

Permittee-Responsible Mitigation Plan

FAIRLAWN C-1
FINAL PERMITTEE-RESPONSIBLE MITIGATION PLAN
BERKELEY AND CHARLESTON COUNTIES, SOUTH CAROLINA

PROJECT:
CAMP HALL RAIL PROJECT
BERKELEY COUNTY, SOUTH CAROLINA

APPLICANT:
PALMETTO RAILWAYS

SUBMITTED TO:
U.S. Army Corps of Engineers, Charleston District
U.S. Environmental Protection Agency, Region 4
U.S. Fish and Wildlife Service, Charleston Ecological Services
National Oceanic and Atmospheric Administration, National Marine Fisheries Service
S.C. Department of Natural Resources
S.C. Department of Health and Environmental Control

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Table of Contents

1.0 Permittee-Responsible Mitigation	1
2.0 Available Mitigation Credits	2
3.0 Watershed Approach	3
3.1 Watershed Descriptions.....	4
3.1.1 Cooper River Watershed (8-Digit HUC 03050201)	4
3.1.2 Subwatershed.....	4
3.2 Land Use and Potential for Growth.....	5
3.3 Watershed Needs and Threats	6
3.4 Water Quality Issues and Needs	6
4.0 Permittee-Responsible Mitigation Plan	7
4.1 Goals and Objectives.....	7
4.2 Site Selection.....	8
4.2.1 Hydrologic Sources and Water Rights	10
4.2.2 Protected Species	10
4.2.3 Cultural Resources	12
4.3 Site Protection	12
4.4 Permittee-Responsible Mitigation Site Baseline Conditions	12
4.4.1 Ecoregion	12
4.4.2 Historic Land Use	13
4.4.3 Existing Wetlands and Waters.....	13
4.4.4 Topography	14
4.4.5 Vegetative Conditions.....	14
4.4.6 Soils.....	16
4.5 Determination of Credits	17
4.6 Mitigation Work Plan.....	19
4.6.1 Management Units	21
4.6.2 Uplands	24
4.6.3 Prescribed Burn Plan.....	25
4.6.4 Invasive Species Management.....	25
4.6.5 Reference Site	26
4.6.6 Planting Methods and Palettes	26
4.7 Maintenance Plan	27
4.8 Performance Standards.....	28
4.9 Monitoring Requirements.....	29
4.10 Long-Term Management Plan	33
4.10.1 Ownership of the Mitigation Site	33
4.10.2 Identity of Long-Term Manager.....	33
4.10.3 Identification of Long-Term Management Activities	33
4.10.4 Funding Mechanism	34
4.11 Adaptive Management.....	34
4.12 Financial Assurances.....	34

LIST OF TABLES

Table 1.	Proposed Camp Hall Rail Impacts
Table 2.	Subwatershed Land Use
Table 3.	Mitigation Units and Management Actions
Table 4.	Federal and State Listed Threatened and Endangered Plant and Animal Species Known to Occur in Berkeley and Charleston Counties
Table 5.	Mapped Soils and Hydric Characteristics
Table 6.	Potential Credit Production
Table 7.	Wetland Credit Calculations
Table 8.	Comparison of Camp Hall Rail Impacts to Proposed Mitigation
Table 9.	Unit 2 and Unit 5 Performance Standards
Table 10.	Bond Amount Calculation

LIST OF FIGURES

Figure 1	Location Map
Figure 2	Proximity to Conserved Lands
Figure 3	Watershed Map
Figure 4a	1989 Aerial
Figure 4b	1999 Aerial
Figure 4c	2007 Aerial
Figure 4d	2018 Aerial
Figure 5	Jurisdictional Waters of the United States
Figure 6	National Wetlands Inventory Map
Figure 7	USGS Topo Map
Figure 8	Existing Plant Communities
Figure 9	Soils Map
Figure 10a	Wetlands Mitigation Unit Map (Unit 1: Enhance Altered Longleaf Pine)
Figure 10b	Wetlands Mitigation Unit Map (Unit 2: Remove Bedded Loblolly Pine)
Figure 10c	Wetlands Mitigation Unit Map (Unit 3: Bay Forest Preservation)
Figure 10d	Wetlands Mitigation Unit Map (Unit 4: Bottomland Hardwood Preservation)
Figure 10e	Wetlands Mitigation Unit Map (Unit 5: Replant Cutover Wetlands)
Figure 10f	Wetlands Mitigation Unit Map (150-Foot Upland Buffer)
Figure 11	Residual Uplands Enhancement
Figure 12	Reference Location Map – Bottomland Hardwood
Figure 13	Monitoring Plot Locations

LIST OF APPENDICES

Appendix A	Threatened and Endangered Species Report
Appendix B	Cultural Resources Assessment
Appendix C	Restrictive Covenants
Appendix D	Wetland Delineation Overview Map and Wetland Delineation Data Forms
Appendix E	Photographic Log

1.0 Permittee-Responsible Mitigation

Palmetto Railways (hereinafter “Applicant”) proposes to locate, build, own, and operate an industrial rail line connecting the CSXT rail line spur near the Santee Cooper Cross Generating Station to Camp Hall Commerce Park. The approximate 22.7-mile route runs south-southwest from the Cross Generating Station, crossing the Diversion Canal between Lakes Marion and Moultrie, then running through the unincorporated community of Cross, and south into Camp Hall Commerce Park. This route passes through a mix of commercial, residential, and silvicultural properties. Collectively, this route is referred to as the “Impact Site”.

The need for the rail line arises from development of the Camp Hall Commerce Park, which has increased the demand for rail service to interconnect the commerce park with an existing Class 1 rail network in a manner that is logistically feasible to better serve the need of the future tenants and industry within the Camp Hall Commerce Park for transportation, distribution, and logistics. These tenants include, but are not limited to, Volvo Cars, as well as any associated support industries that might desire to locate in proximity to Volvo Cars in the future.

The proposed project will impact waters of the United States. Impacts are grouped by wetland and non-wetland impacts and are listed in Table 1. Refer to the permit application for a complete description of the proposed Camp Hall Rail Project and its associated aquatic resource impacts.

Table 1. Proposed Camp Hall Rail Impacts

Project Impacts to Wetlands	
Impact	Jurisdictional Wetland (Acres)
Permanent Wetland Impact (Cut/Fill)	103.12
Mechanical Clearing Wetland Impact	16.89
Total Impacts	120.01

The proposed Camp Hall Rail Project impact site is located at the convergence of two distinct river basins: (1) the impact site is located predominantly in the upper reaches of the Cypress Swamp Watershed of the Cooper River Basin and (2) a small portion of the impact site is located in the lower boundary of the Lower Four Hole Swamp Watershed of the Edisto River Basin. Land use surrounding the project route is a mix of residential and commercial development, silviculture, and wetlands. The project route includes the unincorporated rural community of Cross, with an estimated total population of 7,253 in 2015. Outside of the Cross community, the route runs south through intensively managed pine plantation in short pulp rotations, and then into the Camp Hall Commerce Park.

The Camp Hall Rail Project will require compensatory mitigation for unavoidable adverse impacts to waters of the United States that result from activities authorized under Sections 401 and 404 of the *Clean Water Act*, and Section 10 of the *Rivers and Harbors Act*, provided such activities have met all applicable requirements and are authorized by the appropriate authority. Specifically, the Camp Hall Rail Project will require 1,406 freshwater wetland mitigation credits. Refer to Section 4.5 (Table 7) for a summary of required compensatory mitigation credits associated with the Camp Hall Rail Project. Required compensatory mitigation for impacts to wetlands and waters of the United States will be provided by a combination of mitigation bank credits and Permittee-Responsible Mitigation (hereinafter “PRM”). For impacts within the Four Hole Swamp watershed, the Applicant is proposing to purchase wetland credits from the Beidler Forest Mitigation Bank. For impacts

within the Cooper River watershed, PRM is proposed at the Fairlawn C-1 parcel site (hereinafter "Mitigation Site"), an approximate 1,380-acre site (Latitude: 33.002045°; Longitude: -79.734442°) within Francis Marion National Forest that will consist of both enhancement and preservation of wetlands, buffers, and associated uplands. More specifically, mitigation activities include enhancement of 371.4 acres of wetlands and the preservation of 522 acres of wetlands. The mitigation site will ultimately be transferred to United States Forest Service (hereinafter "USFS"), which will permanently protect the site and make open to the public 1,380 acres of land, including 893.4 acres of wetlands. Refer to Figure 1 for a location map and to Figure 2 for a depiction of the mitigation site in relation to nearby conserved lands.

