	lemarks)	Shallow Aqu	itard (D3)
Inundation Visible on Aerial Imagery (B7)		✓ FAC-Neutral	Test (D5)
Water-Stained Leaves (B9)		Sphagnum r	noss (D8) <b>(LRR T, U)</b>
Field Observations:			
Surface Water Present? Yes <u>No Y</u> Depth (inches)	):		
Water Table Present? Yes <u>V</u> No <u>Depth</u> (inches)	): <u>14</u>		
Saturation Present? Yes Yes No Depth (inches)	): <u> </u>	etland Hydrology Preser	nt? Yes_▼ No
Describe Recorded Data (stream gauge, monitoring well, aerial photo	os, previous inspectior	ns), if available:	
Remarks:			

Sampling Point: 13

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30' radius )	% Cover	Species?	Status	Number of Dominant Species
1				That Are OBL, FACW, or FAC: (A)
2				Total Number of Dominant
3				Species Across All Strata: (B)
4.				
5.				Percent of Dominant Species That Are OBLE FACW or FAC: $4/4 = 100\%$ (A/B)
6				That Ale OBL, FACW, OF FAC. (A/B)
7				Prevalence Index worksheet:
7				Total % Cover of: Multiply by:
o				OBL species x 1 =
		= I otal Cov	rer	FACW species x 2 =
50% of total cover:	20% of	total cover	·	
Sapling/Shrub Stratum (Plot size: 15' radius )				
1. Baccharis halimifolia	50	Y	FAC	FACU species         x 4 =
2. Morella cerifera	30	Y	FAC	UPL species X 5 =
3				Column Totals: (A) (B)
4.				Dravalance Index - P/A -
5				
6				Hydrophytic Vegetation Indicators:
0				1 - Rapid Test for Hydrophytic Vegetation
7				
8				$\boxed{}$ 3 - Prevalence Index is $\leq 3.0^1$
	80	= Total Cov	rer	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover: 40	20% of	total cover	16	
Herb Stratum (Plot size: 5' radius )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. Eleocharis montevidensis	90	Y	FACW	be present, unless disturbed or problematic.
2 Solidago sempervirens	90	Y	FACW	Definitions of Four Vegetation Strata:
3				
				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
-				more in diameter at breast height (DBH), regardless of height
5				noight.
6				Sapling/Shrub – Woody plants, excluding vines, less
7		<u> </u>		than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10.				Weedy vine All weedy vince greater than 2.29 ft in
11.				height
12				
12.	180	- Total Ca		
<b>500</b> ( a f tatal annual 90			36	
50% of total cover: <u>50</u>	20% of	total cover		
Woody Vine Stratum (Plot size: 15 Tadius )				
1				
2				
3				
4				
5.				Hydrophytic
		- Total Cov	er	Vegetation
E0% of total acuar	200/ of			Present? Yes V No
	20% 0		·	
Remarks: (If observed, list morphological adaptations bel	ow).			

S	Ο	11	
-	-		

Profile Desc	ription: (Describe t	o the dept	h needed to docun	nent the i	ndicator	or confirm	the absence of	of indicators.)
Depth	Matrix		Redo	x Features	S1	2		
(inches)	Color (moist)		Color (moist)		Type'		<u>Texture</u>	Remarks
0-10	2.51 4/2	<u> </u>	101R 4/6	20	<u> </u>	65	sand	
10-18	2.5Y 4/1	<u> </u>					sand	
							·	
<sup>1</sup> Type: C=C	oncentration D=Depl	etion RM=	Reduced Matrix MS	S=Masked	Sand Gr	ains	<sup>2</sup> Location:	PI =Pore Lining M=Matrix
Hydric Soil	Indicators: (Applica	ble to all	LRRs, unless other	wise note	ed.)		Indicators f	for Problematic Hydric Soils <sup>3</sup> :
Histosol Histic Ep Black Hi Hydroge Stratified Organic 5 cm Mu Muck Pr 1 cm Mu Depleted Thick Da Coast Pi Sandy M Sandy G Sandy R Stripped	(A1) pipedon (A2) stic (A3) n Sulfide (A4) d Layers (A5) Bodies (A6) (LRR P, ncky Mineral (A7) (LR esence (A8) (LRR U) nck (A9) (LRR P, T) d Below Dark Surface ark Surface (A12) rairie Redox (A16) (M lucky Mineral (S1) (L eleved Matrix (S4) tedox (S5) Matrix (S6) rface (S7) (LRR P, S	T, U) R P, T, U) (A11) ILRA 150A RR O, S)	<ul> <li>Polyvalue Be</li> <li>Thin Dark Su</li> <li>Loamy Mucky</li> <li>Loamy Gleyee</li> <li>Depleted Math</li> <li>Redox Dark S</li> <li>Depleted Dar</li> <li>Redox Depre</li> <li>Marl (F10) (L</li> <li>Depleted Och</li> <li>Iron-Mangane</li> <li>Umbric Surfa</li> <li>Delta Ochric</li> <li>Reduced Ver</li> <li>Piedmont Flo</li> <li>Anomalous B</li> </ul>	low Surfac rface (S9) y Mineral I d Matrix ( trix (F3) Surface (F k Surface ssions (F4 <b>RR U)</b> nric (F11) ese Masse ce (F13) ( (F17) (ML tic (F18) ( odplain S right Loar	(KRR S, (F1) (LRR S, (F1) (LRR F2) (F7) 8) (MLRA 1 (LRR P, T (LRR P, T RA 151) MLRA 15 oils (F19) my Soils (	RR S, T, U T, U) O) LRR O, P, , U) (MLRA 14 F20) (MLR	<ul> <li>1 cm Mi</li> <li>2 cm Mi</li> <li>Reduce</li> <li>Piedmo</li> <li>Anomal</li> <li>(MLR</li> <li>Red Pa</li> <li>Very Sh</li> <li>Other (B</li> <li>T) <sup>3</sup>Indica</li> <li>wetla</li> <li>unles</li> <li>9A)</li> <li>A 149A, 153C,</li> </ul>	<ul> <li>Juck (A9) (LRR O)</li> <li>Juck (A10) (LRR S)</li> <li>Juck (A10) (LRR S)</li> <li>Juck (A10) (LRR S)</li> <li>Juck (F18) (outside MLRA 150A,B)</li> <li>Juck Floodplain Soils (F19) (LRR P, S, T)</li> <li>Jucus Bright Loamy Soils (F20)</li> <li><b>A 153B</b>)</li> <li>Trent Material (TF2)</li> <li>Juck Material (TF2)</li> <li>Juck</li></ul>
Restrictive I	aver (if observed):	, 1, 0)						
Type:								
Depth (ind	ches):						Hydric Soil F	Present? Yes 🖌 No
Remarks:								
po	otential spoil m	naterial						
1								
1								

le Chasse, Plaquemines Sampling Date: 7 March 2018
State: LA Sampling Point: 14
ip. Range: S6 - T16S - R25E
ave, convex, none): none Slope (%): 0-1%
Long: -89.967898 Datum: NAD 83 UTM 16N
NIWI classification: N/A
No (If no explain in Remarks )
Are Normal Circumstances present? res No
(If needed, explain any answers in Remarks.)
pint locations, transects, important features, etc.
mpled Area
Netland? Yes No
Secondary Indicators (minimum of two required)
Surface Soil Cracks (B6)
Sparsely Vegetated Concave Surface (B8)
Drainage Patterns (B10)
Moss Trim Lines (B16)
Roots (C3) Dry-Season Water Table (C2)
Crayfish Burrows (C8)
(C6) Saturation Visible on Aerial Imagery (C9)
Geomorphic Position (D2)
Shallow Aquitard (D3)
FAC-Neutral Test (D5)
Sphagnum moss (D8) (LRR T, U)
Wetland Hydrology Present? Yes
ctions), if available:

Sampling Point: 1	4
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	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30' radius )	% Cover	Species?	Status	Number of Dominant Species
1. Triadica sebifera	50	Y	FAC	That Are OBL, FACW, or FAC: <sup>8</sup> (A)
2 Quercus virginiana	10	N	FACU	
2				Total Number of Dominant
				Species Across All Strata: (B)
4	·			Percent of Dominant Species
5				That Are OBL, FACW, or FAC: $8/8 = 100\%$ (A/B)
6				Provolonce Index worksheet
7				
8				I otal % Cover of: Wultiply by:
	60	= Total Cov	er	OBL species x 1 =
50% of total cover: <sup>30</sup>	20% of	total cover:	12	FACW species x 2 =
Sapling/Shrub Stratum (Plot size: 15' radius				FAC species x 3 =
Triadica sebifera	40	Y	FAC	FACU species x 4 =
	20	V	FAC	UPL species x 5 =
	15			Column Totals: (A) (B)
	15			
4. Morella cerifera	20	Y	FAC	Prevalence Index = B/A =
5				Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7.				$\square$ 2. Deminance Test is $50\%$
8				
0	95	Total Car		<u> </u>
500/ // // // // // //			10	Problematic Hydrophytic Vegetation' (Explain)
50% of total cover: $\frac{47.5}{1}$	20% of	total cover:	19	
Herb Stratum (Plot size: 5 radius )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. Carex sp	5	Y	OBL	be present, unless disturbed or problematic.
2. Triadica sebifera	20	Υ	FAC	Definitions of Four Vegetation Strata:
3.				
4				I ree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH) regardless of
5				height.
5				Ŭ
б				<b>Sapling/Shrub</b> – Woody plants, excluding vines, less
7	<u> </u>			
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10				<b>Woody vine</b> – All woody vines greater than 3.28 ft in
11.				height.
12				ő
	25	- Total Cov	er	
500% of total any set 12.5	200/ -4		5	
50% of total cover: 12:0	20% 0	total cover	<u> </u>	
woody Vine Stratum (Plot size: 13 radius )	F	V	EAC	
1. Ampeiopsis arborea	5	Y	FAC	
2. Rubus trivialis	20	Y	FAC	
3				
4.				
5.				Hydrophytic
	25	- Total Cov	er	Vegetation
50% of total cover: 12.5	200/ of		5	Present? Yes V No
	20% 0			
Remarks: (If observed, list morphological adaptations belo	w).			

SOIL								
Profile Desc	ription: (Describe to	o the dept	h needed to docun	nent the in	ndicator	or confirm	n the absence	of indicators.)
Depth	Matrix		Redo:	<u>k Features</u>	; 1	1 2	<b>T</b>	Demeria
(inches)		%	Color (moist)		lype <sup>-</sup>		<u> </u>	Remarks
0-18	10YR 4/1		10YR 4/6	20	RM	M	silty clay	
·						·	·	
						·		
						·		
		·				·		
1							2	
Type: C=Co	oncentration, D=Deple	etion, RM=	Reduced Matrix, MS	S=Masked	Sand Gr	ains.	Location:	PL=Pore Lining, M=Matrix.
	indicators: (Applica		.KKS, unless other	wise note	.)			for Problematic Hydric Solis :
	(A1)		Polyvalue Be	low Surfac	e (S8) (I	_RR S, T, U		
	orpedon (A2)		I hin Dark Su	rface (S9)		1, U)		Muck (A10) (LRR S)
	STIC (A3)			/ Wineral (	F1) (LRF Ta)	( U)		
Hydroge	n Sulfide (A4)		Loamy Gleye	d Matrix (I	-2)			ont Floodplain Solis (F19) (LRR P, S, I)
	Layers (A5)	<b>T</b> 11)		FIX (F3)	<b>C</b> )			alous Bright Loamy Solis (F20)
	Bodies (A6) (LRR P,	1, U)		Surrace (F	0) (FZ)			RA 153B)
	icky ivineral (A7) (LRI	R P, I, U)		k Sunace	(F7)			
				SSIONS (FC	5)			(Fundaria in Demonstrate (TF12)
	ICK (A9) (LRR P, I)	(111)		KK U)		E4)		(Explain in Remarks)
	a Delow Dark Surface	(ATT)					T) <sup>3</sup> India	actors of hydrophytic vegetation and
	ark Surface (A12)	0 4 5 0 4				(LKK U, P,	, <b>i</b> ) indic	tand budrology must be present
	uola Minoral (S1) (IVI			(E17) (MI	LKK F, I DA 151)	, 0)	we	and hydrology must be present,
	lucky Willeral (ST) (LI	xx 0, 3)		(FI/) (IVIL Ho (E19) /I	KA 131) MIDA 46	0A 150D	un	ess disturbed of problematic.
				uc (F10) <b>(1</b> odploip Sc			(0.4.)	
	Motrix (S6)			right Loop	NIS (F19)		+9A) 2 A 140 A 1530	152D)
	rface (S7) <b>(I PP P S</b>	T 11)		nyni Luan	Ty Solis (		(A 149A, 1550	, 1550)
Restrictive I	aver (if observed):	1, 0)						
Type								_
Dopth (in	aboc):						Hydric Soil	Brosont2 Vos
Deptil (Int							Hydric 30ii	
Remarks:								

Project/Site: Site 5 - Highway 23 South (MBSD)	City/County: Belle Cha	asse, Plaquemines	Sampling Date: 7 March 2018			
Applicant/Owner: CPRA	State: LA Sampling Point: 15					
Investigator(s): Benjamin Richard and Joe Cancienne	Section, Township, Ran	<sub>ge:</sub> <u>S6 - T16S - R25</u>	E			
Landform (hillslope, terrace, etc.):	Local relief (concave, co	onvex, none): <u>none</u>	Slope (%): 0-1%			
Subregion (LRR or MLRA): MLRA 151 Lat: 29.65	2934 Lo	ona: -89.969522	Datum: NAD 83 UTM 16N			
Soil Map Unit Name: Cancienne silty clay loam, 0-1% slopes		NWI classifi	cation: N/A			
Are climatic / hydrologic conditions on the site typical for this time of y	ear? Yes 🖌 No 🔄	(If no, explain in I	Remarks.)			
Are Vegetation, Soil, or Hydrology significantly	/ disturbed? Are "N	Normal Circumstances"	present? Yes 🖌 No			
Are Vegetation, Soil, or Hydrology naturally pr	oblematic? (If nee	eded, explain any answ	ers in Remarks.)			
	n compling point lo	actions transact	important factures ato			
SUMMARY OF FINDINGS – Attach site map showing	g sampling point lo	cations, transects	s, important features, etc.			
Hydrophytic Vegetation Present?       Yes _ ✓ No         Hydric Soil Present?       Yes _ ✓ No         Wetland Hydrology Present?       Yes _ No _ ✓         Remarks:       Ves _ ✓ No _ ✓	Is the Sampled a within a Wetland	Area d? Yes	No			
HYDROLOGY						
Wetland Hydrology Indicators:		Secondary Indic	ators (minimum of two required)			
Primary Indicators (minimum of one is required; check all that apply)		Surface Soi	l Cracks (B6)			
Surface Water (A1)	13)	Sparsely Ve	egetated Concave Surface (B8)			
High Water Table (A2)	5) (LRR U)	(LRR U) Drainage Patterns (B10)				
Saturation (A3)	Ddor (C1) Moss Trim Lines (B16)					
Water Marks (B1)	neres along Living Roots	(C3) 🔟 Dry-Season	Water Table (C2)			
Sediment Deposits (B2)	ced Iron (C4)	Crayfish Bu	rrows (C8)			
	ction in Tilled Soils (C6)	/isible on Aerial Imagery (C9)				
Algal Mat or Crust (B4)	e (C7)	c Position (D2)				
Linundetian Visible on Aerial Imageny (BZ)	(emarks) Shallow Aquitard (D3)					
Motor Stoined Leaves (P0)		FAC-Neutra				
Field Observations:						
Surface Water Present? Ves No 🗸 Depth (inches	.).					
Weter Table Present? Ves No V Depth (inches	»)					
Saturation Present? Ves No ✓ Depth (inches	s)Wet	land Hydrology Prese	nt? Yes No			
(includes capillary fringe)	b) Wel	ianu nyurology riese				
Describe Recorded Data (stream gauge, monitoring well, aerial phot	os, previous inspections)	, if available:				
Remarks:						

Sam	plina	Point:	15
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	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30' radius )	% Cover	Species?	Status	Number of Dominant Species
1. Quercus nigra	15	Y	FAC	That Are OBL, FACW, or FAC: 9 (A)
2				Tatal New Jones ( Device at
3.				Species Across All Strata: 9 (B)
4	- <u> </u>			
5				Percent of Dominant Species $\frac{9}{9} = 100\%$
5				That Are OBL, FACW, or FAC: $3/3 = 100\%$ (A/B)
0				Prevalence Index worksheet:
· ·				Total % Cover of: Multiply by:
8	15			OBL species x 1 =
	15	= Total Cov	rer	
50% of total cover: <u>7.5</u>	20% of	total cover	3	
Sapling/Shrub Stratum (Plot size: 15' radius )				
1. Ligustrum sinense	40	Y	FAC	FACU species x 4 =
2. Acer negundo	30	Υ	FAC	UPL species x 5 =
3.				Column Totals: (A) (B)
4				Drevelagion Index D/A
5				Prevalence Index = B/A =
S				Hydrophytic Vegetation Indicators:
0				1 - Rapid Test for Hydrophytic Vegetation
7				2 - Dominance Test is >50%
8				$\boxed{}$ 3 - Prevalence Index is $\leq 3.0^1$
	70	= Total Cov	rer	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover: 35	20% of	total cover	14	
Herb Stratum (Plot size: 5' radius )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. Acer negundo	10	Υ	FAC	be present, unless disturbed or problematic.
2. Triadica sebifera	10	Υ	FAC	Definitions of Four Vegetation Strata:
3 Rubus trivialis	10	Y	FAC	
✓ Toxicodendron radicans	10	Y	FAC	<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or
Guercus nigra	10	Y	FAC	height.
5. <u>4000000 mg/d</u>				
6				<b>Sapling/Shrub</b> – Woody plants, excluding vines, less
7				than 3 in. DBH and greater than 3.28 it (1 m) tail.
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10				Woody vine – All woody vines greater than 3.28 ft in
11				height.
12.				
	50	= Total Cov	er	
50% of total cover: 25	20% of	total cover	10	
Weady Vine Stratum (Plat size: 15' radius	2070 01		·	
Rubus trivialis	25	Y	FAC	
1	20		TAO	
2				
3				
4				
5				Hydrophytic
	25	= Total Cov	rer	Vegetation
50% of total cover: 12.5	20% of	total cover	5	Present? Yes V No
Pamarke: (If absorved, list marphalagical adaptations half			· · · · · · · · · · · · · · · · · · ·	
Remarks. (II observed, list morphological adaptations beit	Jvv).			

Profile Desc	ription: (Describe t	o the depth	needed to docur	nent the	indicator	or confirm	n the absence	of indicators.)
Depth	Matrix		Redo	x Feature	S			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-18	10YR 4/2	1	0YR 5/6	20	RM	Μ	clay	
·	·					·		
·						·		
					·	·		
<sup>1</sup> Type: C=C	oncentration, D=Deple	etion, RM=R	educed Matrix, M	S=Masked	d Sand Gr	ains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
Hydric Soil	Indicators: (Applica	ble to all Ll	RRs, unless othe	rwise not	ed.)		Indicators	for Problematic Hydric Soils <sup>3</sup> :
Histosol	(A1)		Polyvalue Be	low Surfa	ice (S8) <b>(I</b>		U) 🛄 1 cm M	1uck (A9) <b>(LRR O)</b>
Histic Ep	pipedon (A2)		Thin Dark Su	irface (S9	) (LRR S,	T, U)	2 cm N	luck (A10) <b>(LRR S)</b>
🔲 Black Hi	stic (A3)		Loamy Muck	y Mineral	(F1) (LRF	R O)	L Reduce	ed Vertic (F18) (outside MLRA 150A,B)
Hydroge	en Sulfide (A4)		Loamy Gleye	ed Matrix (	(F2)		L Piedmo	ont Floodplain Soils (F19) (LRR P, S, T)
Stratified	d Layers (A5)		Depleted Ma	trix (F3)			L Anoma	lous Bright Loamy Soils (F20)
Organic	Bodies (A6) (LRR P,	T, U)	Redox Dark	Surface (F	=6)			RA 153B)
5 cm Mu	icky Mineral (A7) (LR	R P, T, U)	Depleted Da	rk Surface	e (F7)			arent Material (TF2)
Muck Pr	esence (A8) (LRR U)			essions (F	8)		U Very S	hallow Dark Surface (TF12)
	ick (A9) <b>(LRR P, T)</b>	( )	<u> </u>	.RR U)		54)	Uther (	Explain in Remarks)
	D Below Dark Surface	(A11)					T) <sup>3</sup> India	ators of hydrophytic vagatation and
	rairia Redox (A12)	I PA 150A)			(1 <b>DD D 1</b>	LKK U, F,	, I) ITUIC	alors of hydrophytic vegetation and
	Aucky Mineral (S1) (N	RROSI		(F17) <b>(MI</b>	RA 151)	, 0)	unle	and hydrology must be present,
Sandy C	Heved Matrix (S4)	((( <b>0</b> , <b>0</b> )		(F18)	(MI RA 1	50A. 150B)		
Sandy B	edox (S5)		Piedmont Flo	odplain S	Soils (F19)	(MLRA 14	, 49A)	
	Matrix (S6)		Anomalous E	Bright Loa	mv Soils (	F20) (MLR	RA 149A. 153C.	. 153D)
Dark Su	rface (S7) (LRR P, S,	T, U)		5	<b>,</b> ,	-/ (	-,	,,
Restrictive	Layer (if observed):							
Туре:								1
Depth (in	ches):						Hydric Soil	Present? Yes <b>V</b> No
Remarks	/						,	
r tomanto.								

Project/Site: Site 4 - Highway 23 North (MBSD)	_ City/County: Belle Chasse, Plaquemines Sampling Date: 7 March 2018				
Applicant/Owner: CPRA	State: LA Sampling Point: 16				
Investigator(s): Benjamin Richard and Joe Cancienne	Section, Township, Range: S5 - T16S - R25E				
Landform (hillslope, terrace, etc.):	Local relief (concave, convex, none): <u>none</u> Slope (%): <u>0-1%</u>				
Subregion (LRR or MLRA): MLRA 151 Lat: 29.66	0573 Long: -89.973292 Datum: NAD 83 UTM 16N				
Soil Map Unit Name: Cancienne silty clay loam, 0-1% slopes	NWI classification: N/A				
Are climatic / hydrologic conditions on the site typical for this time of ye	ear? Yes 🗸 No (If no, explain in Remarks.)				
Are Vegetation , Soil , or Hydrology significantly	v disturbed? Are "Normal Circumstances" present? Yes ✓ No				
Are Vegetation . Soil . or Hydrology naturally pr	oblematic? (If needed, explain any answers in Remarks.)				
SUMMARY OF FINDINGS Attach site man showing	a compliant point locations, transports, important factures, at				
SUMMARY OF FINDINGS – Attach site map snowing	j sampling point locations, transects, important features, etc.				
Hydrophytic Vegetation Present? Yes No	is the Sampled Area				
Hydric Soil Present? Yes No ✓	within a Wetland? Ves No				
Wetland Hydrology Present?   Yes No					
Remarks:					
HYDROLOGY					
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)				
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)				
Surface Water (A1)	3) Sparsely Vegetated Concave Surface (B8)				
High Water Table (A2)	5) (LRR U)				
L Saturation (A3) Hydrogen Sulfide (	Jdor (C1) Moss Trim Lines (B16)				
	leres along Living Roots (C3) $\square$ Dry-Season Water Table (C2)				
	$\Box$ Clayisti Bullows (C6)				
Algo Mat or Crust (B4)	(C7)				
$\square$ Algal Mat of Clust (B4) $\square$ Thin Muck Sufface	Parates)				
$\Box$ Inundation Visible on Aerial Imagery (B7)					
Water-Stained Leaves (B9)					
Field Observations:					
Surface Water Present? Yes No Depth (inches	.):				
Water Table Present? Yes No _ ✓ Depth (inches	.):				
Saturation Present? Yes No _✓ Depth (inches (includes capillary fringe)	): Wetland Hydrology Present? Yes No				
Describe Recorded Data (stream gauge, monitoring well, aerial photo	os, previous inspections), if available:				
Remarks:					

Sampling Po	int: 16
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	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: <u>30' radius</u> )	% Cover	Species?	Status	Number of Dominant Species
1. Triadica sebifera	20	Y	FAC	That Are OBL, FACW, or FAC: <u>5</u> (A)
2. Carya aquatica	5	N	OBL	Total Number of Dominant
3. Liquidambar styraciflua	15	Y	FAC	Species Across All Strata: (B)
4				Demonst of Dominant Spacing
5				That Are OBL, FACW, or FAC: $5/7 = 71.4\%$ (A/B)
6				
7				Prevalence Index worksheet:
8.				Total % Cover of:Multiply by:
	40	= Total Cov	er	OBL species x 1 =
50% of total cover: <sup>20</sup>	20% of	total cover	8	FACW species x 2 =
Sapling/Shrub Stratum (Plot size: 15' radius )				FAC species x 3 =
1 Callicarpa americana	10	Y	FACU	FACU species x 4 =
<ul> <li>Triadica sebifera</li> </ul>	5	N	FAC	UPL species x 5 =
2. Liquidambar styraciflua	30	Y	FAC	Column Totals: (A) (B)
	00	<u> </u>	1710	
4	·			Prevalence Index = B/A =
5	·			Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7	·			✓ 2 - Dominance Test is >50%
8				$\overline{\Box}$ 3 - Prevalence Index is $\leq 3.0^{1}$
	45	= Total Cov	er	$\square$ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover: 22.5	20% of	total cover:	9	
Herb Stratum (Plot size: 5' radius )				
1 Callicarpa americana	20	Ν	FACU	be present, unless disturbed or problematic.
<ul> <li>Toxicodendron radicans</li> </ul>	20	N	FAC	Definitions of Four Vagatation Strata:
2. Acer negundo	20	N	FAC	Demittoris of Four Vegetation Strata.
3. <u>Figures</u>	5	<u>N</u>	FAC	Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or
4. Ligustum sinense	15			more in diameter at breast height (DBH), regardless of
5. Allum vineale	10		FACU	neight.
6. Potentilla Indica	80	Y	FACU	Sapling/Shrub - Woody plants, excluding vines, less
7				than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10				Woody vine - All woody vines greater than 3.28 ft in
11.				height.
12.				
	160	= Total Cov	er	
50% of total cover: 80	20% of	total cover	32	
Weedy Vine Stratum (Plot size: 15' radius	2070.01			
Vitis rotundifolia	25	Y	FAC	
Toxicodendron radicans	5	N	FAC	
	<u> </u>			
3. Smilax laurifolia	15	Y	FACW	
4	·			
5				Hydrophytic
	45	= Total Cov	er	Vegetation
50% of total cover: 22.5	20% of	total cover:	9	Present? Yes V No
Remarks: (If observed, list morphological adaptations belo	w).			
, , , , , , , , , , , , , , , , , , ,	,			

Profile Desc	ription: (Describe t	o the depth	needed to docur	nent the i	indicator	or confirm	the absence	of indicators.)
Depth	Matrix	p.	Redo	x Feature	s			
(inches)	Color (moist)	%	Color (moist)	<u>%</u>	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-5	10YR 4/3						clay	
5-18	10YR 4/2		10YR 4/6	15	RM	М	clav	
		<u> </u>			·	·	·	
						·		
						·	·	
17							21	Die Deutschleine M. Martin
Type: C=Co	oncentration, D=Deple	etion, RM=F	Reduced Matrix, MS	S=Masked	d Sand Gi	ains.	Location:	PL=Pore Lining, M=Matrix.
					eu.)			
	$(A^{1})$			urface (So	Ce (58) (I	- KK 5, I, U T II)	$D_{2}$ cm N	1uck (A9) (LRR O)
	stic ( $\Delta$ 3)			Mineral	(E1) (I RI	2 ()		ed Vertic (E18) (outside MI RA 150A B)
	n Sulfide (A4)			d Matrix (	(F2)	(0)		ont Floodplain Soils (F19) (I BR P. S. T)
	Lavers (A5)		Depleted Mar	trix (F3)	/			alous Bright Loamv Soils (F20)
Organic	Bodies (A6) (LRR P,	T, U)	Redox Dark	Surface (F	-6)		(MLF	RA 153B)
5 cm Mu	icky Mineral (A7) (LR	R P, T, U)	Depleted Dar	rk Surface	, (F7)		Red Pa	arent Material (TF2)
Muck Pr	esence (A8) (LRR U)		Redox Depre	essions (F	8)		U Very S	hallow Dark Surface (TF12)
🔲 1 cm Mu	ick (A9) <b>(LRR P, T)</b>		Marl (F10) <b>(L</b>	.RR U)			Other (	(Explain in Remarks)
Depleted	d Below Dark Surface	e (A11)	Depleted Och	nric (F11)	(MLRA 1	51)		
Thick Da	ark Surface (A12)		Iron-Mangan	ese Mass	es (F12)	(LRR O, P,	T) <sup>3</sup> Indic	ators of hydrophytic vegetation and
Coast Pr	rairie Redox (A16) (M	LRA 150A)	Umbric Surfa	ce (F13)	(LRR P, 1	', U)	wet	land hydrology must be present,
Sandy M	lucky Mineral (S1) (L	RR O, S)	Delta Ochric	(F17) <b>(ML</b>	RA 151)		unle	ess disturbed or problematic.
Sandy G	leyed Matrix (S4)		Reduced Ver	tic (F18) (		00A, 150B)	0.4)	
	Motrix (S6)			ariaht Loo	ouis (F19)		9A) A 140A 153C	152D)
	rface (S7) <b>/I RR P S</b>	т н)		ngni Lua	Thy Solis (		A 149A, 155C	, 1550)
Restrictive L	aver (if observed):	1,0)					1	
Type <sup>.</sup>								
Depth (inc	ches).						Hydric Soil	Present? Yes No
Bomorko:							Tryane con	
Remarks:								

Project/Site: Site 4 - Highway	y 23 North	(MBSD)	C	ity/County: Belle	e Chasse, Pl	aquemines	Sampling Date:	7 March 2018
Applicant/Owner: CPRA					St	ate: LA	Sampling Point:	17
Investigator(s): Benjamin Ric	hard and	Joe Canc	ienne s	Section. Township	. Range: S5	- T16S - R25	E	
Landform (hillslope, terrace, etc	c.):		L	ocal relief (conca	ive, convex, no	one): none	Slor	<sub>be (%):</sub> 0-1%
Subregion (LRR or MLRA). ML	_RA 151		Lat. 29.6610	023	Long89	9.973491	Da	NAD 83 UTM 16N
Soil Map Linit Name: Cancien	ne silty cla	ay loam, (	2		Long	NI//L clossifi	ication: N/A	
			for this time of use	-2 Yes 🖌	NI- (16			
Are climatic / nydrologic conditi	ons on the s	site typical	for this time of yea	r? Yes <u>*</u> 1	NO (If	no, explain in i	Remarks.)	
Are Vegetation, Soil	, or Hyd	drology	significantly d	isturbed?	Are "Normal C	ircumstances"	present? Yes	• No
Are Vegetation, Soil	, or Hyd	drology	naturally prob	lematic?	(If needed, exp	olain any answ	ers in Remarks.)	
SUMMARY OF FINDING	S – Atta	ich site	map showing	sampling poi	int location	s, transect	s, important fe	eatures, etc.
Hydrophytic Vegetation Prese Hydric Soil Present? Wetland Hydrology Present? Remarks:	int?	Yes <u>√</u> Yes <u>√</u> Yes <u>√</u>	No No No	Is the Sam within a W	pled Area etland?	Yes	No	_
HYDROLOGY								
Wetland Hydrology Indicato					S	econdary India	entors (minimum of	two required)
Primary Indicators (minimum)	of one is rec	nuired: che	eck all that apply)		Ξ	Condary mail	Cracks (B6)	two required)
Surface Water (A1)	01 0110 10 10 10		quatic Fauna (B13)		Ì	Charsely Ve	related Concave	Surface (B8)
High Water Table (A2)			larl Deposits (B15)	(LRR U)	Ē	Drainage Pa	atterns (B10)	Sundoo (Bo)
Saturation (A3)		Пн	vdrogen Sulfide Oc	dor (C1)	Γ	Moss Trim I	Lines (B16)	
Water Marks (B1)		<u> </u>	xidized Rhizospher	res along Living F	Roots (C3)	Dry-Season	Water Table (C2)	
Sediment Deposits (B2)		🔲 Р	resence of Reduce	d Iron (C4)	<u> </u>	Crayfish Bu	rrows (C8)	
Drift Deposits (B3)		П R	ecent Iron Reduction	on in Tilled Soils	(C6)	Saturation \	/isible on Aerial Im	nagery (C9)
Algal Mat or Crust (B4)		🔲 т	hin Muck Surface (	C7)		Geomorphic	c Position (D2)	
Iron Deposits (B5)		<u> </u>	ther (Explain in Re	marks)	Γ	Shallow Aq	uitard (D3)	
Inundation Visible on Aer	ial Imagery	(B7)			<u> </u>	FAC-Neutra	al Test (D5)	
✓ Water-Stained Leaves (B	.9)					Sphagnum	moss (D8) <b>(LRR T</b>	<sup>-</sup> , U)
Field Observations:								
Surface Water Present?	Yes	No	Depth (inches):	2				
Water Table Present?	Yes <u> </u>	_ No	Depth (inches):	2				
Saturation Present? (includes capillary fringe)	Yes 🗡	_ No	Depth (inches):	0	Wetland Hy	drology Prese	ent? Yes <u>▼</u>	No
Describe Recorded Data (stre	am gauge,	monitoring	well, aerial photos	, previous inspec	tions), if availa	ıble:		
Remarks:								

Sampling Point: 1
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	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: <u>30' radius</u> )	% Cover	Species?	Status	Number of Dominant Species
1. Acer rubrum	35	Y	FAC	That Are OBL, FACW, or FAC: _8 (A)
2. Quercus michauxii	10	Y	FACW	Total Number of Dominant
3				Species Across All Strata: 8 (B)
4				Percent of Dominant Species
5				That Are OBL. FACW. or FAC: $8/8 = 100\%$ (A/B)
6				
7				Prevalence Index worksheet:
8.				Total % Cover of:Multiply by:
	45	= Total Cov	ver	OBL species x 1 =
50% of total cover: 22.5	20% of	total cover	9	FACW species x 2 =
Sapling/Shrub Stratum (Plot size: 15' radius )			·	FAC species x 3 =
1 Triadica sebifera	30	Y	FAC	FACU species x 4 =
<ul> <li>Baccharis halimifolia</li> </ul>	15	Y	FAC	UPL species x 5 =
2.				Column Totals: (A) (B)
3				
4				Prevalence Index = B/A =
5				Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7				☑ 2 - Dominance Test is >50%
8				$\square$ 3 - Prevalence Index is $\leq 3.0^1$
	45	= Total Cov	ver	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover: 22.5	20% of	total cover	9	
Herb Stratum (Plot size: 5' radius )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. Limnobium spongia	30	Y	OBL	be present, unless disturbed or problematic.
2. Helenium autumnale	20	Y	FACW	Definitions of Four Vegetation Strata:
3 Carex sp	20	Y	OBL	
Δ Iris fulva	10	Y	OBL	<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or
				height.
5				
0				<b>Sapling/Shrub</b> – Woody plants, excluding vines, less
/				
8				Herb – All herbaceous (non-woody) plants, regardless
9		. <u> </u>		of size, and woody plants less than 3.28 ft tall.
10				Woody vine – All woody vines greater than 3.28 ft in
11				height.
12				
	80	= Total Cov	ver	
50% of total cover: 40	20% of	total cover	16	
Woody Vine Stratum (Plot size: 15' radius )				
1.				
2.				
3				
A		·		
5		Tatal Car		Hydrophytic Vegetation
			er	Present? Yes No No
50% of total cover:	20% of	total cover		
Remarks: (If observed, list morphological adaptations belo	w).			

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)         Depth       Matrix       Redox Features         (inches)       Color (moist)       %       Type <sup>1</sup> Loc <sup>2</sup> Texture       Remarks         0-18       10YR 3/1       10YR 4/6       15       RM       M       silty clay	
Color (moist)     %     Color (moist)     %     Type <sup>1</sup> Loc <sup>2</sup> Texture     Remarks       0-18     10YR 3/1     10YR 4/6     15     RM     M     silty clay	
0-18         10YR 3/1         10YR 4/6         15         RM         M         silty clay	
<sup>1</sup> Type: C-Concentration D-Depletion RM-Reduced Matrix MS-Masked Sand Grains <sup>2</sup> Location: PL-Pore Lining M-Matrix	—
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils <sup>3</sup> :	
Histosol (A1) Polyvalue Below Surface (S8) (LRR S, T, U) 1 cm Muck (A9) (LRR O)	
Histic Epipedon (A2) Thin Dark Surface (S9) (LRR S, T, U) 2 cm Muck (A10) (LRR S)	
Black Histic (A3) Loamy Mucky Mineral (F1) (LRR O)	A,B)
Hydrogen Sulfide (A4)     Loamy Gleyed Matrix (F2)     Piedmont Floodplain Soils (F19) (LRR P, 1     Stratified Lavers (A5)     Depleted Matrix (F3)     Depleted Matrix (F3)	i, I)
Organic Bodies (A6)       (AB)         Organic Bodies (A6)       (AB)         Redox Dark Surface (F6)       (MLRA 153B)	
5 cm Mucky Mineral (A7) (LRR P, T, U) Depleted Dark Surface (F7) Red Parent Material (TF2)	
Muck Presence (A8) (LRR U) Redox Depressions (F8)	
I cm Muck (A9) (LRR P, T)     Marl (F10) (LRR U)     Other (Explain in Remarks)     Depleted Below Dark Surface (A11)     Depleted Ochric (F11) (MI RA 151)	
Thick Dark Surface (A12)	
Coast Prairie Redox (A16) (MLRA 150A) Umbric Surface (F13) (LRR P, T, U) wetland hydrology must be present,	
Sandy Mucky Mineral (S1) (LRR O, S) Delta Ochric (F17) (MLRA 151) unless disturbed or problematic.	
Sandy Gleyed Matrix (S4) Reduced Vertic (F18) (MLRA 150A, 150B)	
Stripped Matrix (S6)	
Dark Surface (S7) (LRR P, S, T, U)	
Restrictive Layer (if observed):	
Type:	
Depth (inches): No	
Remarks:	

Project/Site: Site 5 - Highway 23 South (MBSD) Applicant/Owner: CPRA Investigator(s): Benjamin Richard and Joe Cancienne Landform (hillslope, terrace, etc.): Lat: 29.652 Subregion (LRR or MLRA): MLRA 151 Soil Map Unit Name: Cancienne silty clay loam, 0-1% slopes Are climatic / hydrologic conditions on the site typical for this time of yea Are Vocatation Soil or the site typical for this time of yea	City/County:       Belle Chasse, Plaquemines       Sampling Date:       7 March 2018         State:       LA       Sampling Point:       18         Section, Township, Range:       S6 - T16S - R25E       Slope (%):       0-1%         Local relief (concave, convex, none):       none       Slope (%):       0-1%         2715       Long:       -89.971046       Datum:       NAD 83 UTM 16N         ar?       Yes       ✓       No       (If no, explain in Remarks.)         disturbed?       Are "Nermel Circumstances" present?       Yes       ✓
Are Vegetation, Soli, or Hydrology significantly of Are Vegetation, Soli, or Hydrology significantly or Are Vegetation, Soli, or Hydrology significantly of Are Vegetation, Soli, or Hydrology significantly of Are Vegetation, Soli, or Hydrology significantly of Are Vegetation, Soli, Soli _	blematic? (If needed, explain any answers in Remarks.)
SUMMARY OF EINDINGS Attach site man showing	compling point locations, transacts, important factures, ato
Hydrophytic Vegetation Present?     Yes /     No       Hydric Soil Present?     Yes /     No       Wetland Hydrology Present?     Yes     No       Remarks:     Image: Stream of the second	Is the Sampled Area within a Wetland? Yes No
HYDROLOGY         Wetland Hydrology Indicators:         Primary Indicators (minimum of one is required; check all that apply)         Surface Water (A1)       Aquatic Fauna (B13)         High Water Table (A2)       Marl Deposits (B15)         Saturation (A3)       Hydrogen Sulfide O         Vater Marks (B1)       Oxidized Rhizosphe         Drift Deposits (B2)       Presence of Reduce         Algal Mat or Crust (B4)       Thin Muck Surface         Inundation Visible on Aerial Imagery (B7)       Water-Stained Leaves (B9)	Secondary Indicators (minimum of two required)         Surface Soil Cracks (B6)         Sparsely Vegetated Concave Surface (B8)         Drainage Patterns (B10)         udor (C1)         moder (C1)         eres along Living Roots (C3)         ed Iron (C4)         ion in Tilled Soils (C6)         (C7)         emarks)         FAC-Neutral Test (D5)         Shallow Aquitard (D3)         FAC-Neutral Test (D5)
Field Observations:         Surface Water Present?       Yes No _ ✓ Depth (inches)         Water Table Present?       Yes No _ ✓ Depth (inches)         Saturation Present?       Yes No _ ✓ Depth (inches)         (includes capillary fringe)       Describe Recorded Data (stream gauge, monitoring well, aerial photo         Remarks:       Remarks:	

Sampling Point: 18

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum     (Plot size:)       1	<u>% Cover</u>	<u>Species?</u>	<u>Status</u>	Number of Dominant Species That Are OBL, FACW, or FAC: (A)
2 3				Total Number of Dominant Species Across All Strata: <u>4</u> (B)
4 5.				Percent of Dominant Species That Are OBL EACW or EAC: $4/4 = 100\%$ (A/B)
6				
7				Prevalence Index worksheet:
8				Total % Cover of: Multiply by:
		= Total Co	ver	OBL species x 1 =
50% of total cover:	20% of	total cover	r:	FACW species x 2 =
Sapling/Shrub Stratum (Plot size: 15' radius )				FAC species x 3 =
1				FACU species x 4 =
2.	_			UPL species x 5 =
3.				Column Totals: (A) (B)
4				Prevalence Index = B/A =
5				Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7				✓ 2 - Dominance Test is >50%
8				$\Box$ 3 - Prevalence Index is ≤3.0 <sup>1</sup>
		= Total Co	ver	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover:	20% of	total cover	:: <u> </u>	
Herb Stratum (Plot size: 5' radius ) 1. Trifolium repens	90	Y	FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. Andropogon glomeratus	30	Y	FACW	Definitions of Four Vegetation Strata:
3. Rubus trivialis	30	Y	FAC	Tree Marcharlante evolution vince 2 in (7.0 em) en
4. Cirsium vulgare	30	Y	FAC	more in diameter at breast height (DBH), regardless of height.
67				<b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in, DBH and greater than 3.28 ft (1 m) tall.
8				Herb – All herbaceous (non-woody) plants, regardless
9 10				Woody vine – All woody vines greater than 3.28 ft in
11				height.
	150	= Total Co	ver	
50% of total cover: 75	20% of	total cover	: 30	
Woody Vine Stratum (Plot size: <sup>15'</sup> radius )				
1.				
2.				
3.				
4.				
5				Lhudwanhutia
		= Total Co	ver	Vegetation
50% of total cover:	20% of	total cover		Present? Yes V No
Remarks: (If observed, list morphological adaptations bal	20,00		•	

SUIL								Sampling Point:
Profile Desc	ription: (Describe to	o the dep	th needed to docur	nent the i	indicator	or confirm	n the absence	of indicators.)
Depth	Matrix		Redo	x Feature	S			
(inches)	Color (moist)	%	Color (moist)	%	Type'	Loc <sup>2</sup>	Texture	Remarks
0-4	10YR 3/3							
4-18	10YR 4/1		10YR 4/6	30	RM	Μ	clay	
					·	·		
						·		
					·	·		
						·	,	
	ncentration D-Denk	tion RM-	Reduced Matrix M	S–Masker	d Sand G	rains	<sup>2</sup> Location:	PI –Pore Lining M–Matrix
Hydric Soil I	ndicators: (Applica	ble to all	LRRs, unless other	rwise not	ed.)	uno.	Indicators	for Problematic Hydric Soils <sup>3</sup> :
	(A1)		Polvvalue Be	low Surfa	, ice (S8) <b>(</b>	LRR S. T. U	U) 🛛 1 cm M	Muck (A9) <b>(LRR O)</b>
Histic Ep	pipedon (A2)		Thin Dark Su	urface (S9	) (LRR S,	T, U)	2 cm N	Muck (A10) <b>(LRR S)</b>
Black Hi	stic (A3)		Loamy Muck	y Mineral	(F1) (LRI	₹ Ó)	Reduc	ced Vertic (F18) (outside MLRA 150A,B)
Hydroge	n Sulfide (A4)		Loamy Gleye	ed Matrix (	(F2)		L Piedm	ont Floodplain Soils (F19) (LRR P, S, T)
Stratified	l Layers (A5)		Depleted Ma	trix (F3)			L Anoma	alous Bright Loamy Soils (F20)
Organic	Bodies (A6) (LRR P,	T, U)	Redox Dark	Surface (F	-6)			RA 153B)
5 cm Mu	icky Mineral (A7) <b>(LR</b>	R P, T, U)	Depleted Da	rk Surface	e (F7)			arent Material (TF2)
Muck Pr	esence (A8) (LRR U)		Redox Depre	essions (F	8)			Shallow Dark Surface (TF12)
	ick (A9) <b>(LRR P, T)</b>	(	Marl (F10) <b>(L</b>	.RR U)		<b>E</b> 4)	U Other	(Explain in Remarks)
	Below Dark Surface	(A11)		nric (F11)		51) (IDD O D	T) <sup>3</sup> India	sators of hydrophytic vogetation and
	rairie Redox (A12)	I RA 150/			(IRRP 1		, <b>I)</b> ITUIC	tland hydrology must be present
Sandy M	lucky Mineral (S1) (II	R 0. S)		(F17) <b>(MI</b>	RA 151)	, 0)	unl	ess disturbed or problematic
Sandy G	ileved Matrix (S4)		Reduced Ver	(i i i ) (i i i i i i i i i i i i i i i	(MLRA 1	50A. 150B	)	
Sandy R	edox (S5)		Piedmont Flo	odplain S	Soils (F19)	(MLRA 14	, 49A)	
Stripped	Matrix (S6)		Anomalous E	Bright Loa	my Soils	(F20) <b>(MLF</b>	RA 149A, 153C	;, 153D)
Dark Su	rface (S7) <b>(LRR P, S,</b>	T, U)						
Restrictive L	_ayer (if observed):							
Туре:								/
Depth (inc	ches):						Hydric Soil	Present? Yes 🚩 No
Remarks:								

Project/Site: Site 4 - Highway 23 North (MBSD)	City/County: Belle Chasse, Plaquemines Sampling Date: 7 March 2018
Applicant/Owner: CPRA	State: LA Sampling Point: 19
Investigator(s): Benjamin Richard and Joe Cancienne	Section, Township, Range: S5 - T16S - R25E
Landform (hillslope, terrace, etc.):	Local relief (concave, convex, none): Slope (%): 0-1%
Subregion (LRR or MLRA): MLRA 151 Lat: 29.66	2423 Long: -89.976607 Datum: NAD 83 UTM 16N
Soil Map Unit Name: Cancienne silty clay loam, 0-1% slopes	NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of ve	ear? Yes ✓ No (If no. explain in Remarks.)
Are Vegetation Soil or Hydrology significantly	/ disturbed? Are "Normal Circumstances" present? Yes ✓ No
Are Vegetation Soil or Hydrology naturally pr	oblematic? (If needed, explain any answers in Remarks )
SUMMARY OF FINDINGS – Attach site map showing	J sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes V	
Hydric Soil Present? Yes No ✓	Is the Sampled Area
Wetland Hydrology Present? Yes No	within a Wetland? Yes No
Remarks:	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
Aquatic Fauna (B1)	3) Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)     Main Deposits (B1:	Oder (C1) Drainage Patients (B10)
Water Marks (B1)	Duor (C1) <u> </u>
$\Box \text{ Sediment Deposite (P2)} \qquad \Box \text{ Deposite (P2)}$	$\frac{1}{2} Diy-Season Water Table (C2)$
	$\underline{\Box}$ Claying burlows (Co)
Algal Mat or Crust (B4)	(C7)
$\square$ Iron Deposits (B5) $\square$ Other (Evaluation of E	Remarks)
$\Box$ Inundation Visible on Aerial Imagery (B7)	$\Box = \text{Shallow Aquitation (D5)}$
Water-Stained Leaves (B9)	$\square$ Sphagnum moss (D8) (I RR T. U)
Field Observations:	
Surface Water Present? Yes No ✓ Depth (inches	3):
Water Table Present? Yes No 🗸 Depth (inches	;): ;):
Saturation Present? Yes No V Depth (inches	(i): Wetland Hydrology Present? Yes No
(includes capillary fringe)	/
Describe Recorded Data (stream gauge, monitoring well, aerial phote	os, previous inspections), if available:
Remarks:	

Sampling Poi	int: 19
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	Absolute	Dominant	Indicator	Dominance Test worksheet:	
Tree Stratum (Plot size: <u>30' radius</u> )	% Cover	Species?	Status	Number of Dominant Species	
1. Triadica sebifera	15	Y	FAC	That Are OBL, FACW, or FAC: 7	(A)
2. Quercus nigra	30	Y	FAC	Total Number of Dominant	
3. Liquidambar styraciflua	10	Ν	FAC	Species Across All Strata: 10	'B)
4. Celtis laevigata	20	Y	FACW		/
5				Percent of Dominant Species That Are ODL 5ACM or 5AC $7/10=70\%$	
6	·			That Are OBL, FACW, of FAC:	А/В)
7				Prevalence Index worksheet:	
/·				Total % Cover of: Multiply by:	
8	75			OBL species x 1 =	
07.5	75	= Total Cov	ver	FACW species x 2 =	
50% of total cover: $37.5$	20% of	total cover	15	FAC species x3 =	
Sapling/Shrub Stratum (Plot size: 15' radius )					
1. Celtis laevigata	20	Y	FACW	FACO species X 4 =	
2. Quercus nigra	15	Y	FAC	UPL species X 5 =	
3				Column Totals: (A)	(B)
4.				Provolence Index - P/A -	
5					
6				Hydrophytic Vegetation Indicators:	
8	·			1 - Rapid Test for Hydrophytic Vegetation	
/				2 - Dominance Test is >50%	
8	25			$\square$ 3 - Prevalence Index is $\leq 3.0^1$	
	30	= Total Cov	/er	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	)
50% of total cover: 17.5	20% of	total cover			
Herb Stratum (Plot size: 5' radius )				<sup>1</sup> Indicators of hydric soil and wetland hydrology mu	ust
1. Sabal minor	10	Ν	FACW	be present, unless disturbed or problematic.	
2. Toxicodendron pubescens	20	Υ	FACU	Definitions of Four Vegetation Strata:	
3. Allium vineale	20	Y	FACU		
4. Dryopteris ludoviciana	20	Y	FACW	I ree – Woody plants, excluding vines, 3 in. (7.6 cr more in diameter at breast beight (DBH), regardless	n) or
5				height.	0 01
0				than 3 in DBH and greater than 3 28 ft (1 m) tall	ess
<i>1</i>					
8	<u> </u>			Herb – All herbaceous (non-woody) plants, regard	less
9	<u> </u>			of size, and woody plants less than 3.28 ft tall.	
10		<u> </u>		Woody vine – All woody vines greater than 3.28 ft	tin
11				height.	
12					
	70	= Total Cov	ver		
50% of total cover: 35	20% of	total cover	14		
Woody Vine Stratum (Plot size, 15' radius					
Vitis rotundifolia	20	Y	FAC		
Toxicodendron pubescens	30	Y	FACU		
2. 1000000000000000000000000000000000000		<u> </u>			
3	<u> </u>				
4					
5				Hydrophytic	
	50	= Total Cov	ver	Vegetation	
50% of total cover: 25	20% of	total cover	10	Present? Yes V No	
Remarks: (If observed, list morphological adaptations belo	w).				
	,				

Brofile Dece	rintion, (Decoribe t	a tha danti	noodod to dooun	cont the	indicator	or confirm	the ebeenee	of indicators )
Donth	Motrix	o ine depli	Dede		inuicator	or comm	i the absence	or indicators.)
(inches)	Color (moist)	%	Color (moist)	<u>x reature</u> %	Tvpe <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-6	10YR 3/2						clav	
6-18	10VR 4/3		10VR 5/8	10		М	clay	
0-10	1011( 4/5		10111 3/0	10	<u> </u>		ciay	
				·		·		
					<u> </u>			
						·	·	
					. <u> </u>	·	·	
				·		·		
<sup>1</sup> Type: C=Co	ncentration, D=Deple	etion, RM=	Reduced Matrix, MS	S=Masked	d Sand G	ains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
Hydric Soil I	ndicators: (Applica	ble to all L	RRs, unless other	wise not	ed.)			for Problematic Hydric Soils":
Histosol	(A1)		Polyvalue Be	low Surfa	ice (S8) <b>(I</b>	_RR S, T, U	<b>リ) <u>し</u>1 cm M</b>	1uck (A9) <b>(LRR O)</b>
Histic Ep	ipedon (A2)		Thin Dark Su	rface (S9	) (LRR S,	T, U)		Auck (A10) (LRR S)
	STIC (A3)			y Mineral	(F1) <b>(LRI</b> (F2)	R ()		ed Vertic (F18) (outside MLRA 150A,B)
	Lavers (Δ5)			triv (F3)	(Г2)			alous Bright Loamy Soils (F19) (LRR F, S, T)
	Bodies (A6) (LRR P.	T. U)	Redox Dark S	Surface (F	-6)		<u> </u>	RA 153B)
5 cm Mu	cky Mineral (A7) <b>(LR</b>	R P. T. U)	Depleted Dar	k Surface	e (F7)			arent Material (TF2)
Muck Pre	esence (A8) (LRR U)	, , -,	Redox Depre	ssions (F	8)		Very S	hallow Dark Surface (TF12)
1 cm Mu	ck (A9) (LRR P, T)		Marl (F10) (L	RR U)			Other (	(Explain in Remarks)
Depleted	Below Dark Surface	(A11)	Depleted Och	nric (F11)	(MLRA 1	51)		
Thick Da	rk Surface (A12)		Iron-Mangane	ese Mass	es (F12)	(LRR O, P,	T) <sup>3</sup> Indic	ators of hydrophytic vegetation and
Coast Pr	airie Redox (A16) (M	LRA 150A)	Umbric Surfa	ce (F13)	(LRR P, 1	r, U)	wet	land hydrology must be present,
Sandy M	ucky Mineral (S1) (LI	RR 0, S)	Delta Ochric	(F17) <b>(MI</b>	LRA 151)		unle	ess disturbed or problematic.
Sandy G	eyed Matrix (54)					MIDA 14	0.4.)	
	Matrix (S6)			right Log	my Soils (		Δ 149Δ 153C	153D)
Dark Sur	face (S7) <b>(LRR P. S</b> .	T. U)		ingin Loa			A 143A, 1330	, 1350)
Restrictive L	aver (if observed):	-, -,						
Type:								
Depth (inc	hes).						Hydric Soil	Present? Yes No
Remarks:							ingane con	
Remarks.								

Project/Site: Site 4 - Highway 23 North (MBSD)	City/County: Belle Chasse, Plaquemines Sampling Date: 7 March 2018		
Applicant/Owner: CPRA	State: LA Sampling Point: 20		
Investigator(s): Benjamin Richard and Joe Cancienne	Section, Township, Range: S5 - T16S - R25E		
Landform (hillslope, terrace, etc.):	Local relief (concave, convex, none): none Slope (%): 0-1%		
Subregion (LRR or MLRA): MLRA 151	53662 Long: -89.977101 Datum: NAD 83 UTM 16N		
Soil Map Unit Name: Cancienne silty clay loam, 0-1% slopes	NWI classification: N/A		
Are climatic / hydrologic conditions on the site typical for this time of y	ear? Yes ✓ No (If no. explain in Remarks.)		
Are Vegetation . Soil . or Hydrology significantly	v disturbed? Are "Normal Circumstances" present? Yes V		
Are Vegetation . Soil . or Hydrology naturally p	roblematic? (If needed, explain any answers in Remarks.)		
SUMMARY OF FINDINGS – Attach site map showing	g sampling point locations, transects, important features, etc.		
Hydrophytic Vegetation Present? Yes No	Is the Sampled Area		
Hydric Soil Present? Yes No	within a Wetland? Yes No		
Wetland Hydrology Present? Yes No			
Remarks:			
HYDROLOGY			
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)		
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)		
Surface Water (A1)	13) Sparsely Vegetated Concave Surface (B8)		
High Water Table (A2)	5) (LRR U) Drainage Patterns (B10)		
Saturation (A3)	Odor (C1) Moss Trim Lines (B16)		
Water Marks (B1) Oxidized Rhizospl	heres along Living Roots (C3)		
Sediment Deposits (B2)	ced Iron (C4)		
Drift Deposits (B3)	ction in Tilled Soils (C6) Saturation Visible on Aerial Imagery (C9)		
Algal Mat or Crust (B4)	e (C7) Geomorphic Position (D2)		
Iron Deposits (B5)	Remarks) Shallow Aquitard (D3)		
Inundation Visible on Aerial Imagery (B7)	FAC-Neutral Test (D5)		
Water-Stained Leaves (B9)	Sphagnum moss (D8) (LRR T, U)		
Field Observations:			
Surface Water Present? Yes No Depth (inches	s):		
Water Table Present? Yes No Depth (inches	3):		
Saturation Present? Yes No Depth (inches	s): Wetland Hydrology Present? Yes No		
(includes capillary fringe)	tos previous inspections), if available:		
Describe Recorded Data (stream gauge, monitoring weil, aenai pho			
Pomarka			
Toniano.			
# VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: 2	ampling Po	oint: 20
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	Δhsolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30' radius )	% Cover	Species?	Status	Number of Deminent Species
Acer negundo	50	Y	FAC	That Are OBL EACW or EAC: $6$ (A)
2. Quercus virginiana	30	Y	FACU	
2		<u> </u>		Total Number of Dominant
3	·			Species Across All Strata: <u>10</u> (B)
4				Demonst of Deminerat Creation
5.				That Are OBL EACW or EAC: $6/10=60\%$ (A/B)
6				
				Prevalence Index worksheet:
1	·			Total % Cover of Multiply by
8				
	80	= Total Cov	er	
50% of total cover: <sup>40</sup>	20% of	total cover:	16	FACW species x 2 =
Sapling/Shrub Stratum (Plot size: 15' radius )				FAC species x 3 =
<u>Saping/Sinub Stratum</u> (Flot size. <u></u>	20	V	EAC	FACU species x 4 =
	30		FAC	
2				
3.				Column Totals: (A) (B)
4				
	·			Prevalence Index = B/A =
5				Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7.				$\sqrt{2}$ 2 - Dominance Test is $>50\%$
8				
0	30	Tatal Car		☐ 3 - Prevalence Index is ≤3.0
45	50	= Total Cov	er	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover: 15	20% of	total cover	6	
Herb Stratum (Plot size: 5' radius )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1 Rubus spp.	40	Υ	FAC	be present, unless disturbed or problematic.
o Cirsium vulgare	20	Y	FACU	Definitions of Four Verstation Strate:
				Definitions of Four vegetation Strata:
3. Eleocharis montevidensis	20	ř	FACW	<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or
4. Triadica sebifera	20	Y	FAC	more in diameter at breast height (DBH), regardless of
5.				height.
6	·			
-				<b>Sapling/Snrub</b> – woody plants, excluding vines, less
7				
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10				
44	·			<b>Woody vine</b> – All woody vines greater than 3.28 ft in
11	·			neight.
12				
	100	= Total Cov	er	
50% of total cover: <sup>50</sup>	20% of	total cover:	20	
Woody Vine Stratum (Plot size: 15' radius				
Vitis rotundifolia	30	V	EAC	
		<u> </u>	1.40	
2. I oxicodendron pubescens	20	Y	FACU	
3. Lonciera japonica	25	Υ	FACU	
4				
	·			
5	75			Hydrophytic
	75	= Total Cov	er	Vegetation
50% of total cover: 37.5	20% of	total cover	15	Present? res v No
Remarks: (If observed, list morphological adaptations belo	(we			

#### SOIL

Profile Desc	ription: (Describe t	o the depth	n needed to docum	nent the	indicator	or confirm	the absence	of indicators.)
Depth	Matrix		Redo	x Feature	S			
(inches)	Color (moist)		Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-4	10YR 3/2						silty clay	
4-18	10YR 4/3		10YR 4/6	10	D	Μ	clay	
				·				
						·		
<sup>1</sup> Type: C=Co	oncentration, D=Depl	etion, RM=	Reduced Matrix, MS	S=Masked	d Sand Gr	ains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
Hydric Soil I	ndicators: (Applica	ble to all L	RRs, unless other	rwise not	ed.)		Indicators	for Problematic Hydric Soils <sup>3</sup> :
Histosol	(A1)		Polyvalue Be	low Surfa	ice (S8) <b>(I</b>	.RR S, T, U	<b>J) <u> </u> 1 cm M</b>	Auck (A9) (LRR O)
Histic Ep	ipedon (A2)		Thin Dark Su	Irface (S9	) (LRR S,	T, U)		Auck (A10) (LRR S)
	STIC (A3) n Sulfido (A4)			y Mineral	(F1) <b>(LR</b> (F2)	(0)		ed Vertic (F18) (outside MLRA 150A,B)
	Lavers (A5)			trix (F3)	(Г2)			alous Bright Loamy Soils (F19) (LRK F, S, T)
	Bodies (A6) (LRR P.	T. U)	Redox Dark	Surface (F	=6)		(MLF	RA 153B)
5 cm Mu	cky Mineral (A7) (LR	R P, T, U)	Depleted Dar	rk Surface	e (F7)		Red Pa	arent Material (TF2)
Muck Pro	esence (A8) (LRR U)		Redox Depre	essions (F	8)		Uery S	hallow Dark Surface (TF12)
1 cm Mu	ck (A9) <b>(LRR P, T)</b>		Marl (F10) <b>(</b> L	.RR U)			U Other (	(Explain in Remarks)
Depleted	Below Dark Surface	(A11)	Depleted Och	hric (F11)	(MLRA 1	51)		
Thick Da	rk Surface (A12)		Iron-Mangan	ese Mass	es (F12) (	LRR O, P,	T) Indic	ators of hydrophytic vegetation and
	airie Redox (A16) <b>(M</b> lucky Mineral (S1) <b>(I</b>	LKA 150A) PP O SI	Delta Ochric	(F13) (F17) <b>(MI</b>	(LKK P, I PA 151)	, 0)	wet	and hydrology must be present,
Sandy M	leved Matrix (S4)	KK 0, 3)		(F17) (IVII tic (F18)	(MI RA 1	60A. 150B)	une	ess disturbed of problematic.
Sandy B	edox (S5)		Piedmont Flo	odplain S	Soils (F19)	(MLRA 14	9A)	
Stripped	Matrix (S6)		Anomalous B	Bright Loa	my Soils (	, F20) <b>(MLR</b>	A 149A, 153C	, 153D)
Dark Sur	face (S7) (LRR P, S,	T, U)		-	-			
Restrictive L	ayer (if observed):							
Туре:								
Depth (inc	:hes):						Hydric Soil	Present? Yes No
Remarks:								

Project/Site:       Site 6 - Rail North (MBSD)         Applicant/Owner:       CPRA         Investigator(s):       Benjamin Richard and Joe Cancienne         Landform (hillslope, terrace, etc.):	City/County:       Belle Chasse, Plaquemines       Sampling Date:       9 March 2018         State:       LA       Sampling Point:       21         Section, Township, Range:       S5 - T16S - R25E       Slope (%):       0-1%         Local relief (concave, convex, none):       none       Slope (%):       0-1%         S897       Long:       -89.964403       Datum:       NAD 83 UTM 16N         NWI classification:       N/A         ear?       Yes       ✓       No       (If no, explain in Remarks.)         y disturbed?       Are "Normal Circumstances" present?       Yes       ✓       No         coblematic?       (If needed, explain any answers in Remarks.)       No
Hydrophytic Vegetation Present?       Yes ✓       No         Hydric Soil Present?       Yes ✓       No         Wetland Hydrology Present?       Yes ✓       No         Remarks:       Image: Comparison of the second	Is the Sampled Area within a Wetland? Yes <u>Ves</u> No
Wetland Hydrology Indicators:         Primary Indicators (minimum of one is required; check all that apply)         Surface Water (A1)       Aquatic Fauna (B1)         High Water Table (A2)       Marl Deposits (B1)         Vater Marks (B1)       Oxidized Rhizosph         Sediment Deposits (B2)       Presence of Reduct         Drift Deposits (B3)       Recent Iron Reduct         Iron Deposits (B5)       Other (Explain in F         Inundation Visible on Aerial Imagery (B7)       Water-Stained Leaves (B9)	Secondary Indicators (minimum of two required)         Surface Soil Cracks (B6)         Sparsely Vegetated Concave Surface (B8)         Drainage Patterns (B10)         Odor (C1)         heres along Living Roots (C3)         Dry-Season Water Table (C2)         ction in Tilled Soils (C6)         e (C7)         Remarks)         FAC-Neutral Test (D5)         Shalpon Marker T, U)
Field Observations:         Surface Water Present?       Yes No Depth (inchess Water Table Present?         Yes No Depth (inchess Saturation Present?       Yes No Depth (inchess (includes capillary fringe)         Describe Recorded Data (stream gauge, monitoring well, aerial phot         Remarks:	s):

# VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: 21

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30' radius )	% Cover	Species?	Status	Number of Dominant Species
1				That Are OBL, FACW, or FAC: <u>5</u> (A)
2				Total Number of Dominant
3				Species Across All Strata: 5 (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: $5/5 = 100\%$ (A/B)
6				Drevelan eo Index waalach eet
7				Tatal % Cover aft
8				I otal % Cover or: Multiply by:
		= Total Cov	rer	
50% of total cover:	20% of	total cover	:	FACW species x 2 =
Sapling/Shrub Stratum (Plot size: 15' radius )				FAC species x 3 =
1. <u>Salix nigra</u>	20	Υ	OBL	FACU species x 4 =
2. <u>Triadica sebifera</u>	40	Υ	FAC	UPL species x 5 =
3.	_			Column Totals: (A) (B)
4.				Provolonce Index - R/A -
5.				Hudrophytic Vegetation Indicators
6				Hydrophytic Vegetation Indicators:
7				
8				$\boxed{\square}$ 2 - Dominance Test is >50%
···	60	- Total Cov		$\square$ 3 - Prevalence Index is $\leq 3.0^{\circ}$
50% of total cover: 30	20% of	total cover	12	Problematic Hydrophytic Vegetation' (Explain)
Horb Strotum (Plot size: 5' radius	20 /8 01		·	4
Rubus sop	30	N	FAC	Indicators of hydric soil and wetland hydrology must
1. <u>Nabus spp.</u>	20	N		De finitiere et Ferr Verstetier Oterte
	30	N	EAC	Definitions of Four vegetation Strata:
	40		FAC	Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or
				more in diameter at breast height (DBH), regardless of
5. Juncus enusus				neight.
6. Anibiosia tilida	30		FAC	<b>Sapling/Shrub</b> – Woody plants, excluding vines, less
7		·		than 3 ln. DBH and greater than 3.28 ft (1 m) tall.
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10				Woody vine – All woody vines greater than 3.28 ft in
11				height.
12				
	180	= Total Cov	er	
50% of total cover: 90	20% of	total cover	36	
Woody Vine Stratum (Plot size: 15' radius )				
1. <u>Ampelopsis arborea</u>	40	Υ	FAC	
2. Rubus spp.	30	Y	FAC	
3.	_			
4.				
5.				Hudronbytic
	70	= Total Cov	er	Vegetation
50% of total cover: 35	20% of	total cover	. 14	Present? Yes <u>V</u> No
Remarks: (If observed, list morphological adaptations bel	2070 0		·	
in the market of the second of the second se	G W J.			

