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November 13, 2023

Mississippi Department of Environmental Quality
Groundwater and Remediation Department
P.O. Box 2261
Jackson, Mississippi 39225

Attn: Mr. Thomas Wallace
E: twallace@mdeq.ms.gov
P: (601) 961-5117

RE: Waters of the United States Delineation
Leake County EDD – Site 2 - Northeast
Carthage, Leake County, Mississippi
Terracon Project No. EB237180

Dear Mr. Wallace:

Terracon is pleased to submit the enclosed Waters of the U.S. (WOTUS) Delineation report in accordance with the Mississippi Department of Environmental Quality (MDEQ) work order No:1865-237149-3 dated August 24, 2023. The findings of Terracon's delineation are summarized below:

- Total Site Size – 26.03 acres
- Jurisdictional Wetlands – 0 acres
- Jurisdictional Tributaries – 0 Linear Feet
- Non-Jurisdictional ponds – 0.42 acres
- Uplands – 25.61 acres

Considerations

Terracon understands you may intend to obtain a Jurisdictional Determination from the United States Army Corps of Engineers (USACE). There are two types of Jurisdictional Determinations that can be obtained from USACE; (1) Preliminary Jurisdictional Determination and (2) Approved Jurisdictional Determination.

- **Preliminary Jurisdictional Determination (PJD) Request:** A PJD is the most common type of jurisdictional determination provided by USACE. For purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures, a permit decision made on the basis of a PJD will treat all waters and wetlands that would be affected in any way by the permitted activity as if they are jurisdictional WOTUS. In other words, there is a presumption of jurisdiction for all aquatic resources on a site. In most cases, PJDs are sufficient to initiate wetlands/WOTUS impact permitting if future phases of the project would impact aquatic resources. Other state and federal permitting agencies that rely on USACE to verify wetland/WOTUS boundaries also typically accept PJDs. The advantage of PJDs is less regulatory scrutiny and more expedited response from USACE. It should be noted that PJDs may not satisfy all local and/or state permitting authority requirements and, although infrequent, the USACE may require AJDs on a case-by-case basis.

- **Approved Jurisdictional Determination (AJD) Request:** An AJD is needed if there are non-jurisdictional (isolated) aquatic resources on a site. An AJD may also be required if there are no aquatic resources on the site and the entire site is comprised of uplands. The level of effort to obtain an AJD requires additional documentation and regulatory agency scrutiny is typically greater. Additionally, the USACE will seek concurrence from the United States Environmental Protection Agency (EPA) for AJDs.

By definition, a PJD can only be used to determine that wetlands or other water bodies that exist on a particular site "may be" jurisdictional WOTUS. A PJD by definition cannot be used to determine either that there are no wetlands or other water bodies on a site at all (i.e., that there are no aquatic resources on the site and the entire site is comprised of uplands), or that there are no jurisdictional wetlands or other water bodies on a site, or that only a portion of the wetlands or waterbodies on a site are jurisdictional. A definitive, official determination that there are, or that there are not, jurisdictional WOTUS on a site can only be made by an AJD[1].

Please note that either a PJD or AJD can be used for potential USACE Clean Water Act permitting efforts. The distinction is that PJD carries a presumption of jurisdiction; therefore, all aquatic resources on a site would be jurisdictional and subject to the Clean Water Act. Additionally, although both PJDs and AJDs are

[1] *USACE Regulatory Guidance Letter No. 16-01, dated October 2016*

acceptable for potential permitting, only the AJD option can be appealed. Following the Field Delineation, Terracon will provide site specific consultation regarding the applicability of requesting a PJD or AJD and the level of effort and additional cost required to obtain an AJD as applicable.

Recommendations

Based on the findings of the WOTUS Delineation described in the enclosed report, Terracon recommends submitting a copy of the WOTUS Delineation report and applicable Jurisdictional Determination request form to the USACE District office for review and verification of the WOTUS Delineation to obtain a PJD.

If future activities would result in impacts to aquatic resources located on the 404/401 Clean Water Act (CWA) permitting will likely be required. Impacts to aquatic resources processed as a Nationwide Permit (NWP) or an Individual Permit (IP) depend upon the extent of impacts. NWPs are typically used for projects resulting in less than 0.5 acre of impacts to WOTUS. IPs are typically used for projects resulting in more than 0.5 acre of impacts to WOTUS.

Terracon is available to assist you with 404/401 CWA permitting services at your request. We can also provide additional support studies such as mitigation planning and cultural resource assessments if required by USACE.

Closing

Terracon appreciates the opportunity to provide services on this important project. Please feel free to contact either of the undersigned if you have any questions or require additional information.

Sincerely,
Terracon Consultants, Inc.