Proposed mitigation activities described herein will provide watershed benefits by:

- Establishing natural forested communities, including an imperiled longleaf pine (*Pinus palustris*) ecosystem, in areas that have historically been managed for forestry and pine monoculture;
- Preserving existing and intact aquatic resources and upland communities;
- Enhancing impaired aquatic resource and upland communities and ecotones;
- Preserving land in perpetuity, thereby reducing the land base available for activities detrimental to water quality and limiting encroachments upon Francis Marion National Forest and other terrestrial and aquatic resources from development;
- Providing and improving habitat and corridors for wildlife, including habitat and corridors for rare, threatened, and endangered species;
- Preserving land in perpetuity that is located within portions of the headwaters of the Wando River and the Cainhoy Ridge, a known reservoir for rare, threatened, and endangered species;
- Increasing wetland hydroperiods, improving water quality, and increasing habitat value to endemic and imperiled wetland fauna;
- Providing water quality benefits through retention, detention, recharge, and/or filtration;
- Decreasing on-site erosion and subsequent sedimentation typically associated with forestry, and providing increased filtration of sediments and nutrients;
- Providing flood attenuation and promoting the exchange of surface waters; and by
- Including bioremediation using vegetative cover.

Following implementation of the mitigation activities and documentation of project success, the mitigation site will be transferred to the USFS, which would assume long-term management and ownership obligations in accordance the Conservation Land Use Agreement between the USFS and the United States Army Corps of Engineers (hereinafter "USACE").

2.0 Available Mitigation Credits

The proposed mitigation plan follows the hierarchy outlined in the 2008 Federal Rule. The hierarchy of wetland mitigation preferences is as follows: (1) first seek suitable mitigation banks, (2) then in-lieu fee programs, and, if those are not available or appropriate, (3) develop a PRM Plan.

For impacts within the Four Hole Swamp watershed, the Applicant is proposing to purchase wetland credits from the Beidler Forest Mitigation Bank. The Beidler Forest Mitigation Bank is a pending mitigation bank in the late stages of approval, with the first credit release anticipated by December 1, 2018. Therefore, Beidler Forest Mitigation Bank should be able to provide credits to offset project impacts. In the event that the Beidler Forest Mitigation Bank is not approved and/or that Beidler Forest Mitigation Bank credits are not available prior to project impacts, then the Applicant will purchase wetland credits from an approved mitigation bank (or banks) within the service area to offset impacts within the Four Hole Swamp watershed. For impacts

within the Cooper River watershed, permittee-responsible mitigation using a watershed approach is appropriate for mitigating the project impacts. Following the USACE guidance (2010), and the Rule (CFR 332.3 (b)(2 and 3)), the Regulatory In-Lieu Fee and Bank Information Tracking System was used to locate available mitigation bank credits and in-lieu fee program credits in the Cooper River watershed. Pigeon Pond Mitigation Bank, Congaree Carton Mitigation Bank and Caton Creek Mitigation Bank serve the Cooper River watershed; however, these banks do not have sufficient credits available to meet the needs of the project. Therefore, available mitigation credits in the Cooper River watershed will not provide adequate credits to compensate for the wetland impacts associated with the Camp Hall Rail Project, and there are no in-lieu fee programs in the Cooper River watershed.

District Engineers have the discretion to modify the hierarchy outlined in the 2008 Federal Rule in order to approve the use of environmentally preferable compensatory mitigation, such as when an entity with a proven track record implementing similar mitigation projects proposes a high-value mitigation project, even though mitigation credits from an approved mitigation bank may be available. For reasons outlined within this document, the Applicant feels that the off-site, landscape scale, PRM Plan outlined in this document and utilizing the watershed approach justifies the use of the Fairlawn C-1 parcel site as the preferable method of mitigation over the purchase of mitigation credits from approved mitigation banks.

3.0 Watershed Approach

The Applicant is proposing to purchase 80 credits from Beidler Forest Mitigation Bank to offset wetland impacts occurring within the Edisto River Basin and is proposing to implement the Fairlawn C-1 PRM Plan to offset wetland impacts occurring within the Cooper River Basin. Beidler Forest Mitigation Bank is located within the same 8-digit Hydrologic Unit Code (hereinafter "HUC") (03050205; Four Hole Swamp) and Level III Ecoregion (63; Middle Atlantic Coastal Plain) as the Edisto River Basin portion of the impact site (Figure 3). The Fairlawn C-1 mitigation site is located within the same 8-digit HUC (03050201; Cooper River) and Level III Ecoregion (63; Middle Atlantic Coastal Plain) as the Cooper River Basin portion of the impact site (Figure 3).

Watershed needs were considered during the permittee-responsible mitigation planning process, and multiple sources of information, including watershed management plans and tools, watershed reports, local land use plans, property ownership, and land use trends were examined to assess the suitability of the Fairlawn C-1 project area for mitigation. Beidler Forest Mitigation Bank is a pending mitigation bank whose primary service area includes the impact area occurring within the Edisto River Basin. Therefore, this PRM Plan focuses on offsetting wetland impacts occurring within the Cooper River Basin and watershed. The following watershed reports, plans, and resources were used to assess the Cooper River watershed (8-digit HUC 03050201) and to identify the overall aquatic resource needs:

- U.S. Environmental Protection Agency Water Data and Tools;
- Natural Resources Conservation Service, *Summary of Natural Resource Concerns in South Carolina*;
- Natural Resources Conservation Service, *An Assessment of the Cooper Subbasin*;
- Regulatory In-Lieu Fee and Bank Information Tracking System website;
- South Carolina Department of Natural Resources, *An Overview of the Eight Major River Basins of South Carolina*;
- South Carolina Department of Health and Environmental Control 2016 303(d) Listings;
- SC Watershed Atlas tool;

- South Carolina Department of Health and Environmental Control Watershed Water Quality Assessment for the Cooper River basin website;
- South Carolina Department of Health and Environmental Control watershed assessment reports for Lake Moultrie, Cypress Swamp, and the Wando River;
- South Carolina Department of Health and Environmental Control *Total Maximum Daily Load Revision for Charleston Harbor, Cooper, Ashley, and Wando Rivers*; and
- Town of Mount Pleasant Comprehensive Plan 2009-2019, 2014 Update.

In addition, leading stakeholders in the local and regional conservation community, including Lowcountry Land Trust, National Audubon Society, Coastal Conservation League, The Nature Conservancy, Ducks Unlimited, Lord Berkeley Conservation Trust, and Open Space Institute Land Trust, Inc., were consulted to determine their conservation priorities in the watershed. These entities support the enhancement and protection of the Fairlawn C-1 mitigation site.

3.1 Watershed Descriptions

3.1.1 Cooper River Watershed (8-Digit HUC 03050201)

The Cooper River Basin portion of the Camp Hall Commerce Park Rail Spur impact site and the mitigation site are both located within the overall Santee River major drainage basin, the Cooper River Basin (HUCs 03050201 and 03050202), and the Cooper River watershed, 8-digit HUC 03050201 (Figure 3). The overall Santee River major drainage basin is located in Berkeley, Calhoun, Charleston, Clarendon, Dorchester, Georgetown, Orangeburg, Sumter, and Williamsburg Counties, and encompasses approximately 2,985 square miles within South Carolina (SCDNR, *An Overview of the Eight Major River Basins of South Carolina*). The Cooper River Basin (HUCs 03050201 and 03050202) is limited to Berkeley, Charleston, and Dorchester Counties, and encompasses approximately 1,545 square miles, or approximately 1 million acres (SCDHEC Watershed Water Quality Assessment for the Cooper River basin website). The Cooper River watershed (8-digit HUC 03050201) is limited to Berkeley, Charleston, and Dorchester Counties, and encompasses approximately 755,306 acres (NRCS, *An Assessment of the Cooper Subbasin*). The urban land percentage of the Cooper River watershed is comprised chiefly of the Cities or Towns of Charleston, Goose Creek, Hanahan, James Island, Ladson, Moncks Corner, Mount Pleasant, North Charleston, and Summerville. Two major interstates (I-26 and I-526) and U.S Highway 17 traverse the Cooper River watershed and are urban growth corridors.