SOIL

SOIL								34	ampling Point.	
Profile Desc	ription: (Describe to	o the dept	n needed to docur	nent the i	indicator	or confirm	n the absence	of indicator	rs.)	
Depth	Matrix		Redo	x Feature	S	2				
(inches)	Color (moist)	%	Color (moist)	%	Type'	Loc <sup>2</sup>	Texture		Remarks	
0-15	10YR 3/2		10YR 5/8	15	RM	Μ	clay			
						·				
					· . <u> </u>	·				<u>.</u>
					·					<u> </u>
					· . <u> </u>	·				<u>.</u>
<sup>1</sup> Type: C=Co	oncentration. D=Deple	etion. RM=I	Reduced Matrix. M	S=Masked	d Sand G	rains.	<sup>2</sup> Location:	PL=Pore Li	ning. M=Matri	x.
Hydric Soil	Indicators: (Applica	ble to all L	RRs, unless othe	rwise not	ed.)		Indicators	for Problen	natic Hydric	Soils <sup>3</sup> :
	(Δ1)			Now Surfa	CA (S8) (	RRSTI			RR (I)	
	vinedon (A2)		Thin Dark Su	Inface (S9	) (I RR S	T II)	$\int \frac{1}{2} \operatorname{cm} \mathbf{k}$	/luck (A10) (		
Black Hi	stic (A3)			v Mineral	(F1) <b>(I RI</b>	R (0)		ed Vertic (F1	18) (outside l	WI RA 150A B)
	n Sulfide (A4)			ed Matrix (	(F2)	(0)		ont Floodola	in Soils (F19)	(IRR P. S. T)
	Lavers (A5)		Depleted Ma	trix (F3)	)			alous Bright I	Loamy Soils (	(20)
	Bodies (A6) (LRR P.	T. U)	Redox Dark	Surface (F	-6)		(MLI	RA 153B)	(	0)
5 cm Mu	icky Mineral (A7) (LRI	R P. T. U)		rk Surface	e (F7)			arent Materia	al (TF2)	
	esence (A8) (LRR U)	,.,.,.,	Redox Depre	essions (F	8)			hallow Dark	Surface (TF1	2)
	ick (A9) (LRR P. T)		Marl (F10) (L	.RR U)	-)		Other	(Explain in R	Remarks)	_/
	d Below Dark Surface	(A11)	Depleted Oc	hric (F11)	(MLRA 1	51)		(		
Thick Da	ark Surface (A12)	( )	Iron-Mangan	ese Mass	、 es (F12)	(LRR O, P,	T) <sup>3</sup> Indic	ators of hyd	rophytic vege	tation and
Coast P	rairie Redox (A16) (M	LRA 150A	Umbric Surfa	ace (F13)	(LRR P. 1	ς, υ) Γ. υ)	wet	land hydrolo	bgy must be p	resent,
Sandy M	lucky Mineral (S1) (LI	RR O, S)	Delta Ochric	(F17) <b>(ML</b>	RA 151)		unl	ess disturbed	d or problema	tic.
Sandy G	Bleyed Matrix (S4)		Reduced Ve	rtic (F18) (	(MLRA 1	50A, 150B)	)		·	
Sandy R	edox (S5)		Piedmont Flo	odplain S	ioils (F19)	(MLRA 14	49A)			
Stripped	Matrix (S6)		Anomalous E	Bright Loai	my Soils	(F20) (MLR	RA 149A, 153C	, 153D)		
Dark Su	rface (S7) (LRR P, S,	T, U)		•	-	. , .				
Restrictive I	_ayer (if observed):									
Type:										
Depth (in	chas).						Hydric Soil	Present?	Vos V	No
Depertor							inguite con	Tresent.	100	<u> </u>
Remarks:										

Project/Site. Site 6 - Rail North (MBSD)	City/County: Belle Chasse, Plaquemines Sampling Date: 8 March 2018
Applicant/Ourser, CPRA	State: LA Sampling Date:
Applicativowner.	
Investigator(s):	Section, Township, Range: 00 1100 1252
Landform (hillslope, terrace, etc.):	Local relief (concave, convex, none): <u>Itolie</u> Slope (%): <u>0-1%</u>
Subregion (LRR or MLRA): MLRA 151 Lat: 29.66	D1255 Long: -89.971565 Datum: MAD 83 UTM 16N
Soil Map Unit Name: Cancienne silty clay loam, 0-1% slopes	NWI classification: <u>N/A</u>
Are climatic / hydrologic conditions on the site typical for this time of $\ensuremath{y}$	rear? Yes No (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly	y disturbed? Are "Normal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology naturally pr	roblematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing	g sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present?       Yes ✓       No         Hydric Soil Present?       Yes ✓       No         Wetland Hydrology Present?       Yes       No	Is the Sampled Area within a Wetland? Yes No
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil Cracks (B6)
Aquatic Fauna (B1)	13) Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)     Mail Deposits (B1)     Saturation (A3)	Oder (C1)
Water Marks (B1)	heres along Living Roots (C3)
Sediment Deposits (B2)	uced Iron (C4) $\Box$ Cravfish Burrows (C8)
Drift Deposits (B3)	ction in Tilled Soils (C6) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	e (C7)
Iron Deposits (B5) Other (Explain in F	Remarks) Shallow Aquitard (D3)
Inundation Visible on Aerial Imagery (B7)	FAC-Neutral Test (D5)
Water-Stained Leaves (B9)	Sphagnum moss (D8) (LRR T, U)
Field Observations:	
Surface Water Present? Yes No Depth (inches	s):
Water Table Present? Yes No Depth (inches	s):
Saturation Present? Yes No / Depth (inches (includes capillary fringe)	s): Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: 22

		Absolute	Dominant	Indicator	Dominance Test worksheet:	
Tree Stratum (Plot size: 30' radius	)	<u>% Cover</u>	Species?	<u>Status</u>	Number of Dominant Species	
1. Iriadica sebifera		15	N	FAC	That Are OBL, FACW, or FAC: <u>5</u> (A	4)
2. Quercus nigra		30	Y	FAC	Total Number of Dominant	
3. Liquidambar styraciflua		30	Y	FAC	Species Across All Strata: 7 (E	3)
4. Acer rubrum		10	Ν	FAC	Demont of Demised Operation	
5. Quercus virginiana		30	Υ	FACU	That Are OBL, FACW, or FAC: $5/7 = 71.4\%$ (A	4/B)
6					Presedence in decementation of	
7						
8					I otal % Cover of: Multiply by:	
		115	= Total Cov	er	OBL species x 1 =	
50%	of total cover: 57.5	20% of	total cover:	23	FACW species x 2 =	
Sapling/Shrub Stratum (Plot size: 15'	radius )				FAC species x 3 =	
1. Triadica sebifera		20	Υ	FAC	FACU species x 4 =	
2. Acer negundo		20	Υ	FAC	UPL species x 5 =	
3.				·	Column Totals: (A) (	(B)
4.				·	Dravalance Index D/A	
5						
5					Hydrophytic Vegetation Indicators:	
8					1 - Rapid Test for Hydrophytic Vegetation	
7					2 - Dominance Test is >50%	
8		40		·	3 - Prevalence Index is ≤3.0 <sup>1</sup>	
	22	40	= Total Cov	er	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
50% (	of total cover: 20	20% of	total cover:	8		
Herb Stratum (Plot size: 5' radius	)				<sup>1</sup> Indicators of hydric soil and wetland hydrology mus	st
1. Allium vineale		40	Y	FACU	be present, unless disturbed or problematic.	
2					Definitions of Four Vegetation Strata:	
3					<b>Tree</b> – Woody plants, excluding vines 3 in (7.6 cm	) or
4					more in diameter at breast height (DBH), regardless	s of
5.					height.	
6.					Sanling/Shrub - Woody plants excluding vines le	<b></b>
7.					than 3 in. DBH and greater than 3.28 ft (1 m) tall.	
8.						
9.					of size, and woody plants less than 3.28 ft tall.	ess
10				·		
11					Woody vine – All woody vines greater than 3.28 ft i	in
12					neight.	
12.		40	Total Cau			
500(	- <u>4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4</u>			8		
50% (	of total cover: 20	20% of	total cover:	<u> </u>		
Woody Vine Stratum (Plot size: 13 12	)	20	V	EAC		
		20	<u> </u>	FAC		
2						
3						
4						
5					Hydrophytic	
		20	= Total Cov	er	Vegetation	
50%	of total cover: 10	20% of	total cover:	4	Present? Yes <u>V</u> No	
Remarks: (If observed, list morpholog	ical adaptations belo	w).				

Profile Desc	ription: (Describe t	o the dep	h needed to docur	nent the i	indicator	or confirm	n the absence	of indicators.)
Depth	Matrix		Redo	x Feature	s			
(inches)	Color (moist)	%	Color (moist)	<u>%</u>	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-3	10YR 3/3						clay	
3-16	10YR 3/2		10YR 5/8	5	RM	Μ	clay	
						·		
					·			
<sup>1</sup> Type: C=Co	oncentration, D=Depl	etion, RM=	Reduced Matrix, M	S=Masked	d Sand G	rains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
Hydric Soil I	ndicators: (Applica	ble to all	LRRs, unless othe	rwise not	ed.)		Indicators	for Problematic Hydric Soils <sup>3</sup> :
Histosol	(A1)		Polyvalue Be	elow Surfa	ce (S8) <b>(</b> I	LRR S, T, I	<b>J) 📙</b> 1 cm N	/luck (A9) <b>(LRR O)</b>
Histic Ep	pipedon (A2)		Thin Dark Su	Irface (S9)	) (LRR S,	T, U)		Auck (A10) (LRR S)
	STIC (A3) n Sulfide ( $\Delta A$ )			y Mineral d Matrix (	(F1) <b>(LKI</b> (F2)	R ()		ed Vertic (F18) (outside MLRA 150A,B)
	Lavers (A5)		Depleted Ma	trix (F3)	(12)			alous Bright Loamy Soils (F20)
	Bodies (A6) (LRR P,	T, U)	Redox Dark	Surface (F	-6)		(MLF	RA 153B)
5 cm Mu	cky Mineral (A7) (LR	R P, T, U)	Depleted Da	rk Surface	é (F7)		Red Pa	arent Material (TF2)
Muck Pr	esence (A8) (LRR U)		Redox Depre	essions (F	8)		U Very S	hallow Dark Surface (TF12)
1 cm Mu	ck (A9) <b>(LRR P, T)</b>		Marl (F10) (L	.RR U)			Other	(Explain in Remarks)
	Below Dark Surface	e (A11)	Depleted Oc	hric (F11)	(MLRA 1	51) (, , , , , , , , , , , , , , , , , , ,		atom of herders had been retailed as a d
	ark Surface (A12)		Iron-Mangan	ese Mass	es (F12)	(LRR 0, P, Γ ΙΙ)	(I) India	ators of hydrophytic vegetation and
Sandy M	lucky Mineral (S1) <b>(I</b>	RR O. SI	Delta Ochric	(F17) <b>(MI</b>	RA 151)	i, 0)	unle	ess disturbed or problematic
Sandy G	ileved Matrix (S4)	init 0, 0)	Reduced Ver	(i i / ) (iiii	(MLRA 1	50A. 150B)		
Sandy R	edox (S5)		Piedmont Flo	odplain S	oils (F19)	) (MLRA 14	19A)	
Stripped	Matrix (S6)		Anomalous E	Bright Loai	my Soils	(F20) <b>(MLR</b>	A 149A, 153C	, 153D)
Dark Su	face (S7) (LRR P, S	, T, U)						
Restrictive L	ayer (if observed):							
Туре:								
Depth (inc	ches):						Hydric Soil	Present? Yes Vo No
Remarks:								

Project/Site: Site 7 - Rail South (MBSD)	_ City/County: Belle Chasse, Plaquemines Sampling Date: 8 March 2018
Applicant/Owner: CPRA	State: LA Sampling Point: 23
Investigator(s): Benjamin Richard and Joe Cancienne	_ Section, Township, Range: <u>S6 - T16S - R25E</u>
Landform (hillslope, terrace, etc.):	_ Local relief (concave, convex, none): <u>none</u> Slope (%): <u>0-1%</u>
Subregion (LRR or MLRA): MLRA 151 Lat: 29.65	55233 Long: -89.965022 Datum: NAD 83 UTM 16N
Soil Map Unit Name: Cancienne silt Ioam, 0-1% slopes	NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of y	year? Yes 🖌 No (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantl	ly disturbed? Are "Normal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology naturally p	problematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showin	ig sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present?       Yes        ✓       No         Hydric Soil Present?       Yes        ✓       No         Wetland Hydrology Present?       Yes        No       ✓	<ul> <li>Is the Sampled Area</li> <li>within a Wetland? Yes <u>No</u></li> </ul>
HYDROLOGY	Secondary Indicators (minimum of two required)
Wetland Hydrology Indicators:	Secondary Indicators (minimum or two required)
Surface Water (A1)	
High Water Table (A2)	15) (LRR U)
Saturation (A3)	e Odor (C1) Moss Trim Lines (B16)
Water Marks (B1) Oxidized Rhizosp	heres along Living Roots (C3) Dry-Season Water Table (C2)
Sediment Deposits (B2)	uced Iron (C4) Crayfish Burrows (C8)
Drift Deposits (B3)	uction in Tilled Soils (C6) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	ce (C7) Geomorphic Position (D2)
Iron Deposits (B5)	Remarks) Shallow Aquitard (D3)
Inundation Visible on Aerial Imagery (B7)	FAC-Neutral Test (D5)
	└─I Sphagnum moss (D8) (LRR T, U)
Water-Stained Leaves (B9)	
Water-Stained Leaves (B9)       Field Observations:       Outloop Material Descention	
□       Water-Stained Leaves (B9)         Field Observations:       Surface Water Present?         Yes       No         ✓       Depth (inche         Water Table Dependence       Yes         Version Table Dependence       Yes	s):
□       Water-Stained Leaves (B9)         Field Observations:       Surface Water Present?         Yes No _ ✓       Depth (inche         Water Table Present?       Yes No _ ✓         Optimizing Dresent?       Yes No _ ✓         Optimizing Dresent?       Yes No _ ✓         Optimizing Dresent?       Yes No _ ✓         Depth (inche	es):

Remarks:

#### VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: -	oint: 23	Ρ	pling	Samp
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	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30' radius )	% Cover	Species?	Status	Number of Dominant Species
1. <u>Triadica sebifera</u>	40	Υ	FAC	That Are OBL, FACW, or FAC: 9 (A)
2. Quercus nigra	20	Υ	FAC	Total Number of Deminant
3				Species Across All Strata: 9 (B)
4.				
5				Percent of Dominant Species That Are ODL FACIAL on FAC: $9/9 = 100\%$ (A/D)
6				That are OBL, FACW, of FAC: $\frac{670 - 10070}{10070}$ (A/B)
7				Prevalence Index worksheet:
7				Total % Cover of: Multiply by:
ő	60			OBL species x 1 =
20		= Total Cov	ver 12	FACW species x 2 =
50% of total cover: <u>50</u>	20% of	f total cover	. 12	EAC species $x_3 =$
Sapling/Shrub Stratum (Plot size: 15 radius )				
1. Acer negundo	40	Y	FAC	
2. Triadica sebifera	25	Y	FAC	
3. Celtis laevigata	5	Ν	FACW	Column Totals: (A) (B)
4				Prevalence Index $- B/A -$
5.				Hydrophytic Vegetation Indicators
6				
7				1 - Rapid Test for Hydrophytic Vegetation
·				$\square$ 2 - Dominance Test is >50%
8	70			
25	70	= I otal Cov	ver	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover: 35	20% o	f total cover	14	
Herb Stratum (Plot size: 5' radius )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. Rubus spp.	10	N	FAC	be present, unless disturbed or problematic.
2. Toxicodendron radicans	20	Y	FAC	Definitions of Four Vegetation Strata:
3. Acer negundo	20	Y	FAC	Tree Meady plants evoluting vince 2 in (7.6 cm) or
4. Ambrosia trifida	20	Y	FAC	more in diameter at breast height (DBH), regardless of
5.	_			height.
6				<b>Capling/Chruh</b> Weady planta avaluding vince loss
7	_			than 3 in. DBH and greater than 3.28 ft (1 m) tall.
0				
0				<b>Herb</b> – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.26 it tall.
10				Woody vine - All woody vines greater than 3.28 ft in
11				height.
12				
	70	= Total Cov	ver	
50% of total cover: <u>35</u>	20% of	f total cover	14	
Woody Vine Stratum (Plot size: 15' radius )				
1. Vitis rotundifolia	30	Y	FAC	
2 Toxicodendron radicans	10	Y	FAC	
3				
3				
4		<u> </u>		
5	40			Hydrophytic
00	40	= Total Cov	ver	Present? Yes No
50% of total cover: 20	20% of	f total cover	8	
Remarks: (If observed, list morphological adaptations below	ow).			

Des Cla Deses		- (  ( ( ( (						(in the stars )	
Profile Desc	ription: (Describe t	o the dept	n needed to docul	ment the	Indicator	or contirn	n the absence	of Indicators.)	
Depth	Matrix		Redo	ox Feature	s1		_	<b>-</b>	
(inches)	Color (moist)	<u>%</u>	Color (moist)	%	Type'	Loc	Texture	Remarks	
0-8	10YR 3/3						silty clay		
8-18	10YR 4/3		10YR 5/8	20	RM	М	sandv clav		
			101110/0				oundy only		
					·				
·									_
<sup>1</sup> Type: C=Co	oncentration, D=Depl	etion, RM=	Reduced Matrix, M	S=Masked	d Sand G	rains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.	
Hydric Soil I	ndicators: (Applica	ble to all L	RRs, unless othe	rwise not	ed.)		Indicators	for Problematic Hydric Soils <sup>3</sup> :	
	(A1)			Now Surfa	, co (S8) <b>(</b>	PPSTI			
	(AI)					T IN			
					) (LKK 3,	, I, U) , O)		Muck (ATU) (LRR 5)	
	STIC (A3)			ky iviinerai	(F1) <b>(LRI</b>	R ()		ed Vertic (F18) (Outside MILRA 150A	(,B) —
Hydroge	n Sulfide (A4)		Loamy Gleye	ed Matrix (	(F2)			ont Floodplain Soils (F19) (LRR P, S,	1)
	Layers (A5)		Depleted Ma	atrix (F3)				alous Bright Loamy Soils (F20)	
Organic	Bodies (A6) (LRR P,	T, U)	Redox Dark	Surface (F	=6)			RA 153B)	
5 cm Mu	cky Mineral (A7) (LR	R P, T, U)	Depleted Da	rk Surface	e (F7)		L Red P	arent Material (TF2)	
Muck Pr	esence (A8) (LRR U)		Redox Depre	essions (F	8)		L Very S	Shallow Dark Surface (TF12)	
🔲 1 cm Mu	ck (A9) <b>(LRR P, T)</b>		Marl (F10) (L	_RR U)			U Other	(Explain in Remarks)	
Depleted	Below Dark Surface	e (A11)	Depleted Oc	hric (F11)	(MLRA 1	51)			
Thick Da	rk Surface (A12)	<b>、</b> ,	Iron-Mangar	ese Mass	、 es (F12)	, (LRR O. P.	. T) <sup>3</sup> Indic	ators of hydrophytic vegetation and	
Coast Pr	airie Redox (A16) <b>(N</b>	I RA 150A	Umbric Surfa	ace (F13) (	(I RR P. 1	(, [. U)	wet	land hydrology must be present	
Sandy M	lucky Mineral (S1) (I			(E17) (MI	DA 151)	, 0)	unk	ess disturbed or problematic	
	lough Matrix (C4)	KK 0, 3)					<b>u</b> i i i	ess disturbed of problematic.	
						MALDA 4	) (0. A.)		
	edox (SS)			booplain S		) (IVILKA 14	49A)		
Stripped	Matrix (S6)		Anomalous I	Bright Loai	my Soils	(F20) <b>(MLF</b>	RA 149A, 153C	, 153D)	
Dark Su	face (S7) <b>(LRR P, S</b>	, T, U)							
Restrictive L	.ayer (if observed):								
Type:								1	
Depth (inc	hes).						Hydric Soil	Present? Yes V No	
Doptil (int							inguite con		_
Remarks:									

Project/Site:       Site 7 - Rail South (MBSD)         Applicant/Owner:       CPRA         Investigator(s):       Benjamin Richard and Joe Cancienne         Landform (hillslope, terrace, etc.):	City/County:       Belle Chasse, Plaquemines       Sampling Date:       8 March 2018         State:       LA       Sampling Point:       24         Section, Township, Range:       S6 - T16S - R25E       Slope (%):       0-1%         Local relief (concave, convex, none):       none       Slope (%):       0-1%         5601       Long:       -89.964514       Datum:       NAD 83 UTM 16N         Sar?       Yes       ✓       No       (If no, explain in Remarks.)         disturbed?       Are "Normal Circumstances" present?       Yes       ✓       No         oblematic?       (If needed, explain any answers in Remarks.)       Mo
Hydrophytic Vegetation Present?       Yes _ ✓       No         Hydric Soil Present?       Yes _ ✓       No         Wetland Hydrology Present?       Yes _ ✓       No         Remarks:       Image: No       Image: No	Is the Sampled Area within a Wetland? Yes <u>Ves</u> No
HYDROLOGY         Wetland Hydrology Indicators:         Primary Indicators (minimum of one is required; check all that apply)         Surface Water (A1)       Aquatic Fauna (B1         High Water Table (A2)       Marl Deposits (B15         Vater Marks (B1)       Oxidized Rhizosph         Drift Deposits (B2)       Presence of Reduct         Algal Mat or Crust (B4)       Thin Muck Surface         Inundation Visible on Aerial Imagery (B7)       Other (Explain in Female	Secondary Indicators (minimum of two required)         Surface Soil Cracks (B6)         Sparsely Vegetated Concave Surface (B8)         Drainage Patterns (B10)         Odor (C1)         meres along Living Roots (C3)         Dry-Season Water Table (C2)         ced Iron (C4)         crayfish Burrows (C8)         stion in Tilled Soils (C6)         c(C7)         Remarks)         FAC-Neutral Test (D5)         Sphagnum moss (D8) (LRR T, U)
Field Observations:         Surface Water Present?       Yes No Depth (inchess Water Table Present?         Yes No Depth (inchess Saturation Present?       Yes No Depth (inchess (includes capillary fringe)         Describe Recorded Data (stream gauge, monitoring well, aerial photo         Remarks:	): ): ): D: D: D: Wetland Hydrology Present? Yes No D: D

# VEGETATION (Four Strata) - Use scientific names of plants.

Sampling	Point:	24
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Number of Dominant Species         That Are OBL, FACW, or FAC:       5         (A)         Total Number of Dominant         Species Across All Strata:       5         (B)         Percent of Dominant Species         That Are OBL, FACW, or FAC: $5/5 = 100\%$ (A/B)         Percent of Dominant Species         That Are OBL, FACW, or FAC: $5/5 = 100\%$ (A/B)         Prevalence Index worksheet:         Total % Cover of:       Multiply by:         OBL species       x 1 =         FACW species       x 2 =         FAC species       x 3 =         FACU species       x 4 =         UPL species       x 5 =         Column Totals:       (A)         Mydrophytic Vegetation Indicators:       1 - Rapid Test for Hydrophytic Vegetation         2 - Dominance Test is >50%       3 - Prevalence Index is $\leq 3.0^1$ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)       1
That Are OBL, FACW, or FAC:       5       (A)         Total Number of Dominant       5       (B)         Percent of Dominant Species       5/5 = 100%       (A/B)         Prevalence Index worksheet: $5/5 = 100\%$ (A/B)         Prevalence Index worksheet:       Multiply by:       (A/B)         Prevalence Index worksheet:       Multiply by:       (A/B)         Prevalence Index worksheet:       Multiply by:       (A/B)         OBL species       x 1 =       [A]         FACW species       x 2 =       [A]         FACU species       x 3 =       [A]         Prevalence Index = X4 =       [B]       [B]         Prevalence Index = B/A =       [B]       [B]         Prevalence Index = B/A =       [B]       [B]         Prevalence Index = S/0%       [C]       3 - Prevalence Index is <3.01
Total Number of Dominant Species Across All Strata:5(B)Percent of Dominant Species That Are OBL, FACW, or FAC: $5/5 = 100\%$ (A/B)Prevalence Index worksheet: $5/5 = 100\%$ (A/B)Total % Cover of:Multiply by:OBL species $x 1 =$ FACW species $x 2 =$ FACW species $x 3 =$ FACU species $x 4 =$ UPL species $x 5 =$ Column Totals:(A) $A = B/A =$ Hydrophytic Vegetation Indicators: $1 - Rapid Test for Hydrophytic Vegetation$ $2 - Dominance Test is >50\%$ $3 - Prevalence Index is \leq 3.0^1A = 100\% (Explain)$
Total Number of Dominant Species Across All Strata:5(B)Percent of Dominant Species That Are OBL, FACW, or FAC: $5/5 = 100\%$ (A/B)Prevalence Index worksheet: $5/5 = 100\%$ (A/B)Total % Cover of:Multiply by:OBL species $x 1 =$ FACW species $x 2 =$ FAC species $x 3 =$ FACU species $x 4 =$ UPL species $x 5 =$ Column Totals:(A) $A = B/A =$ Hydrophytic Vegetation Indicators: $1 -$ Rapid Test for Hydrophytic Vegetation $2 -$ Dominance Test is >50% $3 -$ Prevalence Index is $\leq 3.0^1$ Problematic Hydrophytic Vegetation 1 (Explain)
Species Across Air Strata:0(B)Percent of Dominant Species That Are OBL, FACW, or FAC: $5/5 = 100\%$ (A/B)Prevalence Index worksheet:(A/B)Total % Cover of:Multiply by:OBL speciesx 1 =FACW speciesx 2 =FAC speciesx 3 =FACU speciesx 4 =UPL speciesx 5 =Column Totals:(A)(B)Prevalence Index = B/A =Hydrophytic Vegetation Indicators:1 - Rapid Test for Hydrophytic Vegetation2 - Dominance Test is >50%3 - Prevalence Index is <3.01
Percent of Dominant Species That Are OBL, FACW, or FAC: $5/5 = 100\%$ (A/B)Prevalence Index worksheet:Multiply by:(A/B)OBL species $x 1 =$ $x 1 =$ FACW species $x 2 =$ $x 1 =$ FAC species $x 3 =$ $x 3 =$ FACU species $x 4 =$ $x 1 =$ UPL species $x 5 =$ $x 6 =$ Column Totals: $(A)$ $(B)$ Prevalence Index = B/A = $x 6 =$ Hydrophytic Vegetation Indicators: $1 -$ Rapid Test for Hydrophytic Vegetation $2 -$ Dominance Test is >50% $3 -$ Prevalence Index is $\leq 3.0^1$ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
That Are OBL, FACW, or FAC: $5/5 = 100\%$ (A/B)Prevalence Index worksheet:Total % Cover of:Multiply by:OBL speciesx 1 =FACW speciesx 2 =FAC speciesx 3 =FACU speciesx 4 =UPL speciesx 5 =Column Totals:(A)Prevalence Index = B/A =Hydrophytic Vegetation Indicators:1 - Rapid Test for Hydrophytic Vegetation2 - Dominance Test is >50%3 - Prevalence Index is $\leq 3.0^1$ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
Prevalence Index worksheet:         Total % Cover of:       Multiply by:         OBL species       x 1 =         FACW species       x 2 =         FAC species       x 3 =         FACU species       x 4 =         UPL species       x 5 =         Column Totals:       (A)         Prevalence Index = B/A =         Hydrophytic Vegetation Indicators:         1 - Rapid Test for Hydrophytic Vegetation         2 - Dominance Test is >50%         3 - Prevalence Index is ≤3.01         Problematic Hydrophytic Vegetation1 (Explain)
Total % Cover of:       Multiply by:         OBL species       x 1 =         FACW species       x 2 =         FAC species       x 3 =         FACU species       x 4 =         UPL species       x 5 =         Column Totals:       (A)         Prevalence Index = B/A =         Hydrophytic Vegetation Indicators:         1 - Rapid Test for Hydrophytic Vegetation         2 - Dominance Test is >50%         3 - Prevalence Index is ≤3.01         Problematic Hydrophytic Vegetation1 (Explain)
Initial % Cover of:       Multiply by:         OBL species $x 1 =$ FACW species $x 2 =$ FAC species $x 3 =$ FACU species $x 4 =$ UPL species $x 5 =$ Column Totals:       (A)         Prevalence Index $B/A =$ Hydrophytic Vegetation Indicators:         1       - Rapid Test for Hydrophytic Vegetation         2 - Dominance Test is >50%         3 - Prevalence Index is $\leq 3.0^1$ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
OBL species       x 1 =         FACW species       x 2 =         FAC species       x 3 =         FACU species       x 4 =         UPL species       x 5 =         Column Totals:       (A)         Prevalence Index = B/A =         Hydrophytic Vegetation Indicators:         1 - Rapid Test for Hydrophytic Vegetation         2 - Dominance Test is >50%         3 - Prevalence Index is ≤3.01         Problematic Hydrophytic Vegetation1 (Explain)
FACW species       x 2 =         FAC species       x 3 =         FACU species       x 4 =         UPL species       x 5 =         Column Totals:       (A)         Prevalence Index = $B/A =$ Hydrophytic Vegetation Indicators:         1 - Rapid Test for Hydrophytic Vegetation         2 - Dominance Test is >50%         3 - Prevalence Index is <3.01
FAC species       x 3 =         FACU species       x 4 =         UPL species       x 5 =         Column Totals:       (A)         Prevalence Index = $B/A =$ Hydrophytic Vegetation Indicators:         1 - Rapid Test for Hydrophytic Vegetation         2 - Dominance Test is >50%         3 - Prevalence Index is $\leq 3.0^1$ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
FACU species       x 4 =         UPL species       x 5 =         Column Totals:       (A)         Prevalence Index = $B/A =$ Hydrophytic Vegetation Indicators:         1 - Rapid Test for Hydrophytic Vegetation         2 - Dominance Test is >50%         3 - Prevalence Index is $\leq 3.0^1$ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
UPL species x 5 = Column Totals: (A) (B) Prevalence Index = $B/A =Hydrophytic Vegetation Indicators:1 - Rapid Test for Hydrophytic Vegetation2 - Dominance Test is >50%3 - Prevalence Index is \leq 3.0^1Problematic Hydrophytic Vegetation1 (Explain)$
Column Totals:       (A)       (B)         Prevalence Index       = B/A =
Prevalence Index = B/A =
Prevalence Index = $B/A =$ Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is $\leq 3.0^1$ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
Hydrophytic Vegetation Indicators:         1 - Rapid Test for Hydrophytic Vegetation         2 - Dominance Test is >50%         3 - Prevalence Index is ≤3.0 <sup>1</sup> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
<ul> <li>1 - Rapid Test for Hydrophytic Vegetation</li> <li>2 - Dominance Test is &gt;50%</li> <li>3 - Prevalence Index is ≤3.0<sup>1</sup></li> <li>Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)</li> </ul>
<ul> <li>2 - Dominance Test is &gt;50%</li> <li>3 - Prevalence Index is ≤3.0<sup>1</sup></li> <li>Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)</li> </ul>
□       3 - Prevalence Index is ≤3.0 <sup>1</sup> □       Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
1 materia at levels and and set to all builts to the set of the se
Indicators of hydric soil and wetland hydrolody must
be present, unless disturbed or problematic.
Definitions of Four Vegetation Strata:
Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
more in diameter at breast height (DBH), regardless of height
neight.
Sapling/Shrub – Woody plants, excluding vines, less
than 3 in. DBH and greater than 3.28 ft (1 m) tall.
Herb – All berbaceous (non-woody) plants, regardless
of size, and woody plants less than 3.28 ft tall.
Woody vine – All woody vines greater than 3.28 ft in height
neight.
Hydrophytic
Hydrophytic Vegetation
Hydrophytic Vegetation Present? Yes <u>V</u> No

Profile Desc	ription: (Describe t	o the dep	th needed to docur	nent the i	indicator	or confirm	n the absence	of indicators.)
Depth	Matrix		Redo	x Feature	s			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-3	10YR 2/1						silty clay	
3-18	10YR 4/2		7.5YR 4/6	20	RM	Μ	clay	
						·		
						·		
						·		
<sup>1</sup> Type: C=Co	oncentration, D=Depl	etion, RM=	Reduced Matrix, MS	S=Masked	d Sand Gi	ains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
Hydric Soil I	ndicators: (Applica	ble to all	LRRs, unless other	rwise not	ed.)		Indicators	for Problematic Hydric Soils <sup>3</sup> :
Histosol	(A1)		Polyvalue Be	low Surfa	ce (S8) <b>(I</b>		<b>J) 🗌</b> 1 cm N	Muck (A9) <b>(LRR O)</b>
Histic Ep	oipedon (A2)		Thin Dark Su	irface (S9	) <b>(LRR S,</b>	T, U)	2 cm N	Muck (A10) <b>(LRR S)</b>
Black Hi	stic (A3)		Loamy Muck	y Mineral	(F1) <b>(LR</b>	R O)		ced Vertic (F18) (outside MLRA 150A,B)
	n Sulfide (A4)		Loamy Gleye	ed Matrix (	(F2)			ont Floodplain Soils (F19) <b>(LRR P, S, T)</b>
	Layers (A5)	T II)	Peday Dark	trix (F3) Surfaca (E	56)			alous Bright Loamy Solis (F20)
	cky Mineral (A7)	і, U) Р Р Т III		Sunace (r rk Surface	-0) (F7)			ra 1556) Parent Material (TE2)
	esence (A8) (I RR U)	i ( i , i , <b>o</b> )		essions (F	8)			Shallow Dark Surface (TE12)
	ck (A9) (LRR P. T)		Marl (F10) (L	.RR U)	0)		Other	(Explain in Remarks)
Depleted	Below Dark Surface	e (A11)	Depleted Oct	hric (F11)	(MLRA 1	51)		
Thick Da	ark Surface (A12)		Iron-Mangan	ese Mass	es (F12)	(LRR O, P,	T) <sup>3</sup> Indic	cators of hydrophytic vegetation and
Coast Pr	airie Redox (A16) <b>(M</b>	ILRA 150	🔥 🔲 Umbric Surfa	ce (F13)	(LRR P, 1	', U)	wet	tland hydrology must be present,
🔲 Sandy M	lucky Mineral (S1) <b>(L</b>	RR O, S)	Delta Ochric	(F17) <b>(ML</b>	RA 151)		unl	ess disturbed or problematic.
Sandy G	ileyed Matrix (S4)		Reduced Ver	rtic (F18) (	(MLRA 1	50A, 150B)	)	
Sandy R	edox (S5)		Piedmont Flo	odplain S	ioils (F19)	(MLRA 14	19A)	
Stripped	Matrix (S6)		Anomalous E	Bright Loai	my Soils (	F20) <b>(MLR</b>	RA 149A, 153C	, 153D)
Dark Su	face (S7) (LRR P, S	, T, U)						
Restrictive	ayer (if observed):							
Type:								
Depth (inc	ches):						Hydric Soil	Present? Yes <u>•</u> No
Remarks:								

Project/Site: Site 8 - Supplemental		City/County: Belle Chasse,	Plaquemines	Sampling Date: 20 September 2019
Applicant/Owner: CPRA			State: LA	Sampling Point: 25
Investigator(s): Benjamin Richard and Joe	Cancienne	Section, Township, Range: S	6 - T16S - R25I	E
Landform (hillslope, terrace, etc.):		Local relief (concave, convex,	none): none	Slope (%): 0-1%
Subregion (LRR or MLRA): MLRA 151	Lat: 29.656	6317 Long:	89.965363	Datum: NAD 83 UTM 16N
Soil Map Unit Name: Cancienne silt Ioam, C	)-1% slopes		NWI classifi	cation: N/A
Are climatic / hydrologic conditions on the site	typical for this time of ye	ar? Yes 🖌 No	(If no, explain in F	Remarks.)
Are Vegetation, Soil, or Hydrold	ogy significantly	disturbed? Are "Norma	Circumstances"	present? Yes 🖌 No
Are Vegetation , Soil , or Hydrold	ogy naturally pro	blematic? (If needed, e	explain any answe	ers in Remarks.)
	oito mon obowing	compling point locati	no trancost	important factures ato
SUMMART OF FINDINGS - Allach	site map snowing		ons, transects	s, important leatures, etc.
Hydrophytic Vegetation Present?YesHydric Soil Present?YesWetland Hydrology Present?YesPomarks:Yes	3 No 3 No∕ 3 No∕	Is the Sampled Area within a Wetland?	Yes	No
HYDROLOGY				
Wetland Hydrology Indicators:			Secondary Indica	ators (minimum of two required)
Primary Indicators (minimum of one is require	ed; check all that apply)		Surface Soil	Cracks (B6)
Surface Water (A1)	Aquatic Fauna (B1:	3)	Sparsely Ve	getated Concave Surface (B8)
High Water Table (A2)	Marl Deposits (B15	5) (LRR U)	Drainage Pa	atterns (B10)
Saturation (A3)	Hydrogen Sulfide C	Ddor (C1)	Moss Trim L	ines (B16)
Water Marks (B1)	Oxidized Rhizosph	eres along Living Roots (C3)	Dry-Season	Water Table (C2)
Sediment Deposits (B2)	Presence of Reduc	ced Iron (C4)	Crayfish Bu	rrows (C8)
Drift Deposits (B3)	Recent Iron Reduc	tion in Tilled Soils (C6)	Saturation V	isible on Aerial Imagery (C9)

Thin Muck Surface (C7)

Yes \_\_\_\_ No \_\_\_ Depth (inches): \_\_\_\_\_

Yes \_\_\_\_ No ✓ Depth (inches): \_\_\_\_\_

Yes \_\_\_\_ No \_✓ Depth (inches): \_\_\_\_\_

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Other (Explain in Remarks)

Remarks:

Algal Mat or Crust (B4)

Water-Stained Leaves (B9)

Inundation Visible on Aerial Imagery (B7)

Iron Deposits (B5)

Field Observations:

Surface Water Present?

Water Table Present?

Saturation Present? (includes capillary fringe) Geomorphic Position (D2)

Sphagnum moss (D8) (LRR T, U)

Wetland Hydrology Present? Yes \_\_\_\_ No \_\_\_\_

Shallow Aquitard (D3)

FAC-Neutral Test (D5)

# VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Poir	nt: ∠⊃
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	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30' radius )	% Cover	Species?	Status	Number of Dominant Species
1. Triadica sebifera	50	Y	FAC	That Are OBL, FACW, or FAC: 9 (A)
2. Acer negundo	20	Y	FAC	
3.				Species Across All Strata: 10 (B)
4				
5				Percent of Dominant Species
				That Are OBL, FACW, or FAC: (A/B)
0				Prevalence Index worksheet:
7				Total % Cover of: Multiply by:
8	70			OBL species $x = 1 = 1$
	70	= Total Cov	ver	
50% of total cover: <u>35</u>	20% of	total cover	14	
Sapling/Shrub Stratum (Plot size: 15' radius )				FAC species x 3 =
1. Acer negundo	20	Y	FAC	FACU species x 4 =
2. Triadica sebifera	30	Y	FAC	UPL species x 5 =
3 Ligustrum sinense	20	Y	FAC	Column Totals: (A) (B)
4				
				Prevalence Index = B/A =
0				Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7		. <u> </u>		✓ 2 - Dominance Test is >50%
8				3 - Prevalence Index is ≤3.0 <sup>1</sup>
	70	= Total Cov	ver	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover: <u>35</u>	20% of	total cover	14	
Herb Stratum (Plot size: 5' radius )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. Rubus spp.	20	Y	FAC	be present, unless disturbed or problematic.
2. Toxicodendron radicans	30	Y	FAC	Definitions of Four Vegetation Strata:
3				
0				<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or
+				height
5				
6				Sapling/Shrub – Woody plants, excluding vines, less
7				than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10				Woody vine All woody vines greater than 3.28 ft in
11.				height.
12				
·	50	= Total Cov	or	
50% of total action 25	2001/ -6		. 10	
50% of total cover. 25	20% 01	total cover		
Woody Vine Stratum (Plot size: 13 radius )	00	V	FAC	
		ř	FAC	
2. Ampelopsis arborea	20	Y	FAC	
3. Parthenocissus quinquefolia	20	Y	FACU	
4				
5.				Hydrophytic
	60	= Total Cov	/er	Vegetation
50% of total cover: 30	20% of	total cover	. 12	Present? Yes V No
Demarkey (If abaanvad, liet merrikalerical adaptations hat			·	
Remarks: (If observed, list morphological adaptations belo	JW).			

SOIL
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Profile Desc	ription: (Describe t	o the depth	needed to docum	ent the i	ndicator	or confirm	n the absence of	of indicators.)	
Depth	Matrix		Redox	Features	s				
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks	
0-6	10YR 4/3						loam		_
6-12	10YR 4/2						clay		
12-15	2.5Y 4/3						sand		
									_
									_
					·				_
									_
					·				_
<sup>1</sup> Type: C=Co	ncentration, D=Depl	etion, RM=Re	educed Matrix, MS	=Masked	Sand Gra	ains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.	
Hyaric Soli I	ndicators: (Applica	IDIE TO AII LR	Rs, unless other	wise note	ea.)			for Problematic Hydric Solis":	
	(A1) inodon (A2)		Polyvalue Bel     Thin Dark Sur	ow Surfac	ce (S8) (L	RR S, T, U T 11)		uck (A9) (LRR O)	
	stic (A3)			Mineral (	(F1) (LRR	() ()		ed Vertic (F18) <b>(outside MLRA 150A</b>	B)
	n Sulfide (A4)		Loamy Gleve	d Matrix (I	F2)	,		ont Floodplain Soils (F19) (LRR P. S.	,D, T)
Stratified	Layers (A5)		Depleted Mat	rix (F3)	,		Anomal	lous Bright Loamy Soils (F20)	
Organic	Bodies (A6) (LRR P,	T, U)	Redox Dark S	Surface (F	6)			A 153B)	
5 cm Mu	cky Mineral (A7) (LR	R P, T, U)	Depleted Darl	k Surface	(F7)			rrent Material (TF2)	
	esence (A8) (LRR U)		Redox Depres	ssions (F8	8)		U Very St	nallow Dark Surface (TF12)	
	CK (A9) (LKK P, T) Below Dark Surface	(A11)		<b>ric</b> (E11) (	(MI RA 1	51)			
Thick Da	rk Surface (A12)	, (, (, 1))	Iron-Mangane	ese Masse	es (F12) (I	LRR 0, P,	T) <sup>3</sup> Indica	ators of hydrophytic vegetation and	
Coast Pr	airie Redox (A16) (M	ILRA 150A)	Umbric Surfac	ce (F13) <b>(</b>	LRR P, T	, U)	wetland hydrology must be present, unless disturbed or problematic.		
Sandy M	ucky Mineral (S1) <b>(L</b>	RR O, S)	Delta Ochric (	(F17) <b>(ML</b>	RA 151)				
Sandy G	leyed Matrix (S4)		Reduced Vert	tic (F18) <b>(</b> I	MLRA 15	0A, 150B)			
Sandy R	edox (S5) Matrix (S6)			odplain So right Loon	OIIS (F19) ny Soile (I	(MLRA 14	19A)	152D)	
Dark Sur	face (S7) <b>(LRR P. S</b> .	. T. U)		ngni Luan	ity 3015 (1		A 149A, 155C,	1550)	
Restrictive L	ayer (if observed):	, , - ,							
Туре:			_					1	
Depth (inc	:hes):		_				Hydric Soil	Present? Yes No 🖌	_
Remarks:									

Project/Site: Site 8 - Supplemental	City/County: Belle Chasse, Plaquemines Sampling Date: 20 September 2019					
Applicant/Owner: CPRA	State: LA Sampling Point: 26					
Investigator(s): Benjamin Richard and Joe Cancienne	Section Township Range: S6 - T16S - R25E					
Landform (billslope, terrace, etc.):	Local relief (concave, convex, none). none Slope (%). 0-1%					
Subregion (LBR or MLRA): MLRA 151	656760 Long: -89.964232 Datum: NAD 83 UTM 16N					
Soil Man Unit Name. Cancienne silt Ioam, 0-1% slopes	NWI classification: N/A					
Are climatic / hydrologic conditions on the site typical for this time of	f vear? Yes V No (If no explain in Remarks )					
Are Vegetation Soil or Hydrology significar	ntly disturbed? Are "Normal Circumstances" present? Yes V No					
Are Vegetation Soil or Hydrology naturally	problematic? (If needed, explain any answers in Remarks.)					
SUMMARY OF FINDINGS Attach site man showi	ing compling point locations, transports, important factures, etc.					
SUMMARY OF FINDINGS – Attach site map show	ing sampling point locations, transects, important leatures, etc.					
Hydrophytic Vegetation Present?       Yes _ ✓ No         Hydric Soil Present?       Yes _ ✓ No         Wetland Hydrology Present?       Yes _ ✓ No	─ Is the Sampled Area ─ within a Wetland? Yes No					
Remarks:						
HYDROLOGY						
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)					
Primary Indicators (minimum of one is required; check all that app	<u>ly)</u> Surface Soil Cracks (B6)					
Aquatic Fauna (	B13) EXAMPLE Sparsely Vegetated Concave Surface (B8)					
$\square \text{ High Water Table (A2)} \qquad \square \text{ Water Pable (A2)} \qquad \qquad \square \text{ Hydrogen Sulfid}$	$\frac{1}{1000000000000000000000000000000000$					
Water Marks (B1)	spheres along Living Roots (C3)					
Sediment Deposits (B2)	duced Iron (C4)					
Drift Deposits (B3)	duction in Tilled Soils (C6)					
Algal Mat or Crust (B4)	ace (C7)					
Iron Deposits (B5)	n Remarks)  Shallow Aquitard (D3)					
Inundation Visible on Aerial Imagery (B7)	FAC-Neutral Test (D5)					
Water-Stained Leaves (B9)	Sphagnum moss (D8) (LRR T, U)					
Field Observations:						
Surface Water Present? Yes No Y Depth (inch	1es):					
Water Table Present? Yes <u>No Y</u> Depth (inch	1es):					
Saturation Present? Yes <u>v</u> No <u>Depth</u> (inch (includes capillary fringe)	les): 15 Wetland Hydrology Present? Yes No					
Describe Recorded Data (stream gauge, monitoring well, aerial ph	notos, previous inspections), if available:					
Remarks:						

# VEGETATION (Four Strata) – Use scientific names of plants.

Sampling	Point:	26
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	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: <u>30' radius</u> )	<u>% Cover</u>	Species?	Status	Number of Dominant Species
1. Triadica sebifera	50	Y	FAC	That Are OBL, FACW, or FAC: 4 (A)
2				
2				Total Number of Dominant
S				Species Across All Strata: (B)
4	··			Percent of Dominant Species
5		. <u> </u>		That Are OBL, FACW, or FAC: $\frac{4/4 = 100\%}{4/4 = 100\%}$ (A/B
6				Developer to develop the basets
7				Prevalence Index worksneet:
8.				Total % Cover of: Multiply by:
	50	= Total Cov	er	OBL species x 1 =
50% of total cover: 25	20% of	total cover	10	FACW species x 2 =
Oraclia a (Ohanthe Ohanthana (Distrations, 15' radius	20 % 01			FAC species x 3 =
Sapling/Shrub Stratum (Plot size: 13 radius )	20	V		FACU species x 4 =
	20	ř	FAC	
2. Triadica sebifera	40	Y	FAC	
3				Column Totals: (A) (B)
4.				Brouglance Index = D/A =
5				Prevalence index = B/A =
o		·		Hydrophytic Vegetation Indicators:
6	··			1 - Rapid Test for Hydrophytic Vegetation
7				✓ 2 - Dominance Test is >50%
8				$\square$ 3 - Prevalence Index is ≤3.0 <sup>1</sup>
	70	= Total Cov	rer	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover: 35	20% of	total cover	14	
Horb Stratum (Plot size: 5' radius				1
Alternanthera philoxeroides	80	v	OBI	'Indicators of hydric soil and wetland hydrology must
		<u> </u>	ODL	be present, unless disturbed or problematic.
2				Definitions of Four Vegetation Strata:
3				<b>Tree</b> – Woody plants, excluding vines, 3 in (7.6 cm) o
4.				more in diameter at breast height (DBH), regardless of
5				height.
3				
0				<b>Sapling/Shrub</b> – Woody plants, excluding vines, less
7		·		than 3 In. DBH and greater than 3.28 ft (1 m) tail.
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10.				We advantage Allowed to since any start them 0.00 ft in
11				woody vine – All woody vines greater than 3.28 ft in
10				neight.
12				
	00	= Total Cov	rer	
50% of total cover: 40	20% of	total cover	16	
Woody Vine Stratum (Plot size: 15' radius )				
1				
2				
<u>د.</u>				
٥				
4		. <u> </u>		
5				Hydrophytic
	:	= Total Cov	rer	Vegetation
				Present? Yes Yes No
50% of total cover	20% of	total cover		
50% of total cover:	20% of	total cover	·	
50% of total cover: Remarks: (If observed, list morphological adaptations b	20% of pelow).	total cover	:	
50% of total cover: Remarks: (If observed, list morphological adaptations b	20% of pelow).	total cover	:	
50% of total cover: Remarks: (If observed, list morphological adaptations b	20% of pelow).	total cover	:	
50% of total cover: Remarks: (If observed, list morphological adaptations b	20% of pelow).	total cover	:	
50% of total cover: Remarks: (If observed, list morphological adaptations b	20% of pelow).	total cover	: <u></u>	
50% of total cover: Remarks: (If observed, list morphological adaptations b	20% of	total cover	: <u></u>	

SOIL

Profile Description: (Des	cribe to the dep	th needed to docu	ment the indicat	or or confir	m the absence	of indicators.)
Depth M	atrix	Redo	ox Features			
(inches) Color (mc	oist) %	Color (moist)	<u>%</u> Type	e <sup>1</sup> Loc <sup>2</sup>	Texture	Remarks
0-18 10YR 4/3		10YR 4/8	20 RM	M	silty clay	
					·	
					·	
Type: C=Concentration, I	D=Depletion, RM=	-Reduced Matrix, M	S=Masked Sand	Grains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
lydric Soil Indicators: (/	Applicable to all	LRRs, unless othe	erwise noted.)		Indicators	for Problematic Hydric Soils <sup>3</sup> :
Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) Organic Bodies (A6) (I 5 cm Mucky Mineral (A Muck Presence (A8) (I 1 cm Muck (A9) (LRR Depleted Below Dark (A Coast Prairie Redox (A Sandy Mucky Mineral Sandy Gleyed Matrix (S Sandy Redox (S5) Stripped Matrix (S6) Dark Surface (S7) (LF	LRR P, T, U) A7) (LRR P, T, U) LRR U) P, T) Surface (A11) 12) A16) (MLRA 1504 (S1) (LRR O, S) (S4) R P, S, T, U)	Polyvalue Be     Thin Dark Su     Loamy Muck     Loamy Gleye     Depleted Ma     Redox Dark     Depleted Da     Redox Depre     Marl (F10) (I     Depleted Oc     Iron-Mangar     Delta Ochric     Reduced Ve     Piedmont Fle     Anomalous I	elow Surface (S8 urface (S9) <b>(LRR</b> ky Mineral (F1) <b>(L</b> ed Matrix (F2) atrix (F3) Surface (F6) ark Surface (F7) essions (F8) <b>LRR U)</b> chric (F11) <b>(MLR/</b> hese Masses (F12) ace (F13) <b>(LRR F</b> c (F17) <b>(MLRA 15</b> ) ertic (F18) <b>(MLRA</b> oodplain Soils (F Bright Loamy Soi	A 151) RR O) 2) (LRR O, P 2) (LRR O, P 7, T, U) 1) 150A, 150B 19) (MLRA 1 Is (F20) (MLI	U) 1 cm N 2 cm N Reduc Piedm Anoma (MLF Red Pi Very S Other of very S Other of all disc very A9A) RA 149A, 153C	Muck (A9) (LRR O) Muck (A10) (LRR S) eed Vertic (F18) (outside MLRA 150A,B) ont Floodplain Soils (F19) (LRR P, S, T) alous Bright Loamy Soils (F20) <b>RA 153B)</b> arent Material (TF2) Shallow Dark Surface (TF12) (Explain in Remarks) cators of hydrophytic vegetation and tland hydrology must be present, ess disturbed or problematic. 5, 153D)
Restrictive Layer (if obsection of the section of t	erved):				Hudria Sail	
Deptn (inches):					Hydric Soli	Present? res <u> </u>

Project/Site: Site 8 - Supplemental City.	/County: Belle Chasse, Plaquemines Sampling Date: 20 September 2019
Applicant/Owner: CPRA	State: LA Sampling Point: 27
Investigator(s): Benjamin Richard and Joe Cancienne Sec	tion, Township, Range: S6 - T16S - R25E
Landform (hillslope, terrace, etc.): leveed pasture	al relief (concave, convex, none): <u>none</u> Slope (%): <u>0-1%</u>
Subregion (LRR or MLRA): MLRA 151 Lat: 29.64845	8 Long: -89.9790532 Datum: NAD 83 UTM 16N
Soil Map Unit Name: Harahan clay, 0-1% slopes	NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year?	Yes V No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly dist	urbed? Are "Normal Circumstances" present? Yes 🗸 No
Are Vegetation , Soil , or Hydrology naturally probler	matic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing sa	mpling point locations, transects, important features, etc.
Hydrophytic Vegetation Present?       Yes        ✓       No         Hydric Soil Present?       Yes        ✓       No         Wetland Hydrology Present?       Yes        ✓       No         Remarks:       Image: No       Image: No       Image: No	Is the Sampled Area within a Wetland? Yes <u>No</u>
HYDROLOGY	
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Surface Water (A1)	
High Water Table (A2)	RR U) Drainage Patterns (B10)
Saturation (A3)	(C1) Moss Trim Lines (B16)
Water Marks (B1)	along Living Roots (C3) Dry-Season Water Table (C2)
Sediment Deposits (B2)	ron (C4) Crayfish Burrows (C8)
Drift Deposits (B3)	in Tilled Soils (C6) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	) Geomorphic Position (D2)
✓   Iron Deposits (B5)      Other (Explain in Remained in Re	arks) Shallow Aquitard (D3)
Inundation Visible on Aerial Imagery (B7)	I FAC-Neutral Test (D5)
Eield Observations:	
Surface Water Present? Yes No ✓ Denth (inches)	
Water Table Present? Yes No ✓ Depth (inches):	
Saturation Present? Yes No ✓ Depth (inches):	Wetland Hydrology Present? Yes V
(includes capillary fringe)	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, p	revious inspections), if available:
Demoder	
Remarks:	
1	

# VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: 27

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 radius ) 1.	<u>% Cover</u>	Species?	Status	Number of Dominant Species That Are OBL, FACW, or FAC: <sup>4</sup> (A)
2.				Tatal Number of Deminant
3				Species Across All Strata: 5 (B)
4				
5				Percent of Dominant Species That Are OBL, FACW, or FAC: $\frac{4/5 = 80\%}{4/5}$ (A/B)
6				Provolonco Index workshoot:
7				Total % Cover of: Multiply by:
8			. <u> </u>	OBL species x1 =
		= Total Cov	er	EACW species x 2 =
50% of total cover:	20% of	total cover		FAC species x3 =
Sapling/Shrub Stratum (Plot size: 15' radius )				FACIL species x 4 =
1. Baccharis halimitolia	25	Y	FAC	
2				Column Totolo: (A) (P)
3				
4				Prevalence Index = B/A =
5				Hydrophytic Vegetation Indicators:
6				✓ 1 - Rapid Test for Hydrophytic Vegetation
7				2 - Dominance Test is >50%
8				$\boxed{\square}$ 3 - Prevalence Index is $\leq 3.0^{1}$
	25	= Total Cov	er	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover: 12.5	20% of	total cover:	5	
Herb Stratum (Plot size: <sup>5'</sup> radius )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. Cynodon dactylon	90	Y	FACU	be present, unless disturbed or problematic.
2 Juncus effusus	20	Y	OBL	Definitions of Four Vegetation Strata:
3 Alternanthera philoxeroides	50	Y	OBL	
4				<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or
5				height.
6				
7				than 3 in DBH and greater than 3 28 ft (1 m) tall
0				
9				<b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
10				<b>Woody vine</b> – All woody vines greater than 3 28 ft in
11	<u> </u>			height.
12				
	160	= Total Cov	er	
50% of total cover: 80	20% of	total cover:	32	
Woody Vine Stratum (Plot size: 15' radius )				
1. Vigna luteola	20	Y	FACW	
2.				
3.				
4.	- <u></u>			
5				Linder a butic
···	20	= Total Cov	er	Hydropnytic Vegetation
50% of total cover: 10	= 10tal Cover 20% of total cover: 4		4	Present? Yes <u>V</u> No
Demonitory (If absorved, list membels rise) adaptations hal	20 /0 01			
Remarks: (If observed, list morphological adaptations bein	OW).			

#### SOIL

Profile Desc	ription: (Describe f	to the dep	h needed to docum	nent the	indicator	or confirm	n the absence	of indicators.)
Depth	Matrix		Redox	Feature	es1	. 2		
(inches)	Color (moist)	%		20			lexture	Remarks
0-0	101R 3/1		10VDVD 5/0	20				
8-12	10YR 2/1			30			clay	
12-16	10YR 4/2		10YR 5/8	25	RM	M	clay	
<sup>1</sup> Type: C=Co	oncentration, D=Depl	etion, RM=	Reduced Matrix, MS	=Maske	d Sand Gr	ains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
Hydric Soil I	ndicators: (Applica	able to all	LRRs, unless other	wise not	ed.)		Indicators	for Problematic Hydric Soils <sup>3</sup> :
Histosol	(A1)		Polyvalue Bel	low Surfa	ace (S8) <b>(L</b>	.RR S, T, I	<b>U)  1 cm M</b>	/luck (A9) <b>(LRR O)</b>
Histic Ep	bipedon (A2)		Thin Dark Su	face (S9	) (LRR S,	T, U)	2 cm №	fuck (A10) (LRR S)
Black His	stic (A3)		Loamy Mucky	/ Mineral	(F1) <b>(LRF</b> (F2)	R O)		ed Vertic (F18) <b>(outside MLRA 150A,B)</b>
	II Suilide (A4)		Loanny Gieye     Depleted Mat	u Matrix riv (E3)	(FZ)			alous Bright Loamy Soils (F19) (LRR P, S, T)
	Bodies (A6) (LRR P.	T. U)	Redox Dark S	Surface (I	F6)		(MLF	RA 153B)
5 cm Mu	cky Mineral (A7) (LR	R P, T, U)	Depleted Dar	k Surface	e (F7)		Red Pa	arent Material (TF2)
Muck Pr	esence (A8) (LRR U)	)	Redox Depre	ssions (F	8)		Uery S	hallow Dark Surface (TF12)
1 cm Mu	ck (A9) <b>(LRR P, T)</b>		Marl (F10) <b>(L</b>	RR U)			U Other (	(Explain in Remarks)
	Below Dark Surface	e (A11)		ric (F11)	(MLRA 1	51) L D D O D	T) <sup>3</sup> localia	store of budges budges a set of an and
	rk Sufface (A12)	II RA 150/		ese Mass	ies (F12) (		, I) Indic	ators of hydrophytic vegetation and land hydrology must be present
Sandy M	lucky Mineral (S1) (L	RR O. S)	Delta Ochric (	(F17) <b>(M</b> I	LRA 151)	, 0)	unle	ess disturbed or problematic.
Sandy G	leyed Matrix (S4)	,.,	Reduced Ver	tic (F18)	(MLRA 15	0A, 150B	)	
Sandy R	edox (S5)		Piedmont Flo	odplain S	Soils (F19)	(MLRA 1	49A)	
Stripped	Matrix (S6)		Anomalous B	right Loa	my Soils (	F20) <b>(MLF</b>	RA 149A, 153C	, 153D)
Dark Su	face (S7) (LRR P, S	, T, U)						
Type:	ayer (if observed):							
Depth (inc	ches).						Hydric Soil	Present? Yes No
Remarks:								
1								

# APPENDIX B PHOTOGRAPHS



**Description:** Data Point 1 Soil Profile





**Description:** Data Point 1 Typical Vegetation





**Description:** Data Point 2 Soil Profile





**Description:** Data Point 2 Typical Vegetation





**Description:** Data Point 3 Soil Profile



### Photo: 6

**Description:** Data Point 3 Typical Vegetation





**Description:** Data Point 4 Soil Profile





**Description:** Data Point 4 Typical Vegetation





**Description:** Data Point 5 Soil Profile







**Description:** Data Point 6 Soil Profile



Photo: 12

**Description:** Data Point 6 Typical Vegetation





**Description:** Data Point 7 Soil Profile



### Photo: 14

**Description:** Data Point 7 Typical Vegetation





**Description:** Data Point 8 Soil Profile



Photo: 16

**Description:** Data Point 8 Typical Vegetation



# Photographic Documentation Approximately 455 Acre Mid Barataria Sediment Diversion Auxiliary Areas Plaquemines Parish, Louisiana



Photo: 17

**Description:** Data Point 9 Soil Profile





**Description:** Data Point 9 Typical Vegetation





**Description:** Data Point 10 Soil Profile





**Description:** Data Point 10 Typical Vegetation





**Description:** Data Point 11 Soil Profile



### Photo: 22

**Description:** Data Point 11 Typical Vegetation





**Description:** Data Point 12 Soil Profile



### Photo: 24

**Description:** Data Point 12 Typical Vegetation




**Description:** Data Point 13 Soil Profile







**Description:** Data Point 14 Soil Profile



Photo: 28

**Description:** Data Point 14 Typical Vegetation



## Photographic Documentation Approximately 455 Acre Mid Barataria Sediment Diversion Auxiliary Areas Plaquemines Parish, Louisiana



Photo: 29

**Description:** Data Point 15 Soil Profile



Photo: 30

**Description:** Data Point 15 Typical Vegetation





**Description:** Data Point 16 Soil Profile



#### Photo: 32

**Description:** Data Point 16 Typical Vegetation





**Description:** Data Point 17 Soil Profile



#### Photo: 34

**Description:** Data Point 17 Typical Vegetation





**Description:** Data Point 18 Soil Profile



#### Photo: 36

**Description:** Data Point 18 Typical Vegetation





**Description:** Data Point 19 Soil Profile





**Description:** Data Point 19 Typical Vegetation



## Photographic Documentation Approximately 455 Acre Mid Barataria Sediment Diversion Auxiliary Areas Plaquemines Parish, Louisiana



#### Photo: 39

**Description:** Data Point 20 Soil Profile



#### Photo: 40

**Description:** Data Point 20 Typical Vegetation





**Description:** Data Point 21 Soil Profile



Photo: 42

**Description:** Data Point 21 Typical Vegetation





**Description:** Data Point 22 Soil Profile





**Description:** Data Point 22 Typical Vegetation





**Description:** Data Point 23 Soil Profile



#### Photo: 46

**Description:** Data Point 23 Typical Vegetation





**Description:** Data Point 24 Soil Profile





Photo: 48

**Description:** Data Point 24 Typical Vegetation

## Photographic Documentation Approximately 455 Acre Mid Barataria Sediment Diversion Auxiliary Areas Plaquemines Parish, Louisiana



#### Photo: 49

**Description:** Typical Site Characteristics

Duck Pond located in south west portion of project site.





Photo: 50

**Description:** Typical Drainage Ditch



**Description:** Typical Drainage Ditch (Pump Station)





**Description:** Typical Site Characteristics

Marsh behind duck camp.



Photographic Documentation Approximately 455 Acre Mid Barataria Sediment Diversion Auxiliary Areas Plaquemines Parish, Louisiana



Photo: 53

**Description:** 

Data Point 25 - Soil profile.





## **Description:**

Data Point 25 - Typical Site Characteristics



## Photographic Documentation Approximately 455 Acre Mid Barataria Sediment Diversion Auxiliary Areas Plaquemines Parish, Louisiana



## Photo: 55

#### **Description:**

Data Point 26 - Soil profile.



#### Photo: 56

## **Description:**

Data Point 26 - Typical Site Characteristics





**Description:** 

Data Point 27 - Soil profile.