Spencer J. McQuaig
Staff Geologist

Jim W. Baxter
Senior Ecologist

David Brunet
Project Scientist

Enclosure: Waters of the US Delineation Report

Waters of the United States Delineation

Leake County EDD – Site 2 - Northeast

Carthage, Leake County, Mississippi

November 13, 2023 | Terracon Project No. EB237180

Prepared for:

The Mississippi Department of Environmental Quality

Jackson, Mississippi

Prepared by:

Terracon Consultants, Inc.

Ridgeland, Mississippi

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1.0 INTRODUCTION

Terracon Consultants, Inc. (Terracon) was retained by Leake County Economic Development District (Leake County EDD, client) to perform a Waters of the U.S. (WOTUS) delineation on the Carthage #2 Site located in Carthage, Leake County, Mississippi hereafter referred to as the site. The site location is depicted in Appendix A; Exhibit 1. The WOTUS Delineation was performed in accordance with work order No: 1865-237149-3 issued by the Mississippi Department of Environmental Quality (MDEQ) dated August 24, 2023.

The delineation consisted of an approximately 26.03-acre site that contains open pastureland and a small area of a mixture of hard wood and pines. Photographs depicting the conditions on-site are provided in Appendix C.

The purpose of performing the preliminary WOTUS delineation was to characterize the existing site conditions, observe the site for the presence of WOTUS, including wetlands, and provide an opinion regarding whether or not WOTUS (if observed) would be considered jurisdictional by the United States Army Corps of Engineers (USACE).

2.0 SCOPE OF SERVICES

Terracon performed the following scope of work in accordance with our proposal:

- Preliminary Data Gathering and Analysis of readily available government documentation.
- Mobilized to the site to conduct the Field Delineation using consecutively numbered colored flagging to mark aquatic resource boundaries.
- Sub-meter Global Positioning Satellite (GPS) surveying of each delineation flag.
- Prepared a map showing approximate locations of delineated WOTUS, including wetland areas observed during the Field Delineation, if any.
- Completed a preliminary WOTUS Delineation Report that included site characterization information, a discussion of applicable data, and recommendations for the site.

3.0 PRELIMINARY DATA GATHERING AND ANALYSIS

Prior to visiting the site to conduct the field delineation, background research was conducted, consisting of locating and reviewing historic aerial photographs, historic topographic maps, U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps, U.S. Geological Survey (USGS) National Hydrography Dataset (NHD) maps, soil data from the Natural Resources Conservation Service (NRCS), Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), publicly available elevation data such as light detection and ranging (LiDAR) data, and/or other related data based on availability. The preliminary data analysis assisted Terracon in identifying potential aquatic resources and jurisdictional features on the site. The data evaluated is described in the subsections below.

3.1 Topographic Maps and Aerial Photographs

Readily available USGS topographic maps and aerial photographs were reviewed to evaluate the potential presence of aquatic resources that may be considered WOTUS by USACE. Table 1 contains a brief description of applicable features identified during review of the topographic map.

- **Topographic map:** Conway and Carthage, Mississippi, **2020** – USGS Topographic Maps (1:24,000)
- **Aerial Photograph:** USDA, **2021** (1” =500’)

Table 1: Summary of Topographic Map

Direction	Description
Site	The site is illustrated as mostly open land with a small amount of wooded land
North	Mississippi Highway 25
East	Industrial property
South	A mixture of wooded and opened land
West	A mixture of wooded and opened land

Based on the review of the USGS topographic map, the site elevation ranges from approximately 400 to 420 feet above mean sea level. Topography is illustrated as a hilly area. The topographic map is provided as Exhibit 2 in Appendix A.

3.2 National Wetlands Inventory and National Hydrography Dataset

The USFWS NWI map was reviewed to identify wetland areas on the site and in the immediate vicinity. The NWI map depicts suspect wetland areas and waterbodies based on stereoscopic analysis of high-altitude aerial photographs. The NHD is used to portray surface water. The NHD represents the drainage network with features such as rivers, streams, canals, lakes, ponds, coastline, dams, and stream gages. An NWI/NHD map is included as Exhibit 3 in Appendix A.

The review of the NWI map indicates no wetlands present on-site.

3.3 Soil Data

Data from the USDA NRCS Web Soil Survey was reviewed to identify soil types, including hydric soils for the site. Soils containing hydric soil components are documented on the National List of Hydric Soils. Inclusion on the National List of Hydric Soils indicates that the soil series or one of its components contain characteristics that may be hydric and is not an indication of hydric soil for a specific location.