3.1.2 Subwatershed

The Cooper River Basin portion of the Camp Hall Commerce Park Rail Spur impact site is specifically located in both the Lake Moultrie subwatershed, identified as 10-digit HUC 03050201-01, and in the Cypress Swamp subwatershed, identified as 10-digit HUC 03050201-05. The mitigation site is specifically located in the Wando River subwatershed, identified as 10-digit HUC 03050201-04. These three subwatersheds are all contained within the overall Cooper River watershed (8-digit HUC 03050201). The Lake Moultrie subwatershed occupies 78,638 acres in the Lower Coastal Plain Region of South Carolina. Based on the South Carolina Department of Health and Environmental Control (hereinafter “SCDHEC”) watershed assessment, there are a total of 14.5 stream miles and 56,759.9 acres of lake waters in the Lake Moultrie subwatershed, all classified as freshwater. The Cypress Swamp subwatershed occupies 139,162 acres in the Lower Coastal Plain Region of South Carolina. Based on the SCDHEC watershed assessment, there are a total of 357.9 stream miles and 219.7 acres of lake waters in the Cypress Swamp subwatershed, all

classified as freshwater. The Wando River subwatershed occupies 72,370 acres in the Lower Coastal Plain Region of South Carolina. Based on the SCDHEC watershed assessment, there are a total of 46.3 stream miles, 38.7 acres of lake waters, and 5,408.6 acres of estuarine areas in the Wando River subwatershed.

3.2 Land Use and Potential for Growth

Of the approximate one million acres located within the Cooper River Basin (8-digit HUCs 03050201 and 03050202), land cover includes 35.5% forested land, 25.8% forested wetland, 13.5% urban land, 10.0% water, 8.0% non-forested wetland, 6.6% agricultural land, and 0.6% barren land. The urban land percentage is comprised chiefly of the greater City of Charleston area.

Table 2 provides an overview of the land use in the Lake Moultrie, Cypress Swamp, and Wando River subwatershed 10-digit HUCs (information was taken from SCDHEC watershed assessment reports). Within the Wando River subwatershed, the urban land percentage is comprised chiefly of the Towns of Mount Pleasant and Awendaw, and the City of Charleston. Major transportation routes within the Wando River subwatershed include Interstate 526, U.S. Highway 17, and South Carolina Highway 41.

Table 2. Subwatershed Land Use

Land Use	Percent Cover 10-Digit HUC 03050201-01 Lake Moultrie subwatershed 78,638 Acres	Percent Cover 10-Digit HUC 03050201-05 Cypress Swamp subwatershed 139,162 Acres	Percent Cover 10-Digit HUC 03050201-04 Wando River subwatershed 72,370 Acres
Forested Land	11.6	52.5	33.1
Agricultural Land	2.9	14.4	2.4
Urban Land	2.5	7.1	16.8
Non-Forested Wetland	2.1	0.4	17.0
Forested Wetland	10.3	25.3	22.6
Water	70.4	0.2	7.7
Barren Land	0.2	0.1	0.4

Per the SCDHEC watershed assessment report for the Wando River, there is an overall high potential for growth in this subwatershed, particularly associated with major development areas such as Dunes West, Liberty, Rivertowne, Brickyard, Long Point, Belle Hall, and Daniel Island. Water and sewer services are available in all potential growth areas. According to the *Town of Mount Pleasant Comprehensive Plan 2009-2019, 2014 Update*, from 1980 to 2010, the population growth rate for the Town of Mount Pleasant was 377%, and the Town of Mount Pleasant was listed as the ninth fastest-growing city in the nation in 2013 by the U.S. Census Bureau. Implementing the proposed mitigation will limit encroachments upon Francis Marion National Forest and other conserved lands, will result in an addition of acreage to the Francis Marion National Forest, and will result in functional uplift to aquatic resources, thereby helping to protect areas of international significance for wildlife and wetlands such as the Cainhoy Ridge and portions of the headwaters of the Wando River.

Land use surrounding the mitigation site is predominantly silviculture, rural single-family residential development, recreational, undisturbed forest, and National Forest. Based upon a review of recent aerial photographs, there are no high-density residential or commercial developments located in close proximity to

the mitigation site. Given that the mitigation site is an approximate 1,380-acre project area that is part of an inholding strategically located within the Francis Marion National Forest, incompatible land uses, such as high-density commercial or industrial developments, are not likely to occur within the immediate watershed of the mitigation site. Furthermore, protecting lands within the mitigation site will limit encroachments upon Francis Marion National Forest and other conserved lands, will result in an addition of acreage to the Francis Marion National Forest, and will result in functional uplift to aquatic resources within the Wando River subwatershed.

3.3 Watershed Needs and Threats

According to the South Carolina Department of Natural Resources (hereinafter “SCDNR”) *Comprehensive Wildlife Conservation Strategy: 2005 - 2010*, loss and fragmentation of habitat have been identified as a major threat to many of the species listed as threatened and endangered in South Carolina. As a result, SCDNR biologists have identified habitat protection as one of the most important actions to ensure the protection of South Carolina priority species.

Per the *Town of Mount Pleasant Comprehensive Plan 2009-2019, 2014 Update*, it is the goal of the Town of Mount Pleasant to protect and enhance the sustainability of natural resources, to reduce environmental impacts, to preserve the surrounding natural beauty, and to be stewards of the natural environment. Furthermore, the Town of Mount Pleasant seeks to increase public access to natural resources and to protect waterways and water quality. The mitigation site’s location is ideal for land conservation efforts and the preservation and protection of diverse terrestrial and aquatic habitats.

Historically, the Middle Atlantic Coastal Plain Ecoregion plant community would have been dominated by longleaf pine, pine flatwoods, pine savannas, freshwater marshes, pond pine woodlands, and pocosins. However, a large portion of the forest cover within the Ecoregion is now mostly managed planted pine plantation of loblolly pine (*Pinus taeda*) and some shortleaf pine (*Pinus echinata*), with patches of oak (*Quercus spp.*), gum, and cypress (*Taxodium spp.*) near major streams. This landscape matrix differs significantly in the diversity of plant and animal life it supports in comparison to native forests. In addition, erosion and subsequent sedimentation are potentially significant and widespread non-point source pollution problems associated with forestry. The mitigation site will establish natural forested communities in areas that have historically been managed as pine monoculture for silviculture, thus re-establishing natural plant communities and eliminating potential erosion and sedimentation issues.

3.4 Water Quality Issues and Needs

On-site aquatic resources flow through Francis Marion National Forest and flow to I’on Swamp. I’on Swamp forms the headwaters of the Wando River. The Wando River accepts drainage from numerous tributaries before draining into the Cooper River, which flows into the Charleston Harbor. The Wando River is classified as Shellfish Harvesting Waters from its headwaters to a point 2.5 miles upstream of its confluence with the Cooper River, and is classified as Saltwaters downstream to its point of confluence with the Cooper River. There are three water quality monitoring stations along the Wando River and recreational uses are fully supported at all sites. Aquatic life uses are fully supported at the upstream site (MD-115). There is a significant decreasing trend in pH, and dissolved oxygen excursions have occurred, although the values were considered to be typical of values seen in such systems and were considered normal. Significant decreasing trends in various parameters suggest improving water quality conditions in the upstream reach of the Wando River. Midstream of the Wando River at Station MD-264, aquatic life uses are fully supported, although there is a significant increasing trend in five-day biochemical oxygen demand. Aquatic life uses are fully supported

at the downstream site (MD-198), and significant decreasing trends in various parameters suggest improving water quality conditions in the downstream reach of the Wando River.

A Total Maximum Daily Load (hereinafter “TMDL”) has been developed by SCDHEC to address dissolved oxygen water quality concerns within the Ashley River and the Cooper River-Wando River-Charleston Harbor complex. The TMDL outlines waste load allocations for oxygen-demanding pollutants from continuous point sources which will be implemented in National Pollutant Discharge Elimination System (hereinafter “NPDES”) permits.

Proposed mitigation actions are expected to complement water quality management efforts within the watershed by re-establishing and enhancing natural habitats within the headwaters of the Wando River and by preserving land comprising the mitigation site in perpetuity, thereby reducing the land base available for activities detrimental to water quality.

4.0 Permittee-Responsible Mitigation Plan

4.1 Goals and Objectives

The goal of the mitigation site is to preserve and enhance wetlands and uplands within the Cooper River watershed to provide compensatory mitigation for adverse impacts to wetlands and/or other aquatic resources authorized by the Department of the Army permit associated with the Camp Hall Commerce Park Rail Spur project. Specific goals of the mitigation site include:

- Promote the exchange and filtration of surface and ground waters within the Cooper River watershed;
- Preserve existing intact natural vegetative communities;
- Establish and/or enhance natural vegetative communities in wetlands, uplands, and associated ecotones that have been managed for forestry and pine monoculture; and
- Permanently protect 1,380 acres.