## Photo: 58

## **Description:**

Data Point 27 - Typical Site Characteristics



## Photographic Documentation Approximately 455 Acre Mid Barataria Sediment Diversion Auxiliary Areas Plaquemines Parish, Louisiana







**2016 Jurisdictional Determination** 

**INTERNAL TRACKING SHEET FOR JURISDICTIONAL DETERMINATIONS** 

(to be used for accounts where no letter is being sent)

Account #: 2012-02806-1 Account Name: Davoli, Elizabeth

DETERMINATION DATE: <u>8/11/16</u> SUBJECT: Jurisdictional Determination

MEMORANDUM FOR CEMVN-OD-SE, ATTN: Brad Laborde

MEMORANDUM FROM CEMVN-OD-SS, Surveillance & Enforcement Section

\_\_\_\_\_

PARISH: <u>Plaquemines</u> SECTION <u>5,16,47,48,4</u> TWP <u>16S</u> RANGE <u>25E</u>

PROPERTY/PROJECT DESCRIPTION: <u>Mid-Barataria Sediment Diversion (BA-153)</u>

OWNER/COMPANY NAME: CPRA of LA

\_\_\_\_\_

1. After careful review, the Surveillance & Enforcement Section has determined that this property/project is:

NONWETLAND		NO PERMIT REQUIRED	
MIXED	$\boxtimes$	AND/OR SECTION 10	$\square$
WETLAND		OTHER:	

A map is enclosed that outlines the wetland or nonwetland area that has been delineated.

- 2. Additional comments: \_\_\_\_\_
- 3. P.O.C. for this determination: Brian Oberlies, x 2275



Mid-Barataria Sediment Diversion Site Map - Wetlands Permitting October 2016			
Jefferson and Plaquemines Parishes, La			
Project Features			
MBSD Pump Station			
<u>Habitat Types</u>			
Open Water			
Uplands			
Wetlands			
Reference Features			
Parish Boundary			
Road			
All project features are graphical representations only,			
are subject to change, and may not reflect true location or dimension			
N N N N N N N N N N N N N N			

# PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there "*may be*" waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

District Office New Orleans District File/ORM #	MVN-2012-02	2086-1-SY	PJD Date: Aug 11, 2016	
State LA City/County Plaquemines Parish		Noma	Ms. Elizabeth Davoli	
Nearest Waterbody: Mississippi River		Address of	Coastal Protection & Restoration Authority of LA	
Location: TRS, LatLong or UTM: Sec. 5,16,47,48,49, T16S, R25E 29.661806 N -89.9635 W		Requesting PJD	P. O. Box 44027 Capitol Station Baton Rouge, LA 70804	
Identify (Estimate) Amount of Waters in the Review Area:         Non-Wetland Waters:       Stream Flow:         linear ft       width       acres         Wetlands:       ~38       acre(s)       Cowardin Class:	Name of Any V on the Site Io Section 10	Water Bodies dentified as Waters: No (Desk) Determina Determination:	Tidal: Mississippi River n-Tidal: ation Date of Field Trip:	
<ul> <li>SUPPORTING DATA: Data reviewed for preliminary JD and requested, appropriately reference sources below):</li> <li>✓ Maps, plans, plots or plat submitted by or on behalf of th <ul> <li>Office concurs with data sheets/delineation</li> <li>Office does not concur with data sheets/delineation</li> <li>Other State/Local wetland inventory map(s).</li> <li>FEMA/FIRM maps:</li> <li>I00-year Floodplain Elevation is:</li> <li>Photographs: ✓ Aerial (Name &amp; Date):</li> <li>98, 04, 05, 06,</li> <li>Other (Name &amp; Date):</li> <li>Previous determination(s). File no. and date of respo</li> <li>Other information (please specify):</li> </ul> </li> </ul>	) (check all that a of the applican le applicant/cor report. ineation report 24k Phoenix l Survey. Citati 	apply - checked i nt/consultant: nsultant.	tems should be included in case file and, where checked	
IMPORTANT NOTE: The information recorded on this form has not necessarily OBERLIES.BRIAN.M Digitaly dgned by OBERLIES BRIAN MC INNEL 320779739 C INNIS.1230779739 Date: 2015.081111.2533-0500 Signature and Date of Regulatory Project Manager (REOURED)	been verified by the Re Signa	e Corps and shoul equested k iture and Date of	d not be relied upon for later jurisdictional determinations. by applicant 6/30/16 Person Requesting Preliminary JD braining the signature is impracticable)	
<b>EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DD</b> 1. The Corps of Engineers believes that there may be jurisdictional waters of the Unith hereby advised of his or her option to request and obtain an approved jurisdictional de has declined to exercise the option to obtain an approved JD in this instance and at this 2. In any circumstance where a permit applicant obtains an individual permit, or a Nat or requests verification for a non-reporting NWP or other general permit, and the per following: (1) the permit applicant has elected to seek a permit authorization based on the option to request an approved JD before accepting the terms and conditions of compensatory mitigation being required or different special conditions; (3) that the ap other general permit authorization; (4) that the applicant can accept a permit authoriz requirements the Corps has determined to be necessary; (5) that undertaking any activ acceptance of the use of the preliminary JD, but that either form of JD will be proce undertaking any activity in reliance on any form of Corps permit authorization based on that activity are jurisdictional waters of the United States, and precludes any challeng appeal or in any Federal court; and (7) whether the applicant elects to use either an proffered individual permit (and all terms and conditions contained therein), or indivi	(REQ ETERMINATIONS ted States on the sub- etermination (JD) for time. tionwide General Per- mit applicant has no a preliminary JD, w the permit authoriza pplicant has the right zation and thereby ag vity in reliance upon essed as soon as is pro on a preliminary JD c ge to such jurisdictio approved JD or a pr idual permit denial c	S: oject site, and the pro- that site. Neverthel mit (NWP) or other other requested an appry- which does not make thich does not	ermit applicant or other affected party who requested this preliminary JD is ess, the permit applicant or other person who requested this preliminary JD r general permit verification requiring "preconstruction notification" (PCN), roved JD for the activity, the permit applicant is hereby made aware of the an official determination of jurisdictional waters; (2) that the applicant has ga permit authorization on an approved JD could possibly result in less ridual permit rather than accepting the terms and conditions of the NWP or a all the terms and conditions of that permit, including whatever mitigation authorization without requesting an approved JD constitutes the applicant's pting a permit authorization (e.g., signing a proffered individual permit) or it that all wetlands and other water bodies on the site affected in any way by tive or judicial compliance or enforcement action, or in any administrative JD will be processed as soon as is practicable. Further, an approved JD, a ely appealed pursuant to 33 C.F.R. Part 331, and that in any administrative	

appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

Potential Waters of the U.S., Including Wetlands Memorandum





## Potential Waters of the U.S., Including Wetlands Memorandum

То	Micaela Coner, Liz Davoli Coastal Protection and Restoration Authority of Le	ouisiana	
From	Brooke Savant, James Thomas, HDR		
СС	Neil McLellan, Betty Dehoney, HDR		
Date	July 30, 2014	Job No.	BA 153-01

# RE: Mid-Barataria Sediment Diversion (BA-153), Plaquemines Parish, Louisiana, Report for Delineation and Evaluation of Potential Waters of the U.S., Including Wetlands, July 2014 Amendment

# Introduction

The Coastal Protection and Restoration Authority of Louisiana (CPRA) authorized HDR to perform a delineation and evaluation of waters of the U.S., including wetlands, for the proposed Mid-Barataria Sediment Diversion (MBSD, or proposed project). The intent of this memorandum is to disclose the findings of HDR's:

- on-site evaluation and delineation of waters of the U.S. as defined by the Clean Water Act, including wetlands, for the preliminary proposed channel footprint
- expanded desktop delineation of a portion of the proposed project's immediate outfall

The information included in this memorandum is considered a complete evaluation of existing wetland conditions and delineation report for waters of the U.S., including wetlands, and will be used by the U.S. Army Corps of Engineers (USACE) New Orleans District to support its jurisdictional determination, evaluation of fill impacts, and permit decision for the proposed project.

The proposed project would divert Mississippi River sediment-laden water through a new diversion structure installed in the Mississippi River and Tributary (MR&T) levee north of Ironton, Louisiana, into degraded marshes in the Barataria Basin to the west. The MBSD would provide sediment and nutrients to restore, build, and maintain wetlands. HDR completed a wetland delineation, proposed jurisdictional determination, and habitat classification of waters of the U.S., including wetlands, to assess potential impacts of dredged and fill placement activities necessary to construct the proposed project.

# Methods

The evaluation included both the preliminary diversion channel footprint and an area of the immediate outfall using a combination of on-site and remote sensing methods, consistent with the flexibility allowed for conducting routine determinations in the USACE 1987 *Wetland Delineation Manual* (USACE 1987) and regional supplements. The delineation of waters of the U.S. was originally completed within the proposed project construction area limits or channel footprint (including a 200-foot construction servitude) in November 2012 for submittal to USACE as part of the Joint Application pursuant to Programmatic General Permits and Coastal Use Permits for the geotechnical investigations and as a required attachment in the Joint Application for an Individual Permit submitted on July 23, 2013.



The on-site field delineation included examination of habitats within the preliminary boundary of the proposed project's footprint (that is, an approximately 1,400-foot-wide corridor, 12,000 feet in length).

Data collected during the field visit included photographs as well as information on vegetation, soils, and hydrology as specified in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region* (Version 2.0) (USACE 2010) and recorded on wetland determination data forms. These data forms and corresponding site photos are included in Attachment B. Additionally, 35,000 acres of the proposed diversion outfall area (U.S. Geological Survey [USGS] Hydrologic Unit Code [HUC] #80903010408) were evaluated through a desktop evaluation or Level 1 routine determination (USACE 1987) of existing wetland and habitat conditions for inclusion in the project's proposed jurisdictional determination.

The methods employed for the delineation and proposed jurisdictional determination of waters of the U.S. varied between the proposed diversion channel footprint—lying primarily between the MR&T levee and the Non-Federal Levee (that is, the back levee)—and the outfall area, consisting primarily of intertidal and subtidal estuarine wetlands and open water habitats, including natural sloughs, bayous, and ponds, as well as excavated channels and collapsed marsh. The following subsections describe the methods and objectives for each evaluation.

# **Diversion Channel Footprint**

The on-site delineation and habitat evaluation of waters of the U.S., including wetlands for the proposed channel footprint (preliminary study limit) was conducted on November 12 and 13, 2012, by HDR wetland scientists and experienced delineators Joe Moake, Christine Magers, and Richard Wilson. During the field visit, HDR scientists generally walked transects (Figure 1) both north and south of the proposed project centerline to collect data on the wetland habitats present within the proposed diversion channel footprint limits. Data were collected (Attachment B) as described above for various soil, vegetation, and hydrologic conditions along these transects to evaluate habitat quality and the approximate percentage of wetland conditions. In addition, HDR noted the presence of other aquatic and excavated drainage features.

Spatial data for the evaluation of waters of the U.S., including wetlands, within the proposed channel footprint limits were collected using a 2010 Trimble GeoXT handheld Global Positioning System (GPS) unit and were post-processed using Trimble GPS Analyst for ArcGIS 10 to ensure sub-meter accuracy. Following the collection of spatial data, the preliminary extent of waters of the U.S. was mapped in ArcGIS 10 based on the field data collection and recent aerial photography.

The latest spatial soil map units for the diversion channel footprint were obtained from the Natural Resources Conservation Service (NRCS) soil survey website. Additionally, the NRCS database information for each soil map unit was evaluated to determine which soil types are listed as hydric and under what conditions. Finally, during on-site routine delineation and jurisdictional determination surveys, soil conditions were assessed at each data point (see data sheets in Attachment B) taken within wetland vegetation communities, with the exception of those exhibiting signs of sufficient hydrology indicators or prolonged inundation. For flooded or ponded areas, an aquic moisture regime and hydric soils can be inferred due to the length of inundation or saturation leading to anaerobic conditions.

The field delineation was conducted within 3 months of Hurricane Isaac, which caused substantial flooding throughout the area resulting in atypical hydrologic and vegetation indicators (rack and debris lines, water marks, vegetation modification, etc.). These indicators are typically most reliable where the soils have been heavily modified (agriculture, drainage improvements, etc.) and can present false positive indicators of wetland conditions in a major flooding event.



Figure 1. Preliminary delineation and proposed jurisdictional determination - waters of the U.S. in MBSD footprint

Consistent with the recommended methodology for atypical situations, additional data and information on the normal conditions were collected from other recent aerial photography and previous delineation and jurisdictional determination documentation. Subsequently, this delineation was updated based on information from USACE. Rob Heffner of the USACE New Orleans District, Regulatory Branch, provided information on recent, valid jurisdictional determinations (Attachment C) for the majority of the area within the limits of the diversion channel footprint (personal and electronic communications on January 18, 2013). This information was used in conjunction with recent aerial photography, including Pictometry® oblique photography taken before Hurricane Isaac, to refine the delineation boundary.

In March 2013, the proposed diversion site was revisited for the purpose of conducting geotechnical investigations. Normal site conditions observed during this field visit were consistent with the refined results of the HDR delineation report. Typical hydrologic and vegetation conditions have reestablished on the site and are consistent with the delineation and preliminary jurisdictional determination provided herein and in the Joint Permit Application submitted to the USACE and Office of Coastal Management in July 2013.

## **Diversion Outfall Area**

Given the anticipated size of the deltaic land building restoration area for the MBSD project and the welldocumented tidal marsh and elevation conditions in the Barataria Basin (U.S. Fish and Wildlife Service 2011; USGS 2011a, 2011b; U.S. Department of Agriculture 2010), HDR employed remote sensing for the evaluation of the proposed diversion outfall area using a variety of publicly available datasets and aerial photographs. The primary objective of the evaluation was to determine the spatial extent, quantity, and configuration of waters of the U.S., including wetlands, other special aquatic sites, deep water habitats (>6.6 feet deep), and uplands (not waters of the U.S.) for consideration during alternatives analysis, evaluation of project effects, and the USACE's use in the Section 404(b)(1) water dependency determination. Since a key objective of the project is to restore coastal wetlands in the Barataria Basin, and given the dynamic nature of the estuarine ecosystem, remote sensing methods were determined to be adequate for project planning and permitting activities in lieu of on-site delineations of the expansive outfall study area.

Given that delineation is needed to assess existing wetland conditions in areas where potential fill would be placed, either directly or indirectly, and because no Area of Potential Effects has been defined from sediment modeling thus far, USGS HUC #080903010408, which includes 35,000 acres of the immediate outfall area, was assumed to be a sufficient study area for delineation efforts within the Barataria Basin. HDR wetland specialists and geographic information system (GIS) analysts developed delineation maps for the outfall delineation study. This area is bounded by the Non-Federal Levee (that is, the back levee) on the east, Barataria Waterway on the west, Cheniere Traverse Bayou to the north, and Lake Judge Perez, Lake Laurier, and Round Lake to the south. The outfall limits were selected based on preliminary modeling information regarding the anticipated extent of sediment deposition in the Barataria Basin as a result of the MBSD project. At a future date, if modeling identifies a larger extent of delta/land building, the outfall area limits can be expanded for delineations of waters of the U.S., including wetlands, and the report can be amended at that time. The proposed outfall area is a portion of the Mid-Barataria Basin consisting of a complex mosaic of marshes, bayous, subtidal ponds, shallow open water areas, vegetated shallows, excavated channels, spoil banks, and a few developed upland areas featuring residential and industrial sites. For the purposes of the delineation and evaluation of the outfall area, HDR analyzed publicly available spatial datasets (Table 1) to develop an accurate depiction of the following:

• spatial location of waters of the U.S., including special aquatic sites such as wetlands, vegetated shallows, and mudflats

- differentiation of wetland types/classifications (estuarine emergent marsh, palustrine wetlands, scrub/shrub habitats, forested wetlands, etc.), to the extent practicable
- location of uplands
- differentiation of natural open water habitats, shallow subtidal areas, and excavated canals

The following matrix in Table 1 provides an overview of the key characteristics of each dataset evaluated for use in this analysis and an assessment of the applicability to achieve the objectives defined above.

Dataset	Year of imagery/ publication	Data	Constraints
Sasser et al. (2014) - USGS Marsh Vegetation Classification	2014	Includes an estimate of the extent of marsh types (that is, intermediate, brackish, saline) across the Louisiana Coastal Zone	Overestimates marsh by not accurately differentiating open water areas
USDA National Agriculture Imagery Program Satellite Imagery	2010	Most recent and detailed view of existing Basin land uses and vegetation community extents and conditions	Mosaic images create discrepancies in pixel values for similar cover types; difficult to distinguish submerged vegetation and shallows from areas of turbidity given the limitations of aerials (for example, cloud cover, signature inconsistencies)
NWI Mapping	Aerial: 1988, 1989 Publication: 2011	Comprehensive, detailed mapping of wetland and open water types (habitat classifications); provides historical context	Developed from 25-year-old image sources; not reflective of recent marsh loss or marsh creation projects; classification polygons misaligned from aerial base in some areas
USGS Land/Water Classification	2010	Most recent depiction of open water areas	30-meter resolution proved insufficient to identify localized conditions for MBSD project scale; overestimates water area by not capturing vegetated shallows and other marsh areas as land when compared with recent aerial imagery; no differentiation of wetland and open water types
USGS Land Area Change	2011	Assists with identification of marsh loss on a regional basis from 1973 to 2009	30-meter resolution proved insufficient to identify localized conditions for MBSD project scale; no differentiation of wetland types
USGS National Land Cover Database	2011	Recent land cover, including differentiation of wetland extents and types	30-meter resolution provided insufficient level of detail for MBSD project evaluation area; no differentiation of wetland types; overestimated marsh area

Table 1.Dataset overview

Notes: MBSD = Mid-Barataria Sediment Diversion, USDA = U.S. Department of Agriculture, USFWS = U.S. Fish and Wildlife Service, NWI - USFWS National Wetland Inventory , USGS = U.S. Geological Survey

For the purposes of this analysis, multiple datasets were used to support the desktop analysis to delineate jurisdictional waters and wetlands in the outfall study area. This analysis supported the differentiation between wetland and open water, as well as differentiating between different types of wetland habitats (that is, estuarine emergent marsh, palustrine wetlands, scrub/shrub habitats, forested wetlands, etc.) at a scale appropriate for the outfall study area. Although it is the most recent of datasets, the 2013 USGS marsh classification dataset does not provide the local level of mapping or differentiation detail required for the analysis. The USGS marsh classification data were collected through aerial transect surveys and photographic interpretation for the entire Louisiana coast. Although these data provide an overview of recent regional conditions, they showed inconsistencies in open water areas when compared with regional USGS 2010 land/water classification data and recent aerial photographs. For example, smaller areas in the MBSD outfall study area that have undergone marsh collapse during the past several decades are currently subtidal open water areas, but were classified in the USGS 2013 classification as brackish marsh. As a result, the USGS vegetation dataset overestimates marsh acreage in the outfall study area (HUC #080903010408) and underestimates open water areas by more than 17,000 acres. Because of these inconsistencies, the USGS marsh classification dataset was not used for the delineation and classification of marsh in the MBSD outfall study area.

Other datasets were reviewed and were not incorporated because of various constraints in the adequacy or applicability of the data. The U.S. Department of Agriculture (USDA) National Agriculture Imagery Program's (NAIP's) aerial imagery provides a relatively recent and detailed view of Barataria Basin conditions, but would require a substantial amount of time to develop into a classified land cover dataset given inconsistencies between photographs across the large study area. Other available datasets such as the USGS land/water classification, land area change, and land cover datasets were developed for the entire Louisiana coast at a resolution scale of 30 meters, which, as described above, proved too coarse to provide enough detail for delineation and classification. Additionally, a comparison of these spatial datasets with recent aerial photography identified substantial discrepancies in either the classification of marsh or submerged, open water habitats (Figures A-1 to A-3 in Attachment A). So while these datasets can be beneficial to estimate land to water ratios for large areas along the coast, they are too coarse to classify habitat areas and, when overlaid on top of the 2010 imagery, showed an overestimation of areas of water, which the NWI mapping accurately depicted as wetlands.

The process of overlaying the more recent datasets such as the 2010 USGS land/water classification dataset with the NWI mapping to perform spatial updates was evaluated but ultimately ruled out because of the discrepancies in mapping resolution. In other words, overlaying the USGS data that was created at a 30-meter resolution and does not adequately depict smaller areas of wetlands and marsh with the more detailed NWI mapping would have introduced a substantial amount of error.

# Selected Approach for Diversion Outfall Area

Based on the evaluation of existing spatial data (USGS mapping, NWI mapping, NRCS mapping, aerial photos, Coastwide Reference Monitoring System [CRMS] data, tidal gauge data, etc.), the predominance of wetlands plant communities, and the consistency of mapping and conditions observed during a site visit to the proposed diversion outfall area in July 2012, it was determined a Level 1 (Onsite Inspection Unnecessary) Routine Determination was suitable for the outfall area. In accordance with the 1987 Wetlands Delineation Manual, a Level 1 determine the presence of wetlands and upland conditions over the entire study area. This guidance was primarily written to ensure wetland areas (waters of the U.S.) were not inadvertently determined to be uplands (that is, false negatives) that would result in unpermitted fill activities. The 1987 Delineation Manual provides flexibility for the use of professional judgment for applying Level 1 methods for expansive study areas with data to support a determination

that wetland conditions are highly likely to occur. Due to the high-quality aerial photography, the prevalence of open water and marsh habitats, and the detailed hydrologic and soils mapping for the area, a Level 1 determination as described in Section D, Subsection 1 of the 1987 Manual is appropriate.

## Wetland Vegetation Community Analysis

The approach selected as the best method to achieve the stated objectives for the outfall area was to utilize the USFWS NWI dataset with minor modifications to include recently constructed uplands (dredge placement) and marsh creation areas not included in the NWI base mapping. The USFWS NWI dataset delineates the areal extent of wetlands and surface waters as defined by Cowardin et al. (1979). Certain wetland habitats are excluded from the national mapping program because of the limitations of aerial imagery as the primary data source used to detect submerged wetlands types (sea grasses, submerged aquatic vegetation found in the intertidal and subtidal zones, etc.). The mapping was produced as topical overlays using USGS topographic maps as the base and stereoscopic aerial photo interpretation to determine wetland habitat types and uplands. The hard-copy product is a composite map showing topographic and planimetric features from the USGS map base and wetlands and deepwater habitats from USFWS's topical overlay. The maps were then converted to digital files. The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of collateral data, and the amount of ground verification work conducted.

Although the base imagery used for the NWI mapping is approximately 25 years old, based on a comparison with other collected publicly available datasets and recent high resolution aerial photography, it is the best available representation of the location, type, extent, and spatial configuration of wetlands and other special aquatic habitats. While more recent datasets do provide high resolution mapping to differentiate between vegetated and non-vegetated water habitats, they do not provide the differentiation needed between wetland types. These datasets were generated from imagery classification of aerial photographs at 30-meter resolution, resulting in a substantial underestimation of vegetated areas (Figures A-1 to A-3 in Attachment A). The modified NWI dataset provides the best classification of wetlands, other special aquatic sites (vegetated shallows, tidal mudflats, etc.), non-vegetated deep water habitats (natural and excavated), and uplands. To classify various types of NWI features into the groupings mentioned above for the diversion outfall limits area, HDR wetland scientists overlaid the NWI data with the more recent 2010 satellite imagery. This aided in the process of assigning both the HDR Type classification (that is, open water, wetlands and uplands) as well as the HDR subtypes (that is, forested, scrub/shrub and emergent for wetlands and uplands) as well as the HDR subtypes (that is, forested, scrub/shrub and emergent for wetlands and vegetated shallows, natural and excavated for open water) to specific NWI classifications.

Several modifications were made to the original NWI mapping to improve its accuracy and currentness. First, gaps in the source data were reviewed on the 2010 aerials and were determined to largely be spoil banks of excavated canals that are predominantly scrub/shrub wetlands, with the possibility of minor upland inclusions. Next, minor modifications of the NWI dataset were made to account for recent human-induced land changes not captured in the base imagery, including the addition of a developed/upland map unit category for improved areas such as the Myrtle Grove Marina, which includes constructed uplands, as well as oil and gas development areas in the marsh consisting of dredged material and infrastructure. Overall, this category accounts for a very small percentage of the study area. Additionally, the data were edited to include the 2009 development of the BA-39, a marsh restoration project occurring in the northeastern portion of the proposed MBSD diversion outfall. BA-39 involves piping renewable river sediment into the area of degraded marsh to encourage sediment accretion and the establishment of marsh vegetation. Due to the operations of BA-39, this area in the upper northeastern corner of the outfall delineation area changed from a predominately subtidal, open water, degraded habitat type to emergent marsh surrounded by a low ring levee. Finally, while the majority of the NWI mapping was well-aligned

to the 2010 satellite imagery, small sections of the NWI data were slightly shifted in a certain direction. These areas were adjusted to better align with the imagery.

While the modified NWI classification does overestimate the amount of emergent marsh due to the basinwide loss of marsh through various hydrogeologic processes (e.g., tidal erosion, relative sea level rise, lack of sediment, and tropical storm surge erosion) leading to marsh collapse, it is still the most accurate representation of the spatial extent of special aquatic sites in the study area.

Upon completion of all spatial and tabular modifications to the source NWI data, acreages were calculated for all wetland types and subtypes. These acreages are summarized by both by habitat types as well as individual wetland classifications in Tables 4 and 5 in the following results section. Based on an overall spatial and visual comparison of the older NWI classifications with the more recent 2010 satellite imagery and the USGS Land/Water Classification data, the primary change in the diversion outfall delineation area has been the conversion of intertidal estuarine emergent marsh to subtidal estuarine unconsolidated bottom (submerged) areas. HDR wetland scientists and GIS analysts estimated the loss of marsh (since the base mapping was completed in 1989) to be approximately 10 to 20 percent basin-wide, but such loss is highly variable depending on site-specific conditions and varies from approximately 5 to 50 percent. Based on a site visit to the proposed MBSD immediate outfall area of the Basin in July 2012, several of the subtidal vegetated shallow areas were observed to consist of rooted and floating submergent vegetation, dominated by Eurasian watermilfoil (*Myriophyllum spicatum*) and widgeon grass (*Ruppia maritima*). Delineation of vegetated shallows is likely underestimated given substantial changes that can occur seasonally and in response to tropical storm surges.

# Hydrologic Conditions Analysis

A wetland water budget is the total inflows and outflows of water from a wetland. Coastal wetlands such as those in Barataria Basin, while also receiving direct runoff, precipitation, and groundwater inflow, are strongly influenced by surface water (permanent and seasonal) and tidal cycles, particularly in areas of subsidence or lower elevations (CPRA 2011). Sufficient hydrology for the support of wetlands in the diversion channel and outfall area include surface water and streamflow from natural and artificial bayous and canals, freshwater surface flows from the Naomi siphon, Davis Pond diversion, and the Intracoastal Waterway, groundwater discharge, and tides (CPRA 2011).

Using data from a hydrologic modeling effort completed in 2014 by HDR, an elevation analysis was performed for wetland habitat types within the diversion outfall area to perform a comparison with water level and tidal elevation ranges to observe the influence hydrology sources had on ponding, flooding, and soil saturation. Conclusions and data are presented in the results section discussed further in the document.

Continuous hydrologic water surface elevation data were also collected from the CRMS. However, only four CRMS locations were within the delineation boundary for the diversion outfall area (HUC #080903010408). Given the data from only four locations (CRMS 0225, 0276, 3601, 3617) within the 35,000-acre study area, no single water surface elevation or combination of these locations can serve as a representative value for such a dynamic landscape with fluctuating service elevations and subsidence rates. Therefore, average elevation data for the outfall study area and a comparison with tidal elevation trends was conducted to evaluate the hydrologic conditions in vegetated areas.

## **Soils Analysis**

The predominant soils found in the NRCS soils map unit spatial files and documentation were evaluated for the diversion channel footprint and the outfall area. The NRCS National Hydric Soils List was referenced to determine which soils in the study limits were on the list and under which criteria. Site conditions were assessed based on field conditions and aerial photographs for non-forested habitats to

determine whether the soils were similar to the map unit descriptions and if they included hydric conditions or smaller hydric components (that is, inclusions). Hydrology and elevation data were also used in the diversion outfall delineation area to infer that soil saturation likely occurs in the upper 12 inches of the soil profile for at least 3 weeks in the majority of the study area, with the exception of those areas built up with fill, due to tidal inundation and other sources of flow.

## Results

## **Diversion Channel Footprint**

Results of the delineation and habitat evaluation for waters of the U.S., including wetlands, are presented in Figure 1 and Table 2. Representative photographs of the proposed project site are presented later in this memorandum and following corresponding wetland determination data forms in Attachment B. The diversion channel footprint of approximately 362 acres contains forested wetlands, emergent wetlands, and open water habitats considered waters of the U.S., including canals that were excavated for agriculture, drainage, and potential access. Additionally, the study area contains numerous smaller ditches excavated for drainage associated with historical agricultural practices. Drainage channels within wetlands or that have relatively permanent water and are contiguous or adjacent to traditional navigable waters (TNWs) are generally considered jurisdictional waters of the U.S., whereas other excavated ditches and an excavated pond that are not connected to other tributaries or not adjacent to waters of the U.S. are typically considered non-jurisdictional. Both circumstances occur within different portions of the diversion channel footprint.

Table 2.	Aquatic habitats considered waters of the U.S.
in the div	ersion channel footprint

Туре	Acres
Forested wetland	10.0
Emergent wetland	85.2
Open water (canal)	7.3
Total	102.5

At the northeastern portion of the diversion channel footprint, forested wetlands occur in the batture area between the MR&T levee and the Mississippi River. The entire area appears to be seasonally flooded but well-drained due to slopes. Primary hydrology indicators present are drift deposits and inundation that can be seen on aerial photography. Supportive dominant vegetation in the overstory is primarily obligate (OBL) and facultative-wet (FACW) species including black willow (*Salix nigra*), with Chinese tallow (*Triadica sebifera*), swamp privet (*Forestiera acuminata*), smartweeds (*Polygonum* spp.), coco-yam (*Colocasia esculenta*), and peppervine (*Ampelopsis arborea*). This habitat type appears to consist of early successional vegetation, including exotic and invasive species (Chinese tallow and coco-yam).

Within the proposed footprint from the MR&T levee to Belle Chasse Highway (LA 23), a mixture of uplands and forested wetlands occurs. Within this area, three forested wetland depressions occur that appear to be seasonally inundated within their entire extent. The remaining area surrounding the wetland depressions is slightly higher uplands. For forested wetland areas, primary hydrology indicators are water marks, water-stained leaves, and inundation seen on aerial photography. These forested wetlands areas are dominated by OBL species but consist of boxelder (*Acer negundo*), Chinese tallow (exotic), red maple (*Acer rubrum*), rough-leaf dogwood (*Cornus drummondii*), and peppervine. Other non-dominant woody species present include deciduous holly (*Ilex decidua*), water oak (*Quercus nigra*), and black willow. This

vegetation composition is characteristic of regrowth colonizing and non-native species rather than true bottomland hardwood forest (see data forms in Attachment B for site-specific hydrology indicators and dominant vegetation). Between LA 23 and the back levee adjacent to marsh, the proposed footprint contains pasture and numerous drainage ditches excavated for and remaining from past agricultural practices. Near LA 23 a small pond also exists that was likely excavated for livestock watering and borrow material. Three excavated canals cross the area that carry drainage to pumps at the Wilkinson Canal near Myrtle Grove to the southeast. The current use of the pasture habitat in the proposed footprint appears to be cattle grazing. To the southwest, closest to the marsh, the pasture habitat transitions from uplands primarily vegetated with bermudagrass (*Cynodon dactylon*) to wetland increasingly dominated by smartweed and cattail (*Typha* sp.). This emergent wetland appears to be the result of inundation/saturation resulting from subsidence. In this wetland, given the problematic vegetation and hydrology indicators from the recent Hurricane Isaac (late August 2012), the wetland boundary was estimated using transects and reviewing recent aerial photography.

The soils within the diversion channel footprint limits are heavily modified by past agricultural, flood control, and transportation improvements. However, several of the soils within the delineation area exhibit frequently flooded characteristics or are positioned in depressional landscape areas due to the seasonal high water table and high annual precipitation and are listed on the current NRCS Hydric Soils List. The soil series and map units located within the diversion channel footprint include those listed in Table 3 with a description of each following below. Soil series descriptions and map units located within the MBSD footprint are displayed in Figure 2. Some soils, such as Cancienne Silty Clay Loam, include associated soil components or "inclusions" which occur within depressional areas and form hydric soil conditions when seasonal inundation or saturated conditions occur in the upper soil profile.

Soil map unit	Landscape position	Hydric soil list/Component
Clovelly Muck	Marshes	Yes/Hydric
Cancienne Silt Loam	Natural levees	Yes/Hydric inclusions of Gramercy soils (10%)
Cancienne Silty Clay Loam	Natural levees	Yes/Hydric inclusions of Gramercy soils (10%)
Carville, Cancienne, & Schriever Soils, frequently flooded	Batture, natural levees, depressions and backswamps	Yes/Hydric
Harahan Clay	Backswamps	Yes/Hydric
Westwego Clay	Backswamps	Yes/Hydric

#### Table 3. Soil map units located within diversion channel footprint

The Clovelly series consists of very deep, very poorly drained, very slowly permeable soils. These soils formed in moderately thick accumulations of herbaceous organic material overlying very fluid clayey alluvial sediments. These soils are on broad coastal marshes that are nearly continuously flooded with brackish water.





The Cancienne series consists of very deep, level to gently undulating, somewhat poorly drained mineral soils that are moderately slowly permeable. These soils formed in loamy and clayey alluvium. They are on high and intermediate positions on natural levees and deltaic fans of the Mississippi River and its distributaries. Cancienne series can contain hydric inclusions of Gramercy soils which do occur in the eastern portion of the diversion channel footprint between LA 23 and the MR&T Levee. The Gramercy series consists of fine, very deep, poorly drained, very slowly permeable soils that formed in clayey over fine-silty alluvium. These soils are on alluvial flats and on the lower parts of natural levees on the alluvial plain of the Mississippi River and its distributaries.

The Carville series consists of coarse-silty, very deep, somewhat poorly drained, moderately permeable soils that formed in recent loamy alluvium. These soils are on nearly level to very gently sloping natural levee positions on flood plains, mainly along the Mississippi River and its distributaries.

The Harahan series consist of very deep, poorly drained, very slowly permeable soils. They formed in moderately thick firm clayey alluvium overlying fluid clayey sediments. These soils are on broad backswamp positions on the lower Mississippi River flood plain.

The Schriever series consists of very fine, deep, poorly drained, very slowly permeable soils that formed in clayey alluvium. These soils are on the lower parts of natural levees and in backswamp positions on the lower Mississippi River alluvial plain.

The Westwego series consist of very fine, deep, poorly drained, very slowly permeable soils. They formed in semifluid clayey alluvium and organic material that dried and shrank irreversibly in the upper part as the result of artificial drainage. These soils are on broad, drained former swamps along the lower Mississippi River and its distributaries.

## **Diversion Outfall Area**

Based on the analysis of land cover and vegetation datasets and aerial imagery, the 35,000-acre diversion outfall area studied is a mosaic of coastal habitats including palustrine wetlands; estuarine/palustrine, subtidal, and intertidal wetlands; scrub/shrub wetlands, and forested wetlands. Upland areas are mainly found near developed industrial and residential areas along excavated canals, but there is the potential for a minor component (<1 percent) of upland inclusions not readily observable using the remote sensing (Level 1) methods. Results of the delineation and habitat evaluation for waters of the U.S., including wetlands, are presented in Figure 3 (Sheets 1 to 4) and Table 4. The classifications used in Table 4 are summary categories of habitats typically depicted in delineations of waters of the U.S.

As described above, the data presented below are primarily based on detailed NWI mapping with minor modifications and likely overestimate the current extent of emergent marsh habitat types while underestimating open water (natural) and vegetated shallows. Table 5 represents the NWI habitat classification codes used to sub-categorize existing marsh types in the area of the diversion outfall.

Table 4.	Aquatic habitats considered waters of the U.S. in the	ķ
propose	diversion outfall area (HUC #080903010408)	

Туре	Acres
Waters of the U.S.	
Open water – natural	8,173
Open water - artificial (excavated)	2,175
Wetlands - vegetated shallows	1,849
Wetlands – emergent marsh	20,489
Wetlands – scrub/shrub	1,669
Wetlands – forested	532
Subtotal – waters of the U.S.	34,887
Uplands/dredge disposal	189
Total	35,076






Figure 3. Preliminary delineation and proposed jurisdictional determination – waters of the U.S. in outfall area (Sheet 2)



Figure 3. Preliminary delineation and proposed jurisdictional determination – waters of the U.S. in outfall area (Sheet 3)



Figure 3. Preliminary delineation and proposed jurisdictional determination – waters of the U.S. in outfall area (Sheet 4)

# Table 5.National Wetland Inventory classifications and current habitat types in the diversion outfall study area<br/>(HUC #080903010408)

NWI code	NWI description	Updated habitat/ Land use types	Water of the U.S.
E1AB4L5	Estuarine, Subtidal, Aquatic Bed, Floating Vascular, Subtidal, Mesohaline	Emergent Marsh Wetland; Vegetated Shallows	Yes
E1AB5L5	Estuarine, Subtidal, Aquatic Bed, Unknown Submergent, Subtidal, Mesohaline	Vegetated Shallows	Yes
E1UBL	Estuarine, Subtidal, Unconsolidated Bottom, Subtidal	Open Water (natural and excavated)	Yes
E1UBL5	Estuarine, Subtidal, Unconsolidated Bottom, Subtidal, Mesohaline	Open Water (natural)	Yes
E2ABL	Estuarine, Intertidal, Aquatic Bed, Subtidal	Vegetated Shallows	Yes
E2EM1N5	Estuarine, Intertidal, Emergent, Persistent, Regularly Flooded, Mesohaline	Emergent Marsh Wetland	Yes
E2EM1P5	Estuarine, Intertidal, Emergent, Persistent, Irregularly Flooded, Mesohaline	Emergent Marsh Wetland	Yes
E2EM1Pd	Estuarine, Intertidal, Emergent, Persistent, Irregularly Flooded, Partially Drained/Ditched	Emergent Marsh Wetland	Yes
E2EM1Pd*	Estuarine, Intertidal, Emergent, Persistent, Irregularly Flooded, Partially Drained/Ditched	Uplands / Dredged Disposal	No
E2EMPh	Estuarine, Intertidal, Emergent, Irregularly Flooded, Diked/Impounded	Emergent Marsh Wetland	Yes
E2SS1P	Estuarine, Intertidal, Scrub-Shrub, Broad-Leaved Deciduous, Irregularly Flooded	Scrub/Shrub Wetland	Yes
E2SS1P5	Estuarine, Intertidal, Scrub-Shrub, Broad-Leaved Deciduous, Irregularly Flooded, Mesohaline	Scrub/Shrub Wetland	Yes
E2SSs	Scrub/Shrub	Scrub/Shrub Wetland	Yes
E2USN5	Estuarine, Intertidal, Unconsolidated Shore, Regularly Flooded, Mesohaline	Emergent Marsh Wetland; Vegetated Shallows	Yes
PEM1Cdh	Palustrine, Emergent, Persistent, Seasonally Flooded, Partially Drained/Ditched, Diked/Impounded	Emergent Marsh Wetland	Yes
PEM1Cdh*	Palustrine, Emergent, Persistent, Seasonally Flooded, Partially Drained/Ditched, Diked/Impounded	Uplands / Dredged Disposal	No
PEM1R	Palustrine, Emergent, Persistent, Seasonal-Tidal	Emergent Marsh Wetland	Yes
PEM1Rd	Palustrine, Emergent, Persistent, Seasonal-Tidal, Partially Drained/Ditched	Emergent Marsh Wetland	Yes
PEM1Rd*	Palustrine, Emergent, Persistent, Seasonal-Tidal, Partially Drained/Ditched	Uplands / Dredged Disposal	No
PEM1T	Palustrine, Emergent, Persistent, Semipermanent-Tidal	Emergent Marsh Wetland	Yes

# Table 5.National Wetland Inventory classifications and current habitat types in the diversion outfall study area<br/>(HUC #080903010408)

NWI code	NWI description	Updated habitat/ Land use types	Water of the U.S.
PFO1/3R	Palustrine, Forested, Broad-Leaved Deciduous/Broad-Leaved Evergreen, Seasonal-Tidal	Forested Wetlands	Yes
PFO1Ad	Palustrine, Forested, Broad-Leaved Deciduous, Temporarily Flooded, Partially Drained/Ditched	Forested Wetlands	Yes
PFO1Ad*	Palustrine, Forested, Broad-Leaved Deciduous, Temporarily Flooded, Partially Drained/Ditched	Uplands / Dredged Disposal	No
PFO1Cd	Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded, Partially Drained/Ditched	Forested Wetlands	Yes
PFO1R	Palustrine, Forested, Broad-Leaved Deciduous, Seasonal-Tidal	Forested Wetlands	Yes
PFO1S	Palustrine, Forested, Broad-Leaved Deciduous, Temporary-Tidal	Forested Wetlands	Yes
PSS1/3R	Palustrine, Scrub-Shrub, Broad-Leaved Deciduous/Broad-Leaved Evergreen, Seasonal-Tidal	Forested Wetlands	Yes
PSS1Cd	Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded, Partially Drained/Ditched	Scrub/Shrub Wetland	Yes
PSS1Cd*	Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded, Partially Drained/Ditched	Uplands / Dredged Disposal	No
PSS1Cdh	Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded, Partially Drained/Ditched, Diked/Impounded	Scrub/Shrub Wetland	Yes
PSS1R	Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Seasonal-Tidal	Scrub/Shrub Wetland	Yes
PSS1T	Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Semipermanent-Tidal	Scrub/Shrub Wetland	Yes
PUBH	Palustrine, Unconsolidated Bottom, Permanently Flooded	Open Water (excavated)	Yes
PUBHx	Palustrine, Unconsolidated Bottom, Permanently Flooded, Excavated	Open Water (excavated)	Yes
R1UBV	Riverine, Tidal, Unconsolidated Bottom, Permanent-Tidal	Open Water (natural)	Yes
n/a	Developed Land	Uplands / Dredged Disposal	No

Note: NWI categories classified as uplands/dredged disposal areas are based on recent (2010–2013) aerial photography or land use mapping comprising approximately 189 acres (0.5%) of the outfall study area.

Based on a site visit in July 2012 and available vegetation data in the CRMS for sites within the outfall study area, vegetative shallows are dominated by Eurasian watermoil and widgeon grass. Emergent marsh habitats are dominated by salt meadow cordgrass (*Spartina patens*), smooth cordgrass (*S. alterniflora*), and chairmaker's bulrush (*Schoenoplectus americanus*), with co-dominant species including needlegrass rush (*Juncus roemerianus*) and saltgrass (*Distichlis spicata*).

Dominant species occurring on the spoil banks parallel to the excavated channels include saltwater false willow (*Baccharis angustifolia*), and Chinese tallow, with understory herbaceous subdominants including saltgrass (*Distichlis spicata*) and saltmarsh morning glory (*Ipomoea sagittata*).

## **Hydrologic Conditions**

In an effort to evaluate hydrologic influence to wetlands in the outfall area, baseline information was used to extract elevations for existing marsh types. Performing a GIS analysis, the latest surface elevation model from July 2014 was used to generate representative sampling locations at 20-foot increments across the delineation study area. Each data point was assigned an elevation value corresponding to that location from the model as well as corresponding marsh type information. Over 3 million individual sampling points were generated from this exercise and were subsequently summarized to obtain an average elevation (in feet) for each marsh type. The ranges derived from these values provide estimated elevations that can be used, in combination with tidal range information, to evaluate hydrologic conditions. Areas with wetland hydrology indicators in the project ecoregion would be inundated or saturated within the upper 12 inches of the soil surface for a duration of at least 3 weeks annually. Seasonally, tides tend to be highest in late summer through mid-fall (August to November) and lowest in the winter and early spring (December to March) (CPRA 2011). With typical tidal ranges of approximately 0.25 to 2.5 mean sea level (msl) within the outfall area, these habitats experience inundation or saturation for prolonged periods with a high probability of producing anaerobic soil conditions needed for hydric soil conditions to develop. The average elevations in the wetland and vegetated shallows range from -2 to 1.7 feet msl, while average depths in the open water and excavated areas are approximately -3 to -8 msl. Based on the evaluation of mean high tide in the project outfall area and the average elevations, there is evidence to indicate the majority of the outfall study limits meet the wetland hydrologic criteria. This is consistent with on-site conditions observed by the project team, NRCS soil mapping, USGS mapping, and NWI mapping.

#### **Soils Conditions**

The soils in the Louisiana Coastal Zone formed in either alluvial sediments or loess, and may have many accumulations of organic matter in the upper part. Deltaic processes have played a significant role in the types of soils present in the study area. The types of soils present today in this area are characterized by the depositional environments associated with the natural episodic deltaic cycle (CPRA 2011). Soils are a significant resource and a critical element of coastal habitat which supports vegetation growth and open water benthic productivity (CPRA 2011).

A desktop query was used to identify soils in the diversion outfall area. Several are listed as current NRCS Hydric Soils and are included in Table 6 with a description of each following below. Soil series descriptions and map units located within the MBSD outfall area are displayed in Figure 4 (Sheets 1 to 4).

Soil map unit	Landscape position	Hydric soil list/Component		
Clovelly Muck	Marshes	Yes/Hydric		
Cancienne Silty Clay Loam	Natural levees	Yes/Hydric inclusions of Gramercy soils (10%)		
Gentilly Muck	Marshes	Yes/Hydric		
Harahan Clay	Backswamps	Yes/Hydric		
Lafitte – Clovelly Association	Marshes	Yes/Hydric		
Lafitte Muck	Marshes	Yes/Hydric		
Schriever Clay	Backswamps	Yes/Hydric		
Westwego Clay	Backswamps	Yes/Hydric		

Table 6. Soil map units located within study area delineation limits

The Clovelly series consists of very deep, very poorly drained, very slowly permeable soils. These soils formed in moderately thick accumulations of herbaceous organic material overlying very fluid clayey alluvial sediments. These soils are on broad coastal marshes that are nearly continuously flooded with brackish water.

The Cancienne series consists of very deep, level to gently undulating, somewhat poorly drained mineral soils that are moderately slowly permeable. These soils formed in loamy and clayey alluvium. They are on high and intermediate positions on natural levees and deltaic fans of the Mississippi River and its distributaries

The Gentilly series consists of very deep, very poorly drained, very slowly permeable slightly to moderately saline soils. These soils formed in thin accumulations of herbaceous plant remains and semifluid clayey alluvium over consolidated clayey deposits.

The Harahan series consist of very deep, poorly drained, very slowly permeable soils. They formed in moderately thick firm clayey alluvium overlying fluid clayey sediments. These soils are on broad backswamp positions on the lower Mississippi River flood plain.

Lafitte-Clovelly soils are level, poorly drained soils that have a thick or moderately thick mucky surface layer and clayey underlying material in brackish marshes. The Lafitte series consists of very deep, very poorly drained, moderately rapidly permeable organic soils formed in herbaceous plant remains over mineral sediments in intermediate and brackish marshes in the extreme lower Mississippi River Delta and coastal areas.

The Schriever series consists of very fine, deep, poorly drained, very slowly permeable soils that formed in clayey alluvium. These soils are on the lower parts of natural levees and in backswamp positions on the lower Mississippi River alluvial plain.

The Westwego series consist of very fine, deep, poorly drained, very slowly permeable soils. They formed in semifluid clayey alluvium and organic material that dried and shrank irreversibly in the upper part as the result of artificial drainage. These soils are on broad, drained former swamps along the lower Mississippi River and its distributaries.

















### Discussion

The proposed MBSD project footprint area should be monitored during the continued planning and design phases of the project to evaluate changes in infrastructure or existing drainage systems that could result in changes in the extent or type of wetlands present. Additionally, if the proposed footprint or location changes, additional delineation efforts may be required if the new right-of-way or construction servitude is not included in previously surveyed areas, or if more than 5 years have passed since the date of USACE verification.

With regard to the delineation of wetlands in the MBSD outfall area, careful evaluation of multiple spatial datasets and comparison with recent aerial photography indicate the USFWS NWI mapping provides the most accurate depiction of the types and spatial configuration of waters of the U.S. and special aquatic sites, including wetlands, in the outfall area. While other databases provide valuable information of trends (marsh loss, salinity trends, relative percentage of vegetated cover, etc.), none of the other datasets are useful for identifying the types and spatial extent of wetlands and special aquatic sites in the Barataria Basin necessary for the delineation and proposed jurisdictional determination. Also, trying to generate a combined GIS map to represent the current extent of submerged types while maintaining the NWI vegetated wetland classifications is not practicable due to the minor differences in resolution and spatial georectification between the datasets. However, as described above, given the age of the aerial imagery used as the base map for the NWI data and the continued degradation and dynamics of the system, it is likely that it overestimates the current extent of marsh habitats in the basin. Therefore, HDR recommends continued evaluation of new spatial data and mapping sources to further refine this evaluation. USGS is currently developing a 2013 land/water classification spatial database. When available, this dataset should be evaluated to determine whether the vegetated and submerged habitat areas are more accurately captured within the outfall area than under the existing mapping. If so, the 2013 data could be used to perform a GIS analysis of the previous marsh areas that have collapsed and converted to a submerged habitat type (vegetated shallows or open water).

# Representative Site Photographs: Diversion Channel Footprint

1. Top of MR&T Levee. Batture area is presented on the left toe of levee and forested habitat on the right.



2. Forested wetland habitat dominated by black willow in the batture adjacent to the Mississippi River.





3. Forested wetland depression in the area between MR&T levee and LA 23.

4. Forested upland habitat in the area between MR&T levee and LA 23.



5. Upland pasture habitat with excavated pond in the background, facing southwest, from LA 23.



6. Pre-Isaac (July 2012 site visit): Canal and subsiding vegetation on the protected side of the Non-Federal Levee (NFL, back levee) on the background (right side).



7. Post-Isaac (2012): Emergent wetland near canal on protected side of NFL (back levee) with flooding impacts from Hurricane Isaac.



8. Aerial image of pasture (partially wetland) southwest of LA 23, with cattle and drainage ditches visible.



9. Post-Isaac (2012): Canal transecting the study area between pasture with emergent wetland to the south, nearest the NFL (back levee).



**10.** Aerial image of emergent wetland in subsided pasture and drainage channels near west canal by the NFL (back levee) at the southwestern end of the proposed diversion channel footprint.



**11.** Post-Isaac (2012): Emergent wetland in pasture with wetland conditions attributable to subsidence (note the vegetation community impacts resulting from saltwater flooding during Hurricane Isaac).



# Representative Aerial Photographs: Outfall Area

12. Example of broken emergent marsh habitat near the proposed outfall with a mosaic of natural open water, submerged areas (previously marsh), excavated canals, and scrub/shrub (spoil banks).



**13.** Pre-Isaac (summer 2012): Emergent marsh habitat on southern edge of BA-39 marsh restoration area, submerged vegetated shallows to the left, and open water in background.



14. Previous emergent marsh habitat in north-central portion of outfall area with only remnant marsh areas, submerged areas (previously marsh), and scrub/shrub (spoil banks) along oil and gas canals.



**15.** Pre-Isaac (summer 2012): Natural open water area with the remnants of field structures.



**16.** Pre-Isaac (summer 2012): Scrub shrub habitats on low spoil berms from excavated oil canal excavation. Typical elevation is within 12 inches of mean high tide, allowing establishment of marsh on lower intertidal elevations and shrubs in intermittently and seasonally flooded areas.



17. Emergent marsh habitat near Bayou Dupont in outfall area.



18. Emergent marsh habitat in central Barataria Basin with marsh collapse in background; natural bayous and excavated canals with scrub/shrub (bright green vegetation) along spoil banks; lighter brown vegetation in lower right quadrant of the photograph is predominantly Spartina patens.



**19.** Pre-Isaac (July 2012): Open water in collapsed marsh area consisting of both vegetated shallows and deep water habitats.



**20.** Emergent marsh habitat near the confluence of Bayou Dupont and Round Lake, presumably protected by natural sand deposition ridges, with marsh collapse beginning in the interior likely because of effects of saltwater intrusion and tidal erosion in areas with smaller particle and organic soils.



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# Attachment A. Dataset Comparison Figures

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**Figure A-1**. 2010 USGS Land/Water Classification Dataset compared with 2010 aerial imagery (Microsoft Corp. and its data suppliers). Visual estimate of 25 to 30 percent of emergent marsh misclassified as open water.





**Figure A-2**. 2011 USGS National Land Classification Dataset compared with 2010 aerial imagery (Microsoft Corp. and its data suppliers). Visual estimate of 15 to 20 percent of emergent marsh misclassified as open water.



**Figure A-3**. 2013 NRCS Soil Mapping (web soil survey) compared with 2010 aerial imagery (Microsoft Corp. and its data suppliers). Visual estimate of 25 to 30 percent of emergent marsh misclassified as open water.

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# Attachment B. Wetland Determination Data Forms and Site Photographs

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### WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: MBSD		City/County: Place	uemines	Sampling Date: 11/13/12				
Applicant/Owner: CPRA / Ram Tern	ninals		State: LA	Sampling Point: DP-1				
Investigator(s): CM, JM, RW	Section, Township, Range: N/A							
Landform (hillslope, terrace, etc.): Batt	ure	Local relief (conca	ve, convex, none): No	one Slope (%): 2				
Subregion (LRR or MLRA): Outer Coast	stal Plain (LRR T) Lat: 29.	622 N	Lona: 89.9631 V	V Datum: NAD 83				
Soil Map Unit Name: Carville, Cancie	enne, and Schriever soils	s, frequently flooded	d NWI	classification: PFO1R				
Are climatic / hvdrologic conditions on t	he site typical for this time o	f vear? Yes X	No (If no. expl	ain in Remarks.)				
Are Vegetation . Soil . or	Hvdrology significar	ntly disturbed?	Are "Normal Circumsta	ances" present? Yes No X				
Are Vegetation Soil or	Hydrology naturally	problematic?	(If needed, explain any	(answers in Remarks )				
SUMMARY OF FINDINGS - Attach site man showing sampling point locations, transacts, important features, etc.								
Hydrophytic Vegetation Present?	Yes X No	- Is the Sam	pled Area					
Hydric Soil Present?	Yes <u>^ No </u>	within a W	etland? Ye	es X No				
Remarks:	res <u>~</u> No							
Between river and levee								
Detween nver and levee.								
HYDROLOGY								
Wetland Hydrology Indicators:			Secondar	y Indicators (minimum of two required)				
Primary Indicators (minimum of one is	required; check all that app	bly)	Surfa	ce Soil Cracks (B6)				
Surface Water (A1)	Aquatic Fauna (	(B13)		sely Vegetated Concave Surface (B8)				
High Water Table (A2)	Marl Deposits (I	B15) <b>(LRR U)</b>	L Drain	age Patterns (B10)				
Saturation (A3)	Hydrogen Sulfic	de Odor (C1)		Trim Lines (B16)				
Sodimont Doposito (P2)		spheres along Living F	$\Box Dry-S$	ich Rurrowa (C2)				
✓ Drift Deposits (B3)		duction in Tilled Soils (	$(C6)$ $\Box$ Satur	ration Visible on Aerial Imagery (C9)				
Algal Mat or Crust (B4)	Thin Muck Surf:	ace (C7)	Geon	norphic Position (D2)				
Iron Deposits (B5)	Other (Explain i	in Remarks)	Shall	ow Aquitard (D3)				
Inundation Visible on Aerial Imag	ery (B7)		FAC-	Neutral Test (D5)				
Water-Stained Leaves (B9)			📃 Spha	gnum moss (D8) <b>(LRR T, U)</b>				
Field Observations:	v							
Surface Water Present? Yes _	No <u>^</u> Depth (inch	hes):						
Water Table Present? Yes _	No <u>^</u> Depth (inch	hes):						
Saturation Present? Yes _ (includes capillary fringe)	No <u>^</u> Depth (incl	hes):	Wetland Hydrology	Present? Yes <u>^ No</u>				
Describe Recorded Data (stream gau	ge, monitoring well, aerial ph	hotos, previous inspec	tions), if available:					
Aerials: 2010 ESRI & US	SDA							
Remarks:								

### VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP-1

	Absolute	Dominant	Indicator	Dominance Test worksheet:		
Tree Stratum (Plot size: <u>30 radius</u> )	<u>% Cover</u>	<u>Species?</u>	<u>Status</u>	Number of Dominant Species		
1. Salix nigra	20	Y	OBL	That Are OBL, FACW, or FAC: <u>5</u> (A)		
2				Total Number of Dominant		
3				Species Across All Strata: 6 (B)		
4				Percent of Dominant Species		
5				That Are OBL, FACW, or FAC: <sup>83</sup> (A/B)		
6	<u> </u>					
7				Prevalence Index worksheet:		
8.				Total % Cover of: Multiply by:		
	20	= Total Cov	/er	OBL species x 1 =		
50% of total cover: 10	20% of	total cover	. 4	FACW species x 2 =		
Sapling/Shrub Stratum (Plot size 30' radius )			·	FAC species x 3 =		
<u>Salix nigra</u> (1 lot 5/20:)	10	Y	OBL	FACU species x 4 =		
2. Triadica sebifera	10	Y	FAC	UPL species x 5 =		
2		<u> </u>		Column Totals: (A) (B)		
3						
4				Prevalence Index = B/A =		
5				Hydrophytic Vegetation Indicators:		
6				1 - Rapid Test for Hydrophytic Vegetation		
7						
8				□ 3 - Prevalence Index is $\leq 3.0^{1}$		
	20	= Total Cov	/er	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)		
50% of total cover: <u>10</u>	20% of	total cover	: 4			
Herb Stratum (Plot size: 30' radius				<sup>1</sup> Indicators of hydric soil and wetland hydrology must		
1. Physalis angulata	40	Y	FACU	be present, unless disturbed or problematic.		
2. Colocasia esculenta	20	Y	FACW	Definitions of Four Vegetation Strata:		
3 Persicaria hydropiperoides	20	Y	OBL			
△ Cardiospermum halicacabum	10	N	FAC	<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or		
- Brunnichia ovata	10	N	FACW	height.		
5. <u> </u>						
0				<b>Sapling/Shrub</b> – Woody plants, excluding vines, less		
/						
8				Herb – All herbaceous (non-woody) plants, regardless		
9				of size, and woody plants less than 3.28 ft tall.		
10				Woody vine – All woody vines greater than 3.28 ft in		
11				height.		
12						
	100	= Total Cov	/er			
50% of total cover: 50	20% of	total cover	20			
Woody Vine Stratum (Plot size: <u>30' radius</u> )						
1						
2.						
3.						
4						
5						
	0	- Total Ca		Hydrophytic Vegetation		
			/ei	Present? Yes $\underline{\times}$ No		
Remarks: (If observed, list morphological adaptations below).						

Profile Desc	ription: (Describe	to the dep	th needed to docun	nent the i	indicator	or confirm	the absence	of indicators.)
Depth	Matrix		Redo	x Feature	S			
(inches)	Color (moist)		Color (moist)	%	Type	Loc <sup>2</sup>	Texture	Remarks
0-5	10YR 3/2	100					Sandy clay loam	
5-14	10YR 4/2	95	10YR 3/6	S	С	Μ	Sandy clay loam	
		·			·			
		·					<u> </u>	
						<u> </u>		
<sup>1</sup> Type: C=Co	oncentration, D=Dep	letion. RM=	Reduced Matrix. MS	S=Masked	d Sand Gr	ains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix,
Hydric Soil I	ndicators: (Applic	able to all	LRRs, unless other	wise not	ed.)		Indicators	for Problematic Hydric Soils <sup>3</sup> :
Histosol	(A1)		Polyvalue Be	low Surfa	ice (S8) <b>(L</b>		<b>J)</b> 🛛 1 cm M	luck (A9) <b>(LRR O)</b>
Histic Ep	pipedon (A2)		Thin Dark Su	rface (S9	) (LRR S,	T, U)	2 cm M	luck (A10) (LRR S)
Black Hi	stic (A3)		Loamy Mucky	/ Mineral	(F1) <b>(LRF</b>	R O)		ed Vertic (F18) (outside MLRA 150A,B)
Hydroge	n Sulfide (A4)		Loamy Gleye	d Matrix (	(F2)		Piedmo	ont Floodplain Soils (F19) (LRR P, S, T)
Stratified	Layers (A5)		Depleted Mat	rix (F3)			L Anoma	lous Bright Loamy Soils (F20)
Organic	Bodies (A6) (LRR P	, T, U)	Redox Dark S	Surface (F	=6)			A 153B)
	icky Mineral (A7) <b>(LF</b>	RR P, T, U)	Depleted Dar	k Surface	e (F7)			irent Material (TF2)
	esence (A8) (LRR U	)		SSIONS (F	8)			hallow Dark Surface (TF12)
	ICK (A9) <b>(LRR P, I)</b> 1 Below Dark Surfac	o (A11)		<b>KK U)</b> pric (E11)		51)		Explain in Remarks)
	ark Surface (A12)	C (ATT)		ese Mass	es (F12) (		T) <sup>3</sup> Indica	ators of hydrophytic vegetation and
Coast Pr	airie Redox (A16) (N	/LRA 150/	Umbric Surfa	ce (F13)	(LRR P. T	.U)	wetla	and hydrology must be present.
Sandy M	lucky Mineral (S1) (I	RR O, S)	Delta Ochric	(F17) <b>(ML</b>	RA 151)	, -,	unle	ss disturbed or problematic.
Sandy G	ileyed Matrix (S4)		Reduced Ver	tic (F18) (	(MLRA 15	50A, 150B)		·
Sandy R	edox (S5)		Piedmont Flo	odplain S	oils (F19)	(MLRA 14	9A)	
Stripped	Matrix (S6)		Anomalous B	right Loa	my Soils (	F20) <b>(MLR</b>	A 149A, 153C,	153D)
Dark Su	rface (S7) (LRR P, S	5, T, U)					-	
Restrictive L	_ayer (if observed):							
Туре:								×
Depth (inc	ches):						Hydric Soil	Present? Yes <u>^</u> No
Remarks:								
Data Point 1



Project/Site: MBSD	City/County: P	laquemines	Sampling Date: 11/13/12
Applicant/Owner: CPRA / Ram Terminals		State: LA	Sampling Point: DP-2
Investigator(s): CM, JM, RW	Section, Towns	hip, Range: N/A	
Landform (hillslope, terrace, etc.): Batture	Local relief (cor	ncave, convex, none): None	Slope (%): 2
Subregion (I RR or MI RA). Outer Coastal Plain (LRR	T) Lat: 29.6608 N	Long: 89.9629 W	Datum: NAD 83
Soil Map Unit Name. Carville, Cancienne, and Sch	nriever soils, frequently floor	ded NWI classi	fication. PFO1R
Are climatic / hydrologic conditions on the site typical fr	or this time of year? Yes X	No (If no explain in	Remarks )
	significantly disturbed?	_ No (Il No, explain Il'	" propopt? Voc No X
		Ale Normal Circumstances	present: resNo
		(in needed, explain any answ	reis in Remarks.)
SUMMARY OF FINDINGS – Attach site m	ap showing sampling p	ooint locations, transect	s, important features, etc.
Hydrophytic Vegetation Present? Yes X	No Is the S	ampled Area	
Hydric Soil Present? Yes X	_ No within a	Wetland? Yes X	No
Wetland Hydrology Present? Yes X	_ No		
Between levee and river.			
HYDROLOGY			
Wetland Hydrology Indicators:		Secondary Indi	cators (minimum of two required)
Primary Indicators (minimum of one is required; check	k all that apply)	Surface Sc	vil Cracks (B6)
Surface Water (A1)	uatic Fauna (B13)	Sparsely V	egetated Concave Surface (B8)
$\square High Water Table (A2) \qquad \square Ma$	rl Deposits (B15) <b>(LRR U)</b>	Drainage F	atterns (B10)
Saturation (A3)	drogen Sulfide Odor (C1)	a Roots (C3) $\Box$ Dry-Seaso	Lines (B16) n Water Table (C2)
$\Box$ Sediment Deposits (B2)	sence of Reduced Iron (C4)	Cravfish Bu	urrows (C8)
Drift Deposits (B3)	cent Iron Reduction in Tilled Sol	ils (C6) Saturation	Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	n Muck Surface (C7)	🔲 Geomorphi	ic Position (D2)
Iron Deposits (B5)	er (Explain in Remarks)	Shallow Ac	uitard (D3)
Inundation Visible on Aerial Imagery (B7)		FAC-Neutr	al Test (D5)
Water-Stained Leaves (B9)  Field Observations:		<u> </u>	moss (D8) (LRR 1, U)
Surface Water Present? Yes No X	Depth (inches):		
Water Table Present? Yes No X	Depth (inches):	-	
Saturation Present? Yes No X	Depth (inches):	Wetland Hydrology Prese	ent? Yes X No
Describe Recorded Data (stream gauge, monitoring v	vell, aerial photos, previous insp	pections), if available:	
Aerials: 2010 ESRI & USDA			
Remarks:			

Sampling	Point:	DP-2
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	Absolute	Dominant	Indicator	Dominance Test worksheet:	
Tree Stratum (Plot size: 30' radius )	% Cover	Species?	Status	Number of Dominant Species	
1 Salix nigra	70	Y	OBL	That Are OBL FACW or FAC: 7 (A)	
2					
2	·			Total Number of Dominant	
3				Species Across All Strata: (B)	
4				Percent of Dominant Species	
5				That Are OBL, FACW, or FAC: <sup>100</sup> (A/	B)
6					ŕ
7.				Prevalence Index worksheet:	
0				Total % Cover of: Multiply by:	
0	70			OBL species x 1 =	
	70	= Total Cov	rer	FACW species x 2 =	
50% of total cover: 35	20% of	f total cover:	14		
Sapling/Shrub Stratum (Plot size: 30' radius )				FAC species X 3 =	
1. Forestiera acuminata	5	Y	OBL	FACU species x 4 =	
2				UPL species x 5 =	
2				Column Totals: (A) (B	3)
3					
4				Prevalence Index = B/A =	
5				Hydrophytic Vegetation Indicators:	
6				1 - Rapid Test for Hydrophytic Vegetation	
7.				$\square$ P Rapid rest for Hydrophytic Vegetation	
8					
0	5	Tatal O		3 - Prevalence Index is ≤3.0	
	5	= Total Cov	/er	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
50% of total cover: 2.5	20% of	f total cover:	1		
Herb Stratum (Plot size: 30' radius )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must	
1. Persicaria hydropiperoides	30	Υ	OBL	be present, unless disturbed or problematic.	
2 Ampelopsis arborea	20	Y	FAC	Definitions of Four Vegetation Strata:	
3 Saururus cernus	10	N	OBL	j i i i i i i i i i i i i i i i i i i i	
Colocasia esculenta	10	N	FACW	Tree – Woody plants, excluding vines, 3 in. (7.6 cm)	or
	10	<u>N</u>		more in diameter at breast height (DBH), regardless of	)t
5. Hibiscus moscheulos	10			neight.	
6. Physalis angulata	5	N	FACU	Sapling/Shrub - Woody plants, excluding vines, less	3
7. Boehmeria cylindrica	5	Ν	FACW	than 3 in. DBH and greater than 3.28 ft (1 m) tall.	
8.				Here All borboscous (non woody) plants, recording	
9				of size, and woody plants less than 3.28 ft tall	S
10				Woody vine - All woody vines greater than 3.28 ft in	
11				height.	
12					
	90	= Total Cov	rer		
50% of total cover: <sup>45</sup>	20% of	f total cover:	18		
Woody Vine Stratum (Plot size: 30' radius					
Ampelonsis arborea	10	Y	FAC		
		<u> </u>			
2. Campsis radicans	5	ř	FAC		
3. Brunnichia ovata	5	Y	FACW		
4					
5.				Hydrophytic	
	20	- Total Cov	or	Vegetation	
<b>500</b> ( 101-1	000/ -1		4	Present? Yes $\frac{X}{No}$ No	
	20% 01	total cover:	<u>т</u>		
Remarks: (If observed, list morphological adaptations below	ow).				