Hydric soils listed on the NRCS National List of Hydric Soils must meet one or more of the following NRCS hydric criteria codes:

1. All Histels except Folistels and Histosols except Folists; or
2. Map unit components in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, or Andic, Cumulic, Pachic, or Vitrandic subgroups that:
    a. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
    b. Show evidence that the soil meets the definition of a hydric soil;
3. Map unit components that are frequently ponded for long duration or very long duration during the growing season that:
    a. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
    b. Show evidence that the soil meets the definition of a hydric soil; or
4. Map unit components that are frequently flooded for long duration or very long duration during the growing season that:

a. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
b. Show evidence that the soils meet the definition of a hydric soil.

Table 2 is an excerpt from the NRCS Web Soil Survey Hydric Soil Rating.

Table 2: Excerpt from the NRCS Web Soil Survey

Summary by Map Unit — Leake County, Mississippi				
Map unit symbol	Map unit name	Rating*	Acres in AOI**	Percent of AOI
OrC	Ora Fine sandy loam, 5 to 8 percent slopes, eroded	0	7.1	28.5%
Rk	Rosebloom and Arkabutla soils, frequently flooded	100	3.5	13.9%
SaB	Savannah fine sandy loam, 2 to 5 percent slopes	5	0.1	2.3%
SmD2	Smithdale fine sandy loam, 8 to 15 percent slopes, eroded	10	7.8	32.6%
SmF2	Smithdale fine sandy loam, 15 to 35 percent slopes, eroded	5	4.7	22.7%
Totals for Area of Interest			23.1	100.0%

* This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform.

**Acreages are approximate only.

Based on a review of the NRCS soil data, a large portion of the site is made up of non-hydric soils except for an area on the southern portion of the site (Rk), see Appendix A Exhibit 4. The Rosebloom and Arkabutla soils (Rk) contains 100% hydric soils, and these soils make up approximately 13.9% of the site. These soils are in the southern portion of the site and are listed as frequently flooded.

3.4 FEMA FIRM Map

Terracon downloaded and reviewed Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel Number 28079C0143C (effective 9/16/2011). The site is in the Zone X area of the panel indicating the site is

susceptible to minimal flood risk. The FEMA map is included as Exhibit 5 in Appendix A.

4.0 FIELD DELINEATION TECHNIQUES

Terracon personnel conducted a reconnaissance of the site in October 2023 to characterize the existing site conditions and identify the presence of potential jurisdictional wetlands and waters. Characteristics of potential jurisdictional wetlands and waters were assessed (when applicable) utilizing the criteria detailed in sections 4.1 and 4.2 of this report. The evaluation methods generally followed the routine on-site determination method referenced in the 1987 USACE Manual and the Atlantic and Gulf Coast Region Version 2.0 (Regional Supplement). Section 2.0 of this reports discusses features that were delineated for this report.

4.1 Wetland Observations

Wetlands generally have three essential characteristics: wetland hydrology, hydrophytic vegetation, and hydric soils. Vegetation and hydrology observations were performed throughout the site. Data regarding the three essential characteristics was gathered within observed suspect wetland areas as applicable to further delineate boundaries.

4.1.1 Plant Community Assessment

Areas were visually observed to determine the species, when possible, and absolute percentage of ground cover for five strata of plant community types within a thirty-foot radius of the observation location. The wetland indicator status for each species of vegetation observed was documented. The indicator status was determined using the USACE National Wetlands Plant List (2018 NWPL v3.4). Indicator status categories for vegetation are presented below:

- **Obligate Wetland (OBL)**: occur almost always (estimated probability greater than 99%) under natural conditions in wetlands.
- **Facultative Wetland (FACW)**: usually occur in wetlands (estimated probability 67%-99%) but occasionally found in non-wetlands.
- **Facultative (FAC)**: equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).
- **Facultative Upland (FACU)**: usually occur in non-wetlands (estimated probability 67%-99%) but occasionally found in wetlands.

- **Upland (UPL)**: rarely occur in wetlands but occur almost always (estimated probability greater than 99%) under natural conditions in non-wetlands.

The percent cover of each stratum was determined, and dominance was evaluated. Dominant species were the most abundant species that accounted for more than 20 percent of the absolute percent coverage of the stratum. The number of dominant species with an indicator status of OBL, FACW, and/or FAC was compared to the total number of dominant species across all strata. Typically, when more than 50 percent of the dominant species had an indicator status of OBL, FACW, and/or FAC, hydrophytic vegetation was present. If the percentage of dominant species with an indicator status of OBL, FACW, and/or FAC was less than 50 percent, prevalence index and morphological adaptations may have been evaluated to confirm if hydrophytic vegetation was present or absent.