Table 3 provides a description of the proposed mitigation units and management actions.

Table 3. Mitigation Units and Management Actions

Mitigation Unit	Amount (acres)	Management Actions
Unit 1: Enhance Altered Longleaf Pine	79.2 wetland acres	Thin undesirable species (i.e. species other than longleaf pine), spot plant (if needed) longleaf pine where other species are removed, implement a prescribed fire regime
Unit 2: Remove Bedded Loblolly Pine	272.4 wetland acres	Clear-cut loblolly pine, allow areas to “green-out”, site preparation (including herbicide application, mechanical removal of beds and troughs, shear pine stumps below ground elevation or extract, root rake and removal of woody debris, and/or burning), plant native hardwood wetland species
Unit 3: Bay Forest Preservation	183.5 wetland acres	Preserve functional wetlands

Unit 4: Bottomland Hardwood Preservation	340.6 wetland acres	Preserve functional wetlands
Unit 5: Replant Cutover Wetlands	19.8 wetland acres	Site preparation (including herbicide application, mechanical removal of beds and troughs, shear pine stumps below ground elevation or extract, root rake and removal of woody debris, and/or burning), plant native hardwood wetland species
150-Foot Upland Buffer (excluding roadways)	327 upland acres	Clear-cut loblolly pine, allow areas to "green-out", site preparation (including herbicide application, mechanical removal of beds and troughs, shear pine stumps below ground elevation or extract, root rake and removal of woody debris, and/or burning), construct fire break around Units 2 and 5, plant longleaf pine, implement a prescribed fire regime, enhance ecotonal habitat. Replant areas recently clearcut
Residual Uplands (excluding roadways)	138.6 upland acres	Clear-cut loblolly pine, allow areas to "green-out", site preparation (including herbicide application, mechanical removal of beds and troughs, removal of woody debris, and/or burning), plant longleaf pine, implement a prescribed fire regime OR Preserve existing intact longleaf pine ecosystem, implement a prescribed fire regime

Note: There are 21 acres of existing roads not included in the above table. Existing roads will be maintained as is.

In summary, implementing the above-described management actions will enhance 371.4 acres of wetlands through thinning and clearing, site preparation, herbicidal control of mid-story competition, planting of native hardwood wetland species, and/or prescribed fire application. An additional 522 acres of hardwood forested wetland will be preserved.

4.2 Site Selection

A detailed discussion of the criteria used to determine the suitability of the property as a mitigation site is provided below. A description of the factors considered, including aquatic habitat diversity, habitat connectivity, relationships to hydrologic sources, land use trends, ecological benefits, and compatibility with adjacent land uses is included in this discussion. In general, suitable mitigation sites meet the criteria listed below. Factors considered during the site selection process are included in *italics* following each listed criterion.

- Property Acreage – Mitigation sites are typically best suited for large parcels of land (greater than 200 acres) that contain a large quantity and variety of aquatic resources. *The property on which the mitigation site is located is 1,380 acres.*
- Property Owners – Sites with one property owner, family, or corporation are ideal to minimize or avoid lengthy coordination with multiple property owners. *The rights necessary to own and operate the mitigation site are owned by one entity, which minimizes the extent of property owner coordination. The site will eventually be transferred to the USFS for inclusion into the Francis Marion National Forest.*

- Proximity to Proposed Impact Areas – Mitigation sites should be located within or adjacent to the 8-digit HUC in which the anticipated impacts are expected to occur. *The mitigation site is located within the same 8-digit HUC and Level III Ecoregion as the impact site.*
- Land Use Trends – Sites adjacent to industrial, commercial, or high-density land uses are typically not suitable for mitigation. *Land use surrounding the mitigation site is predominantly silviculture, recreational, undisturbed forest, National Forest and conserved lands, with some adjacent rural single-family residential development. The mitigation site is uniquely situated adjacent to and nearby lands where similar habitat and conservation goals exist, and is strategically located to connect existing protected properties in a manner that contributes to widespread, landscape scale habitat protection. A mining operation (presumably a sand/clay and/or topsoil mine) is located adjacent to a portion of the southwestern mitigation site boundary, immediately adjacent to and south of Halfway Creek Road. Per the SC Active Mines Viewer website, this mine is referred to as Green Bay 2 Mine and is operated by O L Thompson Construction Company Inc. During operation, this mine will be regulated by SCDHEC under the S.C. Mining Act and applicable mining regulations, thus ensuring compliance and enforcement. Upon closure, the S.C. Mining Act and applicable mining regulations will ensure the rehabilitation of the affected land for useful purposes and the protection of the natural resources of the surrounding area, with the basic objective of establishing vegetative cover, soil stability, water conditions, and safety conditions appropriate to the area. Thus, the existing mining operation should have no long-term adverse impacts on the mitigation site.*
- Preservation, Enhancement, and Restoration Potential – Suitable mitigation sites typically have a combination of preservation, enhancement, and/or restoration of streams and/or wetlands. Properties with historic alterations, such as agricultural ditches or silviculture, are generally the most appropriate for mitigation. *Functional aquatic wetlands exist on-site. However, the mitigation site has historically been used, and is currently being used, for recreation and silviculture. Land management practices have caused on-site wetlands and buffers to be converted to planted pine plantation. Therefore, preservation and enhancement potential are present on-site.*
- Ecological Benefit – Mitigation sites typically demonstrate an ecological benefit to the watershed. *Mitigation activities will preserve functional wetlands, will enhance forested wetlands, and will establish natural vegetative communities within protected buffers and upland habitat. Headwaters of the Wando River and the Cainhoy Ridge will be permanently protected.*
- Habitat Connectivity – Mitigation sites typically demonstrate a connection of aquatic and terrestrial habitat through protection of major wetland complexes, headwater tributaries, and wide riparian corridors. *The mitigation site will protect 465.6 acres of uplands and buffers and 893.4 acres of wetlands occurring within the Cooper River watershed. The site will eventually be donated to the USFS for inclusion into the Francis Marion National Forest.*

The approximate 1,380-acre mitigation site is part of an inholding strategically located within the Francis Marion National Forest proclamation boundary in Berkeley and Charleston Counties (Figure 2). The mitigation site is also located in close proximity to Cape Romain National Wildlife Refuge. Francis Marion National Forest and Cape Romain National Wildlife Refuge have been recognized as areas of international significance for wildlife and wetlands, including recognition by the United Nations as a Culturally Significant Biosphere Reserve and listing as a Ramsar Wetland of International Significance. The mitigation site's location essentially within the Francis Marion National Forest compromises the USFS's ability to manage its surrounding properties for controlled burns, as well as for rare, threatened, and endangered species and represents a significant risk to Francis Marion National Forest. For these reasons, the mitigation site has been identified as one of the highest-ranking priorities in the country for the USFS; this view is shared by other State and Federal natural resource agencies and environmental groups. Considering its high priority with the USFS, preservation of the mitigation site alone makes a contribution of national importance and

provides an overwhelming public benefit.

The mitigation site is adjacent to or nearby other conservation lands and other Clean Water Act mitigation lands. Development of the mitigation site would compromise the surrounding public lands and landscape scale conservation taking place. The mitigation site is strategically located to connect existing protected properties in a manner that contributes to widespread, landscape scale habitat protection. Such protection is essential to preserve large-scale functioning ecosystems. Furthermore, the Fairlawn C-1 mitigation site contains portions of the headwaters of the Wando River, which drains into the Cooper River and Charleston Harbor. The mitigation site also lies on a unique geological formation known as the Cainhoy Ridge, the most concentrated zone of biodiversity in the Francis Marion National Forest and a known reservoir for rare, threatened, and endangered species. This biodiversity is a product of the extensive matrix of natural longleaf pine forests and embedded wetlands of the Francis Marion National Forest, and is substantially supported by the application of regular prescribed fire. The Cainhoy Ridge contains known concentrations of the federally endangered red-cockaded woodpecker (hereinafter “RCW”), and the only known breeding ponds for the federally threatened frosted flatwoods salamander. A variety of rare plants are also found on Forest Service property directly adjoining the subject tract. Lastly, the Fairlawn property, of which Fairlawn C-1 is a part, has been designated as Important Bird Area by the Audubon Society (Peterson 2013). Fairlawn contains habitats for painted buntings, prothonotary warblers, and swallow-tailed kites.