Profile Desc	ription: (Describe	to the dep	oth needed to docur	nent the	indicator	or confirm	n the absence	of indicators.)
Depth (inchoo)	Matrix	0/	Redo	x Feature	es Turo <sup>1</sup>	1.00 <sup>2</sup>	Toyturo	Pomorko
<u>(inches)</u> 0-8	10YR 4/2	97	10YR 4/6	3	C Type	M	Sandy clay loam	Remarks
8-14	10YR 5/2	95	10 YR 4/6	5	- <u> </u>		Sandy clay loam	
0-14	1011( 3/2			<u> </u>	0			
				- <u> </u>				
				<u> </u>				
<sup>1</sup> Type: C=Co	oncentration, D=Dep	letion, RM	=Reduced Matrix, MS	S=Maske	d Sand G	ains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
Hydric Soil I	ndicators: (Applic	able to all	LRRs, unless other	rwise not	ted.)		Indicators	for Problematic Hydric Soils <sup>3</sup> :
Histosol	(A1)		Polyvalue Be	low Surfa	ace (S8) <b>(</b> I	_RR S, T,	<b>∪) <u> </u></b>	Muck (A9) <b>(LRR O)</b>
Histic Ep	hipedon (A2)		Thin Dark Su	Irface (SS	) (LRR S,	T, U)		Muck (A10) (LRR S)
	STIC (A3) n Sulfido (A4)			y Mineral	(F1) (LRI	( O)		ced Vertic (F18) (outside MLRA 150A,B)
	I Javers (A5)			trix (F3)	(Г2)			alous Bright Loamy Soils (F19) (LKK F, S, T)
	Bodies (A6) <b>(LRR P</b>	, T, U)	Redox Dark	Surface (I	F6)		(ML	RA 153B)
5 cm Mu	cky Mineral (A7) (L	RR P, T, U	) 🔲 Depleted Dar	rk Surface	é (F7)		Red P	arent Material (TF2)
Muck Pre	esence (A8) <b>(LRR L</b>	J)	Redox Depre	essions (F	8)		Uery S	Shallow Dark Surface (TF12)
1 cm Mu	ck (A9) <b>(LRR P, T)</b>		Marl (F10) <b>(L</b>	.RR U)			Cther	(Explain in Remarks)
	Below Dark Surfac	e (A11)	Depleted Och	hric (F11)	(MLRA 1	51) (LDD O D	<b>T)</b> <sup>3</sup> la alt	
	rk Surrace (A12)			ese Mass	(F12)	(LRR 0, P - 11)	, I) India	tand hydrology must be present
Sandy M	lucky Mineral (S1) (		Delta Ochric	(F17) <b>(M</b>	LRA 151)	, 0)	unl	ess disturbed or problematic.
Sandy G	leved Matrix (S4)		Reduced Ver	(i ) <b>(i</b> rtic (F18)	(MLRA 1	50A, 150B	)	
Sandy R	edox (S5)		Piedmont Flo	odplain S	、 Soils (F19)	(MLRA 1	, 49A)	
Stripped	Matrix (S6)		Anomalous E	Bright Loa	my Soils	(F20) (MLF	RA 149A, 153C	c, 153D)
Dark Sur	face (S7) (LRR P, S	S, T, U)						
Restrictive L	ayer (if observed).							
Туре:								- · · · · ·
Depth (inc	ches):						Hydric Soil	Present? Yes <u>^</u> No
Remarks:								

# Data Point 2a



# Data Point 2b



Project/Site: MBSD		City/County: Plaq	uemines		Sampling Date: 11/13/12
Applicant/Owner: CPRA / Ram	1 Terminals		State	e: LA g	Sampling Point: DP-3
Investigator(s): CM, JM, RW		Section, Township	, Range: N/A		
Landform (hillslope, terrace, etc.)	): Delta / Fastland	Local relief (conca	ve, convex, none	e): concave	Slope (%): <u>1</u>
Subregion (LRR or MLRA): Oute	er Coastal Plain (LRR T) Lat: 29.6	6617 N	Long: 89.9	645 W	Datum: NAD 83
Soil Map Unit Name: Cancienn	ie silt loam			NWI classificat	<sub>ion:</sub> Upland
Are climatic / hydrologic condition	ns on the site typical for this time of	vear? Yes X	No (lf no	o, explain in Rei	narks.)
Are Vegetation , Soil	, or Hydrology X significar	ntly disturbed?	Are "Normal Circ	umstances" pre	esent? Yes No X
Are Vegetation . Soil	. or Hydrology naturally	problematic?	(If needed, expla	in anv answers	in Remarks.)
SUMMARY OF FINDINGS	S – Attach site map showi	ng sampling poi	nt locations	, transects,	important features, etc.
Hydrophytic Vegetation Presen Hydric Soil Present? Wetland Hydrology Present?	t? Yes X No Yes No X Yes No X	Is the Sam	pled Area etland?	Yes	No
Between river levee a hydrologic indicators.	and Highway 23. Hurrica	ane Isaac has	resulted in	atypical co	onditions and
Wetland Hydrology Indicator			Sec	condary Indicate	ors (minimum of two required)
Primary Indicators (minimum of	one is required; check all that appl	ly)	🛛	Surface Soil C	racks (B6)
Surface Water (A1)	Aquatic Fauna (	B13)	님	Sparsely Vege	tated Concave Surface (B8)
High Water Table (A2)	Marl Deposits (E	315) <b>(LRR U)</b>	片	Drainage Patte	erns (B10)
Saturation (A3)		le Odor (C1)		Moss I rim Lin	es (B16)
Sediment Deposits (B2)		duced Iron (C4)		Cravitsh Burro	aler Table $(C2)$
$\square$ Drift Deposits (B3)		duction in Tilled Soils (	C6) 🗍	Saturation Visi	ble on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Thin Muck Surfa	ace (C7)		Geomorphic P	osition (D2)
Iron Deposits (B5)	Other (Explain ir	n Remarks)	$\Box$	Shallow Aquita	rd (D3)
Inundation Visible on Aeria	ıl Imagery (B7)			FAC-Neutral T	est (D5)
Water-Stained Leaves (B9	)			Sphagnum mo	ss (D8) <b>(LRR T, U)</b>
Field Observations:	V				
Surface Water Present?	Yes <u>No </u> Depth (inch	nes):			
Water Table Present?	Yes <u>No ^</u> Depth (inch	ies):			X
Saturation Present? (includes capillary fringe)	Yes <u>No </u> Depth (inch	nes):	Wetland Hydr	ology Present	? Yes <u>No ^</u>
Describe Recorded Data (strea	m gauge, monitoring well, aerial ph	iotos, previous inspec	tions), if availabl	e:	
Remarks:	X UODA				
Atypical situation fals	se positive indicators du	le to hurricane			

Sampling	Point:	DP-3
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		Absolute	Dominant	Indicator	Dominance Test worksheet:		
Tree Stratum (Plot size: 30' rac	dius )	% Cover	Species?	Status	Number of Dominant Species		
1. Carya aquatica		10	Y	OBL	That Are OBL, FACW, or FAC	; 7	(A)
2. Cornus drummondii		20	Υ	FAC			
3		·		· · · · · ·	Total Number of Dominant	7	
3		·			Species Across All Strata:	1	(B)
4		·		·	Percent of Dominant Species		
5					That Are OBL, FACW, or FAC	<u>;</u> 100	(A/B)
6		. <u> </u>					
7.					Prevalence Index worksheet	i:	
8					Total % Cover of:	Multiply by:	_
0		30	Total Car		OBL species	x 1 =	
	15			/er	FACW species	x 2 =	
	50% of total cover: 15	20% of	total cover	. 0	EAC species	x 3 -	-
Sapling/Shrub Stratum (Plot siz	e: <u>30'</u> radius )					× 3 =	-
1. Acer negundo		30	Y	FAC	FACU species	x 4 =	_
2 Acer rubrum		10	Y	FAC	UPL species	x 5 =	_
2		·			Column Totals:	(A)	(B)
3		·		·			
4		·		<u> </u>	Prevalence Index = B/A	. =	_
5					Hydrophytic Vegetation Indi	cators:	
6					1 - Rapid Test for Hydron	hytic Vegetation	
7.							
0					2 - Dominance Test is >50	J%	
ö		40	<b>T</b> ( ) O		$\square$ 3 - Prevalence Index is $\leq 3$	3.0'	
	0.0	40	= Total Cov	/er	Problematic Hydrophytic	Vegetation <sup>1</sup> (Explai	n)
	50% of total cover: 20	20% of	total cover	: 8			
Herb Stratum (Plot size: 30' rad	dius )				<sup>1</sup> Indicators of hydric soil and w	vetland hydrology n	nust
1. Saururus cernus		5	Υ	OBL	be present, unless disturbed of	or problematic.	laot
2 Ampelopsis arborea		5	Y	FAC	Definitions of Four Vegetation	on Strata	
2		·		·	Deminions of Four Vegetation	Sh Otrata.	
3		·			Tree - Woody plants, excludir	ng vines, 3 in. (7.6 o	cm) or
4		·		<u> </u>	more in diameter at breast hei	ght (DBH), regardle	ess of
5					height.		
6					Sapling/Shrub – Woody plant	ts. excluding vines	less
7.					than 3 in. DBH and greater that	an 3.28 ft (1 m) tall	
°		·		·			
8		·			Herb – All herbaceous (non-w	oody) plants, regar	rdless
9		·		<u> </u>	of size, and woody plants less	than 3.28 ft tall.	
10					Woody vine – All woody vines	s areater than 3.28	ft in
11					height.	0	
12.							
		10	= Total Cov	/er			
	50% of total anyon 5	200/ of		. 2			
	20' radius	20% 01	IUIAI COVEI				
Woody Vine Stratum (Plot size:	<u> </u>	_					
1. Ampelopsis arborea		5	Y	FAC			
2							
3.							
1		·					
		·					
5				·	Hydrophytic		
		5	= Total Cov	/er	Vegetation	No	
	50% of total cover: 2.5	20% of	total cover	<u> </u>	Present? Tes <u>*</u>		
Remarks: (If observed, list more	phological adaptations belo	ow).					
		,.					

Profile Desc	ription: (Describe	e to the dep	th needed to docu	ment the	indicato	r or confiri	m the absence	of indicators	.)	
Depth	Matrix		Rede	ox Feature	S1					
(inches)	Color (moist)	%	Color (moist)	%	Type		Texture		Remarks	
0-14	10YR 4/1	99	10YR 4/6	1	С	M	Clay			
					·		- <u></u>	-		
					·		·			
					· · <u></u>					
				_		_	·			
					·					
							·			
<sup>1</sup> Type: C=Co	oncentration, D=De	pletion, RM:	Reduced Matrix, M	S=Masked	d Sand G	Grains.	<sup>2</sup> Location:	PL=Pore Lini	ng, M=Matrix	
Hydric Soil	Indicators: (Appli	cable to all	LRRs, unless othe	erwise not	ed.)		Indicators	for Problema	atic Hydric S	oils <sup>3</sup> :
Histosol	(A1)		Polyvalue B	elow Surfa	ce (S8) (	LRR S. T.		/luck (A9) <b>(LR</b>	R O)	
Histic Er	pipedon (A2)		Thin Dark S	urface (S9	) (LRR S	5. T. U)	$\square 2 \text{ cm } \mathbb{N}$	/uck (A10) (LI	RR S)	
Black Hi	stic (A3)		Loamv Much	v Mineral	(F1) <b>(LR</b>	R O)		ed Vertic (F18	(outside M	LRA 150A.B)
	en Sulfide (A4)		Loamy Glev	ed Matrix	(F2)	- /	D Piedm	ont Floodplair	Soils (F19) (	LRR P. S. T)
Stratified	d Lavers (A5)		Depleted Ma	atrix (F3)	( )			alous Bright Lo	amy Soils (F	20)
	Bodies (A6) (LRR	P. T. U)	Redox Dark	Surface (F	-6)		(MLI	RA 153B)	<b>,</b>	- /
5 cm Mu	icky Mineral (A7) (L	.RR P. T. U)		ark Surface	e (F7)			arent Material	(TE2)	
	esence (A8) <b>(I RR</b>	U)		essions (F	8)		Verv S	shallow Dark S	()) =/ Surface (TE12	)
	ick (A9) (I RR P. T)	-,	Marl (F10) (		•)		Other	(Explain in Re	marks)	/
	d Below Dark Surfa	ce (A11)		-hric (F11)		151)			marito)	
	ark Surface (A12)		Iron-Mangar	nese Mass	es (F12)	(LRR O. P	<b>. T)</b> <sup>3</sup> India	ators of hydro	phytic vegeta	tion and
Coast P	rairie Redox (A16)	MI RA 150	Umbric Surf	ace (F13)	(IRR P.	( 0, . T. U)	, , , wei	land hydrolog	v must be pre	sent
Sandy M	lucky Mineral (S1)		Delta Ochric	: (F17) <b>(MI</b>	RA 151	)	unl	ess disturbed	or problemati	2
Sandy G	Reved Matrix (S4)			rtic (F18)	(MI RA 1	, 50Δ 150B	3		orproblemati	5.
Sandy R	Pedax (S5)			oodolain S		MIRA 1	γ 49Δ)			
	Matrix (S6)			Bright Log	my Soile		437) PA 1/0A 1530	153D)		
	rface (S7) <b>/I PP P</b>	S T IN		Dright Loa	iny Solis		IXA 143A, 1330	, 1550)		
Pestrictive I	aver (if observed	<u>, , , , , , , , , , , , , , , , , , , </u>					1			
Turner	Layer (il observed									
Type:								-		X
Depth (inc	ches):						Hydric Soil	Present?	Yes	No <u>^</u>
Remarks:	aday aanaan	trationa	not common							
ĸ	edox concen	trations	not common.							

# Data Point 3



Project/Site: MBSD		City/Co	ounty: Plaquemir	nes	_ Sampling Date: 11/13/12
Applicant/Owner: CPRA / Rai	m Terminals	-	-	State: LA	Sampling Point: DP-4
Investigator(s): CM, JM, RW		Section	n, Township, Rang	<sub>le:</sub> N/A	
Landform (hillslope, terrace, etc	.): Delta / Fastland	Local r	elief (concave, cor	nvex, none): none	Slope (%): 2
Subregion (LRR or MLRA): Ou	ter Coastal Plain (LRR T)	Lat: 29.6605	Lo	ng: 89.9642	Datum: NAD 83
Soil Map Unit Name: Cancien	ne silt loam			NWI classif	ication: Upland
Are climatic / hvdrologic conditio	ons on the site typical for t	his time of vear? Ye	x No	(If no. explain in	Remarks.)
Are Vegetation . Soil	. or Hydrology X	significantly disturb	ed? Are "N	ormal Circumstances"	present? Yes No X
Are Vegetation . Soil	. or Hydrology	naturally problemat	tic? (If need	ded. explain any answ	ers in Remarks.)
SUMMARY OF FINDING	S – Attach site ma	p showing sam	pling point loc	cations, transect	s, important features, etc.
	Y				
Hydrophytic Vegetation Prese	nt? Yes <u>^</u>	No	Is the Sampled A	rea	¥
Wetland Hydrology Present?	Yes	No X	within a Wetland	? Yes	No <u>X</u>
Remarks:		<u> </u>			
Between river levee	and Highway 23.	Hurricane Isa	ac has resu	Ited in atypical	conditions and
hvdrologic indicators	3.				
HYDROLOGY					
Wetland Hydrology Indicato	rs:			Secondary India	cators (minimum of two required)
Primary Indicators (minimum o	of one is required; check a	ll that apply)		Surface So	il Cracks (B6)
Surface Water (A1)	L Aquat	ic Fauna (B13)		Sparsely Ve	egetated Concave Surface (B8)
High Water Table (A2)		Deposits (B15) (LRR	U)	Drainage P	atterns (B10)
Saturation (A3)	Hydro	gen Sulfide Odor (C	1)	Moss Trim	Lines (B16)
Water Marks (B1)		ed Rhizospheres al	ong Living Roots (	C3) 🔟 Dry-Seasor	Water Table (C2)
Sediment Deposits (B2)		nce of Reduced Iron	i (C4) Tilled Seile (C6)	Crayfish Bu	Irrows (C8)
$\square$ Algel Mat or Cruct (B4)		Auck Surface (C7)			c Position (D2)
Iron Deposits (B5)		(Explain in Remarks	5)	Shallow Ag	uitard (D3)
Inundation Visible on Aeri	ial Imagery (B7)		<i>,</i> ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	FAC-Neutra	al Test (D5)
Water-Stained Leaves (B	9)			D Sphagnum	moss (D8) <b>(LRR T, U)</b>
Field Observations:					
Surface Water Present?	Yes No X C	Pepth (inches):			
Water Table Present?	Yes No <u>X</u> _ C	Pepth (inches):			
Saturation Present?	Yes No X C	Pepth (inches):	Wetla	and Hydrology Prese	ent? Yes <u>No X</u>
(includes capillary fringe) Describe Recorded Data (stre	am gauge, monitoring wel	I. aerial photos, prev	ious inspections).	if available:	
Aerials: 2010 ESRI	& USDA	,,			
Remarks:					
Atypical situation, fa	lse positive indica	tors due to hu	urricane.		
· · · <b>/</b> · · · · · · · · · · · · · · · · · · ·					

20' rodiuo	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: <u>30 radius</u> )	<u>% Cover</u>	<u>Species?</u>	<u>Status</u>	Number of Dominant Species
1. Triadica sobifara			FAC	That Are OBL, FACW, or FAC: _/ (A)
	10	<u> </u>	FAC	Total Number of Dominant
3				Species Across All Strata: / (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 100 (A/B)
6		<u> </u>		Brovalanca Index workshoot:
7				Total % Cover of: Multiply by:
8				
	45	= Total Cov	rer	
50% of total cover: 22.5	20% of	total cover	9	FACW species X 2 =
Sapling/Shrub Stratum (Plot size: 30' radius )				FAC species X 3 =
1. Acer negundo	15	Y	FAC	FACU species x 4 =
2. Cornus drummondii	10	Y	FAC	UPL species x 5 =
3. Morella cerifera	5	Υ	FAC	Column Totals: (A) (B)
4.				Prevalence Index - B/A -
5.				Hydrophytic Vogetation Indicators:
6.				A Depid Test for Lludrenbutic Vegetation
7				
8				$\square$ 2 - Dominance Test is >50%
···	30	- Total Cov		$\square$ 3 - Prevalence Index is $\leq 3.0$
50% of total cover: 15	20% of	total cover	6	Problematic Hydrophytic Vegetation' (Explain)
Horb Stratum (Plot size: 30' radius )	2070 01			1
<u>There stratum</u> (Flot size)	30	Y	FACW	Indicators of hydric soil and wetland hydrology must
Ampelonsis arborea		N	FAC	Definitions of Four Verstetion Starter
2. Acer negundo			FAC	Definitions of Four vegetation Strata:
			TAC	Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or
4				more in diameter at breast height (DBH), regardless of
5				noight.
6				Sapling/Shrub – Woody plants, excluding vines, less
7				than 3 m. DBH and greater than 3.28 ft (1 m) tail.
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10		<u> </u>		Woody vine – All woody vines greater than 3.28 ft in
11				height.
12				
	40	= Total Cov	er	
50% of total cover: 20	20% of	total cover	8	
Woody Vine Stratum (Plot size: 30' radius )				
1. Ampelopsis arborea	5	Y	FAC	
2				
3				
4.				
5.				Hydrophytic
	5	= Total Cov	rer	Vegetation
50% of total cover: <sup>2.5</sup>	20% of	total cover	1	Present? Yes <u>×</u> No
Remarks: (If observed, list morphological adaptations be	low)			
	iow).			

Profile Desc	cription: (Describe	e to the dep	th needed to docu	ment the	indicato	or confirm	m the absence of	f indicators.)	
Depth	Matrix		Rede	ox Feature	S				
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remar	ks
0-16	10YR 4/2	99	10YR 4/6	1	С	M	Silty clay		
							·		
					<u> </u>		·		
					<u> </u>		·		
1 <u>т</u>						- <u>.</u>	21 11 1		
Type: C=C	oncentration, D=De	pletion, RM=	Reduced Matrix, M	IS=Masked	d Sand G	rains.	Location: P	L=Pore Lining, M=N	
Hydric Soli	indicators: (Appli	cable to all	LRRS, unless othe	erwise not	ea.)			or Problematic Hyd	ric Solis":
Histosol	(A1)		Polyvalue B	elow Surfa	ice (S8) <b>(</b>	LRR S, T,	<b>U) <u> </u> 1 cm Mu</b>	ck (A9) <b>(LRR O)</b>	
Histic Ep	pipedon (A2)		Thin Dark S	urface (S9	) <b>(LRR S</b>	, T, U)	2 cm Mu	ck (A10) <b>(LRR S)</b>	
Black Hi	istic (A3)		Loamy Mucl	ky Mineral	(F1) <b>(LR</b>	R 0)	Reduced	I Vertic (F18) (outsi	de MLRA 150A,B)
Hydroge	en Sulfide (A4)		Loamy Gley	ed Matrix	(F2)		Piedmon	t Floodplain Soils (F	<sup>-</sup> 19) <b>(LRR P, S, T)</b>
Stratified	d Layers (A5)		Depleted Ma	atrix (F3)			Anomalo	ous Bright Loamy So	ils (F20)
Organic	Bodies (A6) (LRR	P, T, U)	Redox Dark	Surface (F	-6)			(153B)	
5 cm Μι	ucky Mineral (A7) <b>(L</b>	.RR P, T, U)	Depleted Da	ark Surface	e (F7)		Red Pare	ent Material (TF2)	
Muck Pr	resence (A8) (LRR	U)	Redox Depr	essions (F	8)		Ury Sha	allow Dark Surface (	TF12)
1 cm Mւ	uck (A9) <b>(LRR P, T)</b>		<u> </u>	LRR U)			U Other (E	xplain in Remarks)	
Deplete	d Below Dark Surfa	ce (A11)	Depleted Oc	chric (F11)	(MLRA <sup>·</sup>	151)			
Thick Da	ark Surface (A12)		Iron-Mangar	nese Mass	es (F12)	(LRR O, P	, T) <sup>3</sup> Indicat	ors of hydrophytic v	egetation and
Coast P	rairie Redox (A16)	(MLRA 150A	)	ace (F13)	(LRR P,	T, U)	wetla	nd hydrology must b	e present,
Sandy N	/lucky Mineral (S1)	(LRR O, S)	Delta Ochric	: (F17) <b>(MI</b>	_RA 151)		unles	s disturbed or proble	ematic.
Sandy G	Gleyed Matrix (S4)		Reduced Ve	ertic (F18)	(MLRA 1	50A, 150B	)		
Sandy F	Redox (S5)		Piedmont FI	oodplain S	Soils (F19	) (MLRA 1	49A)		
Stripped	l Matrix (S6)		Anomalous	Bright Loa	my Soils	(F20) <b>(MLF</b>	RA 149A, 153C, 1	53D)	
Dark Su	rface (S7) (LRR P,	S, T, U)							
Restrictive	Layer (if observed	):							
Type:									
Depth (in	ches):						Hydric Soil P	resent? Yes	No X
Remarks:									
R	edox concen	trations	not common.						

Data Point 4



Project/Site: MBSD		City/County: _	Plaquemines	Sampling Date: 11/13/12
Applicant/Owner: CPRA / Rar	cant/Owner: CPRA / Ram Terminals			Sampling Point: DP-1
Investigator(s): <u>CM</u> , JM, RW		Section, Towr	iship, Range: N/A	
Landform (hillslope, terrace, etc	.): Batture	Local relief (co	oncave, convex, none): None	Slope (%): 2
Subregion (LRR or MLRA): Out	er Coastal Plain (LRR T)	<sub>at:</sub> 29.622 N	<sub>Long:</sub> 89.9631 W	Datum: NAD 83
Soil Map Unit Name: Carville,	Cancienne, and Schrieve	er soils, frequently floo	oded NWI class	ification: PFO1R
Are climatic / hydrologic conditio	ons on the site typical for this	time of year? Yes X	No (If no, explain ir	Remarks.)
Are Vegetation , Soil	or Hvdroloav si	anificantly disturbed?	Are "Normal Circumstances	s" present? Yes No X
Are Vegetation Soil	or Hydrology n	aturally problematic?	(If needed, explain any ans	wers in Remarks )
SUMMARY OF FINDING	S – Attach site map :	showing sampling	point locations, transec	ts important features, etc.
	v			to, important router cc, c
Hydrophytic Vegetation Preser	nt? Yes <u>^</u> No	Is the	Sampled Area	
Hydric Soil Present?	Yes <u>^</u> NC	within	a Wetland? Yes $\frac{X}{X}$	No
Remarks		·		
Between river and le	vee.			
HYDROLOGY				
Wetland Hydrology Indicator	rs:		Secondary Ind	icators (minimum of two required)
Primary Indicators (minimum c	of one is required; check all th	hat apply)	Surface So	oil Cracks (B6)
Surface Water (A1)		Fauna (B13)		/egetated Concave Surface (B8)
$\square \qquad \text{High Water Table (A2)} \\ \square \qquad \text{Saturation (A3)}$		DSIIS (B15) (LKK U) n Sulfide Odor (C1)		Patterns (B10)
Water Marks (B1)		Rhizospheres along Livi	ng Roots (C3)	on Water Table (C2)
Sediment Deposits (B2)	Presence	e of Reduced Iron (C4)	Crayfish B	Surrows (C8)
Drift Deposits (B3)	Recent I	ron Reduction in Tilled S	oils (C6)	Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	🛄 Thin Mud	k Surface (C7)	Geomorph	nic Position (D2)
Iron Deposits (B5)	U Other (E	xplain in Remarks)	Shallow A	quitard (D3)
Inundation Visible on Aeria	al Imagery (B7)		FAC-Neut	ral Test (D5)
Water-Stained Leaves (B)	<i>)</i> )			n moss (D8) <b>(LRR T, U)</b>
Fleid Observations.	Ves No X Der	th (inches):		
Mater Table Present?	Voc No X Der	th (inches):	-	
Saturation Present?	Yes No X Dep	th (inches):	Wetland Hydrology Pres	sent? Yes <sup>X</sup> No
(includes capillary fringe)	,			
Aprilate 2010 ESE	am gauge, monitoring weii, a פווכחג	erial photos, previous ins	spections), if available:	
Atliais. 2010 LON				
Remarks:				

Sampling Point: DP-1

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: <u>30 radius</u> )	<u>% Cover</u>	Species?	<u>Status</u>	Number of Dominant Species
1. Salix nigra	20	Y	OBL	That Are OBL, FACW, or FAC: <u>5</u> (A)
2				Total Number of Dominant
3				Species Across All Strata: 6 (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: <sup>83</sup> (A/B)
6				
7				Prevalence Index worksheet:
8.				Total % Cover of: Multiply by:
	20	= Total Cov	/er	OBL species x 1 =
50% of total cover: 10	20% of	total cover	. 4	FACW species x 2 =
Sapling/Shrub Stratum (Plot size 30' radius )			·	FAC species x 3 =
<u>Salix nigra</u> (1 lot size:)	10	Y	OBL	FACU species x 4 =
2. Triadica sebifera	10	Y	FAC	UPL species x 5 =
2		<u> </u>		Column Totals: (A) (B)
3				、 , , 、 , ,
4				Prevalence Index = B/A =
5				Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7				✓ 2 - Dominance Test is >50%
8				$\boxed{\square}$ 3 - Prevalence Index is $\leq 3.0^1$
	20	= Total Cov	/er	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover: <sup>10</sup>	20% of	total cover	: 4	
Herb Stratum (Plot size: 30' radius )				<sup>1</sup> Indicators of hydric soil and watland hydrology must
1. Physalis angulata	40	Υ	FACU	be present, unless disturbed or problematic.
2 Colocasia esculenta	20	Y	FACW	Definitions of Four Vegetation Strata
Persicaria hydropiperoides	20	Y	OBL	
Cardiospermum halicacabum	10	N	FAC	<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or
- Brunnichia ovata	10		FACW	more in diameter at breast height (DBH), regardless of height
			171011	
6				<b>Sapling/Shrub</b> – Woody plants, excluding vines, less
7				
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10				Woody vine – All woody vines greater than 3.28 ft in
11				height.
12				
	100	= Total Cov	/er	
50% of total cover: <sup>50</sup>	20% of	total cover	20	
Woody Vine Stratum (Plot size: 30' radius				
1.				
2				
3				
۵				
4				
5	0			Hydrophytic
	<u> </u>	= Total Cov	/er	Present? Yes X No
50% of total cover:	20% of	total cover	:	
Remarks: (If observed, list morphological adaptations bel	ow).			

Profile Desc	ription: (Describe	to the dep	th needed to docun	nent the i	indicator	or confirm	the absence	of indicators.)
Depth	Matrix		Redo	x Feature	S			
(inches)	Color (moist)		Color (moist)	%	Type	Loc <sup>2</sup>	Texture	Remarks
0-5	10YR 3/2	100					Sandy clay loam	
5-14	10YR 4/2	95	10YR 3/6	S	С	Μ	Sandy clay loam	
		·			·			
		·						
						<u> </u>		
					. <u> </u>			
<sup>1</sup> Type: C=Co	oncentration, D=Dep	letion. RM=	Reduced Matrix. MS	S=Masked	d Sand Gr	ains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix,
Hydric Soil I	ndicators: (Applic	able to all	LRRs, unless other	wise not	ed.)		Indicators	for Problematic Hydric Soils <sup>3</sup> :
Histosol	(A1)		Polyvalue Be	low Surfa	ice (S8) <b>(L</b>		<b>J)</b> 🛛 1 cm M	luck (A9) <b>(LRR O)</b>
Histic Ep	pipedon (A2)		Thin Dark Su	rface (S9	) (LRR S,	T, U)	2 cm M	luck (A10) (LRR S)
Black Hi	stic (A3)		Loamy Mucky	/ Mineral	(F1) <b>(LRF</b>	R O)		ed Vertic (F18) (outside MLRA 150A,B)
Hydroge	n Sulfide (A4)		Loamy Gleye	d Matrix (	(F2)		Piedmo	ont Floodplain Soils (F19) (LRR P, S, T)
Stratified	Layers (A5)		Depleted Mat	rix (F3)			L Anoma	lous Bright Loamy Soils (F20)
Organic	Bodies (A6) (LRR P	, T, U)	Redox Dark S	Surface (F	=6)			RA 153B)
	icky Mineral (A7) <b>(LF</b>	RR P, T, U)	Depleted Dar	k Surface	e (F7)			arent Material (TF2)
	esence (A8) (LRR U	)		SSIONS (F	8)			hallow Dark Surface (TF12)
	ICK (A9) <b>(LRR P, I)</b> 1 Below Dark Surfac	o (A11)		<b>KK U)</b> pric (E11)		51)		Explain in Remarks)
	ark Surface (A12)	e (ATT)		ese Mass	es (F12) (		T) <sup>3</sup> Indica	ators of hydrophytic vegetation and
Coast Pr	airie Redox (A16) (N	/LRA 150/	Umbric Surfa	ce (F13)	(LRR P. T	.U)	wetl	and hydrology must be present.
Sandy M	lucky Mineral (S1) (I	RR O, S)	Delta Ochric	(F17) <b>(ML</b>	RA 151)	, -,	unle	ess disturbed or problematic.
Sandy G	ileyed Matrix (S4)		Reduced Ver	tic (F18) (	(MLRA 15	50A, 150B)		
Sandy R	edox (S5)		Piedmont Flo	odplain S	oils (F19)	(MLRA 14	9A)	
Stripped	Matrix (S6)		Anomalous B	right Loa	my Soils (	F20) <b>(MLR</b>	A 149A, 153C,	153D)
Dark Su	rface (S7) (LRR P, S	5, T, U)					-	
Restrictive L	_ayer (if observed):							
Туре:								×
Depth (inc	ches):						Hydric Soil	Present? Yes <u>^</u> No
Remarks:								

Data Point 1



Project/Site: MBSD	City/County: P	laquemines	Sampling Date: 11/13/12
Applicant/Owner: CPRA / Ram Terminals		State: LA	Sampling Point: DP-2
Investigator(s): CM, JM, RW	Section, Towns	hip, Range: N/A	
Landform (hillslope, terrace, etc.): Batture	Local relief (cor	ncave, convex, none): None	Slope (%): 2
Subregion (I RR or MI RA). Outer Coastal Plain (LRR	T) Lat: 29.6608 N	Long: 89.9629 W	Datum: NAD 83
Soil Map Unit Name. Carville, Cancienne, and Sch	nriever soils, frequently floor	ded NWI classi	fication. PFO1R
Are climatic / hydrologic conditions on the site typical fr	or this time of year? Yes X	No (If no explain in	Remarks )
	significantly disturbed?		" propopt? Voc No X
		Ale Normal Circumstances	present: resNo
		(in needed, explain any answ	reis in Remarks.)
SUMMARY OF FINDINGS – Attach site m	ap showing sampling p	ooint locations, transect	s, important features, etc.
Hydrophytic Vegetation Present? Yes X	No Is the S	ampled Area	
Hydric Soil Present? Yes X	_ No within a	Wetland? Yes X	No
Wetland Hydrology Present? Yes X	_ No		
Between levee and river.			
HYDROLOGY			
Wetland Hydrology Indicators:		Secondary Indi	cators (minimum of two required)
Primary Indicators (minimum of one is required; check	k all that apply)	Surface Sc	vil Cracks (B6)
Surface Water (A1)	uatic Fauna (B13)	Sparsely V	egetated Concave Surface (B8)
$\square High Water Table (A2) \qquad \square Ma$	rl Deposits (B15) <b>(LRR U)</b>	Drainage F	atterns (B10)
Saturation (A3)	drogen Sulfide Odor (C1)	a Roots (C3) $\Box$ Dry-Seaso	Lines (B16) n Water Table (C2)
$\Box$ Sediment Deposits (B2)	sence of Reduced Iron (C4)	Cravfish Bu	urrows (C8)
Drift Deposits (B3)	cent Iron Reduction in Tilled Sol	ils (C6) Saturation	Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	n Muck Surface (C7)	🔲 Geomorphi	ic Position (D2)
Iron Deposits (B5)	er (Explain in Remarks)	Shallow Ac	uitard (D3)
Inundation Visible on Aerial Imagery (B7)		FAC-Neutr	al Test (D5)
Water-Stained Leaves (B9)  Field Observations:		<u> </u>	moss (D8) (LRR 1, U)
Surface Water Present? Yes No X	Depth (inches):		
Water Table Present? Yes No X	Depth (inches):	-	
Saturation Present? Yes No X	Depth (inches):	Wetland Hydrology Prese	ent? Yes X No
Describe Recorded Data (stream gauge, monitoring v	vell, aerial photos, previous insp	pections), if available:	
Aerials: 2010 ESRI & USDA			
Remarks:			

Sampling	Point:	DP-2
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	Absolute	Dominant	Indicator	Dominance Test worksheet:	
Tree Stratum (Plot size: 30' radius )	% Cover	Species?	Status	Number of Dominant Species	
1 Salix nigra	70	Y	OBL	That Are OBL FACW or FAC: 7 (A)	
2					
2	·			Total Number of Dominant	
3				Species Across All Strata: (B)	
4				Percent of Dominant Species	
5				That Are OBL, FACW, or FAC: <sup>100</sup> (A/	B)
6					ŕ
7.				Prevalence Index worksheet:	
0				Total % Cover of: Multiply by:	
0	70			OBL species x 1 =	
05	70	= Total Cov	rer	FACW species x 2 =	
50% of total cover: 35	20% of	f total cover:	14		
Sapling/Shrub Stratum (Plot size: 30' radius )				FAC species X 3 =	
1. Forestiera acuminata	5	Y	OBL	FACU species x 4 =	
2				UPL species x 5 =	
2				Column Totals: (A) (B	3)
3					
4				Prevalence Index = B/A =	
5				Hydrophytic Vegetation Indicators:	
6				1 - Rapid Test for Hydrophytic Vegetation	
7.				$\square$ P Rapid rest for Hydrophytic Vegetation	
8					
0	5	Tatal O		3 - Prevalence Index is ≤3.0	
	5	= Total Cov	/er	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
50% of total cover: 2.5	20% of	f total cover:	1		
Herb Stratum (Plot size: 30' radius )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must	
1. Persicaria hydropiperoides	30	Υ	OBL	be present, unless disturbed or problematic.	
2 Ampelopsis arborea	20	Y	FAC	Definitions of Four Vegetation Strata:	
3 Saururus cernus	10	N	OBL	j i i i i i i i i i i i i i i i i i i i	
Colocasia esculenta	10	N	FACW	Tree – Woody plants, excluding vines, 3 in. (7.6 cm)	or
	10	<u>N</u>		more in diameter at breast height (DBH), regardless of	)t
5. Hibiscus moscheulos	10			neight.	
6. Physalis angulata	5	N	FACU	Sapling/Shrub - Woody plants, excluding vines, less	3
7. Boehmeria cylindrica	5	Ν	FACW	than 3 in. DBH and greater than 3.28 ft (1 m) tall.	
8.				<b>Harb</b> All borboscous (non woody) plants, recording	
9				of size, and woody plants less than 3.28 ft tall	S
10				Woody vine - All woody vines greater than 3.28 ft in	
11				height.	
12					
	90	= Total Cov	rer		
50% of total cover: <sup>45</sup>	20% of	f total cover:	18		
Woody Vine Stratum (Plot size: 30' radius					
Ampelonsis arborea	10	Y	FAC		
		<u> </u>			
2. Campsis radicans	5	ř	FAC		
3. Brunnichia ovata	5	Y	FACW		
4					
5.				Hydrophytic	
	20	- Total Cov	or	Vegetation	
<b>500</b> ( 101-1	000/ -1		4	Present? Yes $\frac{X}{No}$ No	
	20% 01	total cover:	<u>т</u>		
Remarks: (If observed, list morphological adaptations below	ow).				

Profile Desc	ription: (Describe	to the dep	oth needed to docur	nent the	indicator	or confirm	n the absence	of indicators.)
Depth (inchoo)	Matrix	0/	Redo	x Feature	es Turca <sup>1</sup>	1.00 <sup>2</sup>	Toyturo	Pomorko
<u>(inches)</u> 0-8	10YR 4/2	97	10YR 4/6	3	C Type	M	Sandy clay loam	Remarks
8-14	10YR 5/2	95	10 YR 4/6	5	- <u> </u>		Sandy clay loam	
0-14	1011( 3/2			<u> </u>	0			
				- <u> </u>				
				<u> </u>				
<sup>1</sup> Type: C=Co	oncentration, D=Dep	letion, RM	=Reduced Matrix, MS	S=Maske	d Sand G	ains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
Hydric Soil I	ndicators: (Applic	able to all	LRRs, unless other	rwise not	ted.)		Indicators	for Problematic Hydric Soils <sup>3</sup> :
Histosol	(A1)		Polyvalue Be	low Surfa	ace (S8) <b>(</b> I	_RR S, T,	<b>∪) <u> </u></b>	Muck (A9) <b>(LRR O)</b>
Histic Ep	hipedon (A2)		Thin Dark Su	Irface (SS	) (LRR S,	T, U)		Muck (A10) (LRR S)
	STIC (A3) n Sulfido (A4)			y Mineral	(F1) (LRI	( O)		ced Vertic (F18) (outside MLRA 150A,B)
	I Javers (A5)			trix (F3)	(Г2)			alous Bright Loamy Soils (F19) (LKK F, S, T)
	Bodies (A6) <b>(LRR P</b>	, T, U)	Redox Dark	Surface (I	F6)		(ML	RA 153B)
5 cm Mu	cky Mineral (A7) (L	RR P, T, U	) 🔲 Depleted Dar	rk Surface	é (F7)		Red P	arent Material (TF2)
Muck Pre	esence (A8) <b>(LRR L</b>	J)	Redox Depre	essions (F	8)		Uery S	Shallow Dark Surface (TF12)
1 cm Mu	ck (A9) <b>(LRR P, T)</b>		Marl (F10) <b>(L</b>	.RR U)			Cther	(Explain in Remarks)
	Below Dark Surfac	e (A11)	Depleted Och	hric (F11)	(MLRA 1	51) (LDD O D	<b>T)</b> <sup>3</sup> la alt	
	rk Surrace (A12)			ese Mass	(F12)	(LRR 0, P - 11)	, I) India	tand hydrology must be present
Sandy M	lucky Mineral (S1) (		Delta Ochric	(F17) <b>(M</b>	LRA 151)	, 0)	unl	ess disturbed or problematic.
Sandy G	leved Matrix (S4)		Reduced Ver	(i ) <b>(i</b> rtic (F18)	(MLRA 1	50A, 150B	)	
Sandy R	edox (S5)		Piedmont Flo	odplain S	、 Soils (F19)	(MLRA 1	, 49A)	
Stripped	Matrix (S6)		Anomalous E	Bright Loa	my Soils	(F20) (MLF	RA 149A, 153C	c, 153D)
Dark Sur	face (S7) (LRR P, S	S, T, U)						
Restrictive L	ayer (if observed).							
Туре:								- · · · · ·
Depth (inc	ches):						Hydric Soil	Present? Yes <u>^</u> No
Remarks:								

# Data Point 2a



# Data Point 2b



Project/Site: MBSD		City/County: Plaq	uemines		Sampling Date: 11/13/12	
Applicant/Owner: CPRA / Ram	1 Terminals		State	e: LA g	Sampling Point: DP-3	
Investigator(s): CM, JM, RW		Section, Township	, Range: N/A			
Landform (hillslope, terrace, etc.)	): Delta / Fastland	Local relief (conca	ve, convex, none	e): concave	Slope (%): <u>1</u>	
Subregion (LRR or MLRA): Oute	er Coastal Plain (LRR T) Lat: 29.6	6617 N	Long: 89.9	645 W	Datum: NAD 83	
Soil Map Unit Name: Cancienn	ie silt loam			NWI classificat	<sub>ion:</sub> Upland	
Are climatic / hydrologic condition	ns on the site typical for this time of	vear? Yes X	No (lf no	o, explain in Rei	narks.)	
Are Vegetation , Soil	, or Hydrology X significar	ntly disturbed?	Are "Normal Circ	umstances" pre	esent? Yes No X	
Are Vegetation . Soil	. or Hydrology naturally	problematic?	(If needed, expla	in anv answers	in Remarks.)	
SUMMARY OF FINDINGS	S – Attach site map showi	ng sampling poi	nt locations	, transects,	important features, etc.	
Hydrophytic Vegetation Presen Hydric Soil Present? Wetland Hydrology Present?	t? Yes X No Yes No X Yes No X	Is the Sam	pled Area etland?	Yes	No	
Between river levee a hydrologic indicators.	and Highway 23. Hurrica	ane Isaac has	resulted in	atypical co	onditions and	
Wetland Hydrology Indicator			Sec	condary Indicate	ors (minimum of two required)	
Primary Indicators (minimum of	one is required; check all that appl	ly)	🛛	Surface Soil C	racks (B6)	
Surface Water (A1)	Aquatic Fauna (	B13)	Sparsely Vegetated Concave Surface (B8)			
High Water Table (A2)	Marl Deposits (E	315) <b>(LRR U)</b>	片	Drainage Patte	erns (B10)	
Saturation (A3)		le Odor (C1)		Moss Trim Lines (B16)		
Sediment Deposits (B2)		duced Iron (C4)	Ing Living Roots (C3) Dry-Season Water Table (C2)			
$\square$ Drift Deposits (B3)		duction in Tilled Soils (	C6) 🗍	Saturation Visi	ble on Aerial Imagery (C9)	
Algal Mat or Crust (B4)	Thin Muck Surfa	ace (C7)		Geomorphic P	osition (D2)	
Iron Deposits (B5)	Other (Explain ir	n Remarks)	$\Box$	Shallow Aquita	rd (D3)	
Inundation Visible on Aeria	ıl Imagery (B7)			FAC-Neutral T	est (D5)	
Water-Stained Leaves (B9	)			Sphagnum mo	ss (D8) <b>(LRR T, U)</b>	
Field Observations:	V					
Surface Water Present?	Yes <u>No </u> Depth (inch	nes):				
Water Table Present?	Yes <u>No ^</u> Depth (inch	ies):			X	
Saturation Present? (includes capillary fringe)	Yes <u>No </u> Depth (inch	nes):	Wetland Hydr	ology Present	? Yes <u>No ^</u>	
Describe Recorded Data (strea	m gauge, monitoring well, aerial ph	iotos, previous inspec	tions), if availabl	e:		
Remarks:	X UODA					
Atypical situation fals	se positive indicators du	le to hurricane				

Sampling	Point:	DP-3
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		Absolute	Dominant	Indicator	Dominance Test worksheet:		
Tree Stratum (Plot size: 30' rac	dius )	% Cover	Species?	Status	Number of Dominant Species		
1. Carya aquatica		10	Y	OBL	That Are OBL, FACW, or FAC	; 7	(A)
2. Cornus drummondii		20	Υ	FAC			
3		·		·	Total Number of Dominant	7	
3		·			Species Across All Strata:	1	(B)
4		·		·	Percent of Dominant Species		
5		·			That Are OBL, FACW, or FAC	<u>;</u> 100	(A/B)
6		·					
7.					Prevalence Index worksheet	i:	
8					Total % Cover of:	Multiply by:	_
0		30	Total Car		OBL species	x 1 =	
	15			/er	FACW species	x 2 =	
	50% of total cover: 15	20% of	total cover	. 0	EAC species	x 3 -	-
Sapling/Shrub Stratum (Plot siz	e: <u>30'</u> radius )					× 3 =	-
1. Acer negundo		30	Y	FAC	FACU species	x 4 =	_
2 Acer rubrum		10	Y	FAC	UPL species	x 5 =	_
2		·			Column Totals:	(A)	(B)
3		·		·			
4		·		<u> </u>	Prevalence Index = B/A	. =	_
5					Hydrophytic Vegetation Indi	cators:	
6					1 - Rapid Test for Hydron	hytic Vegetation	
7.							
0					2 - Dominance Test is >50	J%	
ö		40	<b>T</b> ( ) O		$\square$ 3 - Prevalence Index is $\leq 3$	3.0'	
	0.0	40	= Total Cov	/er	Problematic Hydrophytic	Vegetation <sup>1</sup> (Explai	n)
	50% of total cover: 20	20% of	total cover	: 8			
Herb Stratum (Plot size: 30' rad	dius )				<sup>1</sup> Indicators of hydric soil and w	vetland hydrology n	nust
1. Saururus cernus		5	Υ	OBL	be present, unless disturbed of	or problematic.	laot
2 Ampelopsis arborea		5	Y	FAC	Definitions of Four Vegetation	on Strata	
2		·		·	Deminions of Four Vegetation	Sh Otrata.	
3		·			Tree - Woody plants, excludir	ng vines, 3 in. (7.6 o	cm) or
4		·		<u> </u>	more in diameter at breast hei	ght (DBH), regardle	ess of
5		·			height.		
6					Sapling/Shrub – Woody plant	ts. excluding vines	less
7.					than 3 in. DBH and greater that	an 3.28 ft (1 m) tall	
°		·		· · · · · ·			
8		·			Herb – All herbaceous (non-w	oody) plants, regar	rdless
9		·		<u> </u>	of size, and woody plants less	than 3.28 ft tall.	
10					Woody vine – All woody vines	s areater than 3.28	ft in
11					height.	0	
12.							
		10	= Total Cov	/er			
	50% of total anyon 5	200/ of		. 2			
	20' radius	20% 01	IUIAI COVEI				
Woody Vine Stratum (Plot size:	<u> </u>	_					
1. Ampelopsis arborea		5	Y	FAC			
2							
3.							
1		·					
		·					
5				·	Hydrophytic		
		5	= Total Cov	/er	Vegetation	No	
	50% of total cover: 2.5	20% of	total cover	<u> </u>	Present? Tes <u>*</u>		
Remarks: (If observed, list more	phological adaptations belo	ow).					
		,.					

Profile Desc	ription: (Describe	e to the dep	th needed to docu	ment the	indicato	r or confiri	m the absence	of indicators	.)	
Depth	Matrix		Rede	ox Feature	S1					
(inches)	Color (moist)	%	Color (moist)	%	Type		Texture		Remarks	
0-14	10YR 4/1	99	10YR 4/6	1	С	M	Clay			
					·		- <u></u>	-		
					·		·			
					· · <u></u>					
				_		_	·			
					·					
							·			
<sup>1</sup> Type: C=Co	oncentration, D=De	pletion, RM:	Reduced Matrix, M	S=Masked	d Sand G	Grains.	<sup>2</sup> Location:	PL=Pore Lini	ng, M=Matrix	
Hydric Soil	Indicators: (Appli	cable to all	LRRs, unless othe	erwise not	ed.)		Indicators	for Problema	atic Hydric S	oils <sup>3</sup> :
Histosol	(A1)		Polyvalue B	elow Surfa	ce (S8) (	LRR S. T.		/luck (A9) <b>(LR</b>	R O)	
Histic Er	pipedon (A2)		Thin Dark S	urface (S9	) (LRR S	5. T. U)	$\square 2 \text{ cm } \mathbb{N}$	/uck (A10) (LI	RR S)	
Black Hi	stic (A3)		Loamv Much	v Mineral	(F1) <b>(LR</b>	R O)		ed Vertic (F18	(outside M	LRA 150A.B)
	en Sulfide (A4)		Loamy Glev	ed Matrix	(F2)	- /	D Piedm	ont Floodplair	Soils (F19) (	LRR P. S. T)
Stratified	d Lavers (A5)		Depleted Ma	atrix (F3)	( )			alous Bright Lo	amy Soils (F	20)
	Bodies (A6) (LRR	P. T. U)	Redox Dark	Surface (F	-6)		(ML)	RA 153B)	<b>,</b>	- /
5 cm Mu	icky Mineral (A7) (L	.RR P. T. U)		ark Surface	e (F7)			arent Material	(TE2)	
	esence (A8) <b>(I RR</b>	U)		essions (F	8)		Verv S	shallow Dark S	()) =/ Surface (TE12	)
	ick (A9) (I RR P. T)	-,	Marl (F10) (		•)		Other	(Explain in Re	marks)	/
	d Below Dark Surfa	ce (A11)		-hric (F11)		151)			marito)	
	ark Surface (A12)		Iron-Mangar	nese Mass	es (F12)	(LRR O. P	<b>. T)</b> <sup>3</sup> India	ators of hydro	phytic vegeta	tion and
Coast P	rairie Redox (A16)	MI RA 150	Umbric Surf	ace (F13)	(IRR P.	( 0, . T. U)	, , , wei	land hydrolog	v must be pre	sent
Sandy M	lucky Mineral (S1)		Delta Ochric	: (F17) <b>(MI</b>	RA 151	)	unl	ess disturbed	or problemati	2
Sandy G	Reved Matrix (S4)			rtic (F18)	(MI RA 1	, 50Δ 150B	3		orproblemati	5.
Sandy R	Pedax (S5)			oodolain S		MIRA 1	γ 49Δ)			
	Matrix (S6)			Bright Log	my Soile		437) DA 1/0A 1530	153D)		
	rface (S7) <b>/I PP P</b>	S T IN		Dright Loa	iny Solis		IXA 143A, 1330	, 1550)		
Pestrictive I	aver (if observed	<u>, , , , , , , , , , , , , , , , , , , </u>					1			
Turner	Layer (il observed									
Type:								-		X
Depth (inc	ches):						Hydric Soil	Present?	Yes	No <u>^</u>
Remarks:	aday aanaan	trationa	not common							
ĸ	edox concen	trations	not common.							

# Data Point 3



Project/Site: MBSD		City/Co	ounty: Plaquemir	nes	_ Sampling Date: 11/13/12
Applicant/Owner: CPRA / Rai	m Terminals	-	-	State: LA	Sampling Point: DP-4
Investigator(s): CM, JM, RW		Section	n, Township, Rang	<sub>le:</sub> N/A	
Landform (hillslope, terrace, etc	.): Delta / Fastland	Local r	elief (concave, cor	nvex, none): none	Slope (%): 2
Subregion (LRR or MLRA): Ou	ter Coastal Plain (LRR T)	Lat: 29.6605	Lo	ng: 89.9642	Datum: NAD 83
Soil Map Unit Name: Cancien	ne silt loam			NWI classif	ication: Upland
Are climatic / hvdrologic conditio	ons on the site typical for t	his time of vear? Ye	x No	(If no. explain in	Remarks.)
Are Vegetation . Soil	. or Hydrology X	significantly disturb	ed? Are "N	ormal Circumstances"	present? Yes No X
Are Vegetation . Soil	. or Hydrology	naturally problemat	tic? (If need	ded. explain any answ	ers in Remarks.)
SUMMARY OF FINDING	S – Attach site ma	p showing sam	pling point loc	cations, transect	s, important features, etc.
	Y				
Hydrophytic Vegetation Prese	nt? Yes <u>^</u>	No	Is the Sampled A	rea	¥
Wetland Hydrology Present?	Yes	No X	within a Wetland	? Yes	No <u>X</u>
Remarks:		<u> </u>			
Between river levee	and Highway 23.	Hurricane Isa	ac has resu	Ited in atypical	conditions and
hvdrologic indicators	3.				
HYDROLOGY					
Wetland Hydrology Indicato	rs:			Secondary India	cators (minimum of two required)
Primary Indicators (minimum o	of one is required; check a	ll that apply)		Surface So	il Cracks (B6)
Surface Water (A1)	L Aquat	ic Fauna (B13)		Sparsely Ve	egetated Concave Surface (B8)
High Water Table (A2)		Deposits (B15) (LRR	U)	Drainage P	atterns (B10)
Saturation (A3)	Hydro	gen Sulfide Odor (C	1)	Moss Trim	Lines (B16)
Water Marks (B1)		ed Rhizospheres al	ong Living Roots (	C3) 🔟 Dry-Seasor	Water Table (C2)
Sediment Deposits (B2)		nce of Reduced Iron	i (C4) Tilled Seile (C6)	Crayfish Bu	Irrows (C8)
$\square$ Algel Mat or Cruct (B4)		Auck Surface (C7)			c Position (D2)
Iron Deposits (B5)		(Explain in Remarks	5)	Shallow Ag	uitard (D3)
Inundation Visible on Aeri	ial Imagery (B7)		<i>,</i> ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	FAC-Neutra	al Test (D5)
Water-Stained Leaves (B	9)			D Sphagnum	moss (D8) <b>(LRR T, U)</b>
Field Observations:					
Surface Water Present?	Yes No X C	Pepth (inches):			
Water Table Present?	Yes No <u>X</u> _ C	Pepth (inches):			
Saturation Present?	Yes No X C	Pepth (inches):	Wetla	and Hydrology Prese	ent? Yes <u>No X</u>
(includes capillary fringe) Describe Recorded Data (stre	am gauge, monitoring wel	I. aerial photos, prev	ious inspections).	if available:	
Aerials: 2010 ESRI	& USDA	,,			
Remarks:					
Atypical situation, fa	lse positive indica	tors due to hu	urricane.		
· · · <b>/</b> · · · · · · · · · · · · · · · · · · ·					

20' rodiuo	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: <u>30 radius</u> )	<u>% Cover</u>	<u>Species?</u>	<u>Status</u>	Number of Dominant Species
1. Triadica sobifera				That Are OBL, FACW, or FAC: _/ (A)
	10	<u> </u>	FAC	Total Number of Dominant
3				Species Across All Strata: / (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 100 (A/B)
6		<u> </u>		Brovalanca Index workshoot:
7				Total % Cover of: Multiply by:
8				
	45	= Total Cov	rer	
50% of total cover: 22.5	20% of	total cover	9	FACW species X 2 =
Sapling/Shrub Stratum (Plot size: 30' radius )				FAC species x 3 =
1. Acer negundo	15	Y	FAC	FACU species x 4 =
2. Cornus drummondii	10	Y	FAC	UPL species x 5 =
3. Morella cerifera	5	Υ	FAC	Column Totals: (A) (B)
4.				Prevalence Index - B/A -
5.				Hydrophytic Vogetation Indicators:
6.				A Depid Test for Lludrenbutic Vegetation
7				
8				$\square$ 2 - Dominance Test is >50%
···	30	- Total Cov		$\square$ 3 - Prevalence Index is $\leq 3.0$
50% of total cover: 15	20% of	total cover	6	Problematic Hydrophytic Vegetation' (Explain)
Horb Stratum (Plot size: 30' radius )	2070 01			1
<u>Herb Stratum</u> (Flot size. <u>55 (1997)</u> )	30	Y	FACW	Indicators of hydric soil and wetland hydrology must
Ampelonsis arborea		N	FAC	Definitions of Four Verstetion Starter
2. Acer negundo			FAC	Definitions of Four vegetation Strata:
			TAC	Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or
4				more in diameter at breast height (DBH), regardless of
5				noight.
6				Sapling/Shrub – Woody plants, excluding vines, less
7				than 3 m. DBH and greater than 3.28 ft (1 m) tail.
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10		<u> </u>		Woody vine – All woody vines greater than 3.28 ft in
11				height.
12				
	40	= Total Cov	er	
50% of total cover: 20	20% of	total cover	8	
Woody Vine Stratum (Plot size: 30' radius )				
1. Ampelopsis arborea	5	Y	FAC	
2				
3				
4.				
5.				Hydrophytic
	5	= Total Cov	rer	Vegetation
50% of total cover: <sup>2.5</sup>	20% of	total cover	1	Present? Yes <u>×</u> No
Remarks: (If observed, list morphological adaptations be	low)			
	iow).			

Profile Desc	cription: (Describe	e to the dep	th needed to docu	ment the	indicato	r or confiri	m the absence o	f indicators.)	
Depth	Matrix		Rede	ox Feature	s				
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remar	ks
0-16	10YR 4/2	99	10YR 4/6	1	С	M	Silty clay		
				_					
				_		-			
					<u> </u>		·		
					<u> </u>				
1							2		
Type: C=C	oncentration, D=De	pletion, RM=	Reduced Matrix, M	S=Masked	d Sand G	rains.		<sup>2</sup> L=Pore Lining, M=N	
Hydric Soli	indicators: (Appli	cable to all	LRRS, unless othe	erwise not	ea.)			or Problematic Hyd	ric Solis":
Histosol	(A1)		Polyvalue B	elow Surfa	ice (S8) <b>(</b>	LRR S, T,	<b>Ս) <u> </u>1 cm Mu</b>	ıck (A9) <b>(LRR O)</b>	
Histic E	pipedon (A2)		Thin Dark S	urface (S9	) <b>(LRR S</b>	, T, U)	2 cm Mu	ıck (A10) <b>(LRR S)</b>	
Black Hi	istic (A3)		Loamy Mucl	ky Mineral	(F1) <b>(LR</b>	R 0)		d Vertic (F18) <b>(outsi</b>	de MLRA 150A,B)
Hydroge	en Sulfide (A4)		Loamy Gley	ed Matrix	(F2)		Piedmor	nt Floodplain Soils (F	<sup>-</sup> 19) <b>(LRR P, S, T)</b>
Stratifie	d Layers (A5)		Depleted Ma	atrix (F3)			L Anomale	ous Bright Loamy Sc	ils (F20)
Organic	Bodies (A6) (LRR	P, T, U)	Redox Dark	Surface (F	-6)		(MLR/	A 153B)	
5 cm Μι	ucky Mineral (A7) <b>(L</b>	.RR P, T, U)	Depleted Da	ark Surface	e (F7)		Red Par	ent Material (TF2)	
Muck Pr	esence (A8) (LRR	U)	Redox Depr	essions (F	8)		L Very Sh	allow Dark Surface (	TF12)
1 cm Mւ	uck (A9) <b>(LRR P, T)</b>		<u> </u>	LRR U)			U Other (E	xplain in Remarks)	
Deplete	d Below Dark Surfa	ce (A11)	Depleted Oc	chric (F11)	(MLRA <sup>·</sup>	151)			
Thick Da	ark Surface (A12)		Iron-Mangar	nese Mass	es (F12)	(LRR O, P	, <b>T)</b> <sup>3</sup> Indica	tors of hydrophytic v	egetation and
Coast P	rairie Redox (A16)	(MLRA 150A	A) 📙 Umbric Surf	ace (F13)	(LRR P,	T, U)	wetla	ind hydrology must b	e present,
Sandy N	/lucky Mineral (S1)	(LRR O, S)	Delta Ochric	: (F17) <b>(MI</b>	_RA 151)		unles	s disturbed or proble	ematic.
Sandy C	Bleyed Matrix (S4)		Reduced Ve	ertic (F18)	(MLRA 1	50A, 150B	)		
Sandy F	Redox (S5)		Piedmont Fl	oodplain S	Soils (F19	) <b>(MLRA 1</b>	49A)		
Stripped	I Matrix (S6)		Anomalous	Bright Loa	my Soils	(F20) <b>(MLF</b>	RA 149A, 153C, <sup>•</sup>	153D)	
Dark Su	rface (S7) (LRR P,	S, T, U)							
Restrictive	Layer (if observed	):							
Туре:									
Depth (in	ches):						Hydric Soil P	resent? Yes	No X
Remarks:									
R	edox concen	trations	not common.						

Data Point 4



Project/Site: MBSD	City/County: Plaquemines	Sampling Date: 11/13/12		
Applicant/Owner: CPRA / Ram Terminals	State	LA Sampling Point: DP-5		
Investigator(s): CM, JM, RW	Section, Township, Range: N/A			
Landform (hillslope, terrace, etc.): Delta / Fastland	Local relief (concave, convex, none	): none Slope (%): 2		
Subregion (LRR or MLRA): Outer Coastal Plain (LRR T) Lat: 29.66	607 N Long: 89.96	559 W Datum: NAD 83		
Soil Map Unit Name: Cancienne silt Ioam		NWI classification: Upland		
Are climatic / hydrologic conditions on the site typical for this time of y	ear? Yes X No (If no	. explain in Remarks.)		
Are Vegetation Soil or Hydrology X significantly	/ disturbed? Are "Normal Circ	umstances" present? Yes No X		
Are Vegetation, coll, or Hydrology organization	oblematic? (If needed, evola	in any answers in Remarks )		
SUMMARY OF FINDINGS – Attach site map showing	g sampling point locations,	transects, important features, etc.		
Hydrophytic Vegetation Present? Yes <u>A</u> No No	Is the Sampled Area	N/		
Wetland Hydrology Present? Yes No X	within a Wetland?	Yes No <u>X</u>		
Remarks:				
Between river levee and Highway 23. Hurricar	ne Isaac has resulted in a	atypical conditions and		
hydrologic indicators.				
, ,				
HYDROLOGY				
Wetland Hydrology Indicators:	<u>Sec</u>	ondary Indicators (minimum of two required)		
Primary Indicators (minimum of one is required; check all that apply)		Surface Soil Cracks (B6)		
Surface Water (A1)		Sparsely Vegetated Concave Surface (B8)		
High Water Table (A2)		Drainage Patterns (B10)		
Saturation (A3) Hydrogen Sulfide (	$\frac{1}{2}$	Moss Trim Lines (B16)		
Sediment Deposits (B2)	$\underline{C}$	Cravitsh Burrows (C8)		
Drift Deposits (B3)	$\underline{\Box}$	Saturation Visible on Aerial Imagery (C9)		
Algal Mat or Crust (B4)	(B4) Thin Muck Surface (C7) Geomorphic Posi			
Iron Deposits (B5)	Remarks)	Shallow Aquitard (D3)		
Inundation Visible on Aerial Imagery (B7)		FAC-Neutral Test (D5)		
Water-Stained Leaves (B9)		Sphagnum moss (D8) (LRR T, U)		
Field Observations:				
Surface Water Present? Yes No ^ Depth (inches	3):			
Water Table Present? Yes No A Depth (inches	s):	X		
Saturation Present? Yes <u>No ^</u> Depth (inches (includes capillary fringe)	S): Wetland Hydro	ology Present? Yes No <u>^</u>		
Describe Recorded Data (stream gauge, monitoring well, aerial phot	os, previous inspections), if available	<u>;</u>		
Aerials: 2010 ESRI & USDA				
Remarks:				
Atypical situation, false positive indicators due	to hurricane.			