4.1.2 Hydric Soils Assessment

After Terracon evaluated wetland vegetation, subsurface soil samples were collected. The samples were collected to a depth of approximately 20 inches below ground surface and were visually compared to Munsell Soil Color Charts®, which aided in the evaluation of hydric soil characteristics. The soil samples were further examined for hydric soil indicators including, but not limited to, histosol, thick dark surface, sandy gleyed matrix, sandy redox, loamy gleyed matrix, redox dark surface, and/or redox depressions. If these or other hydric soil indicators were observed in the subsurface soil sample, the observation location was considered to have hydric soil.

4.1.3 Wetland Hydrology Assessment

Visual indicators of wetland hydrology were evaluated. Examples of primary wetland hydrology indicators include, but are not limited to, surface water, high water table, soil saturation, water marks, sediment deposits, drift deposits, iron deposits, inundation visible on aerial imagery, and water-stained leaves. Examples of secondary wetland hydrology indicators include, but are not limited to, surface soil cracks, drainage patterns, moss trim lines, and crayfish burrows. If at least one primary wetland hydrology indicator or two secondary wetland hydrology indicators were observed, the observation location was considered to have wetland hydrology.

4.2 Classification of Wetlands

Upon completion of the review of the three wetland criteria at each area, a wetland determination was made by a Terracon scientist. Under normal circumstances, if

one or more of the wetland criteria were not identified, the area was not considered to be a wetland. If present, the wetland/upland boundaries were marked in the field using consecutively numbered flagging and each flag location was marked using submeter GPS technology. The Field Delineation included collection of hydrology, vegetation, and soil assessment data from discrete sample locations (Data Points) necessary to complete required USACE Wetland Determination Data Forms. The number of Data Points evaluated was determined based on professional judgement. The recorded Wetland Determination Data Forms for the project site can be found in Appendix B and Data Point locations are depicted on the Depiction of Aquatic Resources Map (Appendix A, Exhibit 7).

4.3 Surface Water and Drainage Feature Observations

Terracon also made observations of site features that may be considered jurisdictional waterbodies. If a waterbody was identified, observations regarding its characteristics were recorded. Potential jurisdictional waterbodies are typically evaluated based on the observation of the following characteristics:

- **Flow Characteristics:**
  - Perennial: contains water at all times except during extreme drought.
  - Intermittent: carries water a considerable portion of the time but ceases to flow occasionally or seasonally.
  - Ephemeral: carries water only during and immediately after periods of rainfall or snowmelt.
- **Ordinary High-Water Mark (OHWM):** The limit line on the shore established by the fluctuation of the water surface. It is shown by such things as a clear line impressed on the bank, shelving, changes in soil character, destruction of terrestrial vegetation, the presence of litter and debris or other features influenced by the surrounding area.
- **Bank Shape Descriptions:**
  - Undercut: banks that overhang the stream channel
  - Steep: bank slope of approximately greater than 30 degrees
  - Gradual: bank slope of approximately 30 degrees or less

- **Aquatic Habitat Descriptions:**
  - Pool: deeper portion of a stream where water flows slower than in neighboring, shallower portions, smooth surface, and finer substrate
  - Riffle: shallow area in a stream where water flows swiftly over gravel and rock or other coarse substrate resulting in a rough flow and a turbulent surface
  - Run: section of a stream with a low or high velocity and with little or no turbulence on the surface of the water.

During the Field Delineation, Terracon personnel marked the jurisdictional limits of aquatic resources using consecutively numbered flagging where possible. Each flag location was marked using submeter GPS technology. Linear aquatic resources located entirely within abutting wetland systems were evaluated for stream parameters and the approximate locations of the linear features were estimated and displayed on the Depiction of Aquatic Resources Map (Appendix A, Exhibit 7).

4.4 Depiction of Aquatic Resources

USACE requires a depiction of the Field Delineation results to serve as the basis for verification of aquatic resource locations. The Depiction of Aquatic Resources Map (Appendix A, Exhibit 7) was created by uploading the shapefile points collected using a Trimble TDC150 with Global Navigation Satellite System (GNSS) receiver at each flag location. The point shapefiles were geoprocessed into polygon shapefiles for each aquatic resource and exported to a map deliverable using ArcMap® software. The Depiction of Aquatic Resources Map contains a generalized boundary of the site based on best available data such as spatially referenced computer aided design and drafting (CADD) data (if available and provided by the client), county parcel data, and/or existing boundary surveys.