The mitigation site’s diversity of habitat, rare topography, extensive wetlands, nearby populations of species of conservation priority, and proximity to other protected lands and important habitats support its selection as a PRM site, and will benefit the overall ecosystem and watershed from greater habitat and biological diversity.

4.2.1 Hydrologic Sources and Water Rights

Implementation of the mitigation activities will not adversely affect adjacent property owners, will promote the exchange of surface water through retention, detention, recharge, and/or filtration, and will enhance flood attenuation. Therefore, water rights and hydrologic trespass are not affected by the proposed mitigation activities.

4.2.2 Protected Species

A detailed threatened and endangered species report is included as Appendix A.

Table 4 provides a list of federal and state threatened and endangered species for Berkeley and Charleston Counties. Table 4 was generated from publicly available lists provided by the United States Fish and Wildlife Service (hereinafter “USFWS”) and the SCDNR. The USFWS lists were dated June 11, 2018. In addition, the Information for Planning and Conservation (hereinafter “IPaC”) database maintained by the USFWS was queried. IPaC is a project planning tool which helps to streamline the USFWS environmental review process and includes a mapping tool which helps to identify listed species occurrences, critical habitat, and other important biological resources within the vicinity of project sites.

Table 4. Federal and State Listed Threatened and Endangered Plant and Animal Species Known to Occur in Berkeley and Charleston Counties

Species Common Name	Species Scientific Name	County	ESA Status
Shortnose Sturgeon	<i>Acipenser brevirostrum</i>	B, C	LE, SE
Atlantic Sturgeon	<i>Acipenser oxyrinchus</i>	B, C	LE
Frosted Flatwoods Salamander	<i>Ambystoma cingulatum</i>	B, C	LT, SE
Spotted Turtle	<i>Clemmys guttata</i>	B, C	ST
Rafinesque's Big-eared Bat	<i>Corynorhinus rafinesquii</i>	B, C	SE
American Swallow-tailed Kite	<i>Elanoides forficatus</i>	B, C	SE
Bald Eagle	<i>Haliaeetus leucocephalus</i>	B, C	BGEPA, ST
Gopher Frog	<i>Lithobates capito</i>	B, C	SE
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	B, C	LT
Red-cockaded Woodpecker	<i>Picoides borealis</i>	B, C	LE, SE
Least Tern	<i>Sterna antillarum</i>	B, C	ST
West Indian Manatee	<i>Trichechus manatus</i>	B, C	LT
Finback Whale	<i>Balaenoptera physalus</i>	C	LE
Right Whale	<i>Balaena glacialis</i>	C	LE
Humpback Whale	<i>Megaptera novaengliae</i>	C	LE
Loggerhead Sea Turtle	<i>Caretta caretta</i>	C	LT, ST
Green Sea Turtle	<i>Chelonia mydas</i>	C	LT
Kemp's Ridley Sea Turtle	<i>Lepidochelys kempii</i>	C	LE
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	C	LE
Wilson's Plover	<i>Charadrius wilsonia</i>	C	ST
Piping Plover	<i>Charadrius melodus</i>	C	LT
Red Knot	<i>Calidris canutus rufa</i>	C	LT
Wood Stork	<i>Mycteria americana</i>	B, C	LT, SE
Broad-striped Dwarf Siren	<i>Pseudobranchius striatus</i>	C	ST
Bachman's Warbler	<i>Vermivora bachmanii</i>	C	LE, SE
Kirkland's Warbler	<i>Setophaga kirtlandii</i>	B, C	LE
Pondberry	<i>Lindera melissifolia</i>	B, C	LE
Canby's Dropwort	<i>Oxypolis canbyi</i>	B, C	LE
Chaffseed	<i>Schwalbea americana</i>	B, C	LE
Seabeach Amaranth	<i>Amaranthus pumilus</i>	C	LT

B = Berkeley County; C = Charleston County; LE = Federally Endangered; LT = Federally Threatened; SE = State Endangered; ST = State Threatened; BGEPA = Bald and Golden Eagle Protection Act

A siting of one RCW individual was recently made on the mitigation site; this siting was reported to the USFWS on July 31, 2018 and resulted in an informal consultation. No known RCW clusters or cavity trees are located on the mitigation site. Furthermore, the property is under a Safe Harbor Agreement with the USFWS.

Implementation of the mitigation plan will result in enhanced RCW habitat. Furthermore, the proposed long-term stewardship of the site is in the best interest of RCWs and will result in additional reporting and RCW

documentation to the USFWS as RCWs expand into the mitigation site as expected. A Memorandum of Agreement between the USFS and the USACE will ultimately result in stronger protection for RCWs and other threatened and endangered species than currently exists.

Additional rare, threatened, and endangered species whose habitat are to be re-established at the mitigation site include the frosted flatwoods salamander, gopher frog, American chaffseed, ciliate leaf tickseed (*Coreopsis integrifolia*), pondberry, Canby's dropwort, Bachman's sparrow (*Peucaea aestivalis*), and the swallow-tailed kite. Additional species of conservation priority have been observed within close proximity to the mitigation site and may likely colonize the site given time.

4.2.3 Cultural Resources

A review of the mitigation site has been conducted to determine the likelihood of identifying historic or prehistoric cultural resources within the project area. A review of the documentary record for the project area showed the project limit of disturbance has been largely undeveloped throughout the historic past. As a result, there are no previously recorded historic resources or archaeological resources within the project area. A review of environmental factors, past disturbances, and known archaeological sites near the project indicate that the overall project has a low probability of encountering archaeological resources eligible for listing on the National Register of Historic Places, although some portions of the project have a moderate to high probability to contain prehistoric and historic archaeological deposits. The historic and cultural resource review report is included as Appendix B.

4.3 Site Protection

Upon project approval, restrictive covenants will be placed upon the mitigation site. Refer to Appendix C for the Declaration of Restrictive Covenants. Following implementation of the mitigation activities and documentation of project success, the mitigation site will be transferred to the USFS, which would assume long-term management and ownership obligations in accordance the Conservation Land Use Agreement between the USFS and the USACE. Following transference of the mitigation site to the USFS, the mitigation site will be subject to the same protections and use requirements defined in the Francis Marion National Forest Final Revised Land Management Plan dated January 2017 (or current version).

The preamble to the conveyance deed will state the project name and identify that lands being conveyed are for purposes of compensatory mitigation for environmental impacts caused as a result of the Camp Hall Rail Project. The lands will be held as compensatory mitigation lands in perpetuity to meet the project mitigation requirements, or alternative mitigation will be provided consistent with current federal law and applicable executive guidance.

4.4 Permittee-Responsible Mitigation Site Baseline Conditions

Preliminary baseline data has been collected to determine the ecological suitability of the mitigation site to achieve the goals and objectives outlined in Section 4.1 above. The following presents a detailed description of the baseline conditions at the mitigation site.

4.4.1 Ecoregion

The Fairlawn C-1 mitigation site is located within the same 8-digit HUC (03050201; Cooper River) and Level III Ecoregion (63; Middle Atlantic Coastal Plain) as the Cooper River Basin portion of the impact site (Figure

3). The Middle Atlantic Coastal Plain region of South Carolina is generally a flat region underlain by unconsolidated sedimentary deposits. Rivers meander through broad floodplains characterized by cut-off lakes and swamp vegetation. Elevation differences in the Middle Atlantic Coastal Plain range from 300 feet at the border of the Sandhills to sea level at the border of the coast. Soils in the Middle Atlantic Coastal Plain consist of a mixture of sand, clay, and organic materials.

Manipulation of the natural environment for forestry, agriculture, and/or recreation is common in the Middle Atlantic Coastal Plain Ecoregion, as demonstrated by the anthropogenic impacts within the mitigation site. While the altered ecological communities throughout the ecoregion are suitable for wetland restoration and/or enhancement projects, the preservation of existing aquatic communities is also an ecological benefit for the ecoregion. The preservation and enhancement of on-site resources will benefit the ecoregion by providing increased filtration of sediments and nutrients, flood attenuation, and habitat for wildlife, among other benefits.

4.4.2 Historic Land Use

Land use practices have remained fairly consistent and primarily include silviculture and timber management. Based upon site visits and field notes, on-site resources have been adversely affected by anthropogenic impacts, with the primary impacts being to vegetation and due to fire suppression and silvicultural practices. Refer to Figures 4a, 4b, 4c, and 4d for aerial photographs of the mitigation site from 1989, 1999, 2007, and 2018, respectively.