Sampling Point: DP-5

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: <u>30' radius</u> )	% Cover	Species?	Status	Number of Dominant Species
1. Quercus nigra	20	Y	FAC	That Are OBL, FACW, or FAC: <u>13</u> (A)
2. <u>Acer negundo</u>	10	Y	FAC	Total Number of Dominant
3. Acer rubrum	10	Y	FAC	Species Across All Strata: 15 (B)
4. <u>Celtis occidentalis</u>	10	Y	FACU	Percent of Dominant Species
5				That Are OBL, FACW, or FAC: $\underline{87}$ (A/B)
6				Drevelance in dev werkele est
7				Prevalence Index worksneet:
8				I otal % Cover of: Multiply by:
	50	= Total Cov	er	
50% of total cover: 25	20% of	total cover	10	FACW species x 2 =
Sapling/Shrub Stratum (Plot size: 30' radius )				FAC species x 3 =
1. <u>Acer negundo</u>	20	Y	FAC	FACU species x 4 =
2. Triadica sebifera	10	Υ	FAC	UPL species x 5 =
3. Quercus nigra	5	Ν	FAC	Column Totals: (A) (B)
4.				Prevalence Index - B/A -
5.				
6				A Denid Test for Undershutic Verstation
7				
8				$\square$ 2 - Dominance Test is >50%
···	35	- Total Cov	or	$\square$ 3 - Prevalence Index is $\leq 3.0^{\circ}$
50% of total cover: 17.5	20% of	total cover	7	Problematic Hydrophytic Vegetation <sup>®</sup> (Explain)
Horb Stratum (Plot size: 30' radius )	2070.01			1
Ampelopsis arborea	5	Y	FAC	Indicators of hydric soil and wetland hydrology must
<ul> <li>Ligustrum sinense</li> </ul>	1	Y	FAC	Definitions of Four Vegetation Strates
2	1	Y	FAC	Definitions of Four vegetation Strata.
	1	· · · · · · · · · · · · · · · · · · ·	FAC	Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or
- Sambucus nigra	1		FAC	more in diameter at breast height (DBH), regardless of height
5. <u>Sambucus nigra</u>	1			noight.
6. Rubus trivislis	1			<b>Sapling/Shrub</b> – Woody plants, excluding vines, less
7. Kubus trivialis	·	<u> </u>	FACU	than 3 m. DBH and greater than 3.26 m (1 m) tail.
8				Herb - All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10				Woody vine - All woody vines greater than 3.28 ft in
11				height.
12				
	11	= Total Cov	er	
50% of total cover: <u>5.5</u>	20% of	total cover	2.2	
<u>Woody Vine Stratum</u> (Plot size: <u>30' radius</u> )				
1. Ampelopsis arborea	5	Y	FAC	
2. Toxicodendron radicans	5	Y	FAC	
3				
4				
5				Hydrophytic
	10	= Total Cov	er	Vegetation
50% of total cover: <u>5</u>	20% of total cover: 2		2	Present? Yes X No
Remarks: (If observed, list morphological adaptations belo	w).			
(	,			

0012							
Profile Desc	ription: (Describe	to the dep	th needed to docun	nent the indic	cator or confir	m the absence	e of indicators.)
Depth	Matrix		Redo	x Features	1 . 2	- <u>-</u> .	
(inches)				<u>_%</u>	vpe Loc	lexture	Remarks
0-14	10YR 4/1	97	10YR 4/6	<u>3</u> <u>C</u>	M	Clay	
·				·			
		·		·	·		
				·			
		·		·			
<u> </u>		·		·			
<sup>1</sup> Type: C=Co	oncentration. D=Dep	letion. RM:	Reduced Matrix. MS	S=Masked Sa	nd Grains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix,
Hvdric Soil I	ndicators: (Applic	able to all	LRRs. unless other	wise noted.)		Indicators	s for Problematic Hydric Soils <sup>3</sup> :
	(A1)			low Surface (			
	(A)		Thin Dark Su	rface (SQ) (I	DPSTIN		
	stic (A3)			Mineral (E1)	(IPPO)		red Vertic (E18) (outside MI BA 150A B)
	n Sulfide (A1)			d Matrix (F2)			pont Eloodolain Soils (E10) (I PR P S T)
				riv (E3)			alous Bright Loamy Soils (F20)
	Bodies (A6) (I RR P	тт	Redox Dark 9	Surface (F6)		<u> </u>	
	icky Mineral (A7) (I F	, , , , , , , , , , , , , , , , , , , ,		k Surface (F7	.)		Parent Material (TE2)
		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		esions (F8)	)		Shallow Dark Surface (TE12)
		,					(Explain in Remarks)
	Below Dark Surface	≏ (A11)		oric (F11) (MI	RA 151)		
	ark Surface (A12)	5 (711)		ese Masses (I	=12) <b>(I RR O F</b>	T) <sup>3</sup> India	cators of hydrophytic vegetation and
	rairie Redox (A16) <b>(N</b>	/I RA 150	Umbric Surfa	ce (F13) <b>(I R</b>	P T II	, <b>i</b> ) max	tland hydrology must be present
Sandy M	lucky Mineral (S1) (I	RR O SI		(F17) (MI RA	151)	unl	less disturbed or problematic
Sandy G	leved Matrix (S4)			tic (F18) <b>(ML</b>	RA 150A 150F	8)	
Sandy C	adox (S5)			no (1 10) <b>(112</b>	(F19) (MI RA 1	2) [49A]	
	Matrix (S6)			right Loamy	(115) (MERA 1 Soils (F20) (MI	RA 149A 153C	153D)
	rface (S7) <b>(I RR P S</b>					114 1404, 1000	, 1000/
Restrictive I	aver (if observed):	, 1, 0)					
Turner							
Type:							X
Depth (inc	ches):					Hydric Soil	Present? Yes <u>^</u> No
Remarks:							

Project/Site: MBSD	City/County: Plaquemines	Sampling Date: 11/13/12
Applicant/Owner: CPRA / Ram Terminals	State: LA	Sampling Point: DP-6
Investigator(s): CM, JM, RW	Section, Township, Range: N/A	
Landform (hillslope, terrace, etc.): Delta / Fastland	Local relief (concave, convex, none): concave	Slope (%): <u>1</u>
Subregion (LRR or MLRA): Outer Coastal Plain (LRR T) Lat: 29.65	598 Long: 89.9653 W	Datum: NAD 83
Soil Map Unit Name: Cancienne silt Ioam	NWI classific	cation: PFO1C
Are climatic / hydrologic conditions on the site typical for this time of y	rear? Yes X No (If no, explain in R	(emarks.)
Are Vegetation Soil or Hydrology X significantly	v disturbed? Are "Normal Circumstances" u	present? Yes No X
Are Vegetation Soil or Hydrology naturally p	roblematic? (If needed, explain any answe	ars in Remarks )
SUMMARY OF FINDINGS – Attach site map showin	g sampling point locations, transects	, important features, etc.
Hydrophytic Vegetation Present? Yes <u>A</u> No	Is the Sampled Area	
Hydric Soll Present? Yes A No	within a Wetland? Yes $\frac{X}{X}$	No
Remarks:	-	
Depression between river levee and Highway	23 Hurricane Isaac has resulted	in some atvnical
conditions		in some atypical
HYDROLOGY		
Wetland Hydrology Indicators:	Secondary Indica	ators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	) Surface Soil	Cracks (B6)
Surface Water (A1)	13) 📃 Sparsely Ve	getated Concave Surface (B8)
High Water Table (A2)	5) (LRR U) Drainage Pa	tterns (B10)
Saturation (A3)	Odor (C1) Moss Trim L	ines (B16)
Water Marks (B1)	heres along Living Roots (C3)	Water Table (C2)
Sediment Deposits (B2)	iced Iron (C4)	rows (C8)
Drift Deposits (B3)	ction in Tilled Soils (C6)	isible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	e (C7) <u>I</u> Geomorphic	Position (D2)
Iron Deposits (B5)	Remarks)	Itard (D3)
Mater Steined Leaves (PO)		Test (D5)
Field Observations:		1055 (D6) (LRR 1, 0)
Surface Water Present? Yes No X Denth (inche)	s).	
Water Table Present? Ves No X Depth (inches	s):	
Saturation Present? Yes No X Depth (inches	s): Wetland Hydrology Prese	nt? Ves X No
(includes capillary fringe)		
Describe Recorded Data (stream gauge, monitoring well, aerial phot	tos, previous inspections), if available:	
Aerials: 2010 ESRI & USDA		
Remarks:		
Duckweed (Lemna sp.) on soil surface. Althou	ugh atypical situation due to hurrie	cane, area appears to
have hydrology under normal conditions.		

Sampling Point: DP-6

	Absolute	Dominant	Indicator	Dominance Test worksheet:						
Tree Stratum (Plot size: 30 radius )	% Cover	Species?	Status	Number of Dominant Species						
1. Salix nigra	20	Y	OBL	That Are OBL, FACW, or FAC: <u>5</u> (A)						
2. Triadica sebifera	25	Υ	FAC	Total Number of Deminant						
3. Acer rubrum	10	Ν	FAC	Species Across All Strata: 5 (B)						
4	_			(=)						
5				Percent of Dominant Species						
0				That Are OBL, FACW, or FAC: (A/B)						
o				Prevalence Index worksheet:						
7				Total % Cover of Multiply by						
8										
	55	= Total Cov	/er							
50% of total cover: 27.5	20% of	total cover	: <u>11</u>	FACW species x 2 =						
Sapling/Shrub Stratum (Plot size: 30' radius )				FAC species x 3 =						
1. Triadica sebifera	10	Υ	FAC	FACU species x 4 =						
2				UPL species x 5 =						
2				Column Totals: (A) (B)						
S										
4				Prevalence Index = B/A =						
5				Hydrophytic Vegetation Indicators:						
6				1 - Rapid Test for Hydrophytic Vegetation						
7				✓ 2 - Dominance Test is >50%						
8				$\square$ 3 - Prevalence Index is <3 0 <sup>1</sup>						
	10	= Total Cov	/er	$\square$ Broblematic Hydrophytic Magatation <sup>1</sup> (Evaluin)						
50% of total cover: 5	20% of	total cover	• 2							
Llorb Stratum (Dist size: 30' radius	2070 01									
Herb Stratum (Plot size: 00 radius )	5	V	OBI	<sup>1</sup> Indicators of hydric soil and wetland hydrology must						
1. Lennia sp.	<u> </u>		OBL	be present, unless disturbed or problematic.						
2				Definitions of Four Vegetation Strata:						
3				<b>Tree</b> – Woody plants, excluding vines, 3 in, (7.6 cm) or						
4				more in diameter at breast height (DBH), regardless of						
5				height.						
6.				Sanling/Shruh - Woody plants, excluding vines, less						
7				than 3 in. DBH and greater than 3.28 ft (1 m) tall.						
0										
0				<b>Herb</b> – All herbaceous (non-woody) plants, regardless						
9				or size, and woody plants less than 3.26 it tall.						
10				Woody vine - All woody vines greater than 3.28 ft in						
11				height.						
12										
	5	= Total Cov	/er							
50% of total cover: 2.5	20% of	total cover	: 1							
Woody Vine Stratum (Plot size: 30' radius										
Ampelopsis arborea	5	Y	FAC							
2										
2										
3										
4										
5				Hydrophytic						
	5	= Total Cov	/er	Vegetation						
50% of total cover: 2.5	20% of	total cover	. 1	Present? Yes <u>^</u> No						
Remarks: (If observed, list morphological adaptations bel	ow).									
	011).									
SOIL								5	ampling Form	
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Profile Desc	cription: (Describe	e to the dep	oth needed to docu	iment the	indicator	or confirm	m the absence	of indicato	ors.)	
Depth	Matrix		Red	ox Featur	es					
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture		Remarks	
0-2	10YR 3/1	100					Clay			
2-16	10YR 5/1	90	10YR 4/6	10	С	М	Clay			
						·				
							·			
<sup>1</sup> Type: C=C	oncentration, D=De	pletion, RM	=Reduced Matrix, M	1S=Maske	ed Sand G	rains.	<sup>2</sup> Location:	PL=Pore L	ining, M=Mat	rix.
Hydric Soil	Indicators: (Appli	cable to all	LRRs, unless othe	erwise no	oted.)		Indicators	for Proble	matic Hydric	Soils <sup>3</sup> :
Histosol	(A1)		Polyvalue B	elow Surf	ace (S8) <b>(</b>	LRR S, T,	<b>U) <u>⊢</u>1 cm №</b>	luck (A9) <b>(L</b>	_RR O)	
Histic Ep	oipedon (A2)		Thin Dark S	Surface (S	9) <b>(LRR S</b>	, T, U)	2 cm M	luck (A10)	(LRR S)	
Black Hi	stic (A3)		Loamy Muc	ky Minera	l (F1) <b>(LR</b>	R 0)		ed Vertic (F	18) <b>(outside</b>	MLRA 150A,B)
Hydroge	en Sulfide (A4)		Loamy Gley	ed Matrix	: (F2)			ont Floodpla	ain Soils (F19	) (LRR P, S, T)
	d Layers (A5)		Depleted M	atrix (F3)				lous Bright	Loamy Soils	(F20)
	Bodies (A6) (LRR I	P, I, U)		Surface	(F6)			(A 153B)		
	ICKY Mineral (A7) (L	.KK P, I, U		ark Surfac	со)			arent Mater	iai (TF2)	10)
	Inck (AO) (I PP P T)	0)			го)			Tallow Darr Evolain in I	R Suilace (TF	12)
	d Below Dark Surfa	ce (A11)		chric (F11	) (MI RA 1	51)			Kennarks)	
	ark Surface (A12)	00 (7111)		nese Mas	ses (F12)	(LRR O. P	<b>T)</b> <sup>3</sup> Indic	ators of hvo	drophytic veg	etation and
Coast P	rairie Redox (A16)	(MLRA 150	A) Umbric Surf	(LRR P, 1	(, U)	, vet	wetland hydrology must be present,			
Sandy M	lucky Mineral (S1)	(LRR O, S)	Delta Ochrid	c (F17) <b>(N</b>	ILRA 151)		unle	ess disturbe	ed or problem	atic.
Sandy G	Gleyed Matrix (S4)		Reduced Ve	ertic (F18)	(MLRA 1	50A, 150B	)			
Sandy R	Redox (S5)		Piedmont F	loodplain	Soils (F19	) (MLRA 1-	49A)			
Stripped	l Matrix (S6)		Anomalous	Bright Loa	amy Soils	(F20) <b>(MLF</b>	RA 149A, 153C	, 153D)		
Dark Su	rface (S7) (LRR P,	S, T, U)								
Restrictive I	Layer (if observed	):								
Туре:										
Depth (in	ches):						Hydric Soil	Present?	Yes X	No
Remarks:										



Project/Site: MBSD	_ City/County: Plaquemines	Sampling Date: <u>11/13/12</u>
Applicant/Owner: CPRA / Ram Terminals	State: LA	Sampling Point: DP-7
Investigator(s): CM, JM, RW	_ Section, Township, Range: <u>N/A</u>	
Landform (hillslope, terrace, etc.): Delta / Fastland	Local relief (concave, convex, none): concave	Slope (%): 1
Subregion (LRR or MLRA): Outer Coastal Plain (LRR T) Lat: 29.6	596 Long: 89.9656	Datum: NAD 83
Soil Map Unit Name: Cancienne silt Ioam	NWI classific	cation: PFO1C
Are climatic / hydrologic conditions on the site typical for this time of y	year? Yes X No (If no, explain in F	Remarks.)
Are Vegetation . Soil . or Hydrology X significant	lv disturbed? Are "Normal Circumstances"	present? Yes No X
Are Vegetation Soil or Hydrology naturally p	problematic? (If needed, explain any answe	ers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showin	g sampling point locations, transects	, important features, etc.
Hydrophytic Vegetation Present?     Yes     X     No       Hydric Soil Present?     Yes     X     No       Wetland Hydrology Present?     Yes     X     No	- Is the Sampled Area within a Wetland? Yes $\frac{\chi}{\chi}$	No
Depression between river levee and Highway conditions.	23. Hurricane Isaac has resulted	in some atypical
HYDROLOGY		
Wetland Hydrology Indicators:	Secondary Indica	ators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply	) Surface Soil	Cracks (B6)
L Surface Water (A1) Aquatic Fauna (B		getated Concave Surface (B8)
Saturation (A3)	$\Box$ Damage Fa	ines (B16)
Water Marks (B1)	beres along Living Roots (C3) Dry-Season	Water Table (C2)
Sediment Deposits (B2)	uced Iron (C4)	rows (C8)
Drift Deposits (B3)	uction in Tilled Soils (C6)	isible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	ce (C7) Geomorphic	Position (D2)
Iron Deposits (B5) Other (Explain in	Remarks) Shallow Aqu	itard (D3)
Inundation Visible on Aerial Imagery (B7)	FAC-Neutral	Test (D5)
✓ Water-Stained Leaves (B9)	Sphagnum r	noss (D8) <b>(LRR T, U)</b>
Field Observations:		
Surface Water Present? Yes No A Depth (inche	es):	
Water Table Present? Yes <u>No </u> Depth (inche	es):	X
Saturation Present? Yes No A Depth (inche (includes capillary fringe)	Wetland Hydrology Presei	nt? Yes <u>^</u> No
Aerials: 2010 ESRI & USDA	itos, previous inspections), if available:	
Remarks:		
Although atypical situation due to hurricane, a	area appears to have hydrology u	nder normal
conditions.		

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: <u>30' radius</u> )	% Cover	Species?	Status	Number of Dominant Species
1. Acer rubrum	40	Y	FAC	That Are OBL, FACW, or FAC: <u>8</u> (A)
2. Acer negundo	10	N	FAC	Total Number of Dominant
3. Triadica sebifera	10	N	FAC	Species Across All Strata: <u>9</u> (B)
4. Quercus nigra	5	Ν	FAC	Demonst of Dominant Spacing
5				That Are OBL. FACW. or FAC: <sup>89</sup> (A/B)
6				
7				Prevalence Index worksheet:
8				Total % Cover of: Multiply by:
	65	= Total Cov	er	OBL species x 1 =
50% of total cover: 32.5	20% of	total cover:	13	FACW species x 2 =
Sapling/Shrub Stratum (Plot size: 30' radius )				FAC species x 3 =
1. Triadica sebifera	20	Y	FAC	FACU species x 4 =
2 Acer negundo	10	Y	FAC	UPL species x 5 =
3 Diospyros virginiana	10	Y	FAC	Column Totals: (A) (B)
Cornus drummondii	5	N	FAC	
5	·			Prevalence Index = B/A =
5				Hydrophytic Vegetation Indicators:
0				1 - Rapid Test for Hydrophytic Vegetation
/	<u> </u>			2 - Dominance Test is >50%
8	45			$\Box$ 3 - Prevalence Index is $\leq 3.0^1$
00 5	40	= Total Cov	er	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover: <u>22.5</u>	20% of	total cover:	9	
Herb Stratum (Plot size: 30' radius )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. Saururus cernus	10	Y	OBL	be present, unless disturbed or problematic.
2. Acer rubrum	5	Y	FAC	Definitions of Four Vegetation Strata:
3. Rubus trivialis	5	Y	FACU	<b>Tree</b> – Woody plants, excluding vines 3 in (7.6 cm) or
4. Ampelopsis arborea	5	Y	FAC	more in diameter at breast height (DBH), regardless of
5				height.
6				Sapling/Shrub – Woody plants, excluding vines, less
7.				than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8.				Harb All berbasseus (non woody) planta, regardlass
9.				of size, and woody plants less than 3.28 ft tall.
10				
11				Woody vine – All woody vines greater than 3.28 ft in height
12				neight.
12.	25	- Total Cav		
FOR at total accurate 12.5			5	
50% of total cover.	20% 0	total cover.		
Woody Vine Stratum (Plot size: <u>50 Paulus</u> )	5	V	FAC	
1. vius rotundiiolia	5		FAC	
2				
3				
4				
5				Hydrophytic
	5	= Total Cov	er	Vegetation
50% of total cover: 2.5	20% of	total cover:	1	
Remarks: (If observed, list morphological adaptations belo	w).			

Brofile Desc	ription: (Describe)	to the der	th needed to docur	nont the	aindicator	or confirm	m the absence of indicators )
FIOILIE Desc	nption. (Describe)	to the dep			emulcator	or comm	in the absence of indicators.)
Depth (inches)	Color (moist)	%	Color (moist)	<u>x Featu</u>	Type <sup>1</sup>		Texture Remarks
0-2	10VP 2/1	100		/0			
0-2		100		·		· <u> </u>	
2-16	10YR 5/1	95	10YR 4/6	5	С	M	Clay
	-	·	-			·	
		·				·	· ·
	-						
1							2
Type: C=Co	oncentration, D=Dep	letion, RM	=Reduced Matrix, MS	S=Mask	ed Sand G	rains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
Hydric Soll I	ndicators: (Applica	able to all	LRRS, unless other	rwise no	oted.)		Indicators for Problematic Hydric Solis":
Histosol	(A1)		Polyvalue Be	low Sur	face (S8) <b>(</b>	LRR S, T, l	U) 1 cm Muck (A9) (LRR O)
Histic Ep	pipedon (A2)		Thin Dark Su	Irface (S	9) (LRR S	T, U)	2 cm Muck (A10) <b>(LRR S)</b>
Black His	stic (A3)		Loamy Muck	y Minera	al (F1) <b>(LR</b> I	R O)	Reduced Vertic (F18) (outside MLRA 150A,B
Hydroge	n Sulfide (A4)		Loamy Gleye	d Matrix	k (F2)		Piedmont Floodplain Soils (F19) (LRR P, S, T)
	Layers (A5)		Depleted Ma	trix (F3)			Anomalous Bright Loamy Soils (F20)
	Bodies (A6) (LRR P,	, T, U)	Redox Dark	Surface	(F6)		
	cky Mineral (A7) (LR	κκ Ρ, Ι, Ο <u>)</u>		rk Surfa			Red Parent Material (TF2)
		)		essions (	(F8)		Citicar (Emplois is Descarde)
	CK (A9) <b>(LRR P, I)</b> L Delevis Derk Surfeer	~ ( ^ 1 1 )		.RR U)		E4)	Uther (Explain in Remarks)
	rk Surfood (A12)	e (ATT)			1) (IVILKA 1		<sup>3</sup> Indicators of hydrophytic vegetation and
	IIK SUITACE (ATZ)					(LKK U, P,	(, 1) Indicators of hydrophytic vegetation and
	airie Redox (AT6) (N	DD O S			) (LKK P,	, 0)	weitand hydrology must be present,
	lucky Willeral (ST) (L			(F17) <b>(N</b>	MIDA 1	50A 450D)	
	adax (SE)			uc (Fio		MIDA 4	// /0.4.
	Matrix (S6)			Right Lo	Solis (F19		43A) RA 149A 153C 153D)
	face (S7) <b>(I RR P S</b>	тт			arry Solis	(F20) <b>(IVIL</b> R	(A 143A, 133C, 133D)
Restrictive I	aver (if observed):	, 1, 0)					
Tupo:	ayer (il observeu).						
Type							
Depth (inc	ches):						Hydric Soil Present? Yes <u>^</u> No
Remarks:							



Project/Site: MBSD	City/County: Plaquemines	Sampling Date: 11/13/12				
Applicant/Owner: CPRA / Ram Terminals	State: LA	Sampling Point: DP-8				
Investigator(s): CM, JM, RW	Section Township Range: N/A					
Landform (hillslope, terrace, etc.): Delta / Fastland	Local relief (concave, convex, none): non	e Slope (%): 1				
Subregion (LRR or MLRA): Outer Coastal Plain (LRR T) Lat: 29.65	91 N Lona: 89.9661 W	Datum: NAD 83				
Soil Map Unit Name: Cancienne silt Ioam	NWI di	assification: Upland				
Are climatic / hydrologic conditions on the site typical for this time of y	ear? Yes X No (If no, explai	in in Remarks.)				
Are Vegetation . Soil . or Hydrology X significantly	/ disturbed? Are "Normal Circumstan	ices" present? Yes No X				
Are Vegetation Soil or Hydrology naturally pr	oblematic? (If needed, explain any a	answers in Remarks )				
SUMMARY OF FINDINGS – Attach site map showing	g sampling point locations, trans	sects, important features, etc.				
Hydrophytic Vegetation Present? Yes X No	Is the Sampled Area	×				
Wetland Hydrology Present? Yes No X	within a Wetland? Yes	No <u>^</u>				
Remarks:						
Between river levee and Highway 23. Hurricar	ne Isaac has resulted in atypi	cal conditions and				
hydrologic indicators.						
HYDROLOGY						
Wetland Hydrology Indicators:	Secondary	Indicators (minimum of two required)				
Primary Indicators (minimum of one is required; check all that apply)		e Soil Cracks (B6)				
Surface Water (A1)	3) <u> </u>	ly Vegetated Concave Surface (B8)				
High Water Table (A2)	5) (LRR U) 🔟 Draina	ge Patterns (B10)				
Saturation (A3) Hydrogen Sulfide (	Udor (C1) <u> </u>	rim Lines (B16)				
Sediment Deposits (B2)	$\frac{1}{2} \frac{1}{2} \frac{1}$	th Burrows (C8)				
Drift Deposits (B3)	ction in Tilled Soils (C6) $\Box$ Saturat	tion Visible on Aerial Imagery (C9)				
Algal Mat or Crust (B4)	e (C7)	orphic Position (D2)				
Iron Deposits (B5)	Remarks) Shallov	w Aquitard (D3)				
Inundation Visible on Aerial Imagery (B7)	FAC-N	eutral Test (D5)				
✓ Water-Stained Leaves (B9)	Sphagi	num moss (D8) <b>(LRR T, U)</b>				
Field Observations:						
Surface Water Present? Yes No ^ Depth (inches	3):					
Water Table Present? Yes No A Depth (inches	s):	× ×				
Saturation Present? Yes <u>No ^</u> Depth (inches (includes capillary fringe)	S): Wetland Hydrology P	resent? Yes <u>No ^</u>				
Describe Recorded Data (stream gauge, monitoring well, aerial phot	os, previous inspections), if available:					
Aerials: 2010 ESRI & USDA						
Remarks:						
Atypical situation, false positive indicators due	to hurricane.					

	Absolute	Dominant	Indicator	Dominance Test worksheet:	
Tree Stratum (Plot size: <u>30 radius</u> )	<u>% Cover</u>	Species?	<u>Status</u>	Number of Dominant Species	
1. Acer rubrum	10	Y	FAC	That Are OBL, FACW, or FAC: 8 (	A)
2. Acer negundo	10	Y	FAC	Total Number of Dominant	
3. Ilex decidua	10	Y	FACW	Species Across All Strata: 10 (	B)
4. Iriadica sebifera	10	Y	FAC	Percent of Dominant Species	
5			<u> </u>	That Are OBL, FACW, or FAC: 80 (	A/B)
6				Brevalence Index worksheet:	
7				Total % Cover of: Multiply by:	
8					
	40	= Total Cov	rer		
50% of total cover: <u>20</u>	20% of	total cover:	8		
Sapling/Shrub Stratum (Plot size: <u>30' radius</u> )					
1. Ilex decidua	10	Y	FACW	FACU species X 4 =	
2. Acer negundo	20	Y	FAC	OPL species         x 5 =           Column Tatala         (A)	
3				Column Lotais: (A)	(B)
4				Prevalence Index = B/A =	
5				Hvdrophytic Vegetation Indicators:	
6				1 - Rapid Test for Hydrophytic Vegetation	
7				$\boxed{1}$ 2 - Dominance Test is >50%	
8				$\square$ 3 - Prevalence Index is <3.0 <sup>1</sup>	
	30	= Total Cov	rer	$\square$ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
50% of total cover: 15	20% of	total cover:	6		
Herb Stratum (Plot size: 30' radius )				<sup>1</sup> Indicators of bydric soil and wetland bydrology mu	iet
1. Allium canadense	5	Υ	FACU	be present, unless disturbed or problematic.	151
2. Viola bicolor	5	Y	FAC	Definitions of Four Vegetation Strata:	
3. Brunnichia ovata	5	Y	FACW		,
4. Rubus trivialis	5	Y	FACU	Tree – Woody plants, excluding vines, 3 in. (7.6 cm	n) or
5. Quercus nigra	1	N	FAC	height.	0.01
6. Sambucus nigra	1	N	FAC	Sanling/Shrub Woody plants evoluting vines 1	200
7 Persicaria hydropiperoides	1	N	OBL	than 3 in. DBH and greater than 3.28 ft (1 m) tall.	599
8					
9			·	Herb – All herbaceous (non-woody) plants, regardl of size, and woody plants less than 3.28 ft tall.	less
10					
11				Woody vine – All woody vines greater than 3.28 ft	in
12			·	neight.	
12.	23	- Total Cov			
50% of total cover: 11.5	20% of	total cover	4.6		
Weedy Vine Stratum (Plot size: 30' radius	20 % 01				
1			. <u> </u>		
2					
3			<u> </u>		
4					
5	0			Hydrophytic Versetation	
		= I otal Cov	er	Present? Yes <sup>X</sup> No	
50% of total cover:	20% of	total cover:			
Remarks: (If observed, list morphological adaptations belo	w).				

#### SOIL

SOIL								3		-
Profile Desc	ription: (Describe	to the dep	th needed to docu	ment the i	ndicator	or confir	m the absence	e of indicate	ors.)	
Depth	Matrix		Redo	ox Features	S	0	-			
(inches)	Color (moist)	%	Color (moist)	%	Type'	Loc <sup>2</sup>	Texture		Remarks	_
0-16	10YR 3/1	98	10YR 4/6	2	С	M	Silty clay			_
·								· · · · · · · · · · · · · · · · · · ·		-
. <u> </u>								·		_
						·		·		-
·								·		_
										_
<sup>1</sup> Type: C=Co	oncentration, D=Dep	letion, RM=	Reduced Matrix, M	S=Masked	I Sand G	rains.	<sup>2</sup> Location	: PL=Pore L	_ining, M=Matrix.	
Hydric Soil I	ndicators: (Applic	able to all	LRRs, unless othe	rwise not	ed.)		Indicators	s for Proble	ematic Hydric Soils <sup>3</sup> :	
	(A1)		Polyvalue Be	elow Surfa	ce (S8) <b>(</b> I	LRR S. T.	<b>U)</b> 1 cm	Muck (A9) (	LRR O)	
	pipedon (A2)		Thin Dark Su	urface (S9)	(LRR S.	. T. U)		Muck (A10)	(LRR S)	
Black His	stic (A3)			v Mineral	(F1) (LRI	R O)	Redu	ced Vertic (F	F18) (outside MLRA 150A.E	3)
	n Sulfide (A4)		Loamy Gleve	ed Matrix (	F2)	,		nont Floodpl	lain Soils (F19) (LRR P. S. T	-, -)
Stratified	Lavers (A5)		Depleted Ma	atrix (F3)	/			alous Bright	t Loamy Soils (F20)	'
	Bodies (A6) (LRR P	р. т. U)	Redox Dark	Surface (F	6)		(ML	RA 153B)		
	icky Mineral (A7) <b>(LI</b>	, ., ., RR P. T. U)	Depleted Da	rk Surface	(F7)			Parent Mater	rial (TF2)	
	esence (A8) (LRR L	J)	Redox Depr	essions (F	8)		Verv	Shallow Dar	k Surface (TF12)	
☐ 1 cm Mu	ick (A9) (LRR P. T)	,	Marl (F10) (I	LRR U)	- /		Other	(Explain in	Remarks)	
Depleted	Below Dark Surfac	e (A11)	Depleted Oc	hric (F11)	(MLRA 1	51)				
Thick Da	ark Surface (A12)	( )	Iron-Mangar	nese Mass	、 es (F12)	, (LRR O, F	<b>P, T)</b> <sup>3</sup> Indi	cators of hy	drophytic vegetation and	
Coast Pr	rairie Redox (A16) (I	MLRA 1504	A) 🗍 Umbric Surfa	ace (F13) <b>(</b>	LRR P, 1	, Γ, U)	We	etland hydrol	logy must be present,	
Sandy M	lucky Mineral (S1) (	LRR O, S)	Delta Ochric	(F17) <b>(ML</b>	.RA 151)		un	less disturbe	ed or problematic.	
Sandy G	leyed Matrix (S4)		Reduced Ve	rtic (F18) (	MLRA 1	50A, 150E	3)			
Sandy R	edox (S5)		Piedmont Fl	oodplain S	oils (F19)	) (MLRA 1	49A)			
Stripped	Matrix (S6)		Anomalous I	Bright Loar	ny Soils	(F20) <b>(ML</b>	RA 149A, 1530	C, 153D)		
Dark Sur	rface (S7) <b>(LRR P, S</b>	S, T, U)								
Restrictive L	_ayer (if observed)	:								
Type:										
Depth (inc	ches):						Hvdric Soi	I Present?	Yes X No	
Pemarks:							,			
Remarks.										



Project/Site: MBSD		City/County: Plaq	uemines	5	Sampling Date: 11/13/12
Applicant/Owner: CPRA / Ram Te	rminals		State	. <u>LA</u> s	Sampling Point: DP-9
Investigator(s): CM, JM, RW		Section, Township	, Range: N/A		
Landform (hillslope, terrace, etc.): De	elta / Fastland	Local relief (conca	ve, convex, none	e): concave	Slope (%): 1
Subregion (LRR or MLRA): Outer Co.	astal Plain (LRR T) Lat: 29	.6600 N	Long: 89.96	675 W	Datum: NAD 83
Soil Map Unit Name: Cancienne sil	t loam			NWI classificat	<sub>ion:</sub> Upland
Are climatic / hydrologic conditions on	the site typical for this time c	of year? Yes X	No (If no	, explain in Rer	narks.)
Are Vegetation , Soil , c	or Hydrology X significa	intly disturbed?	Are "Normal Circ	umstances" pre	esent? Yes No X
Are Vegetation . Soil . c	or Hydrology naturally	problematic?	If needed, expla	in anv answers	in Remarks.)
SUMMARY OF FINDINGS -	Attach site map show	ing sampling poi	nt locations,	transects,	important features, etc.
Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present?	Yes         X         No           Yes         X         No           Yes         No         X	Is the Sam	pled Area etland?	Yes	No <u>X</u>
Between river levee and hydrologic indicators.	Highway 23. Hurric	ane Isaac has	resulted in	atypical co	onditions and
HYDROLOGY					
Wetland Hydrology Indicators:			Sec	ondary Indicato	rs (minimum of two required)
Primary Indicators (minimum of one	is required; check all that app	oly)	님	Surface Soil C	racks (B6)
High Water Table (A2)	Aquatic Fauna	(B13) (B15) <b>(I PP II)</b>	님	Sparsely Vege	tated Concave Surface (B8)
$\square Saturation (A3)$	Hydrogen Sulfi	de Odor (C1)	H	Moss Trim Line	es (B16)
Water Marks (B1)	Oxidized Rhizo	espheres along Living R	oots (C3)	Drv-Season W	ater Table (C2)
Sediment Deposits (B2)	Presence of Re	educed Iron (C4)	) í 🗖	Crayfish Burro	ws (C8)
Drift Deposits (B3)	Recent Iron Re	duction in Tilled Soils (	C6) 🗌	Saturation Visi	ble on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Thin Muck Surf	ace (C7)		Geomorphic Pe	osition (D2)
Iron Deposits (B5)	U Other (Explain	in Remarks)		Shallow Aquita	rd (D3)
Inundation Visible on Aerial Ima	gery (B7)		님	FAC-Neutral T	est (D5)
✓ Water-Stained Leaves (B9)				Sphagnum mo	ss (D8) <b>(LRR T, U)</b>
Field Observations:	No X Donth (inc	haa);			
Weter Table Present? Yes	No <u>X</u> Depth (inc	hes):			
Saturation Present? Yes	No X Depth (inc	hes):	Wetland Hydr	ology Present?	Ves No X
(includes capillary fringe)		nes).		blogy Flesent	
Describe Recorded Data (stream ga	uge, monitoring well, aerial pl	hotos, previous inspec	tions), if available	9:	
Remarks:	ODA				
Atypical situation false r	ositivo indicators d	ue to hurricane			
Atypical situation, laise p					

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 radius )	% Cover	Species?	Status	Number of Dominant Species
1. Acer negundo	20	Y	FAC	That Are OBL, FACW, or FAC: 7 (A)
2. Triadica sebifera	10	Y	FAC	Total Number of Dominant
3. Salix nigra	10	Υ	OBL	Species Across All Strata: 7 (B)
4.				
5.				Percent of Dominant Species
6				That Ale OBL, FACW, OF FAC. (A/B)
7			<u> </u>	Prevalence Index worksheet:
7			<u> </u>	Total % Cover of: Multiply by:
8				OBL species x 1 =
	40	= Total Cov	ver	
50% of total cover: 20	20% of	total cover	: 8	FACW species x z =
Sapling/Shrub Stratum (Plot size: 30' radius )				FAC species x 3 =
1. Triadica sebifera	30	Υ	FAC	FACU species x 4 =
2				UPL species x 5 =
2				Column Totals: (A) (B)
3				
4				Prevalence Index = B/A =
5				Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7				$\sqrt{2}$ - Dominance Test is $>50\%$
8.				$\square$ 2 Dominance rest is 200%
	30	- Total Cov		$\square$ 3 - Prevalence index is $\leq 3.0$
E0% of total anyon 15	200/ at		. 6	Problematic Hydrophytic Vegetation' (Explain)
50% of total cover	20% 0	total cover		
Herb Stratum (Plot size: 50 radius )	_			<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. Saururus cernus	5	Y	OBL	be present, unless disturbed or problematic.
2. Acer negundo	1	N	FAC	Definitions of Four Vegetation Strata:
3.				
4				Iree – Woody plants, excluding vines, 3 ln. (7.6 cm) or more in diameter at breast height (DBH) regardless of
5				height.
5				
б				<b>Sapling/Shrub</b> – Woody plants, excluding vines, less
7		<u> </u>		than 3 in. DBH and greater than 3.28 it (1 m) tail.
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10.				Weedwine Allwoodwines greater than 2.20 ft in
11.				height.
12				
12.	6	Total Car		
			1.2	
50% of total cover: <u>5</u>	20% 01	total cover	. 1.2	
Woody Vine Stratum (Plot size: 30 radius )				
1. Campsis radicans	5	Y	FAC	
2. Ampelopsis arborea	5	Y	FAC	
3.				
4	_			
o	10			Hydrophytic
_	10	= I otal Cov	ver	Present? Yes X No
50% of total cover: <u>5</u>	20% of	total cover	2	
Remarks: (If observed, list morphological adaptations bel	ow).			·

#### SOIL

Profile Descr	iption: (Describe	to the de	pth needed to docu	iment the	indicator	or confir	m the absence	e of indicators.)
Depth	Matrix		Rec	ox Featur	es	2		
(inches)	Color (moist)	%	Color (moist)	%	Type	Loc <sup>2</sup>	Texture	Remarks
0-14	10YR 4/1	97	10YR 4/1	3	<u>C</u>	М	Clay	
Туре: С=Со	ncentration, D=Dep	letion, RN	I=Reduced Matrix, N	/S=Maske	ed Sand G	rains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
lydric Soil Ir	ndicators: (Applic	able to al	I LRRs, unless oth	erwise no	ted.)		Indicators	s for Problematic Hydric Soils <sup>3</sup> :
Histosol ( Histic Epi Black His Hydroger Stratified Organic E 5 cm Muc Nuck Pre 1 cm Muc Depleted Thick Dar Sandy Mi Sandy Gi Sandy Gi Sandy Re Stripped Dark Surf	A1) pedon (A2) tic (A3) n Sulfide (A4) Layers (A5) Bodies (A6) (LRR P cky Mineral (A7) (LF sence (A8) (LRR U ck (A9) (LRR P, T) Below Dark Surface rk Surface (A12) airie Redox (A16) (I ucky Mineral (S1) (L eyed Matrix (S4) edox (S5) Matrix (S6) face (S7) (LRR P, S ayer (if observed):	, T, U) RR P, T, U ) e (A11) /ILRA 150 _RR O, S) ., T, U)	<ul> <li>Polyvalue E</li> <li>Thin Dark S</li> <li>Loamy Muc</li> <li>Loamy Gley</li> <li>Depleted M</li> <li>Redox Darl</li> <li>Depleted D</li> <li>Redox Dep</li> <li>Marl (F10)</li> <li>Depleted O</li> <li>Iron-Manga</li> <li>Umbric Sur</li> <li>Delta Ochri</li> <li>Reduced V</li> <li>Piedmont F</li> <li>Anomalous</li> </ul>	Below Surf Gurface (Si ky Minera ved Matrix atrix (F3) atrix (F3) atrix (F3) atrix (F3) atrix (F3) atrix (F3) chric (F11) nese Mas face (F13) c (F17) ( <b>M</b> ertic (F18) loodplain Bright Loa	ace (S8) (I 9) (LRR S 1 (F1) (LRI (F2) (F6) ace (F7) F8) ) (MLRA 1 Ses (F12) (LRR P, T Soils (F19) amy Soils	LRR S, T, T, U) T, U) R O) (LRR O, F (LRR O, F T, U) 50A, 150E (MLRA 1 (F20) (ML	U) 1 cm M 2 cm M Reduce Piedm Anoma (MLI Red P Very S Other other 2, T) <sup>3</sup> Indice wei unl b) 49A) RA 149A, 153C	Muck (A9) <b>(LRR O)</b> Muck (A10) <b>(LRR S)</b> ced Vertic (F18) <b>(outside MLRA 150A,B)</b> nont Floodplain Soils (F19) <b>(LRR P, S, T)</b> alous Bright Loamy Soils (F20) <b>RA 153B)</b> Parent Material (TF2) Shallow Dark Surface (TF12) (Explain in Remarks) cators of hydrophytic vegetation and tland hydrology must be present, less disturbed or problematic. <b>C, 153D)</b>
Туре:								X
Depth (inc	hes):						Hydric Soil	I Present? Yes <u>×</u> No



Project/Site: MBSD	City/County: Pla	aquemines	Sampling Date: <u>11/13/12</u>
Applicant/Owner: <u>CPRA / Ram Terminals</u>		State: LA	Sampling Point: DP-10
Investigator(s): CM, JM, RW	Section, Townsh	nip, Range: N/A	
Landform (hillslope, terrace, etc.): Delta / Fastla	and Local relief (cond	cave, convex, none): concav	Ve Slope (%): 1
Subregion (LRR or MLRA): Outer Coastal Plain (	LRR T) Lat: 29.6587 N	Long: 89.9694 W	Datum: NAD 83
Soil Map Unit Name: Cancienne silty clay loar	n	NWI class	ification: Upland
Are climatic / hydrologic conditions on the site typ	ical for this time of year? Yes $X$	No (If no, explain ir	n Remarks.)
Are Vegetation , Soil , or Hydrology	X significantly disturbed?	Are "Normal Circumstances	s" present? Yes No X
Are Vegetation , Soil , or Hydrology	naturally problematic?	(If needed, explain any ans	wers in Remarks.)
SUMMARY OF FINDINGS – Attach si	te map showing sampling p	oint locations, transec	ts, important features, etc.
Hydrophytic Vegetation Present?       YesX         Hydric Soil Present?       YesX         Wetland Hydrology Present?       YesX	No         Is the Sa           No         within a	mpled Area Wetland? Yes	No <u>X</u>
Remarks:			
hydrologic indicators.	-		
		0	
Primary Indicators (minimum of one is required;         Surface Water (A1)         High Water Table (A2)         Saturation (A3)         Water Marks (B1)         Sediment Deposits (B2)         Drift Deposits (B3)         Algal Mat or Crust (B4)         Iron Deposits (B5)         Inundation Visible on Aerial Imagery (B7)         Water-Stained Leaves (B9)	check all that apply) Aquatic Fauna (B13) Marl Deposits (B15) <b>(LRR U)</b> Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils Thin Muck Surface (C7) Other (Explain in Remarks)	Surface Solution     Sparsely V     Sparsely V     Drainage I     Moss Trim     Roots (C3)     Dry-Seasc     Crayfish B     s (C6)     Geomorph     Shallow A     FAC-Neut     Sphagnun	oil Cracks (B6) Vegetated Concave Surface (B8) Patterns (B10) In Lines (B16) On Water Table (C2) Burrows (C8) In Visible on Aerial Imagery (C9) Inic Position (D2) quitard (D3) ral Test (D5) In moss (D8) <b>(LRR T, U)</b>
Field Observations:	×		
Surface Water Present?       Yes No         Water Table Present?       Yes No         Saturation Present?       Yes No         (includes capillary fringe)       No         Describe Recorded Data (stream gauge, monito         A criciclar:       2010 E CDL 8 LICDA	Depth (inches):      Depth (inches):      Depth (inches):      Depth (inches):  ring well, aerial photos, previous inspectively	Wetland Hydrology Pres	sent? Yes <u>No X</u>
Aeriais. 2010 ESRI & USDA			
Atypical situation, false positive i	ndicators due to hurrican	е.	

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: <u>30 radius</u> )	% Cover	<u>Species?</u>	<u>Status</u>	Number of Dominant Species
1. Acer rubrum	10	Y	FAC	That Are OBL, FACW, or FAC: 6 (A)
2. <u>Acer negundo</u>	20	Y	FAC	Total Number of Dominant
3. Quercus virginiana	5	N	FACU	Species Across All Strata: <u>6</u> (B)
4			. <u> </u>	Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 100 (A/B)
6				
7				Prevalence Index worksheet:
8				Total % Cover of: Multiply by:
	35	= Total Cov	er	OBL species x 1 =
50% of total cover: 17.5	20% of	total cover:	7	FACW species x 2 =
Sapling/Shrub Stratum (Plot size: 30' radius )				FAC species x 3 =
1 Triadica sebifera	20	Y	FAC	FACU species x 4 =
<ul> <li>Praxinus pennsylvanica</li> </ul>	5	Y	FACW	UPL species x 5 =
2 Quercus nigra	2	N	FAC	Column Totals: (A) (B)
Ilex decidua	3	N	FACW	
	<u> </u>		17.011	Prevalence Index = B/A =
5			·	Hydrophytic Vegetation Indicators:
6			. <u> </u>	1 - Rapid Test for Hydrophytic Vegetation
7				2 - Dominance Test is >50%
8				$\square$ 3 - Prevalence Index is $\leq 3.0^1$
	30	= Total Cov	er	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover: 15	20% of	total cover:	6	
Herb Stratum (Plot size: <u>30' radius</u> )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. Ampelopsis arborea	20	Υ	FAC	be present, unless disturbed or problematic.
2. Cyperus sp.	2	N		Definitions of Four Vegetation Strata:
3 Triadica sebifera	2	N	FAC	
∠ Commelina sp.	1	N		<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or
- Brunnichia ovata	1	N	FACW	height.
5. <u> </u>				
0			·	<b>Sapling/Shrub</b> – Woody plants, excluding vines, less
/				
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft fall.
10			. <u> </u>	Woody vine – All woody vines greater than 3.28 ft in
11				height.
12				
	26	= Total Cov	er	
50% of total cover: 13	20% of	total cover:	5.2	
Woody Vine Stratum (Plot size: 30' radius )				
1. Toxicodendron radicans	10	Υ	FAC	
2.				
3.				
4.				
5				Hadaan bada
	10	- Total Cov	er	Vegetation
50% of total cover: 5	20% of	total cover	2	Present? Yes $\underline{X}$ No
	2078.01		·	
Remarks: (If observed, list morphological adaptations belo	w).			

#### SOIL

Profile Description: (Describe to the	e depth needed to docum	ment the indicato	r or confirm	the absence of	indicators.)
Depth <u>Matrix</u>	Redo	x Features	. 2		
(inches) Color (moist) %	<u>6 Color (moist)</u>	<u>%</u> <u>Type'</u>		<u>Texture</u>	Remarks
0-14 10 FR 4/2 96	101R 4/0	4 0	IVI	Clay	
<sup>1</sup> Type: C=Concentration, D=Depletion Hydric Soil Indicators: (Applicable f Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) Organic Bodies (A6) (LRR P, T, U) 5 cm Mucky Mineral (A7) (LRR P, Muck Presence (A8) (LRR U) 1 cm Muck (A9) (LRR P, T) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Coast Prairie Redox (A16) (MLRA Sandy Mucky Mineral (S1) (LRR C) Sandy Gleyed Matrix (S4)	, RM=Reduced Matrix, MS io all LRRs, unless other Polyvalue Be Thin Dark Su Loamy Mucky Loamy Mucky Depleted Mar , Redox Dark S T, U) Depleted Dar Redox Depre Marl (F10) (L 1) Depleted Oct Iron-Mangan , 150A) Umbric Surfa D, S) Delta Ochric Reduced Ver	S=Masked Sand G rwise noted.) elow Surface (S8) ( urface (S9) (LRR S sy Mineral (F1) (LR ed Matrix (F2) atrix (F3) Surface (F6) rk Surface (F6) rk Surface (F7) essions (F8) _RR U) thric (F11) (MLRA bese Masses (F12) ace (F13) (LRR P, (F17) (MLRA 151) rtic (F18) (MLRA 1	LRR S, T, U , T, U) R O)		_=Pore Lining, M=Matrix. r Problematic Hydric Soils <sup>3</sup> : :k (A9) (LRR O) :k (A10) (LRR S) Vertic (F18) (outside MLRA 150A,B) : Floodplain Soils (F19) (LRR P, S, T) us Bright Loamy Soils (F20) 153B) nt Material (TF2) llow Dark Surface (TF12) :plain in Remarks) prs of hydrophytic vegetation and id hydrology must be present, a disturbed or problematic.
Sandy Redox (S5)	Piedmont Flo	oodplain Soils (F19	) (MLRA 14	9A)	
Dark Surface (S7) (LRR P. S. T. U	Anomalous B	Bright Loamy Soils	(F20) <b>(MLR</b>	A 149A, 153C, 15	53D)
Restrictive Layer (if observed):	1				
Туре:					
Depth (inches):				Hydric Soil Pre	esent? Yes $\underline{\times}$ No
Kemarks:					



Project/Site: MBSD	City/County: Plaquemines	Sampling Date: 11/13/12
Applicant/Owner: CPRA / Ram Terminals	State: LA	Sampling Point: DP-11
Investigator(s): CM, JM, RW	Section, Township, Range: N/A	
Landform (hillslope, terrace, etc.): Delta / Fastland	Local relief (concave, convex, none): None	e Slope (%): 2
Subregion (LRR or MLRA): Outer Coastal Plain (LRR T) Lat: 29.65	74 N Long: 89.9687 W	Datum: NAD 83
Soil Map Unit Name: Cancienne silty clay loam	NWI cla	ussification: Upland
Are climatic / hydrologic conditions on the site typical for this time of y	ear? Yes X No (If no, explain	in Remarks.)
Are Vegetation . Soil . or Hydrology X significantly	/ disturbed? Are "Normal Circumstance	ces" present? Yes No X
Are Vegetation Soil or Hydrology naturally pr	oblematic? (If needed, explain any a	nswers in Remarks )
SUMMARY OF FINDINGS – Attach site map showing	g sampling point locations, transe	ects, important features, etc.
Hydrophytic Vegetation Present? Yes X No	Is the Sampled Area	×
Wetland Hydrology Present? Yes No X	within a Wetland? Yes	No <u>^</u>
Remarks:		
Between river levee and Highway 23. Hurricar	ne Isaac has resulted in atypic	al conditions and
hydrologic indicators.	51	
HYDROLOGY		
Wetland Hydrology Indicators:	Secondary I	ndicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface	Soil Cracks (B6)
Surface Water (A1)	3) 🔟 Sparsel	y Vegetated Concave Surface (B8)
High Water Table (A2)	5) (LRR U) 📃 Drainag	e Patterns (B10)
Saturation (A3) Hydrogen Sulfide	Udor (C1) <u>I</u> Moss II	rim Lines (B16)
Sediment Deposits (B2)	ced Iron (C4) $\Box$ Cravifish	$\frac{1}{2} = \frac{1}{2} = \frac{1}$
Drift Deposits (B3)	ction in Tilled Soils (C6) $\Box$ Saturati	on Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	e (C7)	rphic Position (D2)
Iron Deposits (B5)	Remarks) Shallow	Aquitard (D3)
Inundation Visible on Aerial Imagery (B7)	FAC-Ne	eutral Test (D5)
✓ Water-Stained Leaves (B9)	Sphagn	um moss (D8) <b>(LRR T, U)</b>
Field Observations:		
Surface Water Present? Yes No ^ Depth (inches	3):	
Water Table Present? Yes No A Depth (inches	s):	X
Saturation Present? Yes <u>No ^</u> Depth (inches (includes capillary fringe)	S): Wetland Hydrology Pr	esent? Yes <u>No ^</u>
Describe Recorded Data (stream gauge, monitoring well, aerial phot	os, previous inspections), if available:	
Aerials: 2010 ESRI & USDA		
Remarks:		
Atypical situation, false positive indicators due	to hurricane.	

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: <u>30 radius</u> )	<u>% Cover</u>	<u>Species?</u>	<u>Status</u>	Number of Dominant Species
1. Acer rubrum	25	Y	FAC	That Are OBL, FACW, or FAC: 6 (A)
2. Acer negundo		Y	FAC	Total Number of Dominant
3. Fraxinus pennsylvanica	5	N	FACW	Species Across All Strata: 7 (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: <u>86</u> (A/B
6				
7				Prevalence index worksneet:
8				I otal % Cover of: Multiply by:
	50	= Total Cov	er	OBL species x 1 =
50% of total cover: 25	20% of	total cover	10	FACW species x 2 =
Sapling/Shrub Stratum (Plot size: 30' radius )				FAC species x 3 =
1. Triadica sebifera	20	Υ	FAC	FACU species x 4 =
2. Acer negundo	10	Y	FAC	UPL species x 5 =
3. Cornus drummondii	5	N	FAC	Column Totals: (A) (B)
4.				Provolence Index - P/A -
5.				Prevalence index = D/A =
6				
7				1 - Rapid Test for Hydrophytic Vegetation
0				2 - Dominance Test is >50%
0	35	- Total Ca		☐ 3 - Prevalence Index is ≤3.0
50% of total action 17.5			. 7	Problematic Hydrophytic Vegetation' (Explain)
S0% of total cover	20% 01	total cover	· <u>· · · · · · · · · · · · · · · · · · </u>	
Herb Stratum (Plot size: <u>oo radids</u> )	15	V	FACU	<sup>1</sup> Indicators of hydric soil and wetland hydrology must
			FAC	be present, unless disturbed or problematic.
2. Ampelopsis arborea	- 10			Definitions of Four Vegetation Strata:
3. Rubus trivialis	5	N	FACU	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) o
4				more in diameter at breast height (DBH), regardless of
5			<u> </u>	neight.
6				Sapling/Shrub - Woody plants, excluding vines, less
7				than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10				Woody vine - All woody vines greater than 3.28 ft in
11				height.
12				
	30	= Total Cov	rer	
50% of total cover: <sup>15</sup>	20% of	total cover	6	
Woody Vine Stratum (Plot size: 30' radius				
Ampelopsis arborea	5	Y	FAC	
2				
2				
3				
4				
5	5		<u> </u>	Hydrophytic
		= I otal Co	ver 1	Present? Yes X No
50% of total cover: 2.5	20% of	total cover		
Remarks: (If observed, list morphological adaptations bel	ow).			

Profile Desc	ription: (Describe	to the dep	oth needed to docur	nent the i	ndicator	or confirn	n the absence	of indicators.)
Depth	Matrix		Redo	x Features	S			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-6	10YR 4/2	100					Silty clay	
6-16	10YR 4/2	98	10YR 4/6	2	С	Μ	Clay	
				·				
	-			·				
				·				
<sup>1</sup> Type: C=Co	oncentration, D=Dep	letion, RM	=Reduced Matrix, MS	S=Masked	Sand Gr	ains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
Hydric Soll I	ndicators: (Applic	able to all	LRRS, unless other	wise note	ea.)			for Problematic Hydric Solis":
	(A1)		Polyvalue Be	low Surfa	ce (S8) (L	.RR S, T, U	U) <u> </u>	Muck (A9) <b>(LRR O)</b>
Black His	stic (A3)			Mineral	(ERR 3, (F1) <b>(I R</b> F	2 (0)		ved Vertic (E18) (outside MI RA 150A B)
	n Sulfide (A4)			d Matrix (	F2)	,		nont Floodplain Soils (F19) (LRR P. S. T)
Stratified	Layers (A5)		Depleted Mar	trix (F3)	,			alous Bright Loamy Soils (F20)
Organic	Bodies (A6) (LRR P	, T, U)	Redox Dark	Surface (F	6)		(ML	RA 153B)
5 cm Mu	cky Mineral (A7) <b>(Li</b>	RR P, T, U	) 🔲 Depleted Dar	k Surface	(F7)			arent Material (TF2)
Muck Pre	esence (A8) <b>(LRR U</b>	)	Redox Depre	ssions (Fa	8)			Shallow Dark Surface (TF12)
	ck (A9) <b>(LRR P, T)</b>	~ ( \ 1 1 )	☐ Marl (F10) <b>(</b> L	RRU)		<b>F</b> 4)	U Other	(Explain in Remarks)
	I Below Dark Surrac	e (A11)		nric (F11)	(IVILKA 1 as (E12) /		T) <sup>3</sup> Indi	cators of hydrophytic vegetation and
	airie Redox (A16) (I	MLRA 150	A) Umbric Surfa	ce (F13) (	LRR P. T	LIXIX 0, F, 	, i) indic	tland hydrology must be present.
Sandy M	lucky Mineral (S1) (I	RR O, S)	Delta Ochric	(F17) <b>(ML</b>	RA 151)	, -,	unl	ess disturbed or problematic.
Sandy G	leyed Matrix (S4)		Reduced Ver	tic (F18) <b>(</b>	MLRA 15	50A, 150B)	)	·
Sandy R	edox (S5)		Piedmont Flo	odplain S	oils (F19)	(MLRA 14	49A)	
Stripped	Matrix (S6)		Anomalous E	Bright Loar	ny Soils (	F20) <b>(MLR</b>	RA 149A, 153C	c, 153D)
Dark Sur	face (S7) (LRR P, S	6, T, U)						
Restrictive L	ayer (if observed):							
Type:	(h = = ).						Ukudain Coll	
Depth (Inc	nes):						Hydric Sol	Present? Yes <u></u> No
Remarks:								



Project/Site: MBSD		City/Cou	Inty: Plaquemines		Sampling Date:	11/13/12
Applicant/Owner: CPRA / Rar	n Terminals		5	State: LA	Sampling Point:	DP-12
Investigator(s): CM, JM, RW		Section.	Township, Range: N/	A		
Landform (hillslope, terrace, etc.	.): Delta / Fastland	Local re	lief (concave, convex, r	none): none	Slo	pe (%): 1
Subregion (I RR or MI RA). Out	er Coastal Plain (LRR T)	Lat. 29.6578 N	Long. 8	9.9711 W	Da	atum. NAD 83
Soil Map Unit Name. Cancienr	ne silty clay loam		Long	NWI classifi	cation. Upland	
Are climatic / hydrologic conditio	ons on the site typical for t	his time of year? Yes	X No (	If no, explain in F	Remarks )	
Are Vegetation Soil	or Hydrology X	significantly disturbe	d2 Aro "Normal	Circumstancos"	procent? Vec	No X
	, or righted and				present: res	
	, or Hydrology	_ naturally problematic	c? (If needed, e	xpiain any answe	ers in Remarks.)	
	S – Attach site ma	p showing samp	ling point locatio	ns, transects	s, important f	eatures, etc.
Hydrophytic Vegetation Preser	nt? Yes X	No	the Sampled Area			
Hydric Soil Present?	Yes	No X	vithin a Wetland?	Yes	No X	
Wetland Hydrology Present?	Yes	No X				_
Remarks:						
Between river levee	and Highway 23.	Hurricane Isaa	ac has resulted	in atypical	conditions a	Ind
hydrologic indicators						
HYDROLOGY						
Wetland Hydrology Indicator	'S:	With a transmite (		Secondary Indic	ators (minimum o	f two required)
	<u>т one is required; cnecк a</u>	iii that apply)		Surface Soli	Cracks (B6)	
Ligh Water Table (A2)		ic Fauna (B13)	N	Droipogo Dr	getated Concave	Surface (B8)
High Water Table (A2)		Deposits (B15) (LRR (	ر ر		inco (B10)	
$\square$ Saturation (A3)		ad Rhizophorop olor	) na Livina Pooto (C2)		Motor Table (C2)	
$\square Sodiment Deposite (B2)$				Crawfich Bu		)
Drift Deposits (B3)		at Iron Reduction in Ti	lled Soils (C6)		liuws (CO) /isible on Aerial In	nagery (CQ)
Algel Mat or Crust (B4)		Muck Surface (C7)			Position (D2)	lagery (C3)
		(Explain in Remarks)			itard (D3)	
Inundation Visible on Aeria	al Imagery (B7)			EAC-Neutra	l Test (D5)	
Water-Stained Leaves (B9	))			Sphagnum r	noss (D8) <b>(LRR 1</b>	r. u)
Field Observations:					(	., .,
Surface Water Present?	Yes No X	Depth (inches):				
Water Table Present?	Yes No X [	Depth (inches):				
Saturation Present?	Yes No X [	Depth (inches):	Wetland H	ydrology Prese	nt? Yes	<u>No X</u>
Describe Recorded Data (strea	am gauge, monitoring wel	l, aerial photos, previo	ous inspections), if avai	lable:		
Aerials: 2010 ESRI	& USDA					
Remarks:						
Atypical situation, fal	se positive indica	tor due to hurr	icane.			

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30' radius )	<u>% Cover</u>	Species?	<u>Status</u>	Number of Dominant Species
1. Quercus nigra	30	Y	FAC	That Are OBL, FACW, or FAC: <u>5</u> (A)
2. Acer rubrum	10	N	FAC	Total Number of Dominant
3. Acer negundo	10	N	FAC	Species Across All Strata: <u>5</u> (B)
4. Melia azedarach	5	N	UPL	Percent of Dominant Species
5				That Are OBL, FACW, or FAC: <sup>100</sup> (A/B)
6				
7				Prevalence Index worksheet:
8				Total % Cover of:Multiply by:
	55	= Total Cov	er	OBL species x 1 =
50% of total cover: 27.5	20% of	total cover:	11	FACW species x 2 =
Sapling/Shrub Stratum (Plot size: 30' radius )				FAC species x 3 =
1. Cornus drummondii	10	Y	FAC	FACU species x 4 =
2. Triadica sebifera	10	Y	FAC	UPL species x 5 =
3. Acer negundo	5	N	FAC	Column Totals: (A) (B)
Quercus nigra	5	N	FAC	
ج د Liquidambar stvraciflua	5	N	FAC	Prevalence Index = B/A =
c Ligustrum sinense	5	N	FAC	Hydrophytic Vegetation Indicators:
8. <u>9</u>				1 - Rapid Test for Hydrophytic Vegetation
<i>I</i>				2 - Dominance Test is >50%
8	40		·	$\square$ 3 - Prevalence Index is $\leq 3.0^1$
20	40	= Total Cov	er	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover: 20	20% of	total cover:	8	
Herb Stratum (Plot size: 30' radius )				<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. Ampelopsis arborea	5	Y	FAC	be present, unless disturbed or problematic.
2. Rubus trivialis	1	N	FACU	Definitions of Four Vegetation Strata:
3. Quercus nigra	1	Ν	FAC	<b>Tree</b> – Woody plants, excluding vines $3$ in (7.6 cm) or
4				more in diameter at breast height (DBH), regardless of
5				height.
6				Sapling/Shrub – Woody plants, excluding vines, less
7.				than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8.				Herb All berbasseus (non woody) planta, regardlass
9.				of size, and woody plants less than 3.28 ft tall.
10				
11				Woody vine – All woody vines greater than 3.28 ft in height
12				noight.
12.	7	- Total Cov		
50% of total accurate 3.5			14	
30% of total cover.	20% 0	total cover.		
Woody Vine Stratum (Plot size: 00 radius )	5	V	EAC	
	5	<u> </u>	TAC	
2				
3			. <u> </u>	
4			. <u> </u>	
5				Hydrophytic
	5	= Total Cov	er	Vegetation
50% of total cover: 2.5	20% of	total cover:	1	Present? res <u>~</u> No
Remarks: (If observed, list morphological adaptations belo	w).			1

SOIL

Profile Desc	ription: (Describe	to the depth	needed to docu	ment the inc	dicator o	or confirm	the absence	of indicato	rs.)	
Depth	Matrix		Redo	x Features						
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture		Remarks	
0-14	10YR 4/3	100					Silty clay			
							·			
	ncentration D-Der	letion RM-F	Peduced Matrix M	S-Maskad S	and Gra	ins	<sup>2</sup> Location:	PI – Pore Li	nina M–Ma	trix
Hydric Soil I	ndicators: (Applic	able to all I	RRs. unless othe	rwise noted			Indicators	for Problen	natic Hvdri	c Soils <sup>3</sup>
	(^4)					прети				
	(AI)			urfago (SO) (		κκ 3, 1, υ τ ιιν		luck (A9) (L		
	$A_{2}$			Minoral (E	1) /I DD	0)		nuck (ATU) (	LKK 3)	
	$\operatorname{Sub}(A3)$			y Motrix (F	1) <b>(LKK</b>	0)		eu vertic (r	in Soile (E1	(IDDDCT)
				tu Maliix (F2	<u>(</u> )			Juli Flooupia	III SUIS (FI:	(E20)
	Layers (AS)	о <b>т</b> 10		luix (FS) Surface (EG)				1005 DIIGILI	_Oarry Solis	5 (F20)
	boules (AO) (LKK F				) 			(A 1556) Sroot Motoriu		
		RR P, I, U)		rk Surrace (F	-7)			arent Materia	31 (1FZ) Ourfees (TI	-40)
	esence (A8) (LRR U	))		essions (F8)				nallow Dark	Surface (1F	-12)
	CK (A9) (LRR P, I)	- (0.4.4)	Mari (F10) (L	LRR U)		4	Uther (	Explain in R	emarks)	
	Below Dark Surfac	e (A11)		nric (F11) (IV	ILRA 15	o1)				
	ark Surface (A12)			ese Masses	(F12) <b>(L</b>	-RR 0, P,	i) Indic	ators of nyd	ropnytic veg	jetation and
	airie Redox (A16) (	MLRA 150A)		ace (F13) (Li	KK P, I,	U)	wet	iand nydroid	gy must be	present,
Sandy IV	lucky Mineral (S1) (	LRR O, S)		(F17) (MLR.	A 151)		unle	ess disturbed	d or problem	natic.
Sandy G	leyed Matrix (S4)			rtic (F18) <b>(M</b>	LRA 150	0A, 150B)				
Sandy R	edox (S5)		Piedmont Flo	odplain Soil	s (F19) (	(MLRA 14	9A)			
	Matrix (S6)		Anomalous I	Bright Loamy	/ Soils (F	-20) (MLR	A 149A, 153C	, 153D)		
Dark Sui	face (S7) (LRR P, S	S, T, U)					1			
Restrictive L	ayer (if observed)	:								
Туре:										X
Depth (inc	ches):						Hydric Soil	Present?	Yes	NoX
Remarks:										

Project/Site: MBSD	_ City/County: Plaquemines	Sampling Date: 11/13/12
Applicant/Owner: CPRA / Ram Terminals	State: L	-A Sampling Point: DP-13
Investigator(s): CM, JM, RW	Section, Township, Range: N/A	
Landform (hillslope, terrace, etc.): Delta / Fastland	Local relief (concave, convex, none):	concave Slope (%): 2
Subregion (LRR or MLRA): Outer Coastal Plain (LRR T) Lat: 29.6	6573 N Long: 89.9716	3 W Datum: NAD 83
Soil Map Unit Name: Cancienne silty clay loam	NV	WI classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of	vear? Yes X No (If no. e	xplain in Remarks.)
Are Vegetation . Soil . or Hydrology X significar	tly disturbed? Are "Normal Circum	Istances" present? Yes No X
Are Vegetation Soil or Hydrology naturally	problematic? (If needed, explain a	any answers in Remarks )
SUMMARY OF FINDINGS – Attach site map showi	ng sampling point locations, tr	ansects, important features, etc.
Hydrophytic Vegetation Present? Yes	— Is the Sampled Area	×
Wetland Hydrology Present? Yes No X	within a Wetland?	Yes No <u>^</u>
Remarks:	_	
Between river levee and Highway 23. Hurrica	ane Isaac has resulted in at	ypical conditions and
hydrologic indicators.		, .
HYDROLOGY		
Wetland Hydrology Indicators:	Second	dary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that appl	<u>y)                                     </u>	ırface Soil Cracks (B6)
Surface Water (A1)	B13) 📙 Sp	barsely Vegetated Concave Surface (B8)
High Water Table (A2)	$\begin{array}{ccc} \text{315} & (\text{LRR U}) & & \\ &$	ainage Patterns (B10)
Saturation (A3)	e Odor (C1)	oss Trim Lines (B16)
	pheres along Living Roots (C3) $\square$ Dr	y-Season Water Table (C2)
	Succed from (C4) $\underline{\square}$ Cf (C6) $\underline{\square}$ Cf	aylish Bullows (Co)
Algal Mat or Crust (B4)	$\square$ $\square$ $\square$ $\square$ $\square$ $\square$	action visible on Aenal Imagery (C9)
$\Box$ Iron Deposits (B5) $\Box$ Other (Explain in	$\square$ Remarks) $\square$ Sh	allow Aquitard (D3)
Inundation Visible on Aerial Imagery (B7)		AC-Neutral Test (D5)
Water-Stained Leaves (B9)		phagnum moss (D8) <b>(LRR T, U)</b>
Field Observations:		
Surface Water Present? Yes No X Depth (inch	es):	
Water Table Present? Yes No X Depth (inch	es):	
Saturation Present? Yes <u>No X</u> Depth (inch (includes capillary fringe)	es): Wetland Hydrolo	gy Present? Yes <u>No X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial ph	otos, previous inspections), if available:	
Aerials: 2010 ESRI & USDA		
Remarks:		
Atypical situation, false positive indicators du	e to hurricane.	