5.0 FIELD DELINEATION RESULTS

In October 2023, Terracon performed a Field Delineation on the site using the field techniques described in Section 4.0. The findings of the Field Delineation are illustrated on the Depiction of Aquatic Resources Map (Appendix A, Exhibit 7). The GIS data created using the GPS data was evaluated to determine the approximate size of each aquatic resource. Site photographs, included in Appendix C, provide an indication of the physical characteristics observed during the Field Delineation. Wetland and upland data determination forms for selected wetlands and upland locations representative of aquatic conditions on the site are provided in Appendix

B. Descriptions of the aquatic resource features observed on site are provided in the following sections.

5.1 Wetlands

During Terracon's wetland delineation field work, the site was observed to be mostly open land with a small area of mixed hardwoods and pine. Data Points collected during the field delineation, particularly in the mapped hydric soil area (Rk) determined that the mapped hydric soils were not hydric, based on the soil color characterized (10YR 5/6) as well as the absence of inundated soils throughout the site. The observed canopy cover of the site was indicative of non-wetlands soils as well with the majority of canopy cover consisting of Loblolly Pine (*Pinus taeda*). Based on the above-mentioned observations it was determined that the site did not meet the three needed criteria to be considered a wetland (hydrophytic vegetation, hydric soils, and hydrology).

5.2 Tributaries

Terracon observed no potentially jurisdictional tributaries on the site. One ephemeral channel totaling approximately 320 Linear Feet (LF) was identified on the site. This channel was observed on the southern portion of the site. No tributaries were observed in the northern portion of the site. This ephemeral channel was observed to be approximately 4 feet wide and approximately one foot deep or less and were found to have a non-continuous ordinary high-water mark, therefore making these channels not an intermittent stream. Photo reference points were taken in these locations to document current site conditions (see Appendix C) and a map marking the locations these photos were taken are included in Appendix A, Exhibit 7. Table 3 contains a summary of the tributaries identified on site during the Field Delineation.

Table 3: Summary of Tributaries/Channels

Tributary	Length (LF)	Location	WOTUS	Jurisdictional Opinion	Approximate Width Across OHWM	Exhibit
ET-1	320	South	Ephemeral	Non-Jurisdictional	4 feet	7.0

The Mississippi Department of Environmental Development (MDEQ) and Leake County does not require any vegetative buffers or setback on aquatic features.

5.3 Other Aquatic Features

Terracon observed two small ponds totaling approximately 0.42 acres near the southern boundary of the site. Because of the recent lack of rain, the ponds were not holding water, but it was obvious that they typically do hold water. The ponds had no vegetation in them at the time of this study. Because the pond features are only fed by the ephemeral tributary, they are likely not jurisdictional. Table 4 contains a summary of other aquatic features observed on the site during Field Delineation.

Table 4: Summary of Other Aquatic Features

Tributary	Area (Acres)	Location	Jurisdictional Opinion	Exhibit
Pond 1	0.41	South	Non-Jurisdictional	7.0
Pond 2	0.01	South	Non-Jurisdictional	7.0

5.4 Upland Areas

Terracon sampled and assessed all areas that represented different vegetative communities throughout the project site to thoroughly review if these areas may exhibit the three wetland criteria (hydrophytic vegetation, hydric soils, and hydrology). All of the sample locations were found to be classified as uplands based on the three wetland criteria not being met in the different vegetative communities. The portions of the site not identified as containing aquatic resources are considered uplands (Appendix A, Figure 7).

6.0 CONCLUSIONS

Terracon conducted a WOTUS Delineation of the approximately 23.06-acre site in October 2023. The site visit included locating and delineating all aquatic features on the site, and all potential jurisdictional and non-jurisdictional features have been delineated. One potentially non-jurisdictional ephemeral channels totaling approximately 320 linear feet were identified on the site. Because the pond features are only fed by the ephemeral tributary, they are likely not jurisdictional. These classifications are preliminary and only the USACE can make the final jurisdictional determination on the delineated features. The aquatic resources identified during

Terracon's wetland delineation are illustrated on the Depiction of Aquatic Resources Map located in Appendix A, Exhibit 7.

7.0 GENERAL COMMENTS

The preliminary WOTUS delineation was performed in accordance with generally accepted practices of this profession undertaken in similar studies at the same time and in the same geographical area. A preliminary WOTUS delineation, such as the one performed at this site, is of limited scope, is noninvasive, and cannot eliminate the potential that WOTUS, including wetlands are present at the site beyond what is identified by the limited scope of this preliminary delineation. In conducting the limited scope of services described herein, certain sources of information and public records were not reviewed. No biological delineation can wholly eliminate uncertainty regarding the potential for concerns in connection with a project. The limitations of this preliminary delineation should be recognized.

This report has been prepared in accordance with generally accepted scientific and engineering evaluation practices. This report is for the exclusive use of the client and any relying government entities for the project being discussed. No warranties, either expressed or implied, are intended or made.

Conditions within WOTUS, including wetlands naturally change over time and can vary seasonally over short periods. Effects of man-made disturbances and/or temporal variations (e.g. rainfall, season, drought), and/or subjective regulatory interpretation of data and field conditions may preclude assessment in conformance with USACE requirements and sometimes significantly affect findings, conclusions, and recommendations.