The primary impact to the mitigation site has been the practice of short-rotation loblolly pine forestry and fire suppression. Genetic improvement of the loblolly pine tree has enabled row-planted production forestry to be imposed into areas that were once natural wetland. Silvicultural site practices (such as chopping and bedding), followed by shading from planted pines, and the exclusion of fire have severely impacted the herbaceous species characteristic of the unaltered landscape. Prior to production forestry, the uplands adjacent to these impacted wetlands were likely in longleaf pine forest. Longleaf pine forest, with its open canopy spacing and regular fire returns, supports much greater understory diversity both within the upland forest, and in the adjacent wetland ecotones.

Thick understory and hardwood growths on the mitigation site reduce invertebrate productivity, which is critical for bird foraging. The shading effect also reduces dissolved oxygen levels in isolated ponds during amphibian breeding season. Lastly, dense shrubs reduce sunlight penetration at ecotones. Conversely, the herbaceous layer that is promoted by burning and sparse canopy trees of flats and savannahs allows for more photosynthesis and hence, more oxygen. In addition, burning on a regular interval of every 2-3 years prevents dense undergrowth from establishing, thus allowing sunlight to penetrate ecotonal habitat.

4.4.3 Existing Wetlands and Waters

A delineation of wetlands and other Waters of the United States was conducted for the mitigation site in accordance with methodology outlined in the Atlantic and Gulf Coastal Plain Regional Supplement to the 1987 Corps of Engineers Wetland Delineation Manual (hereinafter "Supplement"). A detailed wetland delineation report and a preliminary jurisdictional determination request will be submitted under a separate cover.

The Supplement was used to collect baseline hydrology, vegetation, and soils data. A Wetland Delineation Overview Map and an Atlantic and Gulf Coastal Plain Wetland Determination Data Form for each data point

are included in Appendix D. Approximate aquatic feature boundaries are depicted on Figure 5; typical photographs of aquatic resources are included in Appendix E. A National Wetlands Inventory Map is also included as Figure 6. Wetland types within the mitigation site include linear hardwood swales, cypress-gum ponds, bays, and freshwater emergent marsh. Wetland hydrology is primarily temporary to semi-permanent. Total upland and wetland areas are 486.6 and 893.4 acres, respectively.

4.4.4 Topography

A USGS topographic map is included as Figure 7. The mitigation site lies in relict dune and swale geology, and displays southwest-northeast upland ridges alternating with wetland swales, particularly in the northeastern portion of the mitigation site. Topography within the mitigation site is relatively flat, with elevations ranging from 24 to 50.5 feet above mean sea level. In general, upland areas of the site grade downslope toward flats. In turn, flats grade downslope toward lower landscape positions that appear as linear features that may be inundated most of the year. Depressional areas are scattered throughout the mitigation site, particularly in the northeastern portion of the mitigation site. On-site aquatic resources flow through Francis Marion National Forest and flow to I'on Swamp. I'on Swamp forms the headwaters of the Wando River.

4.4.5 Vegetative Conditions

Existing vegetative communities were assessed to understand existing impairments, to develop planting plans for enhanced areas, and to establish performance standards. Best professional judgment was used to assess, classify, and describe on-site communities. The mitigation site is composed of various anthropogenic and natural forest types. Refer to Appendix E for typical photographs of on-site vegetative communities; refer to Figure 8 for a general depiction of existing vegetative communities.

Nelson (1986) was utilized to classify existing plant communities on the mitigation site, which include: Bay Forest, Hardwood Forest, Longleaf Pine Woodlands, Loblolly Pine Plantation, and Cutover.

Bay Forest

Bay Forests account for approximately 195 acres on the mitigation site and are saturated forests that have a low diversity of vascular plants. Of these 195 acres, 183.5 acres are contained within jurisdictional wetlands. The canopy is dominated by sweetbay (*Magnolia virginiana*) and swamp bay (*Persea palustris*). Additional canopy species include swamp tupelo (*Nyssa biflora*), pond cypress (*Taxodium ascendens*), red maple (*Acer rubrum*), and titi (*Cliftonia monophylla*). The shrub layer is dominated by fetterbush (*Lyonia lucida*) and can also include gallberry (*Ilex coriacea*), American holly (*Ilex opaca*), sweet pepperbush (*Clethra alnifolia*), and saw palmetto (*Serenoa repens*). The herbaceous layer is sparse and sometimes absent but includes cinnamon fern (*Osmundastrum cinnamomeum*), netted chainfern (*Woodwardia areolate*), and Virginia chainfern (*Woodwardia virginica*).

Hardwood Forest

The existing hardwood forest community at the mitigation site is approximately 340.6 acres in size and consists of two basic types: linear bottomland hardwood swales and isolated ponds. The bottomland hardwoods are intermingled with pine stands occurring at slightly higher elevations throughout the mitigation site. The bottomland hardwoods are characterized by a canopy consisting of diamond-leaf oak (*Quercus laurifolia*), water oak (*Quercus nigra*), swamp chestnut oak (*Quercus michauxii*), live oak (*Quercus*

virginiana), red maple, green ash (*Fraxinus pennsylvanica*), swamp tupelo, loblolly pine (*Pinus taeda*), bald cypress (*Taxodium distichum*), winged elm (*Ulmus alata*), tulip poplar (*Liriodendron tulipifera*), black gum (*Nyssa sylvatica*), river birch (*Betula nigra*), American elm (*Ulmus americana*), American sycamore (*Platanus occidentalis*), American hornbeam (*Carpinus caroliniana*), and sweetgum (*Liquidambar styraciflua*). The understory is typically limited by the overstory cover, ponding, and flowing drainage patterns. The mid-story typically includes younger hardwood species found in the overstory as well as stiff dogwood (*Cornus foemina*), spruce pine (*Pinus glabra*), sweetbay, American holly, wax myrtle (*Morella cerifera*), redbay (*Persea bourbonia*), fetterbush, dwarf palmetto (*Sabal minor*), southern arrowwood (*Viburnum dentatum*), highbush blueberry (*Vaccinium corymbosum*), coastal doghobble (*Leucothoe axillaris*), sweet pepperbush, and giant cane (*Arundinaria gigantea*). The herbaceous stratum is typically sparse, but where present, includes royal fern (*Osmunda spectabilis*), cinnamon fern, netted chainfern, Virginia chainfern, various sedges (*Carex* spp.), lizard's tail (*Saururus cernuus*), and Jack in the pulpit (*Arisaema triphyllum*). Typical vine species include crossvine (*Bignonia capreolata*), Virginia creeper (*Parthenocissus quinquefolia*), roundleaf greenbrier (*Smilax rotundifolia*), saw greenbrier (*Smilax bona-nox*), poison ivy (*Toxicodendron radicans*), muscadine (*Vitis rotundifolia*), Japanese honeysuckle (*Lonicera japonica*), and trumpet creeper (*Campsis radicans*).

Longleaf Pine Woodlands

There are approximately 219 acres of altered longleaf pine woodlands on the mitigation site. Of these 219 acres, 79.2 acres are occurring within wetlands and 139.8 acres are occurring within uplands. These woodlands have been altered due to fire exclusion, which has allowed loblolly pine, sweetgum and other species to form in the mid-story, thereby negatively affecting habitat for sensitive species such as RCW and flatwoods salamander. An herbaceous layer is typically missing from these areas. Canopy closure is also affecting wetland quality by limiting sunlight and allowing accumulation of leaf litter. The mitigation goals for these areas are to reduce the mid-story canopy by thinning undesirable species (i.e. species other than longleaf pine) as needed, spot plant (if needed) longleaf pine where other species are removed, and applying prescribed fires, thereby decreasing leaf litter accumulation and reducing competition from hardwoods, loblolly pine seedlings, and grasses. Removal of leaf litter and allowing fire to encroach into wetland ecotones will enhance adjacent wetlands associated with upland longleaf pine woodlands.

Loblolly Pine Plantation

Approximately 542 acres, including 272.4 acres within jurisdictional wetlands, have been converted to pine plantation monoculture and intensively managed for timber production. These pine plantations contain even-aged planted loblolly pine stands in various stages of rotation. These areas will be restored to natural and historic vegetative conditions and functions (either wetlands dominated by native hardwood wetland species or longleaf pine uplands, depending upon hydrologic regime). Approximately half of the pine monoculture acreage consists of stands that are 15-25 years old. These are typically closed canopy stands with minimal sunlight penetration and sparse mid-story and ground cover vegetation. The lack of sunlight suppresses herbaceous growth and diversity which limits habitat for sensitive species such as RCW and flatwoods salamander. The mitigation goals for these areas are to clear-cut the stands, plant wetland areas with native hardwood wetland species, plant upland areas with longleaf pine, and apply prescribed fires within upland areas. Allowing fire to encroach into wetland ecotones will enhance adjacent wetlands associated with upland stands.