201	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 radius )	<u>% Cover</u>	<u>Species?</u>	<u>Status</u>	Number of Dominant Species
1. Iriadica sebifera	20	Y	FAC	That Are OBL, FACW, or FAC: _/ (A)
2. <u>Acer negundo</u>	10	Y	FAC	Total Number of Dominant
3. Cornus drummondii	10	Y	FAC	Species Across All Strata: 7 (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 100 (A/B)
6				Describer of his law works have t
7	<u> </u>			Prevalence Index worksneet:
8				I otal % Cover of: Multiply by:
	40	= Total Cov	ver	
50% of total cover: 20	20% of	total cover	8	FACW species x 2 =
Sapling/Shrub Stratum (Plot size: 30' radius )				FAC species x 3 =
1. <u>Ilex decidua</u>	20	Υ	FACW	FACU species x 4 =
2. Acer negundo	10	Υ	FAC	UPL species x 5 =
3. Triadica sebifera	10	Y	FAC	Column Totals: (A) (B)
4.				Drovelence Index. – P/A –
5.				Hudranhutia Verstation Indiastara:
6	·			
7		·		
8				V 2 - Dominance Test is >50%
0	40	- Total Cav		$\square$ 3 - Prevalence Index is $\leq 3.0^{\circ}$
EQ9/ of total cover: 20	20% of		. 8	Problematic Hydrophytic Vegetation' (Explain)
50% of total cover	20% 01			
Herb Stratum (Plot size: <u>oo radius</u> )	1	N	FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must
1. Triadica sobifora	1			be present, unless disturbed or problematic.
2. Thadica sebilera	·	IN	FAC	Definitions of Four Vegetation Strata:
3				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
4	·			more in diameter at breast height (DBH), regardless of
5		<u> </u>		neight.
6	. <u> </u>			Sapling/Shrub – Woody plants, excluding vines, less
7				than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10				Woody vine - All woody vines greater than 3.28 ft in
11				height.
12.				
	2	= Total Cov	ver	
50% of total cover:	20% of	total cover	:	
Woody Vine Stratum (Plot size 30' radius )				
Ampelopsis arborea	10	Y	FAC	
2				
2				
S				
4				
5	10			Hydrophytic
-	10	= Total Cov	ver	Present? Yes X No
50% of total cover: 5	20% of	total cover	<u> </u>	
Remarks: (If observed, list morphological adaptations belo	ow).			

Profile Desc	ription: (Describe	to the dep	th needed to docun	nent the	indicator	or confirn	n the absence o	of indicato	ors.)	
Depth	Matrix		Redox	x Feature	S					
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture		Remarks	
0-2	10YR 3/1	100			<u></u>		Silty clay			
2-14	10YR 4/2	96	10YR 4/6	4	С	Μ	Clay			
		·			<u></u>					
		·			·					
		·					<u> </u>			
		. <u> </u>								
		·			·					
1 <u>т о о</u>							2			
Type: C=Co	ncentration, D=Dep	letion, RM:	Reduced Matrix, MS	S=Masked	d Sand Gr	ains.	Location: F	<sup>2</sup> L=Pore L	ining, M=Matri matic Hydric	IX. Soils <sup>3</sup> :
				wise not	eu.)					30115 .
	(A1)		Polyvalue Be	low Surfa	ice (S8) <b>(L</b>	.RR S, T, U		JCK (A9) (L		
	olpedon (A2)			Minorol	) (LKK S,	1, U)		JCK (A10) <b>(</b> d Vortio (E	(LKK 5)	
	n Sulfide (A1)			d Matrix /	(F1) <b>(EKF</b> (F2)	(0)		a venic (r	ain Soile (E10)	IPPPST
			Loanly Gleye     Loanly Gleye	riv (F3)	(ГZ)			ous Bright	Loamy Soils (F19)	(EKK F, 3, 1)
	Bodies (A6) <b>(I RR P</b>	τ.υ)	Redox Dark S	Surface (F	-6)			A 153B)	Loanty Cons (	120)
$\square$ 5 cm Mu	ckv Mineral (A7) (LF	, ., ., RR P. T. U)	Depleted Dar	k Surface	e (F7)		Red Par	rent Mater	ial (TF2)	
Muck Pre	esence (A8) (LRR U	) )	Redox Depre	ssions (F	8)		Very Sh	allow Dark	<pre>surface (TF1</pre>	2)
1 cm Mu	ck (A9) (LRR P, T)	,	Marl (F10) (L	RR U)	,		Other (E	Explain in F	Remarks)	,
Depleted	Below Dark Surfac	e (A11)	Depleted Och	nric (F11)	(MLRA 1	51)				
Thick Da	rk Surface (A12)		Iron-Mangane	ese Mass	es (F12) <b>(</b>	LRR O, P,	<b>T)</b> <sup>3</sup> Indica	tors of hyc	drophytic vege	tation and
Coast Pr	airie Redox (A16) (N	/LRA 150	A) 🔲 Umbric Surfa	ce (F13)	(LRR P, T	', U)	wetla	and hydrolo	ogy must be p	resent,
Sandy M	lucky Mineral (S1) <b>(I</b>	_RR O, S)	Delta Ochric	(F17) <b>(ML</b>	_RA 151)		unles	s disturbe	d or problema	atic.
Sandy G	leyed Matrix (S4)		Reduced Ver	tic (F18)	(MLRA 15	50A, 150B)				
Sandy R	edox (S5)		Piedmont Flo	odplain S	Soils (F19)	(MLRA 14	19A)			
	Matrix (S6)		Anomalous B	right Loa	my Soils (	F20) (MLR	RA 149A, 153C, 1	153D)		
Dark Sur	Tace (S7) (LRR P, S	5, I, U)								
Tuno	ayer (il observed).									
Type:									x X	N
Depth (inc	ches):						Hydric Soil P	'resent?	Yes <u>//</u>	NO
Remarks:										



Project/Site: MBSD		City/Co	ounty: Plaquemines		Sampling Date: 11/13/12			
Applicant/Owner: CPRA / Rai	m Terminals	_ •		State: LA	Sampling Point: DP-14			
Investigator(s): CM, JM, RW		Section	Section, Township, Range: N/A					
Landform (hillslope, terrace, etc	.): Delta / Fastland	Local r	Local relief (concave, convex, none); None Slope (%)					
Subregion (LRR or MLRA): Ou	ter Coastal Plain (LRR T)	Lat: 29.6559 N	Lona: 8	9.9709 W	Date	um: NAD 83		
Soil Map Unit Name: Cancien	ne silty clay loam		0	NWI classifi	<sub>cation:</sub> Upland			
Are climatic / hvdrologic conditio	ons on the site typical for the	his time of vear? Ye	as X No	(If no. explain in F	Remarks.)			
Are Vegetation . Soil	. or Hydrology X	significantly disturb	ed? Are "Normal	Circumstances"	present? Yes	<sub>No</sub> X		
Are Vegetation Soil	or Hydrology	naturally problemat	tic? (If needed, e	explain any answe	ers in Remarks.)			
SUMMARY OF FINDING	S – Attach site map	showing sam	pling point locatio	ons, transects	s, important fe	atures, etc.		
		Nia						
Hydrophylic Vegetation Prese Hydric Soil Present?	Yes	No X	Is the Sampled Area		×			
Wetland Hydrology Present?	Yes	No X	within a Wetland?	Yes	No <u>^</u>			
Remarks:								
Between river levee	and Highway 23.	Hurricane Isa	ac has resulted	in atypical	conditions ar	nd		
hydrologic indicators	S.							
HYDROLOGY								
Wetland Hydrology Indicato	rs:			Secondary Indic	ators (minimum of t	wo required)		
Primary Indicators (minimum o	of one is required; check al	ll that apply)		✓ Surface Soi	l Cracks (B6)			
Surface Water (A1)	L Aquati	ic Fauna (B13)		Sparsely Ve	egetated Concave S	Surface (B8)		
High Water Table (A2)	Marl D	Peposits (B15) (LRR	U)		atterns (B10)			
$\square$ Saturation (A3)		gen Sulfide Odor (C	1)		Lines (B16)			
$\square$ Sodiment Deposite (P2)		ed Knizospheres al						
$\square$ Drift Deposits (B3)		nte of Reduction in -	Tilled Soils (C6)		/isible on Aerial Ima	agery (C9)		
Algal Mat or Crust (B4)		Auck Surface (C7)			Position (D2)			
Iron Deposits (B5)	Other	(Explain in Remarks	5)	Shallow Aqu	uitard (D3)			
Inundation Visible on Aeri	ial Imagery (B7)		,	FAC-Neutra	l Test (D5)			
Water-Stained Leaves (B	9)			Sphagnum	moss (D8) (LRR T,	U)		
Field Observations:								
Surface Water Present?	Yes No X D	epth (inches):						
Water Table Present?	Yes No X D	epth (inches):				X		
Saturation Present?	Yes No X D	epth (inches):	Wetland H	lydrology Prese	nt? Yes	No <u>X</u>		
Describe Recorded Data (stre	am gauge, monitoring well	, aerial photos, prev	vious inspections), if ava	ilable:				
Aerials: 2010 ESRI	& USDA							
Remarks:								
Atypical situation, fa	lse positive indica	tors due to hu	urricane.					

	Absolute	Dominant	Indicator	Dominance Test worksheet:				
Tree Stratum (Plot size: 30 radius )	<u>% Cover</u>	<u>Species?</u>	<u>Status</u>	Number of Dominant Species				
1. Quercus virginiana	40	Y	FACU	That Are OBL, FACW, or FAC: <u>5</u> (A)				
2. <u>Acer negundo</u>	20	Y	FAC	Total Number of Dominant				
3. Ilex decidua	10	N	FACW	Species Across All Strata: <u>6</u> (B)				
4				Percent of Dominant Species				
5				That Are OBL, FACW, or FAC: <u>83</u> (A/B)				
6								
7				Prevalence Index worksheet:				
8				Total % Cover of: Multiply by:				
	70	= Total Cov	er	OBL species x 1 =				
50% of total cover: <u>35</u>	20% of	total cover:	14	FACW species x 2 =				
Sapling/Shrub Stratum (Plot size: 30' radius )				FAC species x 3 =				
1. Ilex decidua	10	Υ	FACW	FACU species x 4 =				
2. Triadica sebifera	10	Y	FAC	UPL species x 5 =				
3 Acer negundo	10	Y	FAC	Column Totals: (A) (B)				
4 Cornus drummondii	5	N	FAC	Dravela era la dava D/A				
5				Prevalence Index = B/A =				
6.				Hydrophytic Vegetation Indicators:				
7				1 - Rapid Test for Hydrophytic Vegetation				
<i>1</i>			·	2 - Dominance Test is >50%				
8	35		<u> </u>	$\square$ 3 - Prevalence Index is $\leq 3.0^1$				
175		= Total Cov	er	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)				
50% of total cover: <u>17.5</u>	20% of	total cover:	1					
Herb Stratum (Plot size: <u>30</u> )			540	<sup>1</sup> Indicators of hydric soil and wetland hydrology must				
1. Acer negundo	1	<u>N</u>	FAC	be present, unless disturbed or problematic.				
2. Quercus virginiana	1	N	FACU	Definitions of Four Vegetation Strata:				
3. Brunnichia ovata	1	N	FACW	<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or				
4				more in diameter at breast height (DBH), regardless of				
5				height.				
6				Sapling/Shrub – Woody plants, excluding vines, less				
7				than 3 in. DBH and greater than 3.28 ft (1 m) tall.				
8				Herb - All herbaceous (non-woody) plants, regardless				
9.				of size, and woody plants less than 3.28 ft tall.				
10.								
11			·	woody vine – All woody vines greater than 3.28 ft in height				
12				linght.				
12.	3	- Total Cav						
500/ of total accurate			ei					
50% of total cover.	20% 0	total cover.						
Woody Vine Stratum (Plot size:)	5	V	EAC					
1. Vills foldificitiona	3	- I						
2. Brunnichia ovata		IN	FACW					
3			<u> </u>					
4								
5				Hydrophytic				
	6	= Total Cov	er	Vegetation				
50% of total cover: 3	20% of	total cover:	1.2	Present? Yes <u>^ No</u>				
Remarks: (If observed, list morphological adaptations belo	w).							

SOIL

Profile Desc	cription: (Describe	to the dept	h needed to docu	ment the i	indicator	or confirm	the absence of	indicators.)
Depth	Matrix		Redo	x Feature	S Turn a <sup>1</sup>	L = = 2	Tautuma	Demedia
(inches)	$\frac{\text{Color}(\text{moist})}{10 \text{VP}} \frac{1}{2}$			1	Type C	Loc <sup>-</sup>	<u>lexture</u>	Remarks
0-10	101K 4/2	99	101K 4/0		0	IVI		
	oncontration D-Don	lotion PM-	Poducod Matrix M	S-Mackar			<sup>2</sup> Location: PL	-Poro Liping M-Matrix
Hydric Soil	Indicators: (Applic	able to all I	.RRs, unless othe	rwise not	ed.)	aii 15.	Indicators for	Problematic Hydric Soils <sup>3</sup> :
	(A1)		Polyvalue Be	elow Surfa	ce (S8) <b>(L</b>	.RR S. T. U		k (A9) <b>(LRR O)</b>
Histic Ep	pipedon (A2)		Thin Dark Su	urface (S9)	) (LRR S,	T, U)	2 cm Muc	k (A10) <b>(LRR S)</b>
Black Hi	istic (A3)		Loamy Muck	y Mineral	(F1) <b>(LRF</b>	R O)	Reduced V	Vertic (F18) (outside MLRA 150A,B)
Hydroge	en Sulfide (A4)		Loamy Gleye	ed Matrix (	(F2)			Floodplain Soils (F19) (LRR P, S, T)
	d Layers (A5)	<b>T</b> 10		itrix (F3) Surfaga (F	-			IS Bright Loamy Soils (F20)
	icky Mineral (A7) (LKK P	, 1, 0) RR P. T. U)		rk Surface	-0) • (F7)			nt Material (TF2)
Muck Pr	resence (A8) (LRR U	uuu, 1, 0, I)	Redox Depre	essions (F	8)		Very Shall	low Dark Surface (TF12)
1 cm Mu	uck (A9) (LRR P, T)		Marl (F10) (L	_RR U)	,		Other (Exp	plain in Remarks)
Deplete	d Below Dark Surfac	e (A11)	Depleted Oc	hric (F11)	(MLRA 1	51)		
Thick Da	ark Surface (A12)		Iron-Mangan	ese Mass	es (F12) (		T) Indicato	rs of hydrophytic vegetation and
Sandy M	Aucky Mineral (S1) (I	RR O. S)	Delta Ochric	(F17) <b>(MI</b>	RA 151)	, 0)	unless	disturbed or problematic
Sandy G	Gleyed Matrix (S4)		Reduced Ve	rtic (F18) (	(MLRA 15	60A, 150B)	anicoo	
Sandy F	Redox (S5)		Piedmont Flo	podplain S	ioils (F19)	(MLRA 14	9A)	
Stripped	l Matrix (S6)		Anomalous E	Bright Loai	my Soils (	F20) <b>(MLR</b>	A 149A, 153C, 15	53D)
Dark Su	Inface (S7) (LRR P, S	S, T, U)					1	
Restrictive	Layer (If observed):							
Type:	abaa);						Undria Cail Dro	No X
Depth (In	cnes):						Hydric Soli Pre	
Remarks:	edox concent	rations i	not common.					

Project/Site: MBSD		City/Co	ounty: Plaquemines		Sampling Date:	11/13/12		
Applicant/Owner: CPRA / Ram Terminals				State: LA	_A Sampling Point: DP-15			
Investigator(s): CM, JM, RW		Sectio	Section, Township, Range: N/A					
Landform (hillslope, terrace, etc	.); Delta / Fastland	Local r	elief (concave, convex.	none): concave	Slop	e (%): 2		
Subregion (I RR or MI RA). Ou	ter Coastal Plain (LRR T)	Lat: 29.6559 N	Long: 8	39.9713 W	Dat	tum: NAD 83		
Soil Map Unit Name: Cancien	ne silty clay loam			NWI classific	ation: Upland			
Are climatic / hydrologic conditio	ons on the site typical for t	his time of year? Ye	x X No	(If no, explain in R	emarks )			
Are Vegetation Soil	or Hydrology X	significantly disturb	ed? Are "Norma	(in no, explain in ra	resent? Ves	No X		
Are Vegetation, Soil	, or Hydrology		tio? (If pooded a		resent: 103	NO		
					s in itematics.)			
SUMMARY OF FINDING	S – Attach site ma	p showing sam	pling point location	ons, transects	, important fe	atures, etc.		
Hydrophytic Vegetation Prese	nt? Yes X	No	le the Sampled Area					
Hydric Soil Present?	Yes	No <u>X</u>	within a Wetland?	Ves	No X			
Wetland Hydrology Present?	Yes	No <u>×</u>		103		-		
Remarks:								
Between river levee	and Highway 23.	Hurricane Isa	ac has resulted	in atypical c	onditions a	nd		
hydrologic indicators	<b>;</b> .							
HYDROLOGY								
Wetland Hydrology Indicato	irs:			Secondary Indica	tors (minimum of	two required)		
Primary Indicators (minimum of	of one is required: check a	II that apply)		Surface Soil (	Cracks (B6)	<u>two requiredy</u>		
Surface Water (A1)		ic Fauna (B13)		Sparsely Ved	etated Concave S	Surface (B8)		
High Water Table (A2)	Marl [	Deposits (B15) <b>(LRR</b>	U)	Drainage Pat	terns (B10)			
Saturation (A3)	Hydrc	gen Sulfide Odor (C	1)	Moss Trim Li	nes (B16)			
Water Marks (B1)	Oxidiz	zed Rhizospheres al	ong Living Roots (C3)	Dry-Season \	Water Table (C2)			
Sediment Deposits (B2)	Prese	nce of Reduced Iror	n (C4)	Crayfish Burr	ows (C8)			
Drift Deposits (B3)		nt Iron Reduction in	Tilled Soils (C6)	Saturation Vi	sible on Aerial Im	agery (C9)		
Algal Mat or Crust (B4)	L Thin M	Muck Surface (C7)		Geomorphic	Position (D2)			
Iron Deposits (B5)	L Other	(Explain in Remarks	6)	Shallow Aqui	tard (D3)			
Inundation Visible on Aeri	al Imagery (B7)			FAC-Neutral	Test (D5)			
[✓] Water-Stained Leaves (B	9)			Sphagnum m	oss (D8) <b>(LRR T</b> ,	, U)		
Surface Water Present?		Penth (inches):						
Water Table Present?	Yes No X [	Pepth (inches):						
Saturation Present?	Yes No X [	Pepth (inches):	Wetland H	lydrology Presen	t? Yes	No X		
(includes capillary fringe)								
Describe Recorded Data (stre	am gauge, monitoring wel	l, aerial photos, prev	vious inspections), if ava	ilable:				
Aeriais: 2010 ESRI	& USDA							
Aturical situation fol								
Atypical situation, fai	ise positive indica	itors due to ni	urricane.					

	Absolute	Dominant	Indicator	Dominance Test worksheet:	
<u>Tree Stratum</u> (Plot size: <u>30 radius</u> )	<u>% Cover</u>	<u>Species?</u>	<u>Status</u>	Number of Dominant Species	
	10			That Are OBL, FACW, or FAC: _/ (A	A)
2. <u>Saint Ingra</u>	20	v	FAC	Total Number of Dominant	
	20	<u> </u>	140	Species Across All Strata: 8 (E	B)
4			<u> </u>	Percent of Dominant Species	
5				That Are OBL, FACW, or FAC: 88 (/	A/B)
6			<u> </u>	Prevalence Index worksheet:	
/				Total % Cover of: Multiply by:	
8	45	Tatal Oa		OBL species x 1 =	
50% of total array 23		= Total Cov	or o	FACW species x 2 =	
50% of total cover: <u>25</u>	20% of	total cover:		FAC species x 3 =	
Sapling/Shrub Stratum (Plot size: 50 radius )	30	v	FAC	FACU species x 4 =	
1. <u>Acer negunuo</u>	20	v	FAC	UPL species x 5 =	
2	10	1 N	FAC	Column Totals: (A)	(B)
3. Thadica sebilera	10		FAC		(_)
4			<u> </u>	Prevalence Index = B/A =	
5				Hydrophytic Vegetation Indicators:	
6				1 - Rapid Test for Hydrophytic Vegetation	
7					
8				□ 3 - Prevalence Index is $\leq 3.0^{1}$	
	60	= Total Cov	er	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
50% of total cover: 30	20% of	total cover	12		
Herb Stratum (Plot size: 30')				<sup>1</sup> Indicators of hydric soil and wetland hydrology mus	st
1. Brunnichia ovata	3	Y	FACW	be present, unless disturbed or problematic.	
2. Ampelopis arborea	2	Y	FAC	Definitions of Four Vegetation Strata:	
3				<b>Tree</b> – Woody plants, excluding vines, 3 in (7.6 cm	n) or
4				more in diameter at breast height (DBH), regardless	s of
5				height.	
6				Sapling/Shrub - Woody plants, excluding vines, le	ess
7				than 3 in. DBH and greater than 3.28 ft (1 m) tall.	
8				Herb - All berbaceous (non-woody) plants, regardly	000
9				of size, and woody plants less than 3.28 ft tall.	000
10.				Weedwaine All weedwainee greater than 2.29 ft	in
11.				height.	In
12.					
	5	= Total Cov	er		
50% of total cover: <sup>2.5</sup>	20% of	total cover	1		
Woody Vine Stratum (Plot size: 30'			·		
Ampelopsis arborea	5	Y	FAC		
2					
3					
0					
			<u> </u>		
5	5	Tatal Car		Hydrophytic	
50% of total answer 2.5	000/ -f		. 1	Present? Yes $\underline{X}$ No	
	20% of	total cover:	<u> </u>		
Remarks: (if observed, list morphological adaptations bein	ow).				

SOIL

Profile Desc	ription: (Describe	e to the dep	th needed to docu	ment the i	indicato	r or confirr	n the absence	of indicators.)
Depth	epth Matrix Redox Features							
(inches)	Color (moist)	<u>or (moist) % Color (moist) % Type' Loc<sup>2</sup></u>			Texture	Remarks		
0-16	10YR 4/6	99	10YR 4/6	1	С	Μ	Silty clay	
					·			
					·			
<sup>1</sup> Type: C=Co	oncentration, D=De	pletion, RM=	Reduced Matrix, M	S=Masked	d Sand G	rains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
Hydric Soil	Indicators: (Appli	cable to all	LRRs, unless othe	rwise not	ed.)		Indicators	for Problematic Hydric Soils <sup>3</sup> :
Histosol	(A1)		Polyvalue Be	elow Surfa	ce (S8) <b>(</b>	LRR S, T,	<b>U)</b> 🛛 1 cm M	luck (A9) <b>(LRR O)</b>
Histic Ep	bipedon (A2)		Thin Dark Su	urface (S9		, T, U)	2 cm M	luck (A10) (LRR S)
Black Hi	stic (A3)		Loamy Muck	y Mineral	(F1) (LR	R 0)		ed Vertic (F18) (outside MLRA 150A,B)
Hydroge	n Sulfide (A4)		Loamy Gley	ed Matrix (	(F2)		D Piedmo	ont Floodplain Soils (F19) (LRR P, S, T)
Stratified	Layers (A5)		Depleted Ma	atrix (F3)			🔲 Anoma	lous Bright Loamy Soils (F20)
Organic	Bodies (A6) (LRR	P, T, U)	Redox Dark	Surface (F	-6)		(MLR	RA 153B)
5 cm Mu	icky Mineral (A7) (L	.RR P, T, U)	Depleted Da	rk Surface	e (F7)		Red Pa	arent Material (TF2)
Muck Pr	esence (A8) (LRR	U)	Redox Depr	essions (F	8)		Very SI	hallow Dark Surface (TF12)
1 cm Mu	ick (A9) (LRR P, T)		Marl (F10) (I	LRR U)			Other (	Explain in Remarks)
Depleted	d Below Dark Surfa	ce (A11)	Depleted Oc	hric (F11)	(MLRA	151)		
Thick Da	ark Surface (A12)		Iron-Mangar	nese Mass	es (F12)	(LRR O, P	, T) <sup>3</sup> Indica	ators of hydrophytic vegetation and
Coast Pi	rairie Redox (A16)	MLRA 150	A) 🔲 Umbric Surfa	ace (F13) (	(LRR P,	T, U)	wetl	and hydrology must be present,
Sandy M	lucky Mineral (S1)	(LRR O, S)	Delta Ochric	(F17) <b>(ML</b>	RA 151)	)	unle	ess disturbed or problematic.
Sandy G	leyed Matrix (S4)		Reduced Ve	rtic (F18) (	(MLRA 1	50A, 150B	)	
Sandy R	edox (S5)		Piedmont Fl	oodplain S	oils (F19	) (MLRA 1	49A)	
Stripped	Matrix (S6)		Anomalous I	Bright Loai	my Soils	(F20) (MLF	RA 149A, 153C,	153D)
Dark Su	rface (S7) (LRR P,	S, T, U)						
Restrictive I	_ayer (if observed	):						
Туре:								
Depth (ind	ches):						Hydric Soil	Present? Yes No X
Remarks:	,						-	
R	edox concen	trations	not common.					


Project/Site: MBSD	City/County: Plaque	emines	Sampling Date: 11/12/12
Applicant/Owner: CPRA / Midway Cattle Ranch		State: LA	Sampling Point: DP-16
Investigator(s): CM, JM, RW	Section, Township, F	Range: N/A	
Landform (hillslope, terrace, etc.): Delta / Fastland	Local relief (concave	, convex, none): none	Slope (%): 1
Subregion (LRR or MLRA): Outer Coastal Plain (LRR T) Lat: 29.	.6475 N	Long: 89.9843 W	Datum: NAD 83
Soil Map Unit Name: Harahan clay		NWI classific	cation: PEM1C
Are climatic / hydrologic conditions on the site typical for this time o	of year? Yes X No	(If no, explain in F	(emarks.)
Are Vegetation X, Soil X, or Hydrology X significa	ntly disturbed? Are	e "Normal Circumstances"	present? Yes No X
Are Vegetation, Soil, or Hydrology naturally	problematic? (If	needed, explain any answe	ers in Remarks.)
SUMMARY OF FINDINGS – Attach site map show	ing sampling point	locations, transects	, important features, etc.
Underschutig Verstetige Descent?			
Hydrophylic Vegetation Present? Yes X No	Is the Sample	ed Area	
Wetland Hydrology Present? Yes X No	within a Wetl	and? Yes <u>^</u>	No
Remarks:			
Pasture between canal and levee adjacent t	o marsh. Hurrica	ne Isaac has resu	Ited in atypical
conditions and hydrologic indicators. Cattle t	trampling evident	t.	
HYDROLOGY			
Wetland Hydrology Indicators:		Secondary Indica	ators (minimum of two required)
Primary Indicators (minimum of one is required; check all that app	oly)		Cracks (B6)
Surface Water (A1)	(B13)	Sparsely Ve	getated Concave Surface (B8)
High Water Table (A2) I Marl Deposits (	B15) <b>(LRR U)</b>	Drainage Pa	itterns (B10)
Saturation (A3) Hydrogen Sulfic	de Odor (C1)		Ines (B16)
	spheres along Living Roc	$\Box$ Dry-Season	
	duction in Tilled Soils (Cf	S) Saturation V	isible on Aerial Imageny (C9)
Algal Mat or Crust (B4)	ace (C7)		Position (D2)
$\square$ Iron Deposits (B5) $\square$ Other (Explain i	in Remarks)	Shallow Aqu	litard (D3)
Inundation Visible on Aerial Imagery (B7)	· · ,	FAC-Neutral	Test (D5)
Water-Stained Leaves (B9)		🔲 Sphagnum r	noss (D8) <b>(LRR T, U)</b>
Field Observations:			
Surface Water Present? Yes No X Depth (incl	hes):		
Water Table Present? Yes X No Depth (incl	hes): <u>12</u>		
Saturation Present? Yes X No Depth (incl (includes capillary fringe)	hes): <u>3</u>	Vetland Hydrology Presei	nt? Yes X No
Describe Recorded Data (stream gauge, monitoring well, aerial pl	hotos, previous inspection	ns), if available:	
Aerials: 2007 Pictometry, 2010 ESRI & US	SDA		
Remarks:			
Although atypical situation due to hurricane,	area appears to	have hydrology u	nder normal
conditions.			

	Absolute	Dominant	Indicator	Dominance Test worksheet:	
Tree Stratum (Plot size: <u>30 radius</u> ) 1	% Cover	Species?	Status	Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A	٩)
2				Total Number of Dominant	
3				Species Across All Strata: 1 (B	3)
4					
5				That Are OBL, FACW, or FAC: (A	√B)
6			. <u> </u>	Brovalance Index workshoot:	
7				Total % Cover of: Multiply by:	
8					
	0	= Total Co	/er		
50% of total cover:	20% of	total cover	:	FAC w species x 2 =	
Sapling/Shrub Stratum (Plot size: 30' radius )				FAC species X 3 =	
1				FACU species X 4 =	
2				UPL species x 5 =	
3				Column Totals: (A) (	(B)
4				Prevalence Index – B/A –	
5.				Hydrophytic Vogetation Indicators	
6.					
7					
0				$\square$ 2 - Dominance Test is >50%	
ö	0	Total Car		☐ 3 - Prevalence Index is ≤3.0	
500/ - ( total			ver	Image: Image: Image: Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
50% of total cover:	20% 01	total cover	:		
Herb Stratum (Plot size: 30 radius )	-	X	FAOL	<sup>1</sup> Indicators of hydric soil and wetland hydrology mus	st
1. Cynodon dactylon	5	Y	FACU	be present, unless disturbed or problematic.	
2				Definitions of Four Vegetation Strata:	
3				Tree – Woody plants, excluding vines, 3 in. (7.6 cm)	) or
4				more in diameter at breast height (DBH), regardless	of
5				height.	
6				Sapling/Shrub – Woody plants, excluding vines, les	SS
7				than 3 in. DBH and greater than 3.28 ft (1 m) tall.	
8				Herb – All berbaceous (non-woody) plants, regardle	200
9.				of size, and woody plants less than 3.28 ft tall.	,00
10.				We advising Allowed wines proton then 2.20 ft i	
11.				height.	n
12					
··	5	- Total Co	/er		
50% of total cover: 2.5	20% of	total cover	- 1		
Weedy Vine Stretum (Plet size: 30' radius	2070 01				
<u>woody vine Stratum</u> (Plot size. <u></u>					
1					
2					
3					
4					
5				Hydrophytic	
	0	= Total Co	/er	Vegetation Present? Ves X No	
50% of total cover:	20% of	total cover	:		
Remarks: (If observed, list morphological adaptations bel	ow).				
Herb stratum with dead Cynodon dacty	lon and	dead P	ersicari	a hydropiperoides (30% cover)	
Hurricane disturbed vegetation so with	other in	dicatore	s hydro	nhytic vegetation assumed	
I I I I I I I I I I I I I I I I I I I		aloatora	, nyuru		

Profile Desc	ription: (Describe	to the dep	th needed to docur	nent the	indicator	or confirm	n the absence	of indicators.)
Depth	Matrix		Redo	x Feature	es			
(inches)	Color (moist)	%	Color (moist)	%	Type'	Loc <sup>2</sup>	<u> </u>	Remarks
0-2	10YR 3/1	100					clay	
2-6	7.5YR 2.5/2	100					clay	
6-10	10YR 4/1	100					clay	
10-14	10YR 4/1	98	10YR 3/6	2	С	Μ	clay	
		_						
				· · · · · · · · · · · · · · · · · · ·				
<sup>1</sup> Turney 0, 0			Deduced Metric M	- Maalua			21	
Hydric Soil	ndicators: (Applic	able to all	LRRs, unless other	s=iviaske	ted.)	ains.	Indicators	for Problematic Hydric Soils <sup>3</sup> :
Histosol Histic Ep Black Hi Hydroge Stratifiec Organic 5 cm Mu Muck Pr 1 cm Mu Depleted Thick Da Coast Pr Sandy M Sandy G Sandy R	(A1) pipedon (A2) stic (A3) n Sulfide (A4) I Layers (A5) Bodies (A6) (LRR F cky Mineral (A7) (LI esence (A8) (LRR V, ck (A9) (LRR P, T) d Below Dark Surface (A12) tarite Redox (A16) (I lucky Mineral (S1) ( lucky Mineral (S4) edox (S5) Matrix (S6) face (C3) (LRP P, C)	P, T, U) RR P, T, U) J) Ee (A11) MLRA 150, LRR O, S)	<ul> <li>Polyvalue Be</li> <li>Thin Dark Su</li> <li>Loamy Muck</li> <li>Loamy Gleye</li> <li>Depleted Ma</li> <li>Redox Dark Su</li> <li>Depleted Data</li> <li>Redox Depresion</li> <li>Marl (F10) (L</li> <li>Depleted Ocl</li> <li>Iron-Mangan</li> <li>Umbric Surfa</li> <li>Delta Ochric</li> <li>Reduced Ver</li> <li>Piedmont Flo</li> <li>Anomalous E</li> </ul>	elow Surfa inface (SS y Mineral ed Matrix trix (F3) Surface ( rk Surface ( rk Surface essions (F <b>.RR U)</b> hric (F11) ese Mass ace (F13) (F17) <b>(M</b> rtic (F18) bodplain S Bright Loa	ace (S8) ( ) (LRR S (F1) (LRI (F2) F6) e (F7) F8) (MLRA 1 ses (F12) (LRR P, T LRA 151) (MLRA 15 Soils (F19) my Soils	51) (LRR O, P) (LRR O, P) (LRR O, P) (J (MLRA 14 (F20) (MLF	J)       □       1 cm M         2 cm M       2 cm M         □       Reduce         □       Piedmod         □       Anoma         (MLF         □       Red Pa         □       Very Si         ☑       Other (         49A)       31ndic         (A 149A, 153C,	Muck (A9) <b>(LRR O)</b> Muck (A10) <b>(LRR S)</b> ed Vertic (F18) <b>(outside MLRA 150A,B)</b> ont Floodplain Soils (F19) <b>(LRR P, S, T)</b> alous Bright Loamy Soils (F20) <b>RA 153B)</b> arent Material (TF2) hallow Dark Surface (TF12) 'Explain in Remarks) ators of hydrophytic vegetation and land hydrology must be present, ess disturbed or problematic.
Dark Su	face (S7) (LRR P, S	S, T, U)						
Type.	ayer (il observed)	•						
Depth (inc	ches):						Hvdric Soil	Present? Yes <sup>X</sup> No
Remarks:	,							
Remarks: M CC	apped as hydoncentrations	dric soil. for hyd	Likely past a ric soil indicat	agricul ors.	tural di	sturbar	nce has rer	moved typical redox



Project/Site: MBSD	City/County: Plaquemines		Sampling Date: 1	1/12/12
Applicant/Owner: CPRA / Midway Cattle Ranch	Si	ate: LA	Sampling Point: D	)P-17
Investigator(s): RW,CM,JM	Section, Township, Range: N/A	<b>N</b>		
Landform (hillslope, terrace, etc.): Delta / Fastland	Local relief (concave, convex, n	<sub>one):</sub> none	Slope	(%): 1
Subregion (LRR or MLRA). Outer Coastal Plain (LRR T)	75 N Long: 89	.9846 W	Datu	". NAD 83
Soil Map Unit Name. Harahan clay	Long	NWI classifica	ation. Upland	
Are climatic / hydrologic conditions on the site typical for this time of y	ear? Yes X No (II		amarks )	
Are Vogotation $X$ Spil $X$ or Hydrology $X$ significantly	v disturbed? Are "Normal (i	ircumstancos" p	rocont? Voc	No X
Are Vegetation, Soil, or Hydrologysignificantly	volsubed: Ale Norman		esent: Tes	NO
SUMMARY OF FINDINGS – Attach site map showing	g sampling point location	is, transects,	important fea	tures, etc.
		-, ,	•	,
Hydrophytic Vegetation Present? Yes No X	Is the Sampled Area			
Hydric Soil Present? Yes X No	within a Wetland?	Yes	No	
Wetland Hydrology Present? Yes No				
Remarks.			to dia otunios	
Pasture between canal and levee adjacent to	marsn. Hurricane Isaa	c nas result	ted in atypica	l
conditions and hydrologic indicators. Slight hig	on between old agricul	tural ditches	5.	
HYDROLOGY				
Wetland Hydrology Indicators:	<u></u>	Secondary Indicat	ors (minimum of tw	vo required)
Primary Indicators (minimum of one is required; check all that apply)		Surface Soil C	Cracks (B6)	
Surface Water (A1)	3)	Sparsely Veg	etated Concave Su	urface (B8)
High Water Table (A2)	5) (LRR U)	Drainage Patt	terns (B10)	
Saturation (A3)	Odor (C1)	Moss Trim Lir	nes (B16)	
U Water Marks (B1)	neres along Living Roots (C3)	Dry-Season V	Vater Table (C2)	
Sediment Deposits (B2)	ced Iron (C4)	Crayfish Burro	ows (C8)	
Drift Deposits (B3)	ction in Tilled Soils (C6)	Saturation Vis	sible on Aerial Imag	gery (C9)
Algal Mat of Crust (B4)	e(07)		Position (D2) $(D3)$	
Inundation Visible on Aerial Imagery (B7)		FAC-Neutral	Test (D5)	
Water-Stained Leaves (B9)	j	Sphagnum m	oss (D8) <b>(LRR T, L</b>	J)
Field Observations:				,
Surface Water Present? Yes <u>No X</u> Depth (inches	3):			
Water Table Present? Yes No X Depth (inches	3):			
Saturation Present? Yes <u>No X</u> Depth (inches	s): Wetland Hy	drology Present	t? Yes	No <u>X</u>
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial phot	os, previous inspections), if availa	able:		
Aerials: 2007 Pictometry, 2010 ESRI & USE	)A			
Remarks:				
Atypical situation, false indicators due to hurri	cane.			

	Absolute	Dominant Indicator	Dominance Test worksheet:
<u>Tree Stratum</u> (Plot size: <u>30' radius</u> ) 1.	<u>% Cover</u>	Species? Status	Number of Dominant Species That Are OBL, FACW, or FAC: <sup>0</sup> (A)
2.	_		
3.			I otal Number of Dominant Species Across All Strata: 0 (B)
4.			
5			Percent of Dominant Species
6			That Are OBL, FACW, of FAC: $\underline{\circ}$ (A/B)
7			Prevalence Index worksheet:
0			Total % Cover of:Multiply by:
0	0	Tatal Causa	OBL species x 1 =
500/ // /		= Total Cover	FACW species x 2 =
50% of total cover:	20% of	total cover:	FAC species x 3 =
Sapling/Shrub Stratum (Plot size: 30 Tadius )			FACIL species x 4 -
1			
2			OFL species
3			Column lotais: (A) (B)
4			Prevalence Index = $B/A$ =
5.			Hydrophytic Vegetation Indicators:
6.			1 Popid Test for Hydrophytic Vegetation
7			
8			
0	0	Total Cover	$\square$ 3 - Prevalence Index is $\leq 3.0^{\circ}$
			Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover:	20% of	total cover:	
Herb Stratum (Plot size: 30 radius ) 1. Cynodon dactylon	2	N FACU	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2.			Definitions of Four Vegetation Strata:
			<b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or
4			more in diameter at breast height (DBH), regardless of height
5			noight
67			<b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8			
0		·	Herb – All herbaceous (non-woody) plants, regardless
5			
10			Woody vine – All woody vines greater than 3.28 ft in
11			height.
12		<u> </u>	
	2	= Total Cover	
50% of total cover:	20% of	total cover:	
Woody Vine Stratum (Plot size: <u>30' radius</u> )			
1			
2			
3			
4.			
5			Ludrank, tia
	0	- Total Cover	nyarophytic Vegetation
E0% of total cover			Present? Yes No $\frac{X}{X}$
Demonium (If a beau and link as a bala size is the last if	20% 0I		
Remarks: (IT observed, list morphological adaptations bel	OW).	<i>i i i</i>	
Herb stratum also with dead Cynodon	dactylon	(95% cover) d	ue to hurricane disturbance.

	(				maioato			or maloutoroly	
Depth	Matrix	0/	Red	ox Featur	es Trans 1	1 2	Tantana	Description	
(inches)		%	Color (moist)	%	Type		<u> </u>	Remarks	
0-1	10YR 2/2						Organic		_
1-16	10YR 4/1	95	10YR 4/6	5	С	Μ	Clay		
		_		_	_				
									—
									_
<sup>1</sup> Type: C=Co	oncentration, D=Dep	oletion, RM	I=Reduced Matrix, N	IS=Maske	d Sand G	rains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.	
Hydric Soil I	ndicators: (Applic	able to al	I LRRs, unless othe	erwise no	ted.)		Indicators	for Problematic Hydric Soils <sup>3</sup> :	
Histosol	(A1)		Polyvalue B	elow Surf	ace (S8) (	LRR S, T, I	<b>U)  1 cm N</b>	Muck (A9) <b>(LRR O)</b>	
Histic Ep	pipedon (A2)		Thin Dark S	urface (S	9) (LRR S	, T, U)	2 cm N	Muck (A10) (LRR S)	
Black His	stic (A3)		Loamy Muc	ky Minera	l (F1) <b>(LR</b>	R 0)	L Reduc	ed Vertic (F18) (outside MLRA 150A,	B)
Hydroge	n Sulfide (A4)		Loamy Gley	ed Matrix	(F2)		L Piedm	ont Floodplain Soils (F19) (LRR P, S,	T)
Stratified	Layers (A5)		Depleted Ma	atrix (F3)				alous Bright Loamy Soils (F20)	
Organic	Bodies (A6) (LRR F	P, T, U)	Redox Dark	Surface	(F6)		(MLI	RA 153B)	
🔲 5 cm Mu	icky Mineral (A7) <b>(L</b>	RR P, T, U	) 🔲 Depleted Da	ark Surfac	e (F7)		Red P	arent Material (TF2)	
Muck Pre	esence (A8) <b>(LRR l</b>	J)	Redox Depr	essions (	F8)		U Very S	Shallow Dark Surface (TF12)	
🔲 1 cm Mu	ick (A9) (LRR P, T)		Marl (F10) <b>(</b>	LRR U)			U Other	(Explain in Remarks)	
Depleted	d Below Dark Surfac	ce (A11)	Depleted Oc	chric (F11	) <b>(MLRA</b>	151)			
Thick Da	ark Surface (A12)		Iron-Manga	nese Mas	ses (F12)	(LRR O, P	, <b>T)</b> <sup>3</sup> Indic	cators of hydrophytic vegetation and	
Coast Pr	rairie Redox (A16) (	MLRA 150	🗚) 📃 Umbric Surf	ace (F13)	(LRR P,	T, U)	wet	tland hydrology must be present,	
Sandy M	lucky Mineral (S1) <b>(</b>	LRR O, S)	Delta Ochrid	c (F17) <b>(</b> №	LRA 151	)	unl	ess disturbed or problematic.	
Sandy G	leyed Matrix (S4)		Reduced Ve	ertic (F18)	(MLRA 1	50A, 150B)	)		
Sandy R	edox (S5)		Piedmont Fl	oodplain	Soils (F19	) <b>(MLRA 1</b> 4	49A)		
Stripped	Matrix (S6)		Anomalous	Bright Lo	amy Soils	(F20) <b>(MLF</b>	RA 149A, 153C	s, 153D)	
Dark Sur	rface (S7) <b>(LRR P,</b>	S, T, U)							
Restrictive L	_ayer (if observed)	:							
Type:	_ayer (if observed)	:							
Type: Depth (inc	Layer (if observed)	:					Hydric Soil	Present? Yes X No	
Restrictive L Type: Depth (inc Remarks:	_ayer (if observed)	:					Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	ayer (if observed)	: dric soi		agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	ayer (if observed)	: dric soi	. Likely past	agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	ayer (if observed)	: dric soi	. Likely past	agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	apped as hyd	: dric soi	. Likely past	agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	ayer (if observed)	: dric soi	Likely past	agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	apped as hyd	: dric soi	Likely past	agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	apped as hyd	: dric soi	. Likely past	agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	apped as hyd	: dric soi	. Likely past	agricu	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	apped as hyd	: dric soil	Likely past	agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	apped as hyd	: dric soi	. Likely past	agricu	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	apped as hyd	: dric soi	. Likely past	agricu	tural d	isturbar	Hydric Soil	Present? Yes X No	
Restrictive L Type: Depth (inc Remarks: M	apped as hyd	: dric soil	. Likely past	agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	apped as hyd	: dric soil	. Likely past	agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	apped as hyd	: dric soi	. Likely past	agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	ayer (if observed)	: dric soi	Likely past	agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	apped as hyd	: dric soi	Likely past	agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	
Restrictive L Type: Depth (inc Remarks: M	apped as hyd	: dric soi	. Likely past	agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	apped as hyd	: dric soi	. Likely past	agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	apped as hyd	: dric soil	. Likely past	agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	apped as hyd	: dric soil	. Likely past	agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	apped as hyd	: dric soil	. Likely past	agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	apped as hyd	: dric soil	. Likely past	agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	apped as hyd	: dric soil	. Likely past	agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	_
Restrictive L Type: Depth (inc Remarks: M	apped as hyd	: dric soil	. Likely past	agricul	tural d	isturbar	Hydric Soil	Present? Yes X No	_



Project/Site: MBSD	City/County: Plaquemines	Sampling Date: 11/12/12
Applicant/Owner: CPRA / Midway Cattle Ranch	St	ate: <u>LA</u> Sampling Point: <u>DP-18</u>
Investigator(s): CM, JM, RW	Section, Township, Range: <u>N/A</u>	A Contraction of the second seco
Landform (hillslope, terrace, etc.): Delta / Fastland	Local relief (concave, convex, no	one): <u>none</u> Slope (%): <u>1</u>
Subregion (LRR or MLRA): Outer Coastal Plain (LRR T) Lat: 29.64	174 W Long: 89	.9848 W Datum: NAD 83
Soil Map Unit Name: Harahan clay		NWI classification: PEM1C
Are climatic / hydrologic conditions on the site typical for this time of y	ear? Yes X No (If	no, explain in Remarks.)
Are Vegetation $X$ , Soil X, or Hydrology X significantly	y disturbed? Are "Normal C	ircumstances" present? Yes No X
Are Vegetation , Soil , or Hydrology naturally p	oblematic? (If needed, ex	blain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing	g sampling point location	s, transects, important features, etc.
Hydrophytic Vegetation Present? Yes <u>~ No</u> No	Is the Sampled Area	
Wetland Hydrology Present? Yes X No	within a Wetland?	Yes <u>×</u> No
Remarks:		
Pasture between canal and levee adjacent to	marsh. Hurricane Isaa	c has resulted in atypical
conditions and hydrologic indicators. Appears	lower than adjacent D	P-17.
HYDROLOGY		
Wetland Hydrology Indicators:	<u>S</u>	econdary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		Surface Soil Cracks (B6)
Surface Water (A1)	13)	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)	5) (LRR U)	Drainage Patterns (B10)
Saturation (A3)	Odor (C1)	Moss Trim Lines (B16)
Water Marks (B1)	neres along Living Roots (C3)	Dry-Season Water Table (C2)
Sediment Deposits (B2)	.ced Iron (C4)	Crayfish Burrows (C8)
Drift Deposits (B3)	ction in Tilled Soils (C6)	Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	∋ (C7)	Geomorphic Position (D2)
☐ Iron Deposits (B5) ☐ Other (Explain in I	Remarks)	Shallow Aquitard (D3)
Inundation Visible on Aerial Imagery (B7)     Water Stained Leaves (B0)	F	FAC-Neutral Test (D5)
Field Observations:	<u>_</u>	
Surface Water Present? Yes No X Depth (inches	s):	
Water Table Present? Yes No X Depth (inches	s):	
Saturation Present? Yes No X Depth (inches (includes capillary fringe)	s): Wetland Hy	drology Present? Yes <u>×</u> No
Describe Recorded Data (stream gauge, monitoring well, aerial phot	os, previous inspections), if availa	ble:
Aerials: 2007 Pictometry, 2010 ESRI & USL	)A	
Remarks:		
Although atypical situation due to hurricane, a	rea appears to have hy	ydrology under normal
conditions.		

	Absolute	Dominant Indi	cator Dominance Test worksheet:
Tree Stratum       (Plot size: 30 radius         1.      )	<u>% Cover</u>	Species? St	atus         Number of Dominant Species            That Are OBL, FACW, or FAC:         0         (A)
2			Total Number of Dominant
3			Species Across All Strata: (B)
4			Boroont of Dominant Spacing
5			—— That Are OBL, FACW, or FAC: <sup>0</sup> (A/B)
6			
7			Prevalence Index worksheet:
8			Total % Cover of:Multiply by:
	0	= Total Cover	OBL species x 1 =
50% of total cover:	20% of	total cover:	FACW species x 2 =
Sapling/Shrub Stratum (Plot size: 30' radius )			FAC species x 3 =
1.			FACU species x 4 =
2			UPL species x 5 =
3			Column Totals: (A) (B)
4			
5			Prevalence Index = B/A =
6		·	Hydrophytic Vegetation Indicators:
0		·	——   🛄 1 - Rapid Test for Hydrophytic Vegetation
/			2 - Dominance Test is >50%
8	0		3 - Prevalence Index is ≤3.0 <sup>1</sup>
	<u> </u>	= Total Cover	Image: Version Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
50% of total cover:	20% of	total cover:	
Herb Stratum (Plot size: 30 radius ) 1. Cynodon dactylon	10	Y FAG	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2.	_		Definitions of Four Vegetation Strata:
3.			
4.			Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast beight (DBH), regardless of
5			height.
6			Conting(Chaute M(contrate evolution visco loco
7.			than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8 9.			Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
10.			Weedy vine All woods vince greater than 2.20 ft in
11.	_		height.
12.			
	10	= Total Cover	
50% of total cover: <sup>5</sup>	20% of	total cover: 2	
Woody Vine Stratum (Plot size: 30' radius )			
1			
2			
3			
<u> </u>			—
۲		·	
- J	0	Total Course	Hydrophytic
500/ // /		= Total Cover	Present? Yes $\chi$ No
50% of total cover:	20% of	total cover:	
Remarks: (If observed, list morphological adaptations bel	ow).		
Herb stratum also with dead Cynodon	dactylon	and dead	Persicaria hydropiperoides (60% cover).
Hurricane disturbed vegetation so with	other in	dicators, h	/drophytic vegetation assumed.
		· •	

#### SOIL

FIOTIle Desc	ription: (Describe	to the dep	oth needed to docui	ment the	indicator	or confirm	n the absence	e of indicators.)
Depth (inchos)	Matrix	0/	Redo	x Featur			Toyturo	Bomorko
<u>(incries)</u> 0-2	7 5YR 3/1	70		70	Type	LUC	Clay	Remarks
0-2	7.511( 3/1						Olavi	Llink Onzenie Metter
2-5	7.5 YR 3/2					·	Clay	High Organic Matter
5-16	10 YR 4/1	95	7.5YR 3/4	5	С	Μ	Clay	
				_				
						·		
Type: C=Co	oncentration, D=Dep	letion, RM	=Reduced Matrix, M	S=Maske	d Sand G	ains.	<sup>2</sup> Location	: PL=Pore Lining, M=Matrix.
Hydric Soll	Indicators: (Applic	able to al	LRRS, unless othe	rwise no	ted.)			s for Problematic Hydric Solis":
	(A1)			elow Surf	ace (S8) <b>(I</b>	LRR S, T, U	) <u>□</u> 1 cm	Muck (A9) (LRR O)
	stic (A3)			v Minera	9) (LKK 3, 1 (F1) <b>(1 R</b>	1, U) ? (0)		ced Vertic (E18) (outside MI RA 150A B)
	en Sulfide (A4)			ed Matrix	(F2)	(0)		nont Floodplain Soils (F19) (LRR P. S. T)
Stratified	d Layers (A5)		Depleted Ma	atrix (F3)	( )		Anom	alous Bright Loamy Soils (F20)
Organic	Bodies (A6) (LRR P	, T, U)	Redox Dark	Surface	F6)		(ML	.RA 153B)
5 cm Mu	icky Mineral (A7) <b>(Li</b>	RR P, T, U	) 🔲 Depleted Da	rk Surfac	e (F7)			Parent Material (TF2)
Muck Pr	esence (A8) (LRR U	))		essions (	-8)			Shallow Dark Surface (TF12)
	ick (A9) <b>(LRR P, T)</b> d Bolow Dork Surfoo	o (A11)	<u> </u>	_RR U)		<b>E</b> 4)	U Other	(Explain in Remarks)
	ark Surface (A12)	e (ATT)		nnc (Fii Nese Mas	(IVILKA I		T) <sup>3</sup> Indi	cators of hydrophytic vegetation and
Coast Pi	rairie Redox (A16) (I	MLRA 150	A) Umbric Surfa	ace (F13)	(LRR P, 1	.U)	we	etland hydrology must be present,
Sandy N	lucky Mineral (S1) (I	LRR O, S)	Delta Ochric	(F17) <b>(M</b>	LRA 151)		un	less disturbed or problematic.
Sandy G	Bleyed Matrix (S4)		Reduced Ve	rtic (F18)	(MLRA 1	50A, 150B)	1	
Sandy R	Redox (S5)		Piedmont Flo	oodplain	Soils (F19)	(MLRA 14	I9A)	
	Motrix (SG)			Destaulter I au	Calle /	E20) /MI D	A 440A 4620	
			Anomalous E	Bright Loa	amy Solis (		A 149A, 1550	C, 153D)
Dark Su	rface (S7) (LRR P, S	S, T, U)		Bright Loa	amy Solis (	(IVILR	A 149A, 1550	C, 153D)
Stripped Dark Su Restrictive I	rface (S7) <b>(LRR P, S</b> Layer (if observed):	S, T, U)	Anomalous E				A 149A, 1550	C, 153D)
Stripped Dark Su Restrictive I Type:	rface (S7) (LRR P, S Layer (if observed):	<b>S, T, U)</b>	Anomalous E				Hudria Sai	
Stripped Dark Su Restrictive I Type: Depth (inc	rface (S7) (LRR P, S Layer (if observed): ches):	S, T, U) :	Anomaious E		amy Solis (	(WLR	Hydric Soi	c, 153D) il Present? Yes <u>X</u> No
Stripped Dark Su Restrictive I Type: Depth (ind Remarks:	rface (S7) (LRR P, S Layer (if observed): ches):	s, t, u)	Anomaious E		tural di	sturban	Hydric Soi	c, 153D) il Present? Yes <u>X</u> No
Stripped Dark Su Restrictive I Type: Depth (inc Remarks: M	rface (S7) (LRR P, S Layer (if observed): ches):	s, t, u)	 Likely past a	agricul	tural di	sturban	Hydric Soi	c, 153D) il Present? Yes X No
Stripped     Dark Su     Dark Su     Restrictive I     Type:     Depth (inc     Remarks:     M	rface (S7) (LRR P, S Layer (if observed): ches):	s, t, u)	Likely past a	agricul	tural di	sturban	Hydric Soi	c, 153D) il Present? Yes <u>×</u> No
Restrictive I Type: Depth (ind Remarks:	rface (S7) (LRR P, S Layer (if observed): 	s, t, u)	Likely past a		tural di	sturban	Hydric Soi	c, 153D) il Present? Yes <u>×</u> No
Control Stripped Stripped Dark Su Restrictive I Type: Depth (ind Remarks: M	lapped as hyc	s, t, u) : dric soil		agricul	tural di	sturban	Hydric Soi	c, 153D) il Present? Yes <u>X</u> No
Stripped Dark Su Restrictive I Type: Depth (ind Remarks: M	rface (S7) (LRR P, S Layer (if observed): ches):	s, t, u)	Likely past a	agricul	tural di	sturban	Hydric Soi	c, 153D) il Present? Yes <u>X</u> No
Control Stripped Stripped Dark Su Restrictive I Type: Depth (ind Remarks: M	rface (S7) (LRR P, S Layer (if observed): ches):	s, t, u)	Likely past a	agricul	tural di	sturban	Hydric Soi	c, 153D) il Present? Yes <u>×</u> No
Control Stripped Stripped Dark Su Restrictive I Type: Depth (ind Remarks: M	rface (S7) (LRR P, S Layer (if observed): 	s, t, u)	Likely past a	agricul	tural di	sturban	Hydric Soi	c, 153D) il Present? Yes <u>X</u> No
Control Stripped Stripped Dark Su Restrictive I Type: Depth (inc Remarks: M	rface (S7) (LRR P, S Layer (if observed): ches):	s, t, u)	Likely past a	agricul	tural di	sturban	Hydric Soi	c, 153D) il Present? Yes <u>X</u> No
Stripped Dark Su Restrictive I Type: Depth (ind Remarks: M	rface (S7) (LRR P, S Layer (if observed): ches):	s, t, u)	Likely past a	agricul	tural di	sturban	Hydric Soi	c, 153D) il Present? Yes <u>X</u> No
Stripped Dark Su Restrictive I Type: Depth (ind Remarks:	rface (S7) (LRR P, S Layer (if observed): ches): lapped as hyc	s, t, u)	Likely past a	agricul	tural di	sturban	Hydric Soi	c, 153D) il Present? Yes <u>×</u> No
Control Stripped Stripped Dark Su Restrictive I Type: Depth (ind Remarks: M	rface (S7) (LRR P, S Layer (if observed): 	s, t, u)	Likely past a	agricul	tural di	sturban	Hydric Soi	c, 153D) il Present? Yes <u>X</u> No
Control Stripped Stripped Dark Su Restrictive I Type: Depth (ind Remarks: M	rface (S7) (LRR P, S Layer (if observed): 	s, t, u)	Likely past a	agricul	tural di	sturban	Hydric Soi	c, 153D) il Present? Yes X No
Stripped Dark Su Restrictive I Type: Depth (ind Remarks: M	rface (S7) (LRR P, S Layer (if observed): ches): lapped as hyc	s, t, u)	Likely past a	agricul	tural di	sturban	Hydric Soi	:, 153D) il Present? Yes <u>X</u> No
Stripped Dark Su Restrictive I Type: Depth (ind Remarks: M	rface (S7) (LRR P, S Layer (if observed): ches): lapped as hyc	s, t, u)	Likely past a	agricul	tural di	sturban	Hydric Soi	:, 153D) il Present? Yes <u>×</u> No
Stripped Dark Su Restrictive I Type: Depth (ind Remarks: M	rface (S7) (LRR P, S Layer (if observed): 	s, t, u)	Likely past a	agricul	tural di	sturban	Hydric Soi	il Present? Yes X No
Control Stripped Control Dark Su Restrictive I Type: Depth (ind Remarks: M	rface (S7) (LRR P, S Layer (if observed): 	s, t, u)	Likely past a	agricul	tural di	sturban	Hydric Soi	I Present? Yes X No
Control Stripped Stripped Dark Su Restrictive I Type: Depth (ind Remarks: M	Inface (S7) (LRR P, S Layer (if observed): 	s, t, u)	Likely past a		tural di	sturban	Hydric Soi	I Present? Yes X No
Stripped Dark Su Restrictive I Type: Depth (ind Remarks: M	rface (S7) (LRR P, S Layer (if observed): 	s, t, u)	Likely past a	agricul	tural di	sturban	Hydric Soi	Il Present? Yes X No
Stripped Dark Su Restrictive I Type: Depth (ind Remarks: M	rface (S7) (LRR P, S Layer (if observed): ches):	s, т, υ)	Likely past a	agricul	tural di	sturban	Hydric Soi	Il Present? Yes X No
Stripped Dark Su Restrictive I Type: Depth (ind Remarks: M	rface (S7) (LRR P, S Layer (if observed): 	s, т, υ)	Likely past a	agricul	tural di	sturban	Hydric Soi	Il Present? Yes X No

Project/Site: MBSD	City/County: Plaquemines		Sampling Date: 11/12/12
Applicant/Owner: CPRA / Midway Cattle Ranch		State: LA	Sampling Point: DP-19
Investigator(s): CM, JM, RW	Section, Township, Range: <u></u>	N/A	
Landform (hillslope, terrace, etc.): Delta / Fastland	Local relief (concave, convex	, <sub>none):</sub> concave	Slope (%): 1
Subregion (LRR or MLRA): Outer Coastal Plain (LRR T)	at: 29.6469 N Long:	89.985 W	Datum: NAD 83
Soil Map Unit Name: Harahan clay		NWI classifica	ation: PEM1C
Are climatic / hydrologic conditions on the site typical for this	time of year? Yes X No	(If no, explain in Re	emarks.)
Are Vegetation $X$ , Soil $X$ , or Hydrology $X$ si	gnificantly disturbed? Are "Norm;	al Circumstances" pr	resent? Yes <u>No X</u>
Are Vegetation, Soil, or Hydrology na	aturally problematic? (If needed,	explain any answer	s in Remarks.)
SUMMARY OF FINDINGS – Attach site map s	showing sampling point locati	ons, transects,	important features, etc.
I hultanhutin Vantation Descent?			
Hydrophytic Vegetation Present? Yes X	Is the Sampled Area	×	
Wetland Hydrology Present? Yes X No	within a Wetland?	Yes <u>^</u>	No
Remarks:			
Pasture between canal and levee adjac	ent to marsh. Hurricane Isa	aac has result	ted in atypical
conditions and hydrologic indicators. Are	ea adiacent to old excavate	ed ditch.	
· · · · · · · · · · · · · · · · · · ·			
HYDROLOGY			
Wetland Hydrology Indicators:		Secondary Indicat	ors (minimum of two required)
Primary Indicators (minimum of one is required; check all th	nat apply)	Surface Soil C	Cracks (B6)
Surface Water (A1)	<sup>-</sup> auna (B13)	Sparsely Veg	etated Concave Surface (B8)
High Water Table (A2)	osits (B15) <b>(LRR U)</b>	Drainage Patt	erns (B10)
Saturation (A3)	า Sulfide Odor (C1)		nes (B16)
U Water Marks (B1)	Rhizospheres along Living Roots (C3)	Dry-Season V	Vater Table (C2)
	e of Reduced Iron (C4)	Crayfish Burro	ows (C8)
	on Reduction in Tilled Solis (C6)	Saturation Vis	Sible on Aerial Imagery (C9)
	x Sufface (C7)		ard $(D3)$
Inundation Visible on Aerial Imagery (B7)			aid (D5)
Water-Stained Leaves (B9)			oss (D8) <b>(LRR T. U)</b>
Field Observations:			
Surface Water Present? Yes No X Dep	th (inches):		
Water Table Present? Yes X No Dep	th (inches): <u>10</u>		
Saturation Present? Yes X No Dep (includes capillary fringe)	th (inches): 8 Wetland	Hydrology Present	? Yes X No
Describe Recorded Data (stream gauge, monitoring well, a	erial photos, previous inspections), if av	ailable:	
Aerials: 2007 Pictometry, 2010 ESRI 8	<u> SUSDA</u>		
Remarks:			
Although atypical situation due to hurric	ane, area appears to have	hydrology un	der normal
conditions.			