APPENDIX A

Exhibits

C:\Users\nrmarshall\OneDrive - Terracon Consultants Inc\Desktop\New folder\2023\CarthageMS\CarthageMS\CarthageMS.aprx

Legend

Site 2 NE Study Area

N

Feet

0 250 500 1,000

DATA SOURCES: MSDEQ, © OpenStreetMap (and) contributors, CC-BY-SA, Esri, HERE, Garmin, iPC, Maxar
ESRI - Basemaps

Project No.:	EB237180
Date:	Sep 2023
Drawn By:	NRM
Reviewed By:	DB

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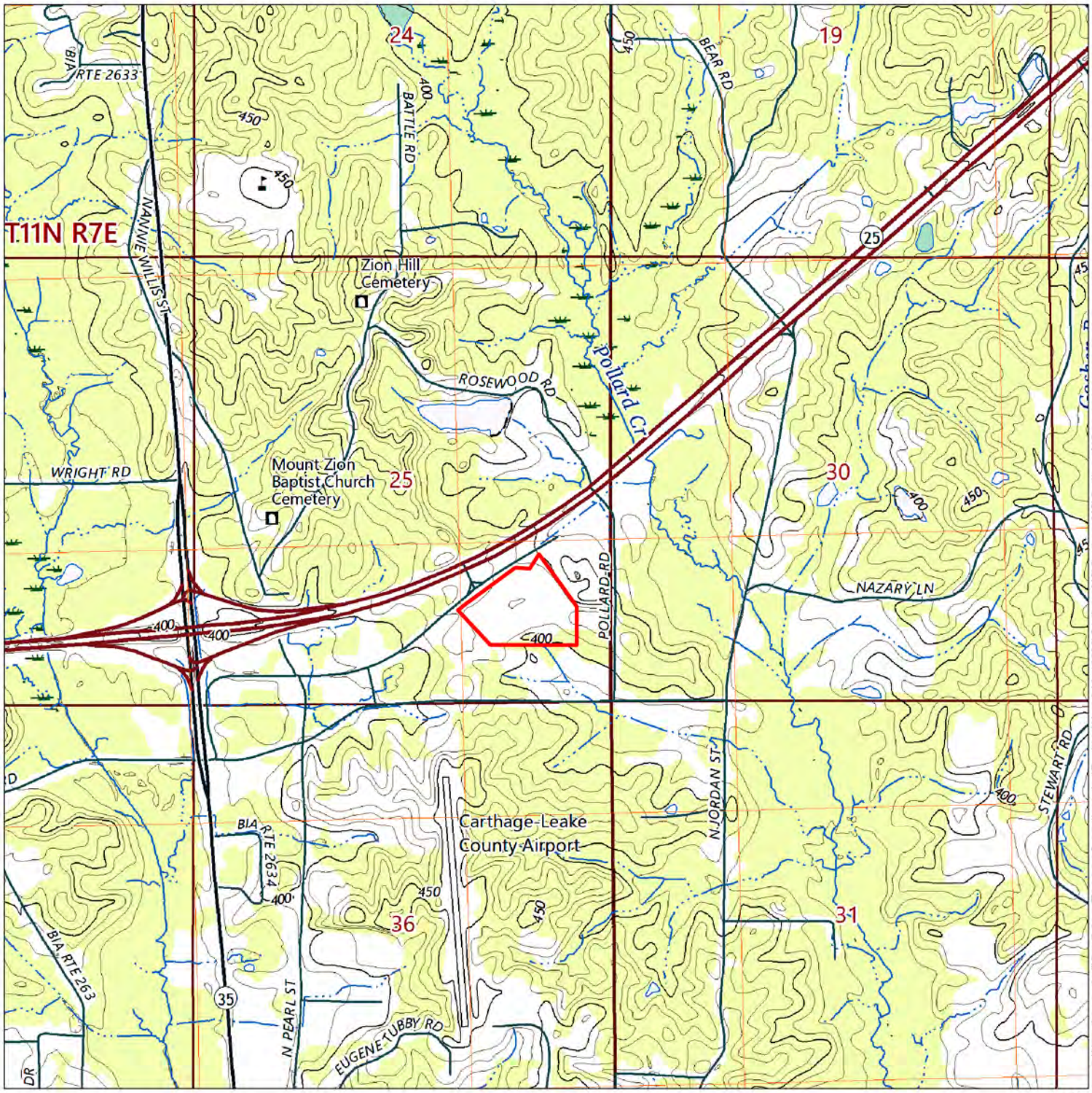
Vicinity Map

MS Department of Environmental Quality
Leake County EDD Site 2-NE
Carthage, Leake County, MS
89°31'40"W 32°46'14"N