The loblolly pine plantation community overstory is almost always exclusively dominated by established and

bedded loblolly pine; however, occasional sweetgum individuals may also be present. Established stands may include a mid-story, which can be densely vegetated depending on age of the stand and whether or not the stand is actively thinned. Mid-story individuals typically include young loblolly pine and hardwood species in the sapling stage including sweetgum, red maple, diamond-leaf oak, water oak, willow oak (*Quercus phellos*), southern red oak (*Quercus falcata*), blackjack oak (*Quercus marilandica*), swamp tupelo, flowering dogwood (*Cornus florida*), black cherry (*Prunus serotina*), winged elm, and American elm. Overall the herbaceous layer is sparsely vegetated, but contains bracken fern (*Pteridium aquilinum*), cinnamon fern, royal fern, partridge pea (*Chamaecrista fasciculata*), dogfennel (*Eupatorium capillifolium*), giant cane, and slender woodoats (*Chasmanthium laxum*). Typical vine species include muscadine, poison ivy, roundleaf greenbrier, Virginia creeper, and trumpet creeper.

Cutover

There is approximately 53 acres of recently clear-cut land. Of these 53 acres, 19.8 acres are occurring within wetlands and 33.2 acres are occurring within uplands. These areas are dominated by young tree, shrub, and herbaceous species. The mitigation goals for these areas are to plant wetland areas with native hardwood wetland species, plant upland areas with longleaf pine, and apply prescribed fires within upland areas. Allowing fire to encroach into wetland ecotones will enhance adjacent wetlands associated with upland areas.

4.4.6 Soils

The Natural Resources Conservation Service soil survey for Berkeley and Charleston Counties (Figure 9) indicates ten soil map units within the mitigation site boundary. Refer to Table 5 for mapped soils and hydric characteristics.

Table 5. Mapped Soils and Hydric Characteristics

Mapped Unit Name	Hydric (Yes/No)	Hydric Component Characteristics	
		Landform	Hydric Criteria*
CaB – Cainhoy fine sand, 0 to 6 percent slopes	No	N/A	-
Cm – Chipley loamy fine sand	Yes	Depressions	2
Ct – Chipley-Echaw complex	Yes	Depressions	2, 3
LaB – Lakeland sand, 0 to 6 percent slopes	Yes	Depressions, Marine Terraces	2
Pa – Pamlico muck	Yes	Flood Plains, Depressions	1, 2, 3
Pk – Pickney loamy fine sand	Yes	Flood Plains	2, 3
Rg – Rutlege loamy fine sand	Yes	Marine Terraces	2, 3
Sa – St. Johns fine sand	Yes	Marine Terraces	2
Sm – Seewee complex	Yes	Depressions	2
Wt – Witherbee fine sand	Yes	Flood Plains, Marine Terraces, Depressions	1, 2, 3

*1 = poorly drained soils in which flooding, ponding, or saturation is likely to occur often under usual weather conditions

2 = somewhat poorly to very poorly drained soils that have a shallow water table (i.e. at a depth of less than 1 foot) during the growing season

3 = soils that are frequently ponded (i.e. greater than 50 percent of the year) for greater than 7 days duration during the growing season

Of these ten soil units, nine meet the hydric soil criteria, accounting for more than 99% of the proposed survey area. Having maintained a pine-dominant ecosystem, the soil chemistry will support the mitigation goals and objectives.

4.5 Determination of Credits

The Applicant is proposing to purchase 80 credits from Beidler Forest Mitigation Bank to offset wetland impacts occurring within the Edisto River Basin and is proposing to implement the Fairlawn C-1 PRM Plan to offset wetland impacts occurring within the Cooper River Basin. Proposed management actions at the mitigation site are outlined in Section 4.6. Figures 10a – 10f depict the proposed mitigation units and upland buffers for the mitigation site. Refer to Figures 10a – 10f for the location and extent of mitigation units and upland buffers used to determine credit yield to be generated from the mitigation site.

The following is a discussion of the credit factors that were used to calculate to credit yield on the mitigation site.

Net Improvement – Net improvement (hereinafter “NI”) is an evaluation of the net level of functional enhancement or restoration to an aquatic site associated with a proposed mitigation action. This factor is evaluated using a sliding scale, with values ranging from 0.1 for low-level enhancement to 3.0 for excellent restoration. Wetland Mitigation Units were divided into five different categories, with each Unit (or category) being assigned its own NI factor based upon proposed management actions. Only the five wetland management units and associated upland buffers were used for credit generation. Refer to Section 4.6. for a detailed discussion of the proposed management actions for each Mitigation Unit.

- Mitigation Unit 1 – Enhance Altered Longleaf Pine: These areas are predominately extant longleaf pine woodlands. However, loblolly pine and other species (primarily sweetgum) have formed in the mid-story and are interspersed throughout the Unit due to fire exclusion. Unit 1 will require thinning of undesirable species (i.e. species other than longleaf pine) and spot planting (if needed) of longleaf pine where other species are removed. A prescribed fire regime will be implemented. A NI of 1.0 was given to these areas.
- Mitigation Unit 2 – Remove Bedded Loblolly Pine: These areas will require clear-cutting of bedded loblolly pine, allowing areas to “green-out”, site preparation (including herbicide application, mechanical removal of beds and troughs, shearing pine stumps below ground elevation or extracting them from the soil as necessary, root raking and the removal of woody debris, and/or burning), and planting of native hardwood wetland species. A NI of 1.0 was given to these areas.
- Mitigation Unit 3 –Bay Forest Preservation: These areas consist of an intact forest community and functional wetlands. The vegetative structure and composition of these areas will be preserved in perpetuity. Therefore, a NI of 0.0 was given to these areas.
- Mitigation Unit 4 –Bottomland Hardwood Preservation: These areas consist of an intact forest community and functional wetlands. The vegetative structure and composition of these areas will be preserved in perpetuity. Therefore, a NI of 0.0 was given to these areas.
- Mitigation Unit 5 – Replant Cutover Wetlands: These areas will require site preparation (including herbicide application, mechanical removal of beds and troughs, shearing pine stumps below ground elevation or extracting them from the soil as necessary, root raking and the removal of woody debris, and/or burning) and planting of native hardwood wetland species. A NI of 1.0 was given to these areas.

Upland Buffer – Upland buffers help maintain the physical, chemical, and biological integrity of the adjacent aquatic resources. Where applicable (buffers are not possible where wetlands border property boundaries), wetlands at the mitigation site will be buffered by a minimum of 150-foot wide buffers (3:1 ratio = 1.0 buffer factor). It was calculated that 77% of the perimeter of the wetlands will receive the benefit of the upland buffer protection. Therefore, the areas that are eligible to receive the benefit of the buffer factor will be assigned a value of 0.77 and the remaining acreage will have an upland buffer value of 0.0.

Credit Schedule – It is anticipated the mitigation project will be implemented concurrently with the impacts, meaning the majority (> 50%) of the mitigation activities (land clearing, vegetative plantings, etc.) are conducted at the same time as the adverse impacts; therefore, a credit schedule value of 0.3 will be used. A credit schedule value of 0.0 will be used for preservation.

Temporal Loss – Temporal loss is the time lag between the loss of aquatic functions associated with permit activities and the replacement of those functions through restoration or enhancement of aquatic resources at the Mitigation Project. It is anticipated it will take 0-5 years for Unit 1 to be fully functional. Therefore, a temporal loss value of -0.1 will be used for Unit 1. It is anticipated it will take 20+ years for Units 2 and 5 to become fully functional. Therefore, a temporal loss value of -0.4 will be used for Units 2 and 5. A temporal loss value of 0.0 will be used for preservation (Units 3 and 4).

Kind – Kind is a factor used to compare the functions and services of an impacted aquatic resource with the functions and services of a potential mitigation project. The mitigation project is expected to enhance and preserve wetlands of similar structural and functional type to the impacted resource, providing a value of 0.4.

Location – The proposed mitigation site is located in the same 8-digit HUC as the proposed wetland impacts, providing a value of 0.4.