	Absolute	Dominant Indicator	Dominance Test worksheet		
Tree Stratum (Plot size: <u>30' radius</u> ) 1	% Cover	Species? Status	Number of Dominant Species That Are OBL, FACW, or FAC	<u> </u>	(A)
2			Total Number of Dominant		
3			Species Across All Strata:	0	(B)
4			Dereent of Deminent Species		
5			That Are OBL, FACW, or FAC	<u>):</u> 0	(A/B)
6					( )
7			Prevalence Index workshee	t:	
8			lotal % Cover of:	Multiply by:	_
	0	= Total Cover	OBL species	x 1 =	-
50% of total cover:	20% of	total cover:	FACW species	x 2 =	-
Sapling/Shrub Stratum (Plot size: 30' radius )			FAC species	x 3 =	-
1			FACU species	x 4 =	-
2			UPL species	x 5 =	-
3			Column Totals:	(A)	_ (B)
4			Prevalence Index - R/A	. —	
5			Hydronbytic Vegetation Ind	icators:	
6.				bytic Vagatation	
7.	_				
8.	_		$\square$ 2 - Dominance Test is >5	0.70	
	0	= Total Cover	$\square$ 3 - Prevalence index is $\leq$	5.0 Vocatotion <sup>1</sup> (Evaloi:	2)
50% of total cover:	20% of	total cover:		vegetation (Explain	1)
Herb Stratum (Plot size: 30' radius )					
1			be present, unless disturbed	vetland hydrology m	nust
2			Definitions of Four Vegetati	on Strata:	
2			Deminions of Four Vegetati	on onuta.	
3			Tree – Woody plants, excludin	ng vines, 3 in. (7.6 c	cm) or
4			height.	ight (DBH), regardle	ess of
5					
8			than 3 in DBH and greater th	ts, excluding vines, an 3 28 ft (1 m) tall	less
· · · · · · · · · · · · · · · · · · ·			and o in DBIT and groater in		
8			Herb – All herbaceous (non-w	loody) plants, regard	dless
9				, than 5.20 ft tail.	
10			Woody vine - All woody vine	s greater than 3.28	ft in
11			height.		
12					
		= Total Cover			
50% of total cover:	20% of	total cover:			
Woody Vine Stratum (Plot size: 30 radius )					
1					
2					
3					
4					
5			Hydrophytic		
	0	= Total Cover	Vegetation	N	
50% of total cover:	20% of	total cover:	Present? Yes <u>^</u>	NO	
Remarks: (If observed, list morphological adaptations be	low).		1		
Herb stratum with dead Persicaria hyd Hurricane disturbed vegetation so with	ropipero other in	ides (30% cove dicators, hydro	er) and Typha sp. (10 <sup>g</sup> phytic vegetation ass	% cover). umed.	

Depth	Matrix			ox Feature				
0-9	10YR 4/1	<u> </u>	7 5YR 4/6	<u>%</u> 10	<u>iype</u> C	<u>Loc</u> M	<u> </u>	Kemarks
9-12	10YR 2/1	100	7.0111 7/0				Silty_clay	
9-12	1011 2/1	100						
. <u> </u>								
<sup>1</sup> Type: C=C	oncentration, D=D	epletion, RM	=Reduced Matrix, N	IS=Maske	d Sand C	Grains.	<sup>2</sup> Location: PL	=Pore Lining, M=Matrix.
Hydric Soil	Indicators: (App	licable to all	LRRs, unless oth	erwise no	ted.)			Problematic Hydric Soils':
	(A1) Dipedon (A2)		D Thin Dark S	Selow Surf	ace (S8) a) <b>(I RR S</b>	(LRR S, I, S T II)		k (A9) (LRR O) k (A10) (LRR S)
Black Hi	istic (A3)			ky Minera	l (F1) <b>(LF</b>	R O)	Reduced	Vertic (F18) (outside MLRA 150A,B)
Hydroge	en Sulfide (A4)		Loamy Gley	ed Matrix	(F2)		Piedmont	Floodplain Soils (F19) (LRR P, S, T)
Stratified	d Layers (A5)		✓ Depleted M	atrix (F3)				us Bright Loamy Soils (F20)
	Bodies (A6) (LRR	P, I, U)	Redox Dark     Depleted D	(Sufface ( ark Surfac	F6) (F7)			153B) nt Material (TE2)
Muck Pr	esence (A8) (LRR	U)	Redox Dep	ressions (I	=8)		Very Shal	low Dark Surface (TF12)
1 cm Mu	uck (A9) (LRR P, T	.)	Marl (F10)	(LRR U)	,		Other (Ex	plain in Remarks)
	d Below Dark Surf	ace (A11)	Depleted O	chric (F11	) (MLRA	151)	<b>3</b>	
	ark Surface (A12) rairie Redox (A16)	(MI RA 150	Iron-Manga     Imbric Sur	nese Mas face (F13)	ses (F12) (I RR P	(LRR O, F T II)	<b>7, 1)</b> Indicato	ors of hydrophytic vegetation and
Sandy N	/ucky Mineral (S1)	(LRR O, S)	Delta Ochri	c (F17) <b>(M</b>	LRA 151	)	unless	disturbed or problematic.
Sandy C	Bleyed Matrix (S4)		Reduced V	ertic (F18)	(MLRA 1	50A, 150E	3)	
Sandy F	Redox (S5)		Piedmont F	loodplain	Soils (F19	9) <b>(MLRA</b> 1	149A)	
Dark Su	I Matrix (S6) Irface (S7) <b>(I RR P</b>	S T U)	Anomalous	Bright Loa	amy Soils	(F20) <b>(ML</b>	.RA 149A, 153C, 15	53D)
Restrictive	Layer (if observe	d):						
Туре:								
Depth (in	ches):						Hydric Soil Pre	esent? Yes X No
Remarks:		1.2			( I	P. C. J. J.		
IV	lapped as ny	/dric soil	. Likely past	agricul	tural o	listurba	nce.	



Project/Site: MBSD	City/County: Plaquemines	Sampling Date: <u>11/12/12</u>
Applicant/Owner: CPRA / Midway Cattle Ranch	State: LA	Sampling Point: DP-20
Investigator(s): CM, JM, RW	Section, Township, Range: <u>N/A</u>	
Landform (hillslope, terrace, etc.): Delta / Fastland	Local relief (concave, convex, none): <u>concave</u>	/e Slope (%): 1
Subregion (LRR or MLRA): Outer Coastal Plain (LRR T) Lat: 29.64	483 N Long: 89.9866 W	Datum: NAD 83
Soil Map Unit Name: Cancienne silty clay loam	NWI class	ification: PEM1C
Are climatic / hydrologic conditions on the site typical for this time of y	ear? Yes X No (If no, explain ir	n Remarks.)
Are Vegetation X, Soil X, or Hydrology X significantly	y disturbed? Are "Normal Circumstances	s" present? Yes No X
Are Vegetation , Soil , or Hydrology naturally p	roblematic? (If needed, explain any ans	wers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showin	g sampling point locations, transec	ts, important features, etc.
Hudrophytic Vegetation Present? Veg X		
Hydric Soil Present? Yes X No	Is the Sampled Area	
Wetland Hydrology Present? Yes X No	within a Wetland? Yes <u>^</u>	No
Remarks:		
Pasture between canal and levee adjacent to	marsh. Hurricane Isaac has res	ulted in atypical
conditions and hydrologic indicators.		
HYDROLOGY		
Wetland Hydrology Indicators:	Secondary Ind	icators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	) Surface S	oil Cracks (B6)
Surface Water (A1)	13) 📙 Sparsely \	/egetated Concave Surface (B8)
High Water Table (A2)	5) (LRR U)	Patterns (B10)
Saturation (A3)	Odor (C1)	Lines (B16)
Codiment Denesite (D2)	neres along Living Roots (C3) Dry-Seaso	on water Table (C2)
Drift Deposits (B3)	ction in Tilled Soils (C6) $\Box$ Saturation	Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	e (C7) $\bigcirc$ Geomorph	hic Position (D2)
Iron Deposits (B5)	Remarks) Shallow A	quitard (D3)
Inundation Visible on Aerial Imagery (B7)	FAC-Neut	ral Test (D5)
Water-Stained Leaves (B9)	🔲 Sphagnun	n moss (D8) <b>(LRR T, U)</b>
Field Observations:		
Surface Water Present? Yes No X Depth (inches	s):	
Water Table Present? Yes <u>No X</u> Depth (inches	s):	× ·
Saturation Present? Yes No X Depth (inches	s): Wetland Hydrology Pres	sent? Yes <u>×</u> No
Describe Recorded Data (stream gauge, monitoring well, aerial pho	tos, previous inspections), if available:	
Aerials: 2007 Pictometry, 2010 ESRI & USE	DA	
Remarks:		
Although atypical situation due to hurricane, a	rea appears to have hydrology	under normal
conditions.		

	Absolute Dominant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: <u>30' radius</u> )	<u>% Cover Species? Status</u>	Number of Dominant Species
1		That Are OBL, FACW, or FAC: $0$ (A)
2		Total Number of Dominant
3		Species Across All Strata: 0 (B)
4		Percent of Dominant Species
5		That Are OBL, FACW, or FAC: $0$ (A/B)
6.		()
7.		Prevalence Index worksheet:
8.		Total % Cover of: Multiply by:
	0 = Total Cover	OBL species x 1 =
50% of total cover:	20% of total cover:	FACW species x 2 =
Sopling/Shrub Stratum (Plot size: 30' radius		FAC species x 3 =
<u>Sapiing/Shrub Stratum</u> (Plot size. <u>60 radius</u> )		FACU species x 4 =
1		UPL species x 5 =
2		Column Totals: (A) (B)
3		
4		Prevalence Index = B/A =
5		Hydrophytic Vegetation Indicators:
6		1 - Rapid Test for Hydrophytic Vegetation
7		2 - Dominance Test is >50%
8.		$\square$ 2. Broycloppo Index is <2.0 <sup>1</sup>
	0 = Total Cover	$\square$ 3 - Flevalence index is $\leq 3.0$
50% of total cover:	20% of total cover:	
1.       2.       3.		be present, unless disturbed or problematic. Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in (7.6 cm) or
4 5		more in diameter at breast height (DBH), regardless of height.
6 7 8		Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
9		of size, and woody plants less than 3.28 ft tall.
11		<b>Woody vine</b> – All woody vines greater than 3.28 ft in height.
12.		
12	0 = Total Cover	
12	0 = Total Cover	
12	0 = Total Cover 20% of total cover:	
12	0 = Total Cover 20% of total cover:	
12	0 = Total Cover 20% of total cover:	
12.       50% of total cover:         50% of total cover:          Woody Vine Stratum (Plot size: 30' radius )       )         1.          2.          3.	0 = Total Cover 20% of total cover:	
12.       50% of total cover:         50% of total cover:	0 = Total Cover 20% of total cover:	
12.       50% of total cover:         50% of total cover:	0 = Total Cover 20% of total cover:	Hydrophytic
12.       50% of total cover:         50% of total cover:	0         = Total Cover           20% of total cover:	Hydrophytic Vegetation
12.       50% of total cover:         50% of total cover:	0         = Total Cover           20% of total cover:	Hydrophytic Vegetation Present? Yes X No

Profile Desc	ription: (Describe	to the dep	oth needed to docur	nent the	indicator	or confirm	n the absence	of indicato	ors.)	
Depth (inches)	Color (moist)	%	Color (moist)	<u>x Feature</u> %	S Type <sup>1</sup>	$l oc^2$	Texture		Remarks	
0-2	10YR 3/1	100					Clay	Organic	matter	
2-14	10YR 5/1	95	10YR 4/6	5	C	M	Clay			
<sup>1</sup> Type: C=Co	oncentration, D=Dep	letion, RM	=Reduced Matrix, M	S=Masker	d Sand G	rains.	<sup>2</sup> Location:	PL=Pore L	ining, M=Matr	ix.
Hydric Soil I	ndicators: (Applic	able to all	LRRs, unless othe	rwise not	ted.)		Indicators	for Proble	matic Hydric	Soils <sup>3</sup> :
Histosol	(A1)		Polyvalue Be	low Surfa	ace (S8) <b>(</b>	LRR S, T, I	U) 📙 1 cm N	/luck (A9) <b>(l</b>	LRR O)	
Histic Ep	ipedon (A2)		Thin Dark Su	urface (S9	) (LRR S	, T, U)		/luck (A10)	(LRR S)	
	stic (A3) n Sulfide (A4)			y Mineral	(F1) <b>(LR</b> ) (F2)	R 0)		ed Vertic (F	18) <b>(outside</b> l ain Soils (E19)	MLRA 150A,B)
	Lavers (A5)		Depleted Ma	trix (F3)	(1 2)			alous Bright	Loamv Soils	(F20)
Organic	Bodies (A6) (LRR P	, T, U)	Redox Dark	Surface (F	F6)		(MLI	RA 153B)	,	( - )
5 cm Mu	cky Mineral (A7) <b>(Lf</b>	₹R P, T, U	) 🔲 Depleted Da	rk Surface	e (F7)			arent Mater	ial (TF2)	
Muck Pro	esence (A8) (LRR U	)		essions (F	-8)			hallow Darl	k Surface (TF1	12)
	ck (A9) <b>(LRR P, T)</b> I Below Dark Surfac	e (A11)	Depleted Oc	<b>.RR U)</b> hric (F11)	(MIRA 1	(51)	<u> </u>	(Explain in I	Remarks)	
Thick Da	rk Surface (A12)	0 (/11)	Iron-Mangan	ese Mass	ses (F12)	(LRR O, P,	, T) <sup>3</sup> India	ators of hyd	drophytic vege	tation and
Coast Pr	airie Redox (A16) (I	/LRA 150	A) 🔲 Umbric Surfa	ace (F13)	(LRR P,	Г, U)	wet	land hydrol	ogy must be p	resent,
Sandy M	lucky Mineral (S1) (I	_RR O, S)	Delta Ochric	(F17) <b>(MI</b>	LRA 151)		unl	ess disturbe	ed or problemation	atic.
Sandy G	leyed Matrix (S4)		Reduced Ver     Piedmont El	rtic (F18) ( podplain S	(MLRA 1: Soile (E19	50A, 150B) (MI PA 1/	) 19A)			
Stripped	Matrix (S6)		Anomalous E	Bright Loa	mv Soils	(F20) (MLF	-37) RA 149A. 153C	. 153D)		
Dark Sur	face (S7) (LRR P, S	δ, T, U)		3	<b>,</b>	· · / <b>·</b>		,,		
Restrictive L	ayer (if observed):									
Туре:									V	
Depth (inc	ches):						Hydric Soil	Present?	Yes X	No
Remarks:	koly post ogri	oulturo								
LI	kely past ayri	cultura	i uistuibance.							



Project/Site: MBSD	City/County: Plaquemir	nes	Sampling Date: 11/12/12
Applicant/Owner: CPRA / Midway Cattle Ranch		State: LA	Sampling Point: DP-21
Investigator(s): CM, JM, RW	Section, Township, Rang	<sub>le: N/A</sub>	
Landform (hillslope, terrace, etc.): Delta / Fastland	Local relief (concave, cor	nvex, none): concave	Slope (%): 1
Subregion (LRR or MLRA): Outer Coastal Plain (LRR T) La	29.6452 N Lo	<sub>ng:</sub> 89.9878 W	Datum: NAD 83
Soil Map Unit Name: Westwego clay		NWI classifica	ation: PEM1C
Are climatic / hydrologic conditions on the site typical for this	ime of year? Yes X No	(If no, explain in Re	emarks.)
Are Vegetation $X$ , Soil $X$ , or Hydrology $X$ sig	nificantly disturbed? Are "N	ormal Circumstances" pi	resent? Yes No X
Are Vegetation, Soil, or Hydrology na	urally problematic? (If need	ded, explain any answer	s in Remarks.)
SUMMARY OF FINDINGS – Attach site map s	howing sampling point loc	cations, transects,	important features, etc.
Hudrophytic Vegetation Brocont? Veg X			
Hydric Soil Present? Yes X No	Is the Sampled A	v v	
Wetland Hydrology Present? Yes X No	within a Wetland	? Yes <u>^</u>	No
Remarks:			
Pasture between canal and levee adjace	ent to marsh. Hurricane	Isaac has result	ted in atypical
conditions and hydrologic indicators.			
HYDROLOGY			
Wetland Hydrology Indicators:		Secondary Indicat	ors (minimum of two required)
Primary Indicators (minimum of one is required; check all the	at apply)	Surface Soil 0	Cracks (B6)
Surface Water (A1)	auna (B13)	Sparsely Veg	etated Concave Surface (B8)
High Water Table (A2)	osits (B15) <b>(LRR U)</b>	Drainage Pati	terns (B10)
Saturation (A3)	Sulfide Odor (C1)	Moss Trim Lir	nes (B16)
Water Marks (B1)	Rhizospheres along Living Roots (	C3) 📙 Dry-Season V	Vater Table (C2)
Sediment Deposits (B2)	of Reduced Iron (C4)	Crayfish Burr	ows (C8)
	on Reduction in Tilled Soils (C6)	Saturation Vis	sible on Aerial Imagery (C9)
	(Surface (C7)	Geomorphic i	Position (D2)
$\square$ Iron Deposits (B5) $\square$ Other (Ex	plain in Remarks)		Laid (D3)
Water-Stained Leaves (B9)			oss (D8) <b>(I RR T II)</b>
Field Observations:			
Surface Water Present? Yes No X Dent	n (inches):		
Water Table Present? Ves X No Dent	(inches): 5		
Saturation Present? Yes X No Dent	n (inches): 5	and Hydrology Present	2 Yes X No
(includes capillary fringe)			
Describe Recorded Data (stream gauge, monitoring well, as Aerials: 2007 Pictometry 2010 ESRI 8	rial photos, previous inspections),	if available:	
Remarks:			
Although atypical situation due to hurrica	ne area annears to ha	we hydrology un	der normal
conditions	ine, area appears to ha	ive hydrology un	

	Absolute	Dominant	Indicator	Dominance Test worksheet:
<u>Tree Stratum</u> (Plot size: <u>30 radius</u> ) 1.	<u>% Cover</u>	Species?	Status	Number of Dominant Species That Are OBL, FACW, or FAC: <sup>0</sup> (A)
2.				
3				Species Across All Strata: 0 (B)
4				
5				Percent of Dominant Species That Are OBL_FACW_or FAC: 0 (A/B)
6				
7				Prevalence Index worksheet:
8				Total % Cover of:Multiply by:
	0	= Total Cov	ver	OBL species x 1 =
50% of total cover:	20% of	total cover	:	FACW species x 2 =
Sapling/Shrub Stratum (Plot size: <u>30' radius</u> )				FAC species x 3 =
1				FACU species x 4 =
2.				UPL species x 5 =
3.				Column Totals: (A) (B)
4				Prevalence Index - B/A -
5.				Hudrenbutie Vegetation Indicatory
6				
7				
8				$\square$ 2 - Dominance Test is >50%
···	0	- Total Cov		$\square$ 3 - Prevalence Index is $\leq 3.0^{\circ}$
50% of total cover	20% of	total cover		Problematic Hydrophytic Vegetation' (Explain)
Herb Stratum (Plot size: 30' radius )	2070 01			1
Cvnodon dactvlon	1	N	FACU	Indicators of hydric soil and wetland hydrology must
1				Definitions of Four Vegetation Strates
2				Demitions of Four vegetation Strata.
3				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
4				more in diameter at breast height (DBH), regardless of height
5				lingit
6				<b>Sapling/Shrub</b> – Woody plants, excluding vines, less
/				
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10				Woody vine - All woody vines greater than 3.28 ft in
11				height.
12				
	1	= Total Cov	ver	
50% of total cover: -	20% of	total cover		
Woody Vine Stratum (Plot size: 30' radius )				
1				
2				
3				
4				
5				Hydrophytic
	0	= Total Cov	ver	Vegetation
50% of total cover:	20% of	total cover	:	Present? Yes <u>^ No</u>
Remarks: (If observed, list morphological adaptations be	ow).			1
Herb stratum with dead Cynodon dacty	lon and	dead T	vpha sr	), (20% cover), Hurricane disturbed
vegetation so with other indicators by	Ironhytic		tion as	sumed
	- opriyite	, vegeta		unioa.

SUL
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Frome Desc	inplion. (Describe						m the absence	or indicators.)
Depth	Matrix	0/	Red	ox Featur	es Trans 1	12	- <b>- - - - - - - - - -</b>	Devende
(inches)		%	Color (moist)	%	Type	LOC		Remarks
0-5	101R 3/1	100					Organic matter	
5-16	7.5YR 2.5/1	97	7.5YR 3/4	3	С	Μ	Clay	
							<u> </u>	
		nlation PM	- Roducod Matrix M				<sup>2</sup> Logation:	
	ndicators: (Appli	cable to all	I RRs unless othe	rwise no	ted )	allis.		for Problematic Hydric Soils <sup>3</sup>
	(A1)			elow Surr		(LKK 5, 1, 5 T II)		1uck (A9) (LRR O)
	stic (A3)			kv Minera	) (ERR 3	R O)		ed Vertic (F18) (outside MI RA 150A B)
	n Sulfide (A4)			ed Matrix	(F2)			ont Floodplain Soils (F19) (LRR P. S. T)
	Lavers (A5)		Depleted Ma	atrix (F3)	()			lous Bright Loamv Soils (F20)
Organic	Bodies (A6) (LRR	P, T, U)	Redox Dark	Surface	F6)		(MLF	RA 153B)
5 cm Mu	cky Mineral (A7) (L	.RR P, T, U	Depleted Da	ark Surfac	e (F7)		Red Pa	arent Material (TF2)
Muck Pr	esence (A8) (LRR	U)	Redox Depr	essions (	F8)		Uery S	hallow Dark Surface (TF12)
🔲 1 cm Mu	ck (A9) (LRR P, T)		<u> </u>	LRR U)			Other (	Explain in Remarks)
Depleted	Below Dark Surfa	ce (A11)	Depleted O	chric (F11	) <b>(MLRA</b>	151)		
Thick Da	ark Surface (A12)		Iron-Manga	nese Mas	ses (F12)	(LRR O, F	<b>P, T)</b> <sup>3</sup> Indic	ators of hydrophytic vegetation and
Coast P	airie Redox (A16)	(MLRA 150)	A) 📙 Umbric Surf	ace (F13)	(LRR P,	T, U)	wet	land hydrology must be present,
Sandy M	lucky Mineral (S1)	(LRR 0, S)	Delta Ochrid	C (⊢17) <b>(M</b>	LRA 151	)	unle	ess disturbed or problematic.
Sandy G	aday (SE)				(IVILKA 1 Soile (E1)	DUA, 150E	5)   40 A \	
	Matrix (S6)			Bright Lo	SUIS (FI:		PA 1/0A 153C	153D)
Dark Su	face (S7) <b>(I RR P</b> .	S. T. U)			arriy Solis	(1 20) (111	IXA 143A, 1330,	, 1350)
Restrictive	aver (if observed	<u>, , , , , , )</u> ;						
Type:		,-						
Depth (in	shes):						Hydric Soil	Present? Ves X No
Deptil (III							Tryane con	
M	apped as hy	dric soil	Likely past	adricul	tural d	listurba	nce.	
	appea ao ny		Entery paor	agnoa	tarar o			



Project/Site: MBSD	City/County: Plaquemines	Sampling Date: <u>11/12/12</u>
Applicant/Owner: CPRA / Midway Cattle Ranch	State:	LA Sampling Point: DP-22
Investigator(s): CM, JM, RW	Section, Township, Range: <u>N/A</u>	
Landform (hillslope, terrace, etc.): Delta / Fastland	Local relief (concave, convex, none):	Slope (%):
Subregion (LRR or MLRA): Outer Coastal Plain (LRR T) Lat: 29	.6443 N Long: 89.990	7 W Datum: NAD 83
Soil Map Unit Name: Westwego clay	N'	WI classification: PEM1C
Are climatic / hydrologic conditions on the site typical for this time of	of year? Yes X No (If no, e	explain in Remarks.)
Are Vegetation X, Soil X, or Hydrology X significa	antly disturbed? Are "Normal Circur	nstances" present? Yes No X
Are Vegetation . Soil . or Hydrology naturally	v problematic? (If needed, explain	any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map show	ing sampling point locations, tr	ransects, important features, etc.
Hydrophytic Vegetation Present? Yes <u>A</u> NO	Is the Sampled Area	Y
Wetland Hydrology Present? Yes X No	within a Wetland?	Yes <u>^</u> No
Remarks:		
Pasture between canal and levee adjacent	to marsh. Hurricane Isaac ha	as resulted in atypical
conditions and hydrologic indicators. Betwee	en old excavated ditches	
HYDROLOGY		
Wetland Hydrology Indicators:	Secon	dary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that ap	<u>oly)</u> 🗹 Si	urface Soil Cracks (B6)
Surface Water (A1)	(B13)	parsely Vegetated Concave Surface (B8)
High Water Table (A2)	(B15) <b>(LRR U)</b>	rainage Patterns (B10)
Saturation (A3)	de Odor (C1)	oss Trim Lines (B16)
U Water Marks (B1) U Oxidized Rhizo	spheres along Living Roots (C3) $\Box$ Di	ry-Season Water Table (C2)
	eduction in Tilled Soils (C6) $\Box$	aturation Visible on Aerial Imageny (C9)
$\square$ Algal Mat or Crust (B4) $\square$ Thin Muck Sur	face (C7) $\Box$ G	eomorphic Position (D2)
Iron Deposits (B5)	in Remarks)	hallow Aquitard (D3)
Inundation Visible on Aerial Imagery (B7)	Ē.	AC-Neutral Test (D5)
Water-Stained Leaves (B9)	🔲 sı	phagnum moss (D8) <b>(LRR T, U)</b>
Field Observations:		
Surface Water Present? Yes No X Depth (inc	:hes):	
Water Table Present? Yes No X Depth (inc	:hes):	×
Saturation Present? Yes <u>No X</u> Depth (includes capillary fringe)	hes): Wetland Hydrold	ogy Present? Yes <u>^</u> No
Describe Recorded Data (stream gauge, monitoring well, aerial p	hotos, previous inspections), if available:	
Aerials: 2007 Pictometry, 2010 ESRI & US	SDA	
Remarks:		
Although atypical situation due to hurricane,	, area appears to have hydro	ology under normal
conditions due to subsidence.		

	Absolute	Dominant	Indicator	Dominance Test worksheet:			
Tree Stratum (Plot size: <u>30' radius</u> ) 1.	<u>% Cover</u>	Species?	Status	Number of Dominant Species That Are OBL, FACW, or FAC: <sup>0</sup> (A)			
2.				()			
3.				I otal Number of Dominant Species Across All Strata: 1 (B)			
4.							
5				Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)			
6				、,			
7				Prevalence Index worksheet:			
8				Total % Cover of:Multiply by:			
	0 = Total Cover		/er	OBL species x 1 =			
50% of total cover:	20% of	total cover	:	FACW species x 2 =			
Sapling/Shrub Stratum (Plot size: 30' radius				FAC species x 3 =			
1				FACU species x 4 =			
2				UPL species x 5 =			
3.				Column Totals: (A) (B)			
4				Prevalence Index = $B/A =$			
5				Hydrophytic Vegetation Indicators			
6				1 - Rapid Test for Hydrophytic Vegetation			
7.				$\square$ 2. Dominance Test is $>50\%$			
8.				$\square$ 2 - Dominance rest is >00%			
	0	- Total Co	/er	$\square$ 3 - Prevalence index is $\leq 3.0$			
50% of total cover:				Problematic Hydrophytic Vegetation' (Explain)			
Horb Stratum (Plot size: 30' radius )	2070 01			1			
Cynodon dactylon	10	Y	FACU	Indicators of hydric soil and wetland hydrology must			
				De freisiene of Four Venetation Otosta			
2				Definitions of Four Vegetation Strata:			
3				Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or			
4				more in diameter at breast height (DBH), regardless of			
5				neight.			
6				Sapling/Shrub – Woody plants, excluding vines, less			
7				than 3 in. DBH and greater than 3.28 ft (1 m) tall.			
8				Herb – All herbaceous (non-woody) plants, regardless			
9				of size, and woody plants less than 3.28 ft tall.			
10				Woody vine – All woody vines greater than 3.28 ft in			
11				height.			
12							
	10	= Total Co	/er				
50% of total cover: <sup>5</sup>	20% of	total cover	2				
Woody Vine Stratum (Plot size: 30' radius							
1.							
2							
3							
A							
5	0	Total Ca		Hydrophytic Vegetation			
	000/ cf		/er	Present? Yes $\times$ No			
50% of total cover:	20% 0	total cover	·				
Remarks: (If observed, list morphological adaptations be	OW).						
Herb stratum with dead Cynodon dacty	lon and	dead P	ersicari	a hydropiperoides (10% cover).			
Hurricane disturbed vegetation so with	other in	dicators	s, hydro	phytic vegetation assumed.			
_							

#### SOIL

Profile Desc	ription: (Describe	e to the dep	th needed to docu	ment the	indicato	r or confiri	m the absence	of indicato	ors.)	
Depth Matrix			Redox Features							
(inches)	Color (moist)	%	Color (moist)	%	<u>% Type<sup>1</sup> Loc<sup>2</sup></u>		Texture	Remarks		
0-12	10YR 3/1	97	2.5YR 2.5/3	3	С	Μ	Clay			
						-	·			
					· <u> </u>					
							·			
					·					
					·					
<sup>1</sup> Type: C=Co	oncentration, D=De	pletion, RM	=Reduced Matrix, M	S=Masked	d Sand G	rains.	<sup>2</sup> Location:	PL=Pore L	ining, M=Matrix	
Hydric Soil	ndicators: (Appli	cable to all	LRRs, unless othe	rwise not	ed.)		Indicators	for Proble	matic Hydric S	oils³:
Histosol	(A1)		Polyvalue B	elow Surfa	ce (S8) <b>(</b>	LRR S, T,	<b>U)</b> 1 cm N	/luck (A9) <b>(L</b>	RR O)	
Histic Ep	pipedon (A2)		Thin Dark S	urface (S9	) (LRR S	, T, U)	2 cm N	/luck (A10)	(LRR S)	
Black Hi	stic (A3)		Loamy Muck	ky Mineral	(F1) <b>(LR</b>	R O)	Reduc	ed Vertic (F	18) <b>(outside M</b>	LRA 150A,B)
Hydroge	n Sulfide (A4)		Loamy Gley	ed Matrix	(F2)		Diedmo	ont Floodpla	ain Soils (F19) <b>(</b>	LRR P, S, T)
Stratified	l Layers (A5)		Depleted Ma	atrix (F3)				alous Bright	Loamy Soils (F	20)
Organic	Bodies (A6) (LRR	P, T, U)	🗹 Redox Dark	Surface (F	-6)		(MLF	RA 153B)		
🔲 5 cm Mu	icky Mineral (A7) <b>(L</b>	.RR P, T, U	Depleted Da	irk Surface	e (F7)		L Red Pa	arent Mater	ial (TF2)	
Muck Pr	esence (A8) (LRR	U)	Redox Depr	essions (F	8)		U Very S	hallow Dark	surface (TF12	)
🗌 1 cm Mu	ick (A9) <b>(LRR P, T)</b>		🔲 Marl (F10) <b>(</b> I	LRR U)			Other (	(Explain in F	Remarks)	
Depleted	d Below Dark Surfa	ce (A11)	Depleted Oc	hric (F11)	(MLRA <sup>·</sup>	151)				
Thick Da	ark Surface (A12)		Iron-Mangar	nese Mass	es (F12)	(LRR O, P	<b>P, T)</b> <sup>3</sup> Indic	ators of hyd	drophytic vegeta	tion and
Coast P	rairie Redox (A16)	(MLRA 150	A) 🔲 Umbric Surfa	ace (F13)	(LRR P,	T, U)	wet	land hydrol	ogy must be pre	sent,
Sandy M	lucky Mineral (S1)	(LRR O, S)	Delta Ochric	: (F17) <b>(MI</b>	RA 151)	)	unle	ess disturbe	d or problemati	с.
Sandy G	ileyed Matrix (S4)		Reduced Ve	rtic (F18)	(MLRA 1	50A, 150B	5)			
Sandy R	edox (S5)		Piedmont Fl	oodplain S	oils (F19	) (MLRA 1	49A)			
Stripped	Matrix (S6)		Anomalous	Bright Loa	my Soils	(F20) <b>(MLI</b>	RA 149A, 153C	, 153D)		
Dark Su	rface (S7) (LRR P,	S, T, U)								
Restrictive I	_ayer (if observed	):								
Type:										
Depth (inc	ches):						Hvdric Soil	Present?	Yes X	No
Remarks:							,			
M	apped as hy	dric soil	Likely past a	agricult	ural d	isturbar	nce.			
	11 ,		51	0						



Attachment C. Supplemental Preliminary Jurisdictional Determinations Provided by USACE for Reference (by others) This page is intentionally left blank.



#### DEPARTMENT OF THE ARMY

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS P.O. BOX 60267 NEW ORLEANS, LOUISIANA 70160-0267 MAY ~ 5 2009

REPLY TO ATTENTION OF:

Operations Division Surveillance and Enforcement Section

Mr. Barton Rogers Gulf Engineers & Consultants 9337 Interline Ave. Baton Rouge, Louisiana 70809

Dear Mr. Rogers:

Reference is made to your request, on behalf of Conoco-Phillips, for a U.S. Army Corps of Engineers' (Corps) jurisdictional determination on property located in Sections 5 & 16, Township 16 South, Range 11 East, Plaquemines Parish, Louisiana (enclosed map). Specifically, this property is identified as a 656 acre proposed borrow pit west of LA Highway 23 near Alliance, LA.

Based on review of maps, aerial photography, and soils data, we have determined that part of the property is wetland and may be subject to Corps' jurisdiction. The approximate limits of the wetland are designated in red on the map. A Department of the Army (DA) permit under Section 404 of the Clean Water Act will be required prior to the deposition or redistribution of dredged or fill material into wetlands that are waters of the United States. Additionally, a DA permit will be required if you propose to deposit dredged or fill material into the waters of the US designated in blue on the map.

You and your client are advised that this preliminary jurisdictional determination is valid for a period of 5 years from the date of this letter unless new information warrants revision prior to the expiration date or the District Engineer has identified, after public notice and comment, that specific geographic areas with rapidly changing environmental conditions merit re-verification on a more frequent basis.

Please be advised that this property is in the Louisiana Coastal Zone. For additional information regarding coastal use permit requirements, contact Ms. Christine Charrier, Coastal Management Division, Louisiana Department of Natural Resources at (225) 342-7591.

Should there be any questions concerning these matters, please contact Mr. Brian Oberlies at (504) 862-2275 and reference our Account No. MVN-2009-00898-SY. If you have specific questions regarding the permit process or permit applications, please contact our Eastern Evaluation Section at (504) 862-2766. The New Orleans District Regulatory Branch is committed to providing quality and timely service to our customers. In an effort to improve customer service, please complete and return the enclosed Customer Service Survey or complete the survey on our web site at http://per2.nwp.usace.army.mil/survey.html.

Sincerely,

Plant a Hiffen

Pete J. Serio Chief, Regulatory Branch

Enclosures







#### DEPARTMENT OF THE ARMY NEW ORLEANS DISTRICT, CORPS OF ENGINEERS

P.O. BOX 60267 NEW ORLEANS, LOUISIANA 70160-0267

FEB 1 0 2012

Operations Division Surveillance and Enforcement Section

Mr. Josh McEnany Gulf South Research Corporation 8081 GSRI Avenue Baton Rouge, Louisiana 70820

Dear Mr. McEnany:

REPLY TO

ATTENTION OF

Reference is made to your request, submitted on behalf of RAM Terminals, LLC, for a U.S. Army Corps of Engineers' (Corps) jurisdictional determination on property located in Sections 5, 6, and 7, Township 16 South, Range 25 East, Plaquemines Parish, Louisiana (enclosed map). Specifically, this property is identified as a 600 acre tract of land on and east of LA-23 along the right descending bank of the Mississippi River at river mile 61.

Based on review of recent maps, aerial photography, soils data, and the information submitted with your request, we have determined that part of the property is wetland and may be subject to Corps' jurisdiction. The approximate limits of the wetland are designated in red on the map. A Department of the Army permit under Section 404 of the Clean Water Act will be required prior to the deposition or redistribution of dredged or fill material into wetlands that are waters of the United States. Additionally, a DA permit will be required if you propose to deposit dredged or fill material into other waters subject to Corps jurisdiction. On the protected side of the levee, other waters that may be subject to Corps' jurisdiction are indicated in blue on the map. Furthermore, the Mississippi River and the wetlands on the river side of the levee are also subject to Corps' jurisdiction under Section 10 of the Rivers and Harbors Act. A DA Section 10 permit will be required prior to any work in this waterway or the wetlands on the river side of the levee.

You and your client are advised that this preliminary jurisdictional determination is valid for a period of 5 years from the date of this letter unless new information warrants revision prior to the expiration date or the District Engineer has identified, after public notice and comment, that specific geographic areas with rapidly changing environmental conditions merit re-verification on a more frequent basis.

Please be advised that this property is in the Louisiana Coastal Zone. For additional information regarding coastal use permit requirements, contact Ms. Christine Charrier, Coastal Management Division, Louisiana Department of Natural Resources at (225) 342-7953.

You are advised that you must obtain a permit from a local assuring agency, usually a Levee Board or Parish Council, for any work within 1500 feet of a federal flood control structure such as a levee. You must apply by letter to the appropriate agency including full-size construction plans, cross sections, and details of the proposed work. Concurrently with your application to the assuring agency, you must also forward a copy of your letter and plans to Ms. Amy Powell, Operations Manager for Completed Works of the Corps and to the appropriate regional office of the Louisiana Department of Transportation and Development (LA DOTD) or the Office of Coastal Protection and Restoration (OCPR) for their review and comments concerning the proposed work. The assuring agency will not issue a permit for the work to proceed until they have obtained letters of no objection from both of these reviewing agencies. For additional information, please contact Ms. Amy Powell at (504) 862-2241.

Should there be any questions concerning these matters, please contact Mr. Brian Oberlies at (504) 862-2275 and reference our Account No. MVN-2011-02552-SY. If you have specific questions regarding the permit process or permit applications, please contact our Eastern Evaluation Section at (504) 862-2766. The New Orleans District Regulatory Branch is committed to providing quality and timely service to our customers. In an effort to improve customer service, please complete and return the enclosed Customer Service Survey.

Sincerely,

- Plant a Kuffun

Pete J. Serio Chief, Regulatory Branch

Enclosures




# G2: Wetland Value Assessment Methodology and Assumptions

# **MID-BARATARIA SEDIMENT DIVERSION PROJECT**

# Methodology and Assumptions for Determining Environmental Benefits

The Wetland Value Assessment (WVA) methodology was selected as the most appropriate tool for determining project wetland benefits. Described below are the models and methods used to determine marsh acreages and the methods for predicted benefits of the proposed project alternatives.

The Wetland Value Assessment (WVA) model, was developed under the Coastal Wetlands Planning, Protection, and Restoration program for determine benefits of proposed coastal wetland restoration projects. The 2017 Corps approved version was used to assess benefits for diversions and other features proposed under this project. Further information on this model may be obtained from the U.S. Army Corps of Engineers, New Orleans District, Regional Planning and Environmental Division South (Point of Contact: Patrick Smith, Phone: 504-862-1583).

The WVA is similar to the U.S. Fish and Wildlife Service's Habitat Evaluation Procedures (HEP), in that habitat quality and quantity are measured for baseline conditions and predicted for future without-project and future with-project conditions. Separate models were used for intermediate marsh and brackish marsh. Instead of the species-based approach of HEP, each WVA model utilizes an assemblage of variables considered important to the suitability of that habitat type for supporting a diversity of fish and wildlife species. As with HEP, the WVA allows a numeric comparison of each future condition and provides a quantitative estimate of project-related impacts to fish and wildlife resources.

The WVA models operate under the assumption that optimal conditions for fish and wildlife habitat within a given coastal wetland type can be characterized, and that existing or predicted conditions can be compared to that optimum to provide an index of habitat quality. Habitat quality is estimated and expressed through the use of a mathematical model developed specifically for each wetland type. Each model consists of: 1) a list of variables that are considered important in characterizing fish and wildlife habitat; 2) a Suitability Index graph for each variable, which defines the assumed relationship between habitat quality (Suitability Index) and different variable values; and 3) a mathematical formula that combines the Suitability Index Suitability Index (HSI). The WVA models assess the suitability of each habitat type for providing resting, foraging, breeding, and nursery habitat to a diverse assemblage of fish and wildlife species. This standardized, multi-species, habitat-based methodology facilitates the assessment of project-induced impacts on fish and wildlife resources.

HSI values are determined for each target year (TY). Target years, determined by the model user, represent significant changes in habitat quality or quantity expected during the 50-year project life, under future with-project and future without-project conditions. In this study, diversion alternative with and without terraces TYs include TY0, 1, 10, 20, 30, 40, 50.

The product of an HSI value and the acreage of available habitat for a given target year is known as the Habitat Unit (HU). The HU is the basic unit for measuring project effects on fish and wildlife habitat. Future HUs change according to changes in habitat quality and/or quantity. Results are annualized over the project life to determine the Average Annual Habitat Units (AAHUs) available for each habitat type.

The change (increase or decrease) in AAHUs for each future with-project scenario, compared to future without-project conditions, provides a measure of anticipated impacts. A net gain in AAHUs indicates that the project is beneficial to the habitat being evaluated; a net loss of AAHUs indicates that the project is damaging to that habitat type. In determining future with-project conditions, all project-related direct (construction) impacts were assumed to occur in Target Year 1.

The WVA models for intermediate and brackish marsh consist of six variables: 1) percent of wetland covered by emergent vegetation; 2) percent open water dominated by submerged aquatic vegetation (SAV); 3) degree of marsh edge and interspersion; 4) percent of open water less than or equal to 1.5 feet deep; 5) salinity; and 6) aquatic organism access. Changes in each variable are predicted for future without-project and future with-project scenarios over a 50-year project life. By incorporating variables for SAV and shallow open water into each of the marsh models, impacts to those habitat components are combined with impacts to emergent marshes. Because emergent marsh is of higher overall fish and wildlife value than SAV, and because SAV is of higher value than shallow open water, those latter components receive proportionally less weight when combined into one AAHU value.

# **General Assumptions For Diversions:**

- The USACE Civil Works WVA Intermediate and Brackish Marsh Models Version 2.0 were used for the analysis. It is approved for regional use for USACE Civil Works Projects. The proposed project occurs within the certified region of the USACE Civil Works WVA Intermediate and Brackish Marsh Models Version 2.0.
- The Delft 3D Hydrologic and Hydraulic (HH) model was used to provide most inputs into WVA for analysis. Staff with The Water Institute for the Gulf (TWIG) used modeling outputs to calculate WVA inputs for this analysis. For more details on the Delft 3D model including descriptions and assumptions, please see the document TO48: Mid-Barataria Sediment Diversion Engineering Modeling Support: Production Runs with the Basin Wide model Version 3 (Messina 2019).
- The Habitat Evaluation Team (HET) is a collection of professionals and/or researchers from various agencies, who are consulted and reach group consensus on variable inputs and their assumptions for the WVA on all alternatives evaluated in a project. The HET for this project includes the US Army Corps of Engineers, Department of the Interior (DOI), Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), Environmental Protection Agency (EPA), US Department of Agriculture (USDA), Natural Resources Conservation Services (NRCS), Coastal Protection and Restoration Authority (CPRA), and Gulf Engineers and Consultants (GEC).

## **General Assumptions For Beneficial Use and Terracing in the outfall area:**

- Three of the Mid-Barataria Sediment Diversion (MBSD) alternatives will include construction of earthern terraces in the outfall area (coupled with 50,000 cfs, 75,000 cfs, and 150,000 cfs sediment diversion alternatives) in the outfall area to promote sediment deposition and resultant benefits. The terraces would be strategically placed to help establish a delta and distributary channels within the sediment deposition outfall area.
- Excavated material during project construction will be used beneficially in designated areas. All alternatives will include varying amounts of beneficial use of dredged material depending on the construction of the project features.
  - Marsh created by beneficial use of dredged material will not be quantified in the delft model for input into WVAs, therefore, WVAs will not capture beneficial use benefits. Terraces were incorporated into the modeling and thus their benefits were captured in the WVAs.
  - Since the beneficial use areas will vary depending on which diversion size is constructed, the HET agreed to not include these additional acres in the WVAs.
  - Though these acres will not be captured in the WVA and will provide some benefits, they will be a relatively small amount compared to the expected land created, nourished, and/or maintained due to the diversions.
- Hydrologic and Hydraulic (HH) model runs for the three sediment diversions with terracing will have the same assumptions as the diversion only assumptions (including loss rates, subsidence, SLR, all that apply).

# **Project Life:**

- Period of analysis will be from 2020 (TY0) to 2070 (TY50).
- The Delft Hydraulic and Hydrologic (HH) model was run to provide outputs for the 50 years period of analysis.
- Hydrologic and environmental (vegetation and SAV) modeling considered benefits of plans over the 50 year period of analysis.
- The Modeling Team conducted HH model runs during 2015-2020 to initialize the model prior to the project life simulation.

# Target Year (TY) Assumptions:

General and Diversion TY Assumptions

- There was agreement among the Habitat Evaluation Team (HET) for simplification of the WVA to assume all features (e.g., all diversions with and without terraces) are built by TY1 regardless of implementation schedule, replenishing sediment sources, etc. The HET acknowledges that real time implementation of all the features for a project of this magnitude and complexity would likely span several years.
- The initial 5 year simulation from 2015-2019 represents Target Year (TY) 0 which is also the baseline year or existing conditions in WVA. See Table 1.
- The existing conditions info are projected forward in the HH models to the start of the project life at year 2020 and then the model runs are conducted over the 50 year period of analysis from 2020 to 2070.
- All output from HH modeling was provided at the end of the requested target year unless defined differently by the HET. For instance salinity (averages over designated time periods depending on habitat type).

- Target Years (TYs) will be consistent for all diversion (with and without terraces) alternatives thus preventing potential bias toward alternatives with more frequent target years.
- Diversion alternative (including terraces) TYs include TYs 0, 1, 10, 20, 30, 40, and 50.
- Interim target years will not be modeled. Discharge will be in primarily open water with the Outfall Transition Feature in place before operation, thus eliminating or minimizing scour. Salinity impacts are expected to occur in TY1.
- Delft 3D provided the following inputs for each TY(TYs 0, 1, 10, 20, 30, 40 and 50):
  - Average salinity during the growing season (March through November) for fresh and intermediate marsh, and average annual salinity for brackish marsh.
  - Functional Marsh Acreage includes Deflt predicted marsh acres plus that for terraces. Once land can grow vegetation based on LAVeg modeling, it is considered functional marsh (see below).
  - Shallow Open Water (<1.5 ft deep but not within the functional marsh elevation window) Acreage
  - Deep Open Water (>1.5 feet) Acreage
  - Non-Functional Marsh Acreage (overall and per marsh creation cell) The nonfunctional marsh acreage is defined as the area of a newly created marsh platform that is not considered fully functional marsh.
  - SAV at the end of the cycle.

				Hydro and Water qualitysimulations				
Decade	Cycle	Period of time	Morpho simulations	Representative year (used to estimate vegetation spatial distribution and organic accretion)	Landscape (topo/bathy/veg distribution) setup used in the simulation	Other name	Additional years simulated	
Initialization	Initialization	2015-2019	5 year simulation	2014	2015	Yr O	1994, 2006, 2010, 2011	
First	Cycle 0	2020-2029	10 year simulation	1970	2020	Yr 1	1994, 2006, 2010, 2011	
Second	Cycle 1	2030-2039	10 year simulation	1975	2030	Yr 10	1994, 2006, 2010, 2011	
Third	Cycle 2	2040-2049	10 year simulation	1985	2040	Yr 20	1994, 2006, 2010, 2011	
Fourth	Cycle 3	2050-2059	10 year simulation	2002	2050	Yr 30	1994, 2006, 2010, 2011	
Fifth	Cycle 4	2060-2069	10 year simulation	2008	2060	Yr 40	1994, 2006, 2010, 2011	
Sixth	Cycle 5	-	-	2008	2070	Yr 50	1994, 2006, 2010, 2011	

#### Table 1. Explanation of target years

# Terraces TY Assumptions

- Assume sediment availability is sufficient for creation of all terraces.
- The terraces in the model are subject to same forces as surrounding wetlands and will not be mechanically maintained. The terraces are assumed to have the short-term function to trap sediment early in the project life and in some cases may be subsumed by the active diversion delta.
- To maintain consistency between alternatives in WVA analysis, the HET agrees to not have the TY3 and 5 after construction of terraces. The target years for terraces include TYs 0, 1, 10, 20, 30, 40, and 50. These direct marsh benefits, plus indirect sediment accretion marsh benefits will be incorporated together with the Delft predicted diversion marsh benefits.
- The HET assumes all terraces that have delft predicted vegetation will be considered fully functional at the target year vegetation appears.

# **HH Modeling Assumptions:**

- The Delft 3D Hydrologic and Hydraulic (HH) model runs were developed and run by The Water Institute of the Gulf (TWIG) contracted by the State's CPRA. See modeling details in Production Runs with the Basin Wide model Version 3, Messina et. al 2019).
- It is assumed that the model will be able to show anticipated sediment trapping benefits of the terraced outfall area.
- The Mid-Barataria Sediment Diversion would be run under the following scenarios. Flows through diversions would be "variable" in that they would be driven by head difference and dependent on river flow (450,000 cubic feet per second (cfs) or greater) as well as changing morphology in the basins. The target maximum diversion discharge (75,000 cfs, 50,000 cfs, or 150,000 cfs, depending on the diversion alternative) will be achieved when the Mississippi River reaches 1 million cfs. The model assumes if the river flow is below 450,000 cfs, all diversion alternatives will have a maintenance (base) flow of 5,000 cfs (see table 2).
- Each of these scenarios will be modeled both with and without the marsh terracing feature in the outfall area. Modeling is expected to include efficiencies of water and sediment delivery resulting from terraces.

Table 2.						
	Rang	ge of Alternativ	es Carried	Forward for A	Analysis	
Alternative	Location (RM)	Trigger (Belle Chasse gage)	Base Flow <sup>1</sup>	Maximum Flow	Outfall Features <sup>2</sup>	
1	60.7	450,000 cfs	5,000 cfs	75,000 cfs	OTF	
2	60.7	450,000 cfs	5,000 cfs	75,000 cfs	OTF + Marsh Terracing	
3	60.7	450,000 cfs	5,000 cfs	50,000 cfs	OTF	
4	60.7	450,000 cfs	5,000 cfs	50,000 cfs	OTF + Marsh Terracing	
5	60.7	450,000 cfs	5,000 cfs	150,000 cfs	OTF	
6	60.7	450,000 cfs	5,000 cfs	150,000 cfs	OTF + Marsh Terracing	
<sup>1</sup> Depending on river flow and head differential 2 OTF = Outfall Transition Feature						

- There will be two types of model runs, Traditional and Hysteresis Runs relative to the sand rating curve used in the model.
  - The "Traditional curve" predicts sand concentration for a given flow rate rising or falling limb of hydrograph doesn't matter. "Suspended sand concentrations in the Mississippi River were estimated from water discharge using the Belle Chasse . . . traditional sand rating curve developed by TWIG from boatbased USGS measurements for the period 2008 to 2012" (Meselhe et al., 2016).
  - "For fine sediment load, a hysteresis rating curve developed for the V2 model was incorporated in the basinwide model V3. There is a difference in the fine sediment concentration peak and the flow peak, which is referred to as 'hysteresis behavior'."(Sadid et al. 2018)

- Models provided outputs for most relevant WVA variables by habitat type: distribution of land (land and water acres), shallow open water (<1.5 foot NAVD 88), total open water, salinity, vegetation habitat type and SAV by TYs as requested and defined by the HET. Modeling outputs for V3 Interspersion were not provided, as there is no way of estimating this with the model. The HET agreed to hold V3 constant for all alternatives. See Interspersion (V3) Section below for more details.
- All alternatives will include the construction of an outfall channel flow transition feature to insure the receiving basin can handle maximum capacity flows of the diversion. These transition features will be accounted for in the HH models and would be classified as deep open water in the WVAs.
- The HET agreed to use the Delft 3D outputs even in cases where we may have previously relied on best professional judgment when modeling outputs were not available to inform WVAs. This is a more conservative approach that ensures the WVA model is based on the objectivity of model outputs rather than the subjectivity of HET consensus.
- Where the model output value is a 0 that would result in a WVA model spreadsheet error (e.g., dividing by 0), the HET agreed to use 0.000001 instead of 0 to eliminate the error. Informal sensitivity analyses indicated little effect on the overall AAHUs.

# **Functional Marsh - General and Diversion Assumptions:**

- An area is classified as marsh when the soil surface elevation is 0 ft NAVD88 or greater at the simulation start (which is adjusted with time to account for sea level rise) in combination with morphological and LaVeg models data to determine when conditions are right for vegetation to grow. The HET assumed, based on input from the modelers, that when the model determines an area becomes vegetated land it is considered to be fully functional tidal marsh. This applies to both land created and maintained with diversions as well as land created through beneficial use and terracing.
- Functional marsh will be determined by the models as the time when land conditions are right for vegetation to grow.
- The Delft model uses excessive salinity and flooding to determine vegetation mortality. Areas of vegetation mortality are removed from functional marsh acres.
- There is no maximum elevation that distinguishes the vegetation between marsh and uplands. Because of the overall small amount of high land and because of the work involved in establishing an upper limit (applying 2.5ft MSL plus SLR over time (or 1% inundation criteria)), the HET agree to not define an upper limit for tidal marsh.
  - The purpose of applying an upper limit (2.5 ft msl) is because the coastal marsh model is geared toward evaluating the quality and quantity of tidal marsh. Any wetlands higher than this threshold normally would not be considered tidal marsh until it subsided to marsh elevation.
  - There are values and functions for land greater than 2.5 feet not captured in the tidal marsh model. There is no intent to plant trees on higher elevations to account for those lands as other habitats.
  - The HET does not expect to see much land building beyond tidal marsh elevations by the diversion. Possible exceptions for high marsh would be land near the diversion outfall as delta splays and/or terraces are created, though with increased water levels from the diversions these finger ridges may still be inundated at times.

- If land is not shown as functional marsh immediately but becomes functional shortly after, it will be captured in the next TY.
- There will not be vegetative plantings on terraces. The model will predict vegetation of e new areas (land created by the diversion; terraces, etc.) based on hydrology (water depth and salinity) and the LaVeg Model. Once conditions are suitable for vegetative establishment, the model will establish that vegetation the very next year. The LaVeg model has a 1-year time step.
- With 10 year increments between TYs, functional marsh acres may not appear until the following TY.
- The terraces are assumed to be short-term and will not be maintained over the project life. Rather they will be subsumed into the delta landscape.

# **Bathymetry**

- The Modeling Team has an extensive collection of bathymetry/elevation/water depth data sets for Barataria basin and the diversion outfall area. This model has been updated using all available bathymetry data provided by CPRA and USACE, including recent data collected by Louisiana's System-Wide Assessment and Monitoring Program (SWAMP).
- The HET agrees this data set, especially with regard to areas with <1.5 foot NAVD 88, is sufficient for our use and that it is not necessary for the HET to conduct field surveys to collect additional water depth data.
- Following is a list of the specific bathymetry/elevation/water depth data sets used in the HH models:
  - 2012 multibeam bathymetry provided by the U.S. Army Corps of Engineers (USACE), New Orleans District for the Mississippi River (unpublished source)
  - 2012 LIDAR data provided by the U.S. Geological Survey (USGS) for the entire Barataria and Breton basins and also the Mississippi River bird's foot delta (unpublished source)
  - 2014 bathymetry data collected by the Water Institute (TWIG) for the channels in the Barataria and Breton basins (described in Chapter 3 of Meselhe at al. (2015a))
  - ADCIRC bathymetry data for the deeper GOM area (<u>http://adcirc.org/products/grids/nc\_inundation\_v6c.grd</u>)
  - The multi-beam bathymetry transects collected by CPRA during the implementation of CPRA's System Wide Assessment and Monitoring Program (Hijuelos & Hemmerling, 2015) have been included into the Delft3D V3 model bathymetry.
  - 2017 bathymetric survey in Mardi Gras Pass in the Bohemia Spillway (Songy et al., 2017)

## Sea Level Rise and Subsidence

The rate of Eustatic Sea Level Rise (SLR) to be used in Delft model simulations will be the same as the 2017 Coastal Master Plan 'Moderate Scenario' of 1.5 meters (m) by 2100 (0.8 m by 2068).

Subsidence in the Delft model is spatially variable and was determined by the 2012 Master Plan Moderate Scenario (20% into the range of subsidence) map as amended in 2015 by the prior Delta Management Federal Study Project Delivery Team.

The Modeling Working Group (MWG) discussed ways to capture the potential variability of SLR over the 50-yr analysis period. The MWG members agreed that the 1.5-meter Gulf-regional sea level rise (GRSLR) scenario could be considered a high estimate of GRSLR by 2100, and Sweet et al. (2017) estimated that a GMSL rise of 1.5 meters had only a 1.3% chance of being exceed by the "worst-case" Representative Concentration Pathways (RCP) 8.5 global climate change scenario. For this reason, the MWG members preferred a less severe GRSLR scenario with a greater exceedance probability under RCP8.5. Based on the science of predicted sea level rise as outlined in Sweet et al. (2017), which was developed to technically underpin the U.S. Global Climate Change Program's 4th National Climate Assessment (NCA4; USGCRP 2018), the MWG agreed to evaluate the No action and alternative 4 (applicant's preferred alt) with the global mean sea level (GMSL) rise scenarios of 0.79 m by 2100 with around a 50% exceedance probability.

NOTE: The Delft model incorporated 1.5m RSLR for all alternatives modeled. The outputs of that model were used for inputs into the WVAs. Delft also incorporated the 0.79m RSLR for the selected alternative. However, WVAs were not run on the Delft outputs using 0.79 m SLR scenario as not all necessary WVA data was available. However it is assumed those WVAs would result in more benefit than the higher SLR used.

**Habitat Zones** – The purpose of determining the habitat zone (fresh, intermediate, brackish, saline) is so the HET can receive all model output by habitat zones of each alternative for use in WVAs. The WVAs must be run by habitat type. Because this is a diversion project it is expected that future shifts in habitat zones of each alternative maybe different between alternatives and for the future without action. Ecological/vegetation model outputs for individual cells were aggregated to determine standard intermediate and brackish marsh habitat type zones. As an area changes with and without action, the weighted average of all cells for each habitat type will change accordingly.

- Salinity and water level thresholds, as well as vegetation colonization rules, are used to determine what plant species grow in a grid/cell. There are some fresh species that have salinity tolerances ranges that overlap with some intermediate species. Where such overlap occurs, the most dominant taxa determined the habitat type (Tables 3 and 4).
- All modeling output data by habitat type (intermediate and brackish) were provided by target year those capturing shifts in habitat types over time for existing and future projections.
- The 7 taxa (vegetation) evaluated by the Delft 3D model were grouped by habitat type (as defined by the HET) to determine habitat type zones over time (Table 3).
- The most dominant taxa determined the habitat type.
- Because there are no veg types in open water, isohalines (salinities) were used where the veg/habitat type boundaries cross open water areas (Table 3).
- It was agreed to move Typha sp. to the intermediate category for determining habitat zones based on best professional judgment of the HET and input from vegetation experts. It makes sense to move Typha to intermediate because it has higher salinity tolerances than the other fresh species.

- The fresh and intermediate habitats were combined because the resolution of the HH model is within the uncertainty range for fresh habitats (based on a fresh salinity of up to 0.5ppt) coupled with the overlapping vegetation types between fresh and intermediate marshes. As a result, most of the fresh/intermediate habitat is interpreted as intermediate with minimal amounts of fresh.
- The fresh and intermediate WVAs are on the same spreadsheet, though they are considered two separate models. The fresh and intermediate WVAs were run together, though inputted into both habitat types.
- The HET agreed we should combine saline habitats into the brackish model similar to the fresh/intermediate habitats. The extremely small amount of saline habitat would be problematic if a separate saline model was run because there is very little saline marsh to begin with and it disappears/shifts to brackish habitat within the project life. For such a small amount of saline marsh it is typical and within the standard operating procedure of the WVAs to lump a small amount of one habitat type with the majority of another where appropriate.

# Table 3. Vegetation species in LaVeg that will be used to determine habitat types for WVA purposes

Habitat	
Types	
saline	Spartina alterniflora
brackish	Spartina patens
	Sagittaria lancifolia, Phragmites, and Typha
intermediate	sp.
fresh	Sagittarai latifolia, Zizaniposis miliacea

# Table 4. Salinity Total Ranges to be used in to determine isohalines in open water for Habitat Zones

Marsh Type	Ave Annual Salinity (ppt)
Fresh Marsh	< 1.5
Intermediate Marsh	1.5 thru 4.0
Brackish Marsh	4.1 thru 10.0
Saline Marsh	> 10.0

Note: the average annual salinity ranges proposed for application to outputs (to identify habitat zones) have brackish marsh as 4.1 ppt through 9.9 ppt. However, given that the WVA model has optimal brackish salinity through 10.0 ppt, we modified our range for brackish to 4.1 ppt through 10.0 ppt and saline to be > 10.0 ppt.

• The above (Table 3) proposed salinity ranges were derived from 2012 LA Vegetation Model Report (modified to fit the WVA habitat models). It should be noted that by using this approach, we assume the habitat types switch with changes in salinity rather than showing benefits or stress to vegetation due to changes in salinities.

## WVA Polygons

- The purpose of the WVA polygons is to provide the modelers with an outer limit to provide outputs for use in the WVA analysis. The model-predicted area of direct impact for sediment accretion was used to delineate the WVA polygon area to be analyzed (Figure 1). By using this approach the HET attempted to capture the majority of accretion to all substrates including subaqueous, intertidal, and existing wetlands.
- The WVA boundary polygons were determined for each diversion alternative (50,000cfs, 75,000cfs, and 150,000cfs). The primary determinant of each diversion polygon size was based on the majority of land change as seen in Figure 1.
  - Initially a combination of impacts for each diversion was reviewed including land change area (land that is maintained, gained or lost), water level changes, salinity differences between alternatives, and vegetation type maps for habitat switching at the end of the project life.
  - By viewing the various components, the HET agreed that WVA was best suited to capture the land change features similar to a CWPPRA WVA standard operating procedure for marsh creation project rather than trying to capture all indirect environmental changes due to the project.
  - Because there is extensive modeling and evaluation, other components (habitat switching, salinity impacts, water quality impacts, etc.) would be discussed in the EIS through other modeling tools available (HSIs, Aquatic modeling, vegetation maps, etc).
  - By using this approach, the near field impacts (land changes due to nutrient inputs, land maintenance, inundation impacts) are captured to the greatest extent in the WVA model and far field impacts are captured through other modeling and evaluation efforts.
  - Parts of the study area that are excluded, such as the rest of the Barataria basin beyond the WVA footprint, are removed because the HET doesn't expect to see measurable WVA differences in FWOA vs FWA in these areas. By including an area larger than the direct footprint, the WVA benefits have been shown in other projects to artificially reduce the sensitivity of the WVA analysis for the project. For example, the land building value of the diversion is diluted over a larger area (the land built/maintained by a diversion is a small amount compared to natural losses over the entire basin).
  - Areas of large open water are removed because they may artificially reduce the sensitivity of the WVA analysis. By leaving large open water areas in, it can skew numbers for variables such as V1, V2, V3, and V4. In addition they do not add much to the WVA analysis. Removing large open water bodies from a project footprint follows the CWPPRA Standard Operating Procedures.
- The HET agreed to encompass at least 80% (or more) of the model-predicted land change impacts within the WVA polygon for each diversion alternative. If far field impacts were isolated or scattered then including them may unnecessarily increase the wva analysis area and might include areas having minimal impacts due to the project compared to no action.

- The WVA project area polygon for the future with diversion for each diversion alternative will be used for the corresponding future without action condition. The three diversion polygons will be applied to the alternatives with and without terraces. For example, the 75,000cfs diversion will have the same polygon sized for the future without action compared to 75,000cfs future with action for both with and without terraces alternatives.
- The WVAs were run for both traditional runs and hysteresis runs (see HH Model Section for info on both modeling runs, Meselhe et. al 2015 and Messina et. al 2019). Previous production runs of the Delft3D basinwide model used a traditional rating curve that predicts sediment load as a direct function of river discharge at a specific river location. That means that for a given water discharge, the rating curve predicts only one corresponding sediment load value regardless of whether the stage is rising or falling or what sediment movement has occurred in the months preceding. Observational data indicates that there are actually a wide range of potential sediment loads that might occur for a given water discharge, in particular on rising and falling river stages, and based upon the sediment load of the months immediately prior to the time of prediction. This phenomenon is called hysteresis behavior.
- Below are the HET agreed upon WVA polygons for the Traditional Runs (Figure 1) followed by the Hysteresis Runs (Figure 2). Several factors were analyzed to help determine the WVA polygons including land change, water level change, and bed elevation change. Changes in bed elevation captured the majority of the changes due to the diversion alternatives. Therefore the below figures shows the WVA project area overlaid on the bed elevation change.



0

2 3

4 5 Miles



**Figure 1**. MidBarataria Sediment Diversion Project footprint for three diversion sizes used in the Traditional Wetland Value Assessment. PR2 is the 50,000 cfs, PR4 is the 75,000 cfs, and PR6 is the 150,000 cfs diversion alternatives, cycle 4 represents conditions at the end of the project period of analysis (50 years).





**Figure 2**. MidBarataria Sediment Diversion Project footprint for three diversion sizes used in the Hysteresis Wetland Value Assessment. PR2 is the 50,000 cfs, PR4 is the 75,000 cfs, and PR6 is the 150,000 cfs diversion alternatives, cycle 4 represents conditions at the end of the project period of analysis (50 years).

<u>Percent Land (V1)</u> –The ecological model will predict land (marsh or wetlands) and water acreage for each ecological model cell under FWOP and FWP conditions. Rather than use USGS land area extrapolations (from coastwide or another series of polygons), we would use ecological model predicted land acreage outputs to inform the WVA. The land acres from the ecological model would be aggregated by habitat type.

- The Modeling Team will provide the HET functional marsh and total water acres within each habitat type. That marsh acreage would include both wetland building, maintenance, and loss to all existing and created marsh. As with other variables the values are for the last day of any requested year.
- The land-acres provided by the HH model outputs include natural processes such as land loss, subsidence, RSLR.
- Components of the model includes vegetative establishment and recruitment features. Therefore functionality of newly created marsh are already incorporated in the outputs
  - The LaVeg model uses environmental variables such as water level and salinity to determine when conditions are suitable for a specific vegetation species (and also when a marsh would collapse). Thus, the HET assumption is that marsh would be considered functional once land becomes suitable for vegetation.
  - Plant death is based on outputs from Dr. Snedden's organ study (Snedden et al 2015).
  - The HET understands that alternatives with terraces are included in the modeling landscape for Delft 3D, and once on the landscape, will be subject to all of the same processes as previously existing land and land built by diversions.
- We also expect to see short term (within the first 10 years) impacts due the diversions from initial plant die off as habitats shift, reestablish, and start to thrive again. These impacts will primarily be seen through the morphology model outputs on the alternative runs.