Exhibit

1.0



Legend

Site 2 NE Study Area

N

Feet

0 1,000 2,000 4,000

DATA SOURCES: MSDEQ, USGS 2020 Topographic Map Carthage, MS Quadrangle © OpenStreetMap (and) contributors, CC-BY-SA © OpenStreetMap (and) contributors, CC-BY-SA
ESRI - Basemaps

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Drawn By:	NRM
Reviewed By:	DB

terracon

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Ridgeland, MS

PH. 601-956-4467 terracon.com

USGS Topographic Map

MS Department of Environmental Quality
Leake County EDD Site 2-NE
Carthage, Leake County, MS
89°31'37"W 32°46'24"N

Exhibit

2.0

C:\Users\nrmarshall\OneDrive - Terracon Consultants Inc\Desktop\New folder\2023\CarthageMS\CarthageMS\CarthageMS.aprx

Legend

- Site 2 NE Study Area
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

N

Feet

0 250 500 1,000

DATA SOURCES: MSDEQ, USFWS NWI, © OpenStreetMap (and) contributors, CC-BY-SA, Esri, HERE, Garmin, iPC, Maxar
ESRI - Basemaps

Project No.:	EB237180
Date:	Sep 2023
Drawn By:	NRM
Reviewed By:	DB

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National Wetlands Inventory Map

MS Department of Environmental Quality
Leake County EDD Site 2-NE
Carthage, Leake County, MS
89°31'40"W 32°46'15"N

Exhibit

3.0

SmF2: Smithdale fine sandy loam, 15 to 35 percent slopes, eroded
OrC: Ora fine sandy loam, 5 to 8 percent slopes, eroded
SmD2: Smithdale fine sandy loam, 8 to 15 percent slopes, eroded

C:\Users\nmarshall\OneDrive - Terracon Consultants Inc\Desktop\New folder\2023\Carthage\MS\CarthageMS\CarthageMS.aprx

Legend

- Site 2 NE Study Area
- Soil Map Unit Symbol
- Hydric Soil Rating
- Water

Feet
0 250 500 1,000

N

DATA SOURCES: MSDEQ, USDA NRCS WSS© OpenStreetMap (and) contributors, CC-BY-SA, Esri, HERE, Garmin, iPC, Maxar
ESRI - Basemaps

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Date:	Sep 2023
Drawn By:	NRM
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USDA Soil Survey Map

MS Department of Environmental Quality
Leake County EDD Site 2-NE
Carthage, Leake County, MS
89°31'40"W 32°46'15"N

Exhibit

4.0

Legend

- Site 2 NE Study Area
- Zone A: 100-Year Flood Zone
- Zone X: Minimal Flood Risk

N

Feet

0 500 1,000 2,000

DATA SOURCES: MSDEQ, FEMA NFHL 28079C effective September 16, 2011, © OpenStreetMap (and) contributors, CC-BY-SA, Esri, HERE, Garmin, iPC, Maxar
ESRI - Basemaps

C:\Users\nrmarshall\OneDrive - Terracon Consultants Inc\Desktop\New folder\2023\CarthageMS\CarthageMS\CarthageMS.aprx

Project No.:	EB237180
Date:	Sep 2023
Drawn By:	NRM
Reviewed By:	DB

Terracon
859 S Pear Orchard Rd
Ridgeland, MS
PH. 601-956-4467 terracon.com

FEMA Flood Risk Map

MS Department of Environmental Quality
Leake County EDD Site 2-NE
Carthage, Leake County, MS
89°31'39"W 32°46'16"N

Exhibit

5.0

Legend

Site 2 NE Study Area

N

Feet

0 1,000 2,000 4,000

DATA SOURCES: MSDEQ, tnmdv2,© OpenStreetMap (and) contributors, CC-BY-SA, Esri, HERE, Garmin, INCREMENT P, NGA, USGS
ESRI - Basemaps

Project No.:	EB237180
Date:	Sep 2023
Drawn By:	NRM
Reviewed By:	DB

Terracon
859 S Pear Orchard Rd
Ridgeland, MS
PH. 601-956-4467 terracon.com

2014 Aerial Imagery

MS Department of Environmental Quality
Leake County EDD Site 2-NE
Carthage, Leake County, MS
89°31'38"W 32°46'22"N

Exhibit

6.0

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Legend

Site 2 NE Study Area

N

Feet

0 1,000 2,000 4,000

DATA SOURCES: MSDEQ, tnmdv2,© OpenStreetMap (and) contributors, CC-BY-SA, Esri, HERE, Garmin, iPC, Maxar
ESRI - Basemaps