**Terraces** – Upon noticing a slight decrease in land acres for diversions with terraces vs without terraces, TWIG responded with the following: The presence of the terraces causes a small but significant modification to the distributary channels' orientation. Specifically, the terraces cause a relative increase in sedimentation between the terrace field and the outfall, selectively 'pushing' channel formation away from that immediate area. This changes the pattern in where the diverted flow and sediment end up. These changes should be quite small; as per our land building analyses. The presence of the terraces doesn't alter the land building magnitude as much as modify the land building pattern.

**SAV (V2)** – This variable is the percent of open water having 100% Submerged Aquatic Vegetation (SAV) coverage.

- The Delft 3D Modeling Team provided information on the salinity, turbidity, exposure, and water depth for the SAV team to work with to develop existing conditions and future projections for fresh/Intermediate and Brackish/saline habitat types for each cycle.
- Because there is no difference in flow between an alternative and its corresponding alternative with terraces (i.e. 75,000cfs alternative vs 75,000 cfs plus terraces alternative), the SAV numbers developed for PR2, PR4, and PR6 were used for PR3, PR5, PR7 respectively.
- Baseline or existing conditions for SAV (Table 5) were determined by using Remotely Sensed SAV predictive modeling data developed by USGS (Couvillion, pers. Comm. 2019). See Appendix A for more details.
- Change in turbidity, water depth, exposure, and salinity, obtained from the Delft 3D model, combined with the premises developed through the SAV Likelihood of Occurrence Model(or SLOO) model for likelihood of occurrence (DeMarco et. al. 2018) were used to develop the projected change in SAV (Table 6) over time for each alternative (PR2, PR4, PR6). See Appendix B for more details.

• See Appendix C for more detail on the method of using Delft 3D data for SAV modeling.

RS Classification SAV Baseline Assessment (2015-2018)						
		% of Water Area				
Region/Model Run	Salinity_Zone	Containing SAV				
V3PR2_HYST_cycle1	Fresh/Inter	10.0633%				
V3PR2_HYST_cycle1	Brackish/Saline	1.6476%				
V3PR2_TRAD_cycle1	Fresh/Inter	12.2452%				
V3PR2_TRAD_cycle1	Brackish/Saline	1.7930%				
V3PR4_HYST_cycle1	Fresh/Inter	8.8769%				
V3PR4_HYST_cycle1	Brackish/Saline	1.2564%				
V3PR4_TRAD_cycle1	Fresh/Inter	11.7902%				
V3PR4_TRAD_cycle1	Brackish/Saline	1.9325%				
V3PR6_HYST_cycle1	Fresh/Inter	6.8072%				
V3PR6_HYST_cycle1	Brackish/Saline	0.6356%				
V3PR6_TRAD_cycle1	Fresh/Inter	10.3548%				
V3PR6_TRAD_cycle1	Brackish/Saline	1.3766%				

Table 5. SAV Baseline Assessment (2015-2018) using remotely sensed SAV predictivemodeling data developed by USGS (Couvillion, pers. Comm. 2019).

#### Table 6. SAV summary projections and trends.





## **Interspersion (V3)**

Approach used: In order to reduce the importance or influence of V3 given the large uncertainty associated with determining the V3 values at this scale, the HET agreed to hold V3 constant for all alternatives.

- The HET agreed to keep the interspersion variable constant for all alternatives, with the caveat that Best Management Practices for beneficial use include creating marsh with optimization for interspersion (this will minimize carpet marsh issues).
- Keeping the interspersion variable constant throughout the WVAs for all alternatives reduces the effects of this subjective variable.
- Class 3 will be used throughout the WVAs for all alternatives, all habitat types and all baseline, existing, and future target years.
- Given the scale of this project, the multiple years that would have to be analyzed, and 5 classes in which to assign each habitat type, the HET agreed to the simplifying approach above.
- In cases where marsh is lost in the future (brackish and saline habitats) the HET agreed to keep the Interspersion (V3) class as a class 3, a simplifying assumption originally agreed to by the HET as interspersion would not be calculable with Delft outputs. Typically with little or no marsh left the interspersion variable would move to a class 5. However the HET felt for a project area this large it would be highly subjective to determine class values, particularly as we can not broadly estimate interspersion at the resolution of the

Delft output data. Thus, in order to eliminate any bias that we would introduce to V3, all values are set to a standardized class 3 for all alternatives and all target years.

<u>Percent Shallow Open Water (V4)</u> - This variable is computed as the percent of water acres less than 1.5 feet deep (feet NAVD 88).

- Like the other variables, this one will be determined by habitat type.
- Modelers can provide the total water acreage by habitat type, and the total shallow water acres by habitat type in order to easily compute the percent of open water that is shallow.
- Shallow open water acreages are provided based on the last day of the Target Year.

<u>Salinity (V5)</u> – This variable is derived from model-predicted average monthly salinity in parts per thousand (ppt) for baseline, existing, and future conditions, by habitat type for all alternatives. Ideally, the habitat type average monthly values would be aggregated as a weighted average based on water acres of the model cells.

- In regards to model outputs for V5 Salinity, the modelers provided salinity outputs averaged for the growing season for fresh and intermediate habitat zones and averaged annually for brackish and saline zones following the CWPPRA protocol.
- The optimal (and full) range for salinities (according to the approved WVA models) in each habitat type are as follows:

Marsh Type	Total Range in Parts Per Thousand (ppt)	Optimal Range ppt	Period of Measure
			Avg Growing Season Salinity
Fresh Marsh	< 5.5	<0.5	(Marsh -November)
			Avg Growing Season Salinity
Intermediate Marsh	0 thru 7.5	0 thru 2.5	(Marsh -November)
Brackish Marsh	0 thru 16	0 thru 10	Average Annual Salinity
Saline Marsh	0 thru 24	9 thru 21	Average Annual Salinity

- The HET expects the bulk of the with-project changes to occur in TY1 due to salinity changes and shifts associated with diversion operation.
- Salinity was based on Delft Hydrologic modeling results grouped by habitat type/zones
  - Fresh/intermediate average salinity during the growing season (March through November)
  - Brackish and saline average annual salinity
- Salinity table provided by The Water Institute of the Gulf (TWIG) had some n/a values. This represents areas that no longer have open water in that habitat type. For instance, FWP in the intermediate and fresh zones the land may still have intermediate marsh (habitat switching may take time) while all the open water becomes fresh. The same is true for brackish where the open water presumably became fresher but a small amount of brackish marsh remained.
- Delft combined the Fresh and Intermediate salinity. In the WVAs we used the same salinity for Fresh and Intermediate.

# Fish Access (V6)

- The value was kept constant and fully optimal for all alternatives. There was no expectation that any alternatives would restrict fish access differently than without the action in any way.
- Because the WVA analysis jumps from TY1 to TY10 the HET agreed to use the simplifying assumption to apply complete fish access to beneficial use areas by TY1. The beneficial use areas are relatively small compared to the entire project area and containment would be degraded closely to the first target year after construction.
- Assuming best management practices are incorporated for beneficial use areas for tidal creeks and where containment is degraded between one to three years after construction to allow for ingress and egress.

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# THE MID-BARATARIA SEDIMENT DIVERSION PROJECT

## Wetland Assessment For Direct Impacts

The following are the assumptions for assessing the direct impacts associated with construction activities of the Mid-Barataria Sediment Diversion Project (Figure 1 and Table 1). Wetlands within the proposed construction footprint were documented by wetland delineation surveys conducted by CPRA and later approved by USACE. The USACE approved surveys determined that the construction footprint included emergent wetlands (wet pasture), scrub/shrub , and forested bottomland hardwood (BLH) wetland types.

A Habitat Evaluation Team (HET) was formed to assist with and concur on the methodology and quantification of environment impacts.



Figure 1. Permanent wetlands impacted within the construction footprint of the MBSD project.

	Imp	Impacts			
Wetland Type	Acres	AAHUs			
Forested wetlands	21.6	-12.1			
Emergent Wetlands (Wet Pasture)	151.0	-102.4			
Emergent Wetlands (Marsh/scrub/shrub)	10.3	-21.2			
Total Project Impacts	182.9	-135.7			
Project Benefits	13,151	3,848			
Difference	12,968	3,712			

Table 1. Summary of Direct Wetland Impacts

#### **Emergent Wetlands or Wet Pasture**

The 151 acres of wet pasture within the project area consists of seasonally flooded, partially drained/ditched, emergent wetlands contained between the levee and the adjacent marsh. The Corps' Habitat Evaluation System (HES) for open lands was used to calculate the AAHUs for this habitat type. The HES uses functional curves for determining a Habitat Quality Index (HQI) value for land use, diversity of land use, distance to cover, distance to wooded areas, frequency of flooding, tract size, and the perimeter development index. Those HQI values are then entered into a formula to estimate the AAHUs. MBSD wet pasture construction footprint acres was combined with variable data taken from Section 2 (Figure 2 and Table 2) of the New Orleans to Venice, Louisiana, Hurricane Protection Project (NOV) – Incorporation of Nonfederal Levees from Oakville to St. Jude, Plaquemines Parish, Louisiana (NFL), project (2011 FWCA Report, HES, and assumptions document) which incorporates this projects' construction footprint. Distances, land use, tract size, and sinuosity were calculated using 2008 DOQQ imagery in ArcGIS for the NOV NFL project. This analysis was conducted in order to determine the value of these habitats to fish and wildlife resources (Table 3).



Figure 2. New Orleans to Venice – Incorporation of Nonfederal Levees, Plaquemines Parish, Louisiana, (NFL) Study Area.

Table 2. New Orleans to Venice, Louisiana, Hurricane Protection Project (NOV) – Nonfederal Levees (NFL), project, Section 2, Habitat Quality Index (HQI) values for wet Pasture using the Habitat Evaluation System (HES).

0					
Site: R_Se	ct2				
VARIABLE	Unit	Data	HQI	WEIGHT	SCORE
land use		pasture	0.65	15.00	9.75
diversity		pasture and open water	0.40	15.00	6.00
cover	feet	approx. 330 ft to swamp	0.69	15.00	10.35
forest	feet	approx. 330 ft to swamp	0.73	14.00	10.22
flooding	interval-yr	annually	1.00	14.00	14.00
tract size	acres	604.75	0.49	13.00	6.37
sinuosity	feet	111222.30	0.90	14.00	12.60
l	1	1	l	100.00	69.29
				L	0.69

		V	VET OPENI	ANDS				WET OPENI	LANDS	
SITE:		MBSD constru	uction footpr	int						
Wet - op	penla	ands				Wet - openla	ands			
Future v	v/out					Future with				
					TOTAL					TOTAL
TY		ACRES	HQI	HU'S	HU'S	ΤY	ACRES	HQI	HU'S	HU'S
	0		0.69	0.00		0	153.00	0.69	105.57	
	1	151.00	0.69	104.19	52.10	1	0.00	0.00	0.00	35.19
	20	151.00	0.69	104.19	1979.61	20	0.00	0.00	0.00	0.00
	50	151.00	0.69	104.19	3125.70	50	0.00	0.00	0.00	0.00
	70			0.00	694.60	70			0.00	0.00
1	00			0.00	0.00	100			0.00	0.00
				AAHU'S	103.15				AAHU'S	0.70
								CHANGE I	N AAHU'S	102.44

Table 3.	Mid-Baratar	ia Sediment I	Diversion C	onstruction	Footprint	change in A	Average A	۱nnual
Habitat <sup>1</sup>	Unit (AAHU)	for Wet Past	ure. Habitat	t Evaluation	System (H	HES).		

## Wetland Value Assessment (WVA)

The WVA operates under the assumption that optimal conditions for general fish and wildlife habitat within a given coastal wetland type can be characterized, and that existing or predicted conditions can be compared to that optimum to provide an index of habitat quality. Habitat quality is estimated or expressed through the use of a mathematical model developed specifically for each wetland type. Each model consists of 1) a list of variables that are considered important in characterizing fish and wildlife habitat, 2) a Suitability Index graph for each variable, which defines the assumed relationship between habitat quality (Suitability Index) and different variable values, and 3) a mathematical formula that combines Suitability Index (SI) for each variable into a single value for wetland habitat quality; that single value is referred to as the Habitat Suitability Index, or HSI.

## **Intermediate Marsh WVA**

Note: Scrub/shrub, open water, and SAV acres are included in the marsh evaluation.

#### Land Loss/ Sea Level Rise Effects

Land loss rates estimated by the Service were adjusted by the projected effects of the medium relative sea level rise (RSLR) scenario for these analyses. The estimations were calculated using the USACE's Sea-Level Calculator. The land loss rate for the Lake Laurier (USGS Polygon 195, figure 3) region was used (-0.56% per year for the period 1985-2016) for the project outfall area background loss rate.

An average accretion rate of 6.5 mm/year was used for this site (6.5 mm/yr from Barataria Basin accretion measurements, Jarvis et al. 2010 an ERDC publication).



Figure 3. USGS polygon key for land loss rate data from 1985 to 2016

An estimated subsidence rate of 5.3 mm/yr was used based on the average subsidence rates of the outfall area used in Delft 3d modeling which was based on the 2012 Coastal Master Plan subsidence values (MRHDM Project Delivery Team. 2015), which matches with the closest long-term gage station to proposed sites (Bayou Barataria at Barataria guage (82750), 5.3mm/yr).

#### **Baseline Year and Project Start Year**

The baseline year (TY0) is 2022 and construction (TY1) starts in 2023. Marsh and water acres of the outfall area and access were measured in Oct 2016. RSLR was applied to the 2016 acres and projected forward to determine TY0, TY1, and TY50 marsh and water acres for the future with the Applicant's Preferred Alternative or APA and the future with the No Action Alternative or NAA. The HET assumed all habitats in the construction footprint would be impacted within the first construction year either by habitat clearing or by ongoing construction activities.

Impacted baseline (TY0) marsh acres (measured in 2016 as 10.3 acres) is 9.5 acres. Beginning (TY0) water acres are 228 acres (227.4 acres in 2016) with a total project area of 237.7 acres.

#### Variable V<sub>1</sub> – Percent of Wetland area covered by emergent vegetation

Persistent emergent vegetation (i.e., emergent marsh) plays an important role in coastal wetlands by providing foraging, resting, and breeding habitat for a variety of fish and wildlife species; and by providing a source of detritus and energy for lower trophic organisms that form the basis of the food chain. Optimal vegetative coverage (i.e., percent marsh) is assumed to occur at 60-80 percent (SI=1.0). In each coastal marsh model, this variable is weighted the highest and thus influences project benefits the most.

**FWOP** – A predetermined land loss rate of -0.56% (see above) was applied to the existing marsh acreage and projected through the period of analysis (50 years).

Intermediate marsh projected forward to 2022 (TY0) is <u>9.5 acres</u> with a total project area of 237.7 acres (Table 4: 4% marsh, 96% open water).

	FWOP Marsh (acres)	FWOP Percent Marsh
TY0	9.5	4.0%
TY1	9.4	4.0%
TY50	4.0	1.7%

Table 4. FWOP acres and percent Emergent Vegetation by Target Year.

FWP- all 9.5 acres would be permanently removed.

#### Variable V<sub>2</sub> – Percent of open water covered by aquatic vegetation

The CWPPRA BA-164 project, Bayou Dupont Marsh Creation #3 cell 1 (Figure 4 and Table 6 - highlighted brown) directly overlays the area we are evaluating. Therefore the HET agreed the observed field data (<u>5% SAV</u>) found in the same footprint as this WVA is the most appropriate data for baseline SAV (Table 5).

Table 5. Percent SAV by target year.

% SAV	TY0	TY1	<b>TY50</b>
FWOP	5	5	0
FWP		0	0



Figure 4. The CWPPRA BA-164 project, Bayou Dupont Sediment Delivery - Marsh Creation and Terrace #3, proposed marsh creation cells.

This is further supported by the review of a variety of other projects in the outfall area (Table 6).

Table 6. Other Projects near the Mid-Barataria Sediment Diversion (M	IBSD) outfall area
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SAV			
Year	Project	Data	
2015-2018	MBSD Fr/Int	8.9%	
	MBSD Br/Sal	1.3%	
	CWPPRA		
2012	BA-164	5%	
2002	BA-39	25% <sup>1</sup>	
2010	BA-48	0%	
2013	Demarco	2%	
	Average w/o BA-39	3%	
	Average All	7%	
<sup>1</sup> Outlier, influ	enced by Naomi siphon		

The MBSD WVA area of analysis baseline conditions for SAV data (top two lines of Table 6) were determined by using Remotely Sensed SAV predictive modeling data developed by USGS. Both the fresh/intermediate (9% SAV) and the brackish/saline (1.3% SAV) WVA areas are considerably larger than the area of interest for direct impacts. The direct impact area is being evaluated as intermediate habitat based on salinity but has characteristics of the adjacent brackish habitat. Additionally wave fetch from the south across the open water area would reduce SAV against the Nonfederal Levee at the outfall. The HET would expect the direct impact area SAV to be somewhere between the two MBSD estimates.

All three CWPPRA projects (Figure 5 and Table 6) claimed to see little or no SAV. BA-164 directly overlays the area being evaluated. BA-39 was thought to be influenced by Naomi, however, would have less influence on the direct impact area since it is separated by the creation of BA-39. As mentioned above wave fetch across the open water area would reduce SAV in the direct impact area.



Figure 5. CWPPRA projects near MBSD

The Demarco paper (Demarco et al. 2018) looked at several WVAs and collected data throughout the basin. The 2% SAV were based on the data closest to the direct impact area which is from 2 CWPPRA WVAs that were located slightly south in a higher salinity (presumably brackish) habitat (figure 6).



Figure 6. Demarco et. al. 2018 points for CWPPRA WVA data.

Finally all data was averaged to 7% SAV and averaged again by removing the CWPPRA BA-39 data as an outlier influenced by the Naomi siphon to get 3% SAV. For all the reasons above the HET believed the impact area would have a lower % SAV than what is seen is areas further away or in areas that are better protected from wave energy.

All the data review confirmed the use of the marsh creation cell 1 of the BA-164 project for a baseline SAV of 5% (Table 6).

Future projections (TY50) assumed conditions would not be suitable for SAV growth with effects of SLR and saltwater intrusion.

FWP- all SAV would be permanently removed from the construction footprint.

# Variable V3 – Marsh edge and interspersion

This variable takes into account the relative juxtaposition of marsh and open water for a given marsh:water ratio.

**FWOP-5**% marsh is considered a class 5 for all target years.

FWP- n/a, habitat would be permanently removed

# <u>Variable V<sub>4</sub> – Percent of open water $\leq$ 1.5 feet deep, in relation to marsh surface</u>

The HET used <u>7.9%</u> shallow open water (SOW, Table 7) based on the data for CWPPRA BA-164, cell 1 because the cell and data overlaps directly in the same place as the impact area. BA-164 "corrected" the field water depth measurements for long-term average water level using the convention adopted by the CWPPRA Environmental Work Group.

Table 7. Shallow open water.

	TY0	TY1	TY50
FWOP % SOW	8%	8%	0%
FWP % SOW	8%		

FWP- n/a, habitat would be permanently removed

## Variable V<sub>5</sub> – Mean high salinity during the growing season (March through November)

Because salinity from the MBSD ranged over a far greater area than the impact area the HET reviewed CRMS data in the area (Table 8). A baseline salinity of <u>1.7ppt</u> (Table 8, highlighted

brown) was used based on the four CRMS stations mean growing season salinity. In the intermediate marsh model salinity is based on mean salinity during the growing season (March – November). This is similar to the CWPPRA BA-164 Bayou Dupont marsh creation project that used the mean growing season salinity of 1.5 ppt for CRMS4103 for the period of record (2008-2012).

Table 8. Salinity of CRMS stations near the MBSD Impact area.

Average	7.1	5.2	
nisedbim	8.1	9.f	4518
nisedbim	9.1	2.0	192
closer but slightly north	8.0	7.1	4103
at BBWW across from outfall	2.4	3.6	548
Notes on guage location relative to the MBSD impact area	Mean Growing Season Salinity (ppt) for 2019	(tqq) (tinits2 nsəM from 2007(8)- 2020	CRMS

Future projections are expected to increase by 0.7ppt shifting from 1.7ppt to 2.4ppt based on Delft 3d salinity output increase for FWOP MBSD (Table 10). Table 9 shows the Delft 3d 50 year projections for fresh/intermediate and brackish habitats.

Table 9. MBSD Delft 3d modeling results for salinity (ppt) for the No Action Alternative.

8.6	7.1	Year 50
8.6	0.1	Year 1
Brackish	Fr/In	
Delft Salinity output NAN (ppt)		

Table 10. Salinity Used for Direct Impact Marsh WVA.

-	-	tqq <sup>7</sup> .I	ЕMЪ
1qq4.2	tqq <sup>7</sup> .I	tqq <sup>7</sup> .I	ЕМОР
1X50	IYT	0XT	

FWP- n/a, habitat would be permanently removed

Variable V<sub>6</sub> – Aquatic Organisms (% wetland accessible & type of access) FWOP – Fish access would be considered open with no obstructions

FWP- n/a, habitat would be permanently removed (PPL18 Grand Liard Marsh and Ridge Restoration, PPL16 Bayou Dupont Marsh and Ridge Restoration, LCA Wetland Creation

#### **Bottomland Hardwoods WVA**

The 21.6 acres of forested wetlands in the construction and trestle footprint dominated by invasive Chinese tallow and native species commonly found in disturbed, early successional forested wetlands, such as black willow, rather than high-quality bottomland hardwood wetlands. Also present, to a lesser extent, was boxelder and red maple (<10%, HDR, 2014).

The forested wetlands in the construction and trestle footprint have been hydrologically altered, they are found between the River Levee (Levee) and Highway (Hwy) 23 and are no longer exposed to natural flooding events and have characteristics of regrowth colonizing and non-native species typically found in disturbed, early successional forested wetlands (such as black willow and Chinese tallow) rather than mature bottomland hardwood forest (HDR, 2014).

Updated (in 2015) BLH WVA data for the Plaquemines Parish Nonfederal Levees (NFL), WBVMRL (West Bank and Vicinity, Mississippi River Levee) Project was pulled from the three nearest sites (WBVMRL1.1, WBVMRL3.1, and WBVMRL5.2, Figure 7) for use in the MBSD Direct Impact BLH WVAs. The NFL WBVMRL project sites are similar to the MBSD BLH site in their location adjacent to the River and developed lands and forest specie associations. The following variables were averaged to achieve representative values: size of contiguous forested areas (V5), surrounding land use (V6), and disturbance (V7). Data for tree species association (V1), stand maturity (V2), understory/midstory (V3), and hydrology (V4) were taken from field data provided in the HDR 2014 report "Mid-Barataria Sediment Diversion (BA-153), Plaquemines Parish, Louisiana, Report for Delineation and Evaluation of Potential Waters of the U.S., Including Wetlands, July 2014 Amendment."


Figure 7. Bottomland hardwood sites for the Plaquemines Parish Nonfederal Levees (NFL) Project.

Separate BLH WVAs were created for the batture (area from the River to the Levee) and for the area between the Levee and Hwy 23. The batture portion consisted of 3.96 acres and the Levee to Hwy 23 is 17.64 acres (Figure 1). They were kept separated because the hydrology and stand structure differed. Once complete the AAHUs from the two BLH WVAs can be combined to provide total impacts to BLH habitat.

Target years were kept to a minimum and included TY0, TY1, TY10, TY20, and TY50. These were the target years used for the WBVMRL WVAs. For consistency the assumptions are the same.

## Variable V1 - Tree Species Association

Wildlife species which utilize bottomland hardwoods depend heavily on mast, other edible seeds, and tree buds as primary sources of food. Based on the below tree species association class definitions (Figure 8) and the HDR 2014 plot data (plots were averaged for each area), baseline (TY0) classification was Class 2 for the batture and a Class 3 for area between Levee and Hwy 23. The batture was dominated by willow which is a non-mast producer and had an average of 45% canopy cover. The area between the Levee and Hwy 23 included oaks and hickory (providing for greater than 10% hard mast producers) and an average of 48% canopy cover.

Class 1:	Less than 25% of overstory canopy consists of mast or other edible- seed producing trees or more than 50% of soft mast present but no hard mast.
Class 2:	25% to 50% of overstory canopy consists of mast or other edible-seed producing trees, but hard mast producers constitute less than 10% of the canopy
Class 3:	25% to 50% of overstory canopy consists of mast or other edible-seed producing trees, and hard mast producers constitute more than 10% of the canopy.
Class 4:	Greater than 50% of overstory canopy consists of mast or other edible- seed producing trees, but hard mast producers constitute less than 20% of the canopy.
Class 5:	Greater than 50% of overstory canopy consists of mast or other edible- seed producing trees, and hard mast producers constitute more than 20% of the canopy.

Figure 8. Bottomland Hardwood Wetland Value Assessment, Variable V1 Tree Species Association, class definitions.

Following the assumptions of the NFL WVAs, it was assumed that by TY50 the trees would have matured to the next level class value (Table 11).

Table 11. Variable 1, Tree Association for Bottomland Hardwood in the Mid-Barataria Sediment Diversion Structure Footprint.

Bottomland Hardwood Area	TY0	TY1	TY10	TY20	TY50
Batture	Class 2	Class 2	Class 2	Class 3	Class 3
River Levee to Hwy 23	Class 3	Class 3	Class 3	Class 4	Class 4

Variable V2 – Stand Maturity

Stand maturity is based upon the average age or dbh of canopy-dominant and canopycodominant trees. The average dbh of the three WBVMLR sites (Table 12) were used for both WVAs (batture and Levee to Hwy 23).

Table 12. Variable 2, Stand Maturity (in dbh) for the Bottomland Hardwood in the Mid-Barataria Sediment Diversion Structure Footprint.

Bottomland Hardwood	TY0	TY1	TY10	TY20	TY50
Area	(dbh)	(dbh)	(dbh)	(dbh)	(dbh)
Batture	7.8	8.1	10.4	12.9	21.3
River Levee to Hwy 23	7.8	8.1	10.4	12.9	21.3

Variable V3 - % Understory / Midstory

Baseline (TY0) % were taken from the 2 batture plots and 15 Levee to Hwy 23 plots of the HDR data (Table). For projections we followed the pattern and assumptions used in the WBVMRL except for the batture understory projection. Batture understory started at 95%. The HET assumed that as the mid story increased that the understory wouldn't be able to increase fully to 100%.

Table 13. Variable 3, Percent Understory and Midstory for Bottomland Hardwood in the Mid-Barataria Sediment Diversion Structure Footprint.

Bottomland Hardwood Area	% Cover	TY0	TY1	TY10	TY20	TY50
Batture	Understory	95	95	95	95	95
Batture	Midstory	13	13	18	23	23
River Levee to Hwy 23	Understory	15	15	17	20	20
River Levee to Hwy 23	Midstory	35	35	40	45	45

Variable V4 – Hydrology

This variable considers the duration and amount/degree of water flow/exchange.

Table 14. Variable 4, Hydrology Suitability Index (SI) values.

		Flow/Exchange			
		High	Moderate	Low	None
סב	Temporary	1.00	0.85	0.70	0.50
tio	Seasonal	0.85	0.75	0.65	0.40
000 Jra	Semi-Permanent	0.75	0.65	0.45	0.25
ΞŐ	Permanent/Dewatered	0.65	0.45	0.30	0.10

Hydrology was based on the HDR 2014 report and knowledge of the area. With direct access to the Mississippi River, the batture is temporarily flooded and has a high flow/exchange (SI = 1). The Levee to Hwy 23 floods temporarily but has no flow/exchange because the Levee and Hwy 23 isolate this area from water inputs and exchanges (SI = 0.5).

## Variable V5 – Size of Contiguous Forested Area

The basic assumption for this variable is that larger forested tracts are less common and offer higher quality habitat than smaller tracts. The forest patch size is taken into consideration and corridors less than 75-feet-wide do not constitute a break in the forested area contiguity (Table 15).

All three WBVMRL sites have a class 3 forest size for all target years. Using those WVAs as a basis both the batture and Levee to Hwy 23 used class 3 for all target years.

Table 15. Variable 5, Size of Contiguous Forested Area Class values.

Class 1	0 to 5 acres
Class 2	5.1 to 20 acres
Class 3	20.1 to 100 acres
Class 4	100.1 to 500 acres
Class 5	> 500 acres

Variable V6 – Suitability and Traversability of Surrounding Land Uses

Many wildlife species commonly associated with bottomland hardwoods will often use adjacent areas as temporary escape or resting cover and seasonal or diurnal food sources. Surrounding land uses which meet specific needs can render a given area of bottomland hardwoods more valuable to a cadre of wildlife species. Additionally, the type of surrounding land use may encourage, allow, or discourage wildlife movement between two or more desirable habitats. Land uses which allow such movement essentially increase the amount of habitat available to wildlife populations.

Land use was averaged across the three WBVMRL sites to use in both the batture and Levee to Hwy 23 WVAs (Table 16).

Table 16. Variable 6, Suitability and Traversability of Surrounding Land Uses values used in the MBSD direct impact BLH WVAs.

	WBVMRL	WBVMRL	WBVMRL	Average
LAND USE	5.2 (%)	3.1 (%)	1.1 (%)	%
Forest / marsh	40	10	25	25
Abandoned Ag	0	0	0	0
Pasture / Hay	10	10	15	12
Active Ag	45	50	40	45
Development	5	30	20	18

## Variable V7 – Disturbance

Human-induced disturbance can displace individuals, modify home ranges, interfere with reproduction, cause stress, and force animals to use important energy reserves. The effects of disturbance are a factor of the distance to disturbance and the type of disturbance (Table 17).

Table 17. Variable 7, Disturbance Class values.

Distance Classes	Type Classes		
Class 1. 0 to 50 ft.	Class 1. Constant/Major. (Major highways, industrial, commercial, major navigation.)		
Class 2. 50.1 to 500 ft.	Class 2. Frequent/Moderate. (Residential development, moderately used roads, waterways commonly used by small to mid-sized boats).		
Class 3. > 500 ft.	Class 3. Seasonal/Intermittent. (Agriculture, aquaculture.)		
	Class 4. Insignificant. (Lightly Used roads and waterways, individual homes, levees, rights of way).		

The average of the three WBVMRL WVA Disturbance values (Distance is 1, Type is 2) was used for all target years for both batture and Levee to Hwy 23 WVAs (Table 18).

Table 18. Variable 7, Disturbance Class values used in the MBSD BLH WVAs.

WVA Sites	<b>Distance Class</b>	Type Class
WBVMRL 5.2	1	2
WBVMRL 3.1	1	2
WBVMRL 1.1	1	2
Average	1	2

## Literature Cited

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## Appendix A

Remotely Sensed Submerged Aquatic Vegetation Base Layer

#### **Remotely Sensed Submerged Aquatic Vegetation Base Layer**

#### Introduction

Submerged aquatic vegetation (SAV) is an important resource for fish and wildlife (Heck et al., 2003; Hitch et al., 2011; Kanouse et al., 2006; La Peyre and Gordon, 2011). Mapping the distribution of submerged aquatic vegetation (SAV) is however difficult due to limited water clarity across much of the coastal Louisiana (DeMarco et al. 2016). Indeed, many attempts at accurately identifying SAV in a particular date of remotely sensed imagery, particularly in turbid areas, are unsuccessful. Mapping methodologies that have successfully identified SAV remotely often take place in clear water or require hyperspectral imagery, which is typically limited in availability (Hestir et al. 2008, Williams et al. 2003, Visser et al. 2013). This effort develops a method for identifying SAV presence in general over large areas.

#### **Study Area**

Baseline conditions regarding the presence and absence of SAV were requested for six areas of interest in Barataria Basin, Louisiana as detailed in Figure 1 below.



Figure 1. Study areas for baseline SAV coverage.

## Methodology

#### 2.1 Aquatic Vegetation Identification Approach

Identification of any particular category of land cover via remotely sensed imagery begins with brainstorming on what unique characteristics of that class could be used to distinguish it from other classes. In the case of submerged aquatic vegetation (SAV), its reflectance values will be characterized by a strong water signal, but also, during clear conditions, at least some vegetation signal. Perhaps of particular note for this technique, those signals will also vary through time, as changing water conditions lead to changes in the reflectance of the target.

We therefore created a SAV layer for coastal Louisiana by querying pixels that contained a variable NDVI signal as well as a variable mNDWI signal through the period of record. The resulting mask was then used to classify presence and absence of SAV during the initialization period of the model for the study area.

#### 2.1.1 Imagery and Data

Sentinel-2 imagery was collected during the 2015-2018 observation period to match as closely as is possible to the model initialization period. Imagery was masked to exclude clouds and other sources of contamination using the "QA60" band, a band which contains flags for pixels determined to containing clouds, cloud shadows or other sources of contamination. Following these pre-processing steps, the following indices were calculated for each date of imagery during the observation period.

#### 2.1.1 Modified Normalized Difference Water Index

A modified Normalized Difference Water Index (mNDWI) (Xu 2005, 2006) was calculated for each image. The mNDWI enhances water features while cutting down on noise from land, vegetation, and soil (Xu, 2006). The mNDWI is seen in Equation 1 below:

mNDWI = (Green-MIR)/(Green+MIR)

MIR: 1.57-1.65 μm Green: 0.53-0.59 μm

#### 2.1.2 Normalized Difference Vegetation Index

A Normalized Difference Vegetation Index (NDVI) was also calculated for each image. The NDVI formula is detailed in Equation 2 below:

NDVI = (NIR-Red)/(NIR+Red)

NIR: 0.85-0.88 μm Red: 0.63-0.68 μm

#### 2.1.3 Index Variability

All cloud-free dates of imagery were used to calculate a standard deviation of both the NDVI and mNDWI during the observation period. The resulting output quantifies variance in these indices on a per

pixel basis, which can be visualized as a raster, such as that seen in Figure 2. It was noted that the areas in which high variance was observed in both indices corresponded with areas known to contain one of three types of targets: FAV, SAV, or land area change. Pixels containing NDVI variance values greater than 1 SD AND mNDWI variance values greater than 1 SD were masked and used in the next portion of this methodology.



Figure 2. Variability of NDVI during the 2015-2018 observation period. Bright white areas represent areas with highly variable vegetation signals.

## 2.1.4 Linear Spectral Mixture Analysis

Linear Spectral Unmixing (LSU) is used to determine the relative abundance of materials in a given pixel of remotely sensed imagery based on the materials' spectral characteristics. In this case, the composition of all pixels within the mask created in the previous step were estimated for the percent FAV, SAV, and land for each date during the observation period. Majority composition was calculated for each pixel and the resulting data was queried for pixels containing SAV. This layer formed the final SAV Occurrence Layer.

#### Results

The resulting layer is shown in Figure 3 for a portion of southeast Louisiana. Areas in red are identified as containing SAV in this layer during the 2015-2018 observation period.



Figure 3. Draft map of SAV occurrence during the 2015-2018 observation period.

## **Accuracy Assessment**

The remotely sensed SAV occurrence layer was compared to 126 locations in Barataria Basin at which field data (confirming the presence or absence of SAV) was available from a similar time-period. Much of the field data used is described in DeMarco et al. 2018. The collection dates of these field data vary from 2013-2015. While these field dates are not during the same time-period as the period of observation for this effort, there were used to provide general information regarding areas in which SAV has been known to occur. It is noted that the accuracy assessment of this effort could be affected by this temporal discrepancy. Additional data points were collected in 2018 as part of an effort to quantify and model SAV in and around Jean LaFitte National Park (JLNP).

Overall accuracy of the remotely sensed SAV occurrence layer was observed to be 74.6% based on the field data available (Table 1). Generally, in remotely sensed classifications, overall accuracies in the 70%-80% range are considered decent, but overall accuracy is not always the best metric of a layer's accuracy and/or applicability. A Kappa statistic, which is a measure of the deviation of a layer's accuracy as compared to what would be expected by chance is used. In this case, the Kappa statistic of 0.49 is considered to indicate moderate agreement between the field are remotely sensed layer.

The true accuracy of the SAV Occurrence Layer is likely much higher than the limited field data indicates.

0				0		c
		Observ	ed vs. SAV Mas	k Accuracy Asso	essment	
				Field Data		
			Presence	Absence	Classified Totals	Producer Accuracy
þ	×	Presence	55	9	64	85.94%
	V Masl	Absence	23	39	62	62.90%
	IS - SA	Field totals	78	48	126	
	8	User Accuracy	70.51%	81.25%		
					Overall Accuracy	0.74603
					Kappa Statistic	0.49

Table 1. Accuracy Assessment of the remotely sensed SAV mask vs field sites in Barataria Basin, Louisiana.

#### SAV Composition in Areas of Interest

Landscape composition was assessed in each area of interest for three categories of land cover: land, water, and SAV. The results of said analysis are presented in acres (Table 2) and as a percent of the area (Table 3). While the areas of interest are intended to represent areas in which the model predicts water during the initialization period, there is some disagreement between the model predictions and the remotely sensed assessment, particularly with regard to land area. Once the land area is removed from consideration, the percent of the water area containing SAV was calculated in Table 4.

Land accounted for an average of approximately a third of the areas of interest (Table 3). The remaining two-thirds was comprised of approximately 92% Water/8% SAV for TRAD areas of interest, and approximately 94% water and 6% SAV (Tables 3&4).

Remotely Sensed Classification SAV Baseline Assessment (2015-2018)					
	Cycle_0			Total Water Area	
Region/Model Run	Salinity_Zone	Water (acres)	SAV (acres)	(acres)	
V3PR2_HYST_cycle1	Fresh/Inter	24,808.09	2,775.84	27,583.93	
V3PR2_HYST_cycle1	Brackish/Saline	9,213.38	154.34	9,367.72	
V3PR2_TRAD_cycle1	Fresh/Inter	16,784.83	2,342.13	19,126.97	
V3PR2_TRAD_cycle1	Brackish/Saline	7,014.83	128.07	7,142.90	
V3PR4_HYST_cycle1	Fresh/Inter	29,460.50	2,869.94	32,330.44	
V3PR4_HYST_cycle1	Brackish/Saline	16,088.69	204.72	16,293.40	
V3PR4_TRAD_cycle1	Fresh/Inter	20,131.70	2,690.82	22,822.52	
V3PR4_TRAD_cycle1	Brackish/Saline	8,370.96	164.95	8,535.91	
V3PR6_HYST_cycle1	Fresh/Inter	42,495.35	3,104.05	45,599.39	
V3PR6_HYST_cycle1	Brackish/Saline	35,859.91	229.38	36,089.28	
V3PR6_TRAD_cycle1	Fresh/Inter	24,652.12	2,847.54	27,499.66	
V3PR6_TRAD_cycle1	Brackish/Saline	14,790.30	206.44	14,996.75	

Table 2. Average water and SAV composition of the six areas of interest by habitat type during the 2015-2018 observation period as assessed by Sentinel-2 imagery (acres).

RS Classification SAV Baseline Assessment (2015-2018)					
		% of Water Area			
Region/Model Run	Salinity_Zone	Containing SAV			
V3PR2_HYST_cycle1	Fresh/Inter	10.0633%			
V3PR2_HYST_cycle1	Brackish/Saline	1.6476%			
V3PR2_TRAD_cycle1	Fresh/Inter	12.2452%			
V3PR2_TRAD_cycle1	Brackish/Saline	1.7930%			
V3PR4_HYST_cycle1	Fresh/Inter	8.8769%			
V3PR4_HYST_cycle1	Brackish/Saline	1.2564%			
V3PR4_TRAD_cycle1	Fresh/Inter	11.7902%			
V3PR4_TRAD_cycle1	Brackish/Saline	1.9325%			
V3PR6_HYST_cycle1	Fresh/Inter	6.8072%			
V3PR6_HYST_cycle1	Brackish/Saline	0.6356%			
V3PR6_TRAD_cycle1	Fresh/Inter	10.3548%			
V3PR6_TRAD_cycle1	Brackish/Saline	1.3766%			

Table 4. Average percent of water area containing SAV in the six areas of interest by habitat type during the 2015-2018 observation period as assessed by Sentinel-2 imagery (percent).

#### Discussion

The Hysteresis (HYST) analysis areas generally contain a larger total area of SAV coverage, but a lower value as a percent on the water area. This occurs as the traditional areas of interest are smaller and contain a larger percentage of small, protected, shallow water bodies, more likely to contain SAV. Conversely, the Hysteresis (HYST) analysis areas are larger and contain more large, open water bodies. These baseline compositions form a good starting estimate from which models can initiate and forecast changes in the future.

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## **Appendix B**

Future projections of SAV based on SLOO model for likelihood of occurrence parameters

To assess the impact of potential changes in environmental conditions on SAV occurrence and coverage, both qualitative and quantitative methods were applied. Results and analyses from DeMarco et al., (2018) indicate that the primary drivers for SAV occurrence in coastal Louisiana include salinity, exposure (to wind, waves, and current velocities), and turbidity. While precise quantitative relationships were not possible to obtain for this effort given scheduling logistics and the inability to currently seamlessly connect hydrologic modeling output to the existing SAV model developed in DeMarco et al., (2018), best professional judgement was used to estimate coarse relationships of SAV to these environmental drivers.

SAV habitat was separated into habitat types (Fresh/Intermediate – F/I and Brackish/Saline – B/S) as well as depth types (0.5 - 2.0 meters = deep - D, 0 - 0.5 meters = shallow - S), where everything greater than 2 meters was assumed to have no SAV. While SAV is occasionally found at these high depths, it is rare in coastal Louisiana, particularly so in Barataria Bay (DeMarco, personal observation), and given the inherent error in elevation and bathymetry data, this cut off has been used previously (DeMarco et al., 2018). These habitat classifications were developed to characterize the unique responses of SAV assemblages in these areas to environmental conditions. For each habitat type (F/I-D, F/I-S, B/S-D, B/S-S), a weighted value was associated with each environmental driver (salinity, turbidity, exposure) to approximate the strength of each on the probability of occurrence and assumed SAV coverage unique to each habitat. Additionally, each driver was assigned a coarse value necessary to have an effect on SAV occurrence and assumed coverage, specifically, an estimated degree of change in a driver necessary to cause a small or large increase or decrease on SAV. Assigning a value that could potentially induce changes in SAV occurrence was needed to link SAV outputs to the hydrodynamic model.

The SAV Likelihood of Occurrence Model (or SLOO) in DeMarco et al., (2018) estimated only the presence or absence of SAV based on environmental conditions. For this effort, it was necessary to estimate how these conditions (ie., drivers of presence) might influence cover. Specifically, what effect a large or small change in an environmental driver (ie., salinity, turbidity, exposure) would then have on SAV coverage in terms of cover increase or decrease. These estimates of cover change were developed by first creating an index for large, small, and no change values that the drivers could have on SAV for each habitat class, then multiplying those estimates by each drivers weight, and finally converting it to a percent change (Table B3). Every possible combination of potential impacts of environmental drivers on SAV change was estimated for each habitat class, resulting in 125 possible combinations. The application of these SAV change values served as a good "check" on the weighted environmental drivers. For example, if there was a large decrease in salinity in F/I habitat types, the SAV change value was 0, reflecting that any decrease in salinity would have no effect on SAV cover in these habitats. Precise values relating cover change to these environmental drivers are not quantitatively known, and are coarse estimates made by years of observations of SAV patterns in the field across south

Louisiana (DeMarco, personal observations). Future efforts should attempt to quantify this SAV response to all environmental drivers found to be significant.

Drivers:

Variable	Salinity (ppt)	Turbidity (mg/L)	DtoL (m)
Habitat Class	F	resh/Intermedia	te
Shallow (< 0.50m)	0.25	0.25	0.5
Deep (0.50001 - 2.0m)	0.1	0.35	0.55
		Brackish/Saline	;
Shallow (< 0.50m)	0.35	0.1	0.55
Deep (0.50001 - 2.0m)	0.25	0.25	0.5
Shallow (< 0.50m) Deep (0.50001 - 2.0m)	0.35 0.25	0.1 0.25	0.55

Table B1: Weights of Environmental Variables (DtoL = Distance to Land)

Magnitude of cover change	Large (+	/-)		Small (+/-)			
Variable	Salinity (ppt)	Turbidity (mg/L)	DtoL (m)	Salinity (ppt)	Turbidity (mg/L)	DtoL (m)	
Habitat Class	Fresh/Intermediate						
Shallow (< 0.50m)	1	15	50	0.1	7.5	25	
Deep (0.50001 - 2.0m)	1	5	25	0.1	2.5	10	
	Brackish/Saline						
Shallow (< 0.50m)	5	20	20	1	10	10	
Deep (0.50001 - 2.0m)	5	10	10	1	5	5	

Table B2: Degree of change in environmental drivers necessary to cause magnitude (large, small) of effect on SAV occurrence and assumed coverage

Magnitude of cover change	]	Large (+/-)		Small (+/-)			No Change			
				Fres	h/Intermedi	ate				
Variable	SalinityTurbidityDtoL(ppt)(mg/L)(m)			Salinity (ppt)	Turbidity (mg/L)	DtoL (m)	Salinity (ppt)	Turbidity (mg/L)	DtoL (m)	
Shallow (< 0.50m)	1	2	2	0	1	1	0	0	0	
Deep (0.50001 - 2.0m)	1	2	2	0	1	1	0	0	0	
		Brackish/Saline								

Shallow (<	2	2	2	1	1	1	0	0	0
0.50m)									
Deep	2	2	2	1	1	1	0	0	0
(0.50001 -									
2.0m)									

Table B3: Estimated strength of effect of environmental conditions on SAV cover. These values were multiplied by the unique weights given to each environmental driver (Table B1), then converted to a percentage to estimate SAV cover change for each habitat class.

## **Salinity**

In F/I habitat classes, salinity acts primarily as a structuring mechanism (Burgos-León et al., 2013; Capers et al., 2010; Rodríguez-Gallego et al., 2015), as salinity changes the occurrence or coverage of SAV assemblages will be minimally impacted, although species communities will shift. Salinity changes are weighed slightly higher in F/I-S habitat types (weight=0.25) as shallow habitats in Barataria Basin are more often classified as intermediate marsh types, while deep ponds are characteristic of fresh marsh types (DeMarco, 2018). An increase or a decrease in salinity in shallow marsh could be generally assumed to be intermediate marsh, and would have a stronger effect on SAV occurrence and coverage. Salinity changes in deep areas was estimated to have a small effect on the SAV populations comparatively (weight=0.1)The magnitude of change necessary to cause a large impact on SAV occurrence and assumed coverage was 1 ppt (a large change in F/I marsh) and 0.1 ppt for a small effect.

Changes in salinity were assumed to impact SAV occurrence and assumed coverage in B/S marshes more strongly that F/I habitats overall. Shallow B/S habitats here are considered to be more sensitive (weight=0.35) to salinity compared to B/S-D (weight=0.25) as salinity increases concurrent with drought and/or dry conditions will be more influential at shallower depths (Kinney et al., 2014). In order to have a large impact on B/S habitats in shallow and deep classes, salinity changes were assumed to be at least 5 ppt, this is based on the knowledge that the species in these communities are adapted to high salinities, and therefore would take a relatively large change in salinity to induce a large decrease or increase in occurrence or coverage. To induce a large change in SAV occurrence or coverage in B/S habitats, 1 ppt was selected for both depth classes.

## **Turbidity**

The original SLOO model (DeMarco et al., 2018) evaluated the effects of turbidity measured as NTUs, while the hydrodynamic model used for this effort expressed turbidity as total suspended solids (TSS). Quantitative relationships linking NTU data with TSS data are location specific, and are as yet unavailable for Barataria Bay and much of coastal Louisiana. Consequently, estimates of turbidity ranges describing their effects on SAV were coarse, and described using additional data (TSS data collected for SAV modeling in Jean Lafitte National Park) where possible. Future attempts to link hydrodynamic models to SAV models should specify this relationship between SAV and TSS.

Turbidity effects were weighted higher in deep classes for both the F/I and B/S habitat types. Turbidity is a measure of water clarity, which meaningful to SAV primarily as it effects light penetration. Turbidity is less important at shallow depths, as light is able to penetrate more of the water column in shallow compared to deep habitats. Similarly, B/S habitats were assumed to be less sensitive to turbidity, as SAV species typically found in these habitats are adapted to higher turbidity conditions (ie., *Ruppia maritima* and/or *Myriophyllum spicatum*; Cho and Poirrier, 2005; Cho et al., 2009; Martin and Valentine, 2012). Note this is not the case for true seagrass species, which are highly sensitive to turbidity, but these seagrass species are absent entirely from the Louisiana coastal zone and Barataria Basin with the exception of the Chandeleur Islands (DeMarco 2018). Many species characteristic to F/I habitats are sensitive to increases in turbidity, in particular, high turbidities can make it difficult for these species to establish (Jarvis and Moore, 2008), although this is highly dependent on seasonal turbidity.

Similarly, the degree of change required to induce an effect was smaller in both F/I habitat types and in deep classes (Table B2). To induce a large effect in SAV occurrence and coverage (Table B2) 5mg/L of TSS change was selected in F/I-D, and 10mg/L in B/S-D, compared to 15 mg/L in F/I-S and 20 mg/L in B/S-S. For turbidity to have a small effect the degree of change was set to 8 mg/L in F/I-S, 3 mg/L in F/I-D, 10 mg/L in B/S-D, and 20 mg/L in B/S-S.

#### Exposure

For the SLOO model (DeMarco et al., 2018), exposure was used as a proxy for the negative effects that physical activity, including wave energy, wind waves, and current velocities, can have on SAV presence (Barrat-Segretain, 2001; Fonseca and Bell, 1998; Gurbisz et al., 2015; Robbins and Bell, 2000; Strand and Weisner, 2001). In Barataria Bay, exposure is believed to have the strongest effect on SAV presence and assumed cover, given the organic sub-aerial soils, which are highly mobile if disturbed (leading to decreased water clarity) and the potentially erosive forces of exposure (DeMarco and Couvillion, personal observation, Jean Lafitte National Park Project). For the SLOO model (DeMarco et al., 2018), exposure was calculated as a measure of annually averaged omni-directional fetch, however, more recent efforts have developed more robust methodologies that include dominant wind direction and seasonality (Jean Lafitte work). However, there is no direct method to translate the hydrology modeling outputs for this effort into exposure as it impacts SAV. Here, distance to land (in meters) was used as an estimate of fetch and assumed exposure, distance to land is hereafter simply referred to as exposure. Future efforts to quantity hydrologic impacts on SAV occurrence and coverage should work to link hydrodynamic modeling impacts to SAV occurrence modeling more precisely.

Given large impact that exposure can have on SAV habitat in the study area, it was weighted the most heavily of all the environmental drivers evaluated in all habitats (Table B1). Meaning if exposure decreased conditions would improve significantly, and if exposure increased, conditions for SAV would decline significantly. In F/I habitats exposure was weighted as 0.5 in shallow and 0.55 in deep habitats, as it was assumed that F/I habitats had soils that were more easily suspended, and increased exposure would in turn decrease water quality, which has a larger effect in deep water. Exposure in shallow habitats of B/S areas has a slightly heavier

weight than in deep classes due to impact of assumed erosion and was weighted at 0.55 in B/S-S, 0.50 in B/S-D.

To estimate changes in exposure (distance to land) that could have a large impact on assumed SAV presence and cover values were assigned as 50m in F/I-S, 5m in F/I-D, 20m in B/S-S, and 10m in B/S-D (Table B2). Values are higher in F/I habitats b/c species in these areas typically have stronger root and stem systems and are not as susceptible to increased current velocities or wave energies, and will consequently require a larger change in exposure to be impacted. Values are higher in shallow areas because light availability in shallow habitats will be less affected by changes in physical activity than deep water. Small changes in SAV occurrence and assumed cover were assigned as 25m in F/I-S, 10m in F/I-D, 10m in B/S-S, and 5m in B/S-D. These estimates attempt to describe the species-specific responses to exposure – F/I species are not as tolerant of decreased water quality (the result of physical activity) as species in B/S habitats.

It is well established that these environmental drivers influence the presence and cover of SAV, both as a single effect and as an interaction. This effort attempted to coarsely capture these interactions using the data that were available, estimating SAV response to changes in salinity, turbidity, exposure, and the combined effects of all 3 over large areas. This is a first attempt at quantifying these impacts on cover and at linking hydrodynamic and SAV models.

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## Appendix C SAV Workflow - Steps in getting SAV Change from DELFT outputs

## SAV Workflow - version date: 20191120 (YMD) YCA

https://thewaterinstitute-

my.sharepoint.com/:f:/g/personal/fmessina\_thewaterinstitute\_org/EoIQSq8FXfJJvvz\_ef mZCV8B9DukM6xjqi-tiqm4417s6Q?e=Yz7T8c

- STEP A-C: Pull in all environmental vars from DELFT HYST (or TRAD)
  - A. Morphology/Exposure (polygons)
    - a. Read in morphology files (*TO48\_PR\_HYST>Land Change Maps > Shapefiles*)
      - i. For 2020 read in "Initial landscape 2020" if bed elevation > 0.04, then
      - land else water This is the same initial morpho file for all PR ii. For all other decades (2030-2070; cycles 0,1,2,3,4) use "Value" to
        - distinguish land and water
          - 1. For PR1 use "landloss" files
          - 2. For all other PR use "land change" files
    - b. Create centroids
    - c. Create subset to land only
    - d. Use full data frame to calculate distance from each cell to nearest land cell (*this is slow*)
  - B. TSS (text files)
    - a. Read in data directly from TWIG (*TO48\_PR\_HYST> HSI analysis TSS\_Batataira*)
  - C. Water Level and Salinity (polygons)
    - a. Water Level
      - i. Read in water level files from Delft (*TO48\_PR\_HYST> Water Level Contour Maps format: Water\_level\_map\_V3PR2\_HYST\_1970*)
      - ii. Replace -999 with NA
      - iii. Calculate annual averages for FWP and FWOP using May and Oct weekly values
      - iv. Reproject to 1583
      - v. Create centroids (instead of polygons)
    - b. Salinity
      - i. Same workflow as water level but do not create centroids (TO48 PR HYST> Salinity Contour Maps)
      - *ii.* Note that there are some really oddball salinity values in the original files - close to the river but 20-30ppt

- D. Join above environmental input variables and calculate depth
  - a. Join salinity and TSS (note that point location of TSS data is slightly different from other data)
  - b. Join above to exposure and water level
  - c. Create centroids
  - d. Convert water level to m
  - e. Calculate Depth: for cycle = 0 calculate depth using bed\_PR1 otherwise use bed\_PRX
    - i. If PR = 1 and
      - 1. bed < 0 then Z = abs(bed) + WL FWOP
      - 2. bed > 0 then  $Z = WL_FWOP bed$
    - ii. If PR = 2,4,6 and
      - 1. bed < 0 then Z = abs(bed) + WL FWP
      - 2. bed > 0 then  $Z = WL_FWP bed$
  - f. Assign depth class as: If Z < 0.5, then "S", else if Z < 2m then "D" otherwise "X"
  - g. Assign salinity class as: If Salinity >= 4, then "BS", otherwise "FI"
  - h. Write out to comboZ folder
- E. Calculate change in environmental variables
  - a. List all file names in folder by PR (each PR and cycle combination)
  - b. Read in all cycles for a single PR from comboZ folder
  - c. Calculate change in environmental variables for all cycles:
    - i. E.g. change 10 = cycle 1 cycle 0
    - ii. Add columns of Zclass and Salclass for the second cycle (e.g. using cycle 1 values in the above example)
    - iii. Write out files: e.g as PR2change10.shp
- F. Combine habitat and environmental files, assign change classes, accumulate % change
  - a. Read in base SAV layer from Brady (e.g. PR2\_Cycle0\_join\_utm\_v3)
  - b. Subset columns keeping: "FWP\_avg", "Prc\_SAV", "SAV\_sqm", "sq\_m"
  - c. Read in first change file (change10)
  - d. Read in thresholds file (SAV\_QualtoQuantEst\_091319.xlsx)
  - e. Join A (SAV base layer) and C (change in env variables) by location
  - f. Create "Start Class" from Z and SalClass Columns e.g. FI and S = FIS
  - g. For each StartClass
    - i. Use change values to assign a class of LD, SD, NC, SI, LI note that I assigned a numeric code (0,1,2,3,4)
    - ii. Paste together the numeric codes to get a unique code ("composite") for each change combination
    - iii. Paste all StartClass results together into one file note that any classes having NA are omitted!
  - h. Read in Expert Opinion table (Expert Opinion on SAV Change 5 and 3 Classes 2 Variablesvalued.xlsx)
    - i. Create "composite" variable based on sal, TSS and exp impacts

- i. Using "composite" as a common index lookup the SAV impact (perSAVchange) for each observation in H
- j. In this first run, populate "cumulative percent change" column using the percent change, and "cumulative SAV change" column using "cumulative percentage change" + initial "Prc\_SAV" conditions
- k. Write to outputs folder
- 1. **For subsequent runs**, use the output in k as the new base layer (step F.a above) and the next change file (e.g. change 21) for Step F.c

#### Columns in the output files (e.g. "PR2change10.shp")

FWP_avg	inherited from base layer DO NOT USE
Prc_SAV	inherited from base layer DO NOT USE
SAV_sqm	inherited from base layer DO NOT USE
sq_m	inherited from base layer DO NOT USE

#### cumprch cumulative percentage change

# cumSAVch cumulative percentage change added to initial Prc\_SAV value – forced to limits of 0 and 100

	limits of 0 and 100
sal_ch	salinity change
TSS_ch	TSS change
exp_ch	exposure change
Depth	depth at second cycle
PRcycle	
salclass	salinity class
Zclass	depth class
StrtCls	combined Z and sal class
Salrange	numeric code of salinity change : LD, SD, NC, SI, LI
turbrange	numeric code of TSS change : LD, SD, NC, SI, LI
exprange	numeric code of exposure change : LD, SD, NC, SI, LI
composit	composite of sal, turb and exp range codes – used to lookup SAV change
prSAVch	resulting percent change in this iteration

**Steps in getting SAV Change from DELFT outputs:** 



## **STEPS A-C: Prepare Environmental Input Layers from DELFT:**

- A. Exposure:
  - **a**. Get morphology at the end of each cycle :
    - have "Value" from land change (FWP) or land loss (FWOP) files ("Value" >=1)
  - b. for initial conditions (landscape 2020) land = (bed elevations >0.04)
  - c. for each cell, calculate exposure as distance (m) to nearest land for each cycle and PR
- B. Turbidity:
  - a. Use annual mean directly for each cycle and PR from files in HSI folder
- C. Water Level and Salinity:
  - a. calculate mean annual water level for representative years from water level contour maps

for each cycle and PR as mean of weekly estimates in May and October

b. calculate mean annual salinity values from salinity contour maps for each cycle and PR as mean of weekly estimates in May and October

## STEP D: Calculate Z, assign depth & salinity classes

- D. Join environmental input variables, calculate depths, assign depth and salinity classes
  - a. Calculate Depth (Z)
    - a. Convert water level to m
    - b. Have bed elevations from morphology files (Step A)
    - c. Have Mean Annual Water Levels (Step C)
      - a. For cycle = 0 use bed\_PR1 otherwise use bed\_PRX
        - a. For PR1 and
          - a. bed < 0 then Z = abs(bed) + WL\_FWOP
          - b. bed > 0 then  $Z = WL_FWOP bed$
        - b. For PR = 2,4,6 and
          - a. bed < 0 then  $Z = abs(bed) + WL_FWP$
          - b. bed > 0 then  $Z = WL_FWP bed$
  - b. Class assignments:
    - a. Assign depth class as: if Depth < 0.5 then "Shallow", else if Depth <2m then "Deep", otherwise "X"
    - b. Assign salinity class as: if FWP/FWOP Sal >= 4 "BS", otherwise "FI"
    - c. Each PR and cycle has a single file with all environmental values, depth class and salinity class

# STEPS E-F. Calculate change, combine habitat and change files, assign change classes and SAV impact, accumulate % change

- E. Calculate change:
  - a. for all PR, calculate change in environmental values between cycles (cycle1 cycle0; cycle2 cycle1....)
  - Each PR has a single change file (change10, change21, change32, change43, change 54) with
    - i. all environmental change variables
    - ii. depth class and salinity class from the second cycle
- F. Combine habitat and change files, assign change classes and SAV impact, accumulate % change
  - a. Combine habitat and change files
    - i. Read in base SAV layer from USGS
    - ii. Read in first change file (change10)
    - iii. Join base SAV layer and change file
  - b. Create new habitat class by merging Z and Sal Class codes (e.g. FIS)
  - c. Read in thresholds file: "SAV\_QualtoQuantEst\_091319.xlsx"
  - *d.* For each habitat class and environmental variable, assign change **class** based on change *values and associated impact thresholds NOTE that any cells having missing values for any environmental value are omitted*
  - e. Combine change classes (from d above) into a "unique change combination code"

- f. Read in "Expert Opinion on SAV Change 5 and 3 Classes\_2\_Variablesvalued.xlsx" and translate to the same "unique change combination codes" as above (500 unique combos = 125 unique combos per habitat class)
- g. Using "unique change combination codes" as a common index, lookup SAV impact (from F.f) for each cell in F.e
- h. For each PR and change calculate a new "SAV State"
  - i. In the first run, SAV state = initial "Prc\_SAV" conditions + SAV impact
  - In subsequent runs, the output above (F.h.i) becomes new base layer (step F.a.i above) and the next change file (e.g. change 21) goes to step F.a.ii (i.e. start with base habitat file and apply changes serially)

"SAV\_QualtoQuantEst\_091319.xlsx"

StartClass	Sal	Turb	Exp	changeclass
FIS	-1	-15	-50	LD
FIS	-0.1	-7.5	-25	SD
FIS	0.1	7.5	25	SI
FIS	1	15	50	LI
FID	-1	-5	-25	LD
FID	-0.1	-2.5	-10	SD
FID	-0.1	2.5	10	SI
FID	1	5	25	LI
BSS	-5	-20	-20	LD
BSS	-1	-10	-10	SD
BSS	1	10	10	SI
BSS	5	20	20	LI
BSD	-5	-10	-10	LD
BSD	-1	-5	-5	SD
BSD	1	5	5	SI
BSD	5	10	10	LI

StartClas	s Salinity	Salval Sa	Ilchange TSS	TSSval TSS	Schange Exp	Expval Expchan	ge NetSAVClass	Weight Es	tSAVCoverChange sa	alrange tu	urbrange ex	xprange
FIS	Large Increase	-1	1 Large Increase	-2	15 Large Increase	-2	50 Large Decrease	-1.75	-17.5	4	4	4
FIS	Large Decrease	e 0	-1 Large Increase	-2	15 Large Increase	-2	50 Large Decrease	-1.5	-15	0	4	4
FIS	Large Increase	-1	1 Small Increase	-1	8 Large Increase	-2	50 Large Decrease	-1.5	-15	4	3	4
FIS	No Change	0	0 Large Increase	-2	15 Large Increase	-2	50 Large Decrease	-1.5	-15	2	4	4
FIS	Small Decrease	e 0	-0.1 Large Increase	-2	15 Large Increase	-2	50 Large Decrease	-1.5	-15	1	4	4
FIS	Small Increase	0	0.1 Large Increase	-2	15 Large Increase	-2	50 Large Decrease	-1.5	-15	3	4	4
FIS	Large Decrease	e 0	-1 Small Increase	-1	8 Large Increase	-2	50 Large Decrease	-1.25	-12.5	0	3	4
FIS	Large Increase	-1	1 No Change	0	0 Large Increase	-2	50 Large Decrease	-1.25	-12.5	4	2	4
FIS	Large Increase	-1	1 Large Increase	-2	15 Small Increase	-1	25 Large Decrease	-1.25	-12.5	4	4	3
FIS	No Change	0	0 Small Increase	-1	8 Large Increase	-2	50 Large Decrease	-1.25	-12.5	2	3	4
FIS	Small Decrease	e 0	-0.1 Small Increase	-1	8 Large Increase	-2	50 Large Decrease	-1.25	-12.5	1	3	4
FIS	Small Increase	0	0.1 Small Increase	-1	8 Large Increase	-2	50 Large Decrease	-1.25	-12.5	3	3	4
FIS	Large Decrease	e 0	-1 No Change	0	0 Large Increase	-2	50 Large Decrease	-1	-10	0	2	4
FIS	Large Decrease	e 0	-1 Large Increase	-2	15 Small Increase	-1	25 Large Decrease	-1	-10	0	4	3
FIS	Large Increase	-1	1 Small Decrease	1	-8 Large Increase	-2	50 Large Decrease	-1	-10	4	1	4
FIS	Large Increase	-1	1 Small Increase	-1	8 Small Increase	-1	25 Large Decrease	-1	-10	4	3	3
FIS	No Change	0	0 No Change	0	0 Large Increase	-2	50 Large Decrease	-1	-10	2	2	4
FIS	No Change	0	0 Large Increase	-2	15 Small Increase	-1	25 Large Decrease	-1	-10	2	4	3
FIS	Small Decrease	e 0	-0.1 No Change	0	0 Large Increase	-2	50 Large Decrease	-1	-10	1	2	4
FIS	Small Decrease	e 0	-0.1 Large Increase	-2	15 Small Increase	-1	25 Large Decrease	-1	-10	1	4	3
FIS	Small Increase	0	0.1 No Change	0	0 Large Increase	-2	50 Large Decrease	-1	-10	3	2	4
FIS	Small Increase	0	0.1 Large Increase	-2	15 Small Increase	-1	25 Large Decrease	-1	-10	3	4	3
FIS	Large Decrease	e 0	-1 Small Decrease	1	-8 Large Increase	-2	50 Small Decrease	-0.75	-7.5	0	1	4

"Expert Opinion on SAV Change -5 and 3classes\_2\_Variablesvalued.xlsx"

#### **DECADAL ALIGNMENT DIAGRAM**



#### UNADDRESSED ISSUES WITH EXPOSURE CALCULATIONS

Example:

Exposure values (m) from PR6 Cycle 3

lssue #1

• cell size artifact at modeling cell size change

Issue #2

 Change in exposure impact thresholds in table (max 50m) are much smaller than model cell size (min 123m)