Project No.:	EB237180
Date:	Sep 2023
Drawn By:	NRM
Reviewed By:	DB

Terracon
859 S Pear Orchard Rd
Ridgeland, MS
PH. 601-956-4467 terracon.com

2022 Aerial Imagery

MS Department of Environmental Quality
Leake County EDD Site 2-NE
Carthage, Leake County, MS
89°31'38"W 32°46'22"N

Exhibit

6.1

Legend

- Study Area
- Data Point
- Reference Photo Point
- Ephemeral Tributary
- Off-Channel Open Water

3

0 100 200 400 Feet

DATA SOURCES:
ESRI WMS - World Aerial Imagery, OpenStreetMap

Project No.:	EB237180
Date:	Oct 2023
Drawn By:	REG
Reviewed By:	DB

Terracon
1801 Handley Ederville Rd
Fort Worth, Texas 76118
PH. (817) 268-8600 terracon.com

Delineation Map

MS Department of Environmental Quality
Leake County EDD Site 2 NE
Leake County, MS
Center 89.528°W 32.7715°N

Exhibit

7.0

E:\GIS\2023\EB237179 and EB237180 - Leake County\GIS Structure\LeakeCoWOTUS.aprx

APPENDIX B

Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Leake County EDD City/County: Leake Sampling Date:
Applicant/Owner: Leake County State: Mississippi Sampling Point: DP 1
Investigator(s): David Brunet, Matthew Brunet Section, Township, Range:
Landform (hillslope, terrace, etc): Hillslope Local relief (concave, convex, none): convex Slope (%): 10
Subregion (LRR or MLRA): LRR-O Lat: 32.770315 Long: 89.529191 Datum:
Soil Map Unit Name: SmD2 Smithdale fine sandy loam NWI classification: MW
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (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 X	
Hydric Soil Present?	Yes	No X	**Is the Sampled Area within a Wetland?** Yes No
Wetland Hydrology Present?	Yes	No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required: check all that apply)

- ___ 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)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes	No X	Depth (inches):
Water Table Present?	Yes	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	No X	Depth (inches):

Wetland Hydrology Present? Yes No X

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

Remarks:

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

Sampling Point: DP 1

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0	= Total Cover	
50% of total cover: 0	20% of total cover: 0		
Sapling/Shrub Stratum (Plot size: 15-ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0	= Total Cover	
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 5-ft)			
1. *Paspalum notatum* / Bahia grass	100	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 30-ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology 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.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (if observed, list morphological adaptions below).

SOIL

Sampling Point: DP 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/6	70	10YR 6/4	30			Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ 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, T, U)**
- ___ 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 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

PHOTO(S)

Sampling Point: DP 1

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Leake County EDD City/County: Leake Sampling Date: 10/04/2023
Applicant/Owner: Leake County State: Mississippi Sampling Point: DP 2
Investigator(s): David Brunet, Matthew Brunet Section, Township, Range:
Landform (hillslope, terrace, etc): Hillslope Local relief (concave, convex, none): convex Slope (%): 20
Subregion (LRR or MLRA): LRR-O Lat: 32.770515 Long: -89.524265 Datum:
Soil Map Unit Name: RK - Rosebloom and Arkabutla Soils NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (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 X	No ____	
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No ____
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required: check all that apply)

- ___ 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)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

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

Remarks:

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

Sampling Point: DP 2

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pinus taeda* / Loblolly pine	75	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	75	= Total Cover	
50% of total cover: 37	20% of total cover:	15	
Sapling/Shrub Stratum (Plot size: 15-ft)			
1. *Diospyros virginiana* / Common persimmon	20	Yes	FAC
2. *Liquidambar styraciflua* / Sweetgum	15	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	35	= Total Cover	
50% of total cover: 17	20% of total cover:	7	
Herb Stratum (Plot size: 5-ft)			
1. *Chasmanthium latifolium* / Indian wood-oats	20	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	20	= Total Cover	
50% of total cover: 10	20% of total cover:	4	
Woody Vine Stratum (Plot size: 30-ft)			
1. *Vitis rotundifolia* / Muscadine	20	Yes	FAC
2.			
3.			
4.			
5.			
	20	= Total Cover	
50% of total cover: 10	20% of total cover:	4	

Dominance Test worksheet:

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: 100.0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	150	x 3 =	450
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	150 (A)		450 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index ≤3.0[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology 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.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (if observed, list morphological adaptions below).

SOIL

Sampling Point: DP 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 5/6	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ 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, T, U)**
- ___ 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 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present. unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

PHOTO(S)

Sampling Point: DP 2

APPENDIX C

Site Photographs

Reference Photos

RPP 1—Facing East

RPP 1—Facing North

RPP 1—Facing West

Ephemeral Tributary Photo

RPP 2—Facing South

RPP 2—Facing East

Terracon

Pond 1 —Facing South