The number of credits generated by the proposed mitigation activities is listed in Table 6; the number of credits generated by the proposed mitigation activities is based on the USACE 2010 mitigation guidelines.

Table 6. Potential Credit Production

Beidler Forest Mitigation Bank	Credits Purchased
Wetland Mitigation Credits	80
Total Wetland Credits	80
Fairlawn C-1 Mitigation Site	Credits Generated
Wetland Enhancement	796.0
Wetland Preservation	530.7
Total Wetland Credits	1,326.7
Total Combined Wetland Mitigation Credits	1,406.7

Figures 10a – 10f show the portions of the property that are used to generate credits per the Charleston District SOP. Mitigation calculations are shown in Table 7.

Table 7. Wetland Credit Calculations

Factor	Unit 1 with Buffer	Unit 1 without Buffer	Unit 2 with Buffer	Unit 2 without Buffer	Unit 3 with Buffer	Unit 3 without Buffer	Unit 4 with Buffer	Unit 4 without Buffer	Unit 5 with Buffer	Unit 5 without Buffer
Net Improvement	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	1.0
Upland Buffer	0.77	0.00	0.77	0.00	0.77	0.00	0.77	0.00	0.77	0.00
Credit Schedule	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.3	0.3
Temporal Loss	-0.1	-0.1	-0.4	-0.4	0.0	0.0	0.0	0.0	-0.4	-0.4
Kind	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Location	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Sum of Factors	2.77	2.0	2.47	1.7	1.57	0.8	1.57	0.8	2.47	1.7
Mitigation Area (acres)	26.1	53.1	150.0	122.4	46.7	136.8	98.1	242.5	6.9	12.9
M x A	72.3	106.2	370.5	208.1	73.3	109.4	154.0	194.0	17.0	21.9
Proposed Wetland Enhancement Credits										796.0
Proposed Wetland Preservation Credits										530.7
Total PRM Credits										1,326.7

Aquatic resources located within the mitigation site, and the proposed management actions described herein as occurring within the mitigation site, generate compensatory mitigation credits in a quantity and character that Palmetto Railways believes is sufficient to adequately mitigate for the comparable loss in the function and value of the wetlands and linear features associated with the impacts of the Camp Hall Rail Project. Refer to Table 8 for a comparison of proposed Camp Hall Rail project impacts to the proposed mitigation.

Table 8. Comparison of Camp Hall Rail Impacts to Proposed Mitigation

Impact Site		Mitigation Site	
Project Area	0.85 square miles or 544 acres	1,380 acres	Project Area
Wetland Acreage Impacted	120.01	893.4	Wetland Acreage Protected
Required Wetland Credits	1,406	1,406.7*	Generated Wetland Credits

*Includes the purchase of 80 wetland credits from Beidler Forest Mitigation Bank.

4.6 Mitigation Work Plan

The landscape of the mitigation site is mostly forested and contains fragmented habitats in need of enhancement in order to become one remarkably diverse ecosystem. The goal of this mitigation plan is to restore an entire intact ecosystem on the mitigation site, not just a part of it, and have the restored site blend with the surrounding landscape. Thus, this mitigation plan includes preservation and enhancement of wetlands and ecotones along with reestablishment of native longleaf pine forest. Utilizing a landscape approach, the entire site (wetlands, ecotones, and uplands) will be restored, enhanced and/or preserved,

thereby contributing to the widespread, landscape scale protection and restoration occurring on more than 5,000 other acres of adjacent or nearby lands. The mitigation site is large enough to accomplish this goal; however, the mitigation site is also uniquely situated adjacent to and nearby other lands where similar habitat and conservation goals exist.

The longleaf pine ecosystem is one of the most imperiled in our nation, with 97% of this habitat being destroyed by human activities including harvest of native longleaf pine, followed by fire suppression and conversion to pine monoculture for timber and paper industries (Frost 2006). The surrounding Francis Marion National Forest was recently identified as a Significant Geographic Area for the maintenance and restoration of longleaf pine in the 2009 Range-Wide Conservation Plan for Longleaf Pine (www.americaslongleaf.org/). Unlike the dense rows of loblolly pine in a plantation, the native longleaf ecosystem provides unique, critical habitat for many rare, threatened, and endangered species with its mosaic of sparsely scattered, tall, long-lived pines with grasses, orchids, and carnivorous plants in the wet areas, and grasses in the dry understory. A return to this type of native habitat, complete with a diversity of wetland types that benefit the aquatic resources and overall ecosystem, is the long-term goal of the mitigation plan.

The relationship of the longleaf pine forest to wetland extent, community composition and structure, and biological health has typically been discounted in site planning and management for wetland mitigation. However, substantial research supports longleaf forest restoration as a path to increase wetland extent and hydroperiod in adjacent and interior wetlands. Research also links the dominant longleaf site management tool (prescribed fire) to those same factors (wetland extent, community composition and structure, and biological health), along with clear improvements in vegetative community composition and structure. Those benefits then accrue to a wide range of species endemic to the longleaf pine ecosystem, including many wetland obligate amphibians. Reestablishing the longleaf matrix around wetlands also improves physiochemical conditions in wetland waters for these species. Therefore, the primary method of long-term enhancement to be used in Unit 1 (existing wetlands comprised of predominant extant longleaf pine woodlands) and uplands is the application of fire at regular intervals to maintain community composition and structure. By thinning and burning the Unit 1 wetlands and longleaf ecosystem, the shrubby and dense understory growth is removed, allowing longleaf pine to benefit from less competition.

Understanding the longleaf forest as a system is critical. The tree stand is only a small part of the system. Other critical factors are fire management, diverse herbaceous plant understories, and the physical setting of the forest. Typically, longleaf forests are heavily intertwined with bottomland hardwood forest, streamhead seeps, high and low pocosins, cypress domes, gum ponds and other wetland types. Fire is the driving process of the system, and naturally burns into wetland edges, forming unique ecotones that support imperiled plants and animals found in no other system. Fire also controls mid-story cover and enhances sunlight penetration to the forest floor. The tree species, stand structure, absence of mid-story, and effect of fire all contribute unique subsidies to water yield, plant and animal diversity, and upland-wetland ecotones.

Longleaf pine forest management with fire and conversion of pine plantations to native longleaf forest is an effective and highly feasible way to increase adjacent and interior wetland hydroperiods, water quality, and value to endemic and imperiled wetland flora and fauna. The longleaf forest context and fire effects drive essential physiochemical functions to support and enhance these wetland qualities. These qualities almost immediately manifest themselves when plantation sites are re-converted back to longleaf pine forest. These principles are abundantly supported in peer-reviewed forest hydrology, wetland, and wildlife literature and practical experiences of local land managers in and around the Francis Marion National Forest and coastal South Carolina.

The mitigation site contains a mix of wetlands that are suitable for both enhancement and preservation, and upland buffers and residual uplands that either contain imperiled longleaf pine forest, or are readily restorable to that condition. The goal of the mitigation plan is to replace the loss of aquatic functions and values at the impact site through activities at the Fairlawn C-1 Tract by (a) converting altered longleaf pine woodlands to natural longleaf pine habitat, (b) converting loblolly pine monoculture to natural and historic vegetative conditions and functions (either wetlands dominated by native hardwood wetland species or longleaf pine uplands, depending upon hydrologic regime), (c) enhancing and preserving quality examples of hardwood swales, evergreen bays, and isolated wetlands, and (c) implementing a fire regime throughout Unit 1 and uplands. Enhancement activities will be undertaken in the short-term and functional lift is expected to occur comparatively rapidly through the use of fire and improvements of forest conditions. However, attaining a fully functioning and mature longleaf forest-wetland complex will likely take decades. The USFS will undertake long-term management activities to ensure re-establishment of the native longleaf ecosystem in accordance with the USFS's land management plans.

Areas will be mechanically prepared where necessary to allow for successful vegetative establishment. Logging decks, debris piles, and bark piles will be managed either by windrowing or burning, or some combination thereof. Minor mechanical site preparation will be required to address existing bedded areas or those areas that have been heavily impacted by prior logging operations. Pine stumps will be sheared below ground elevation or extracted from the soil as necessary. An herbicide spray may be utilized and a site preparatory burn may be conducted. Clear-cut areas may be allowed to "green-out" prior to herbicide application. Forestry Best Management Practices will be utilized during implementation of the mitigation plan to minimize potential impacts to aquatic resources.

A licensed forester and the Forest Service's District Silviculturist have been consulted during the mitigation plan development process and will be available throughout the process to assist with the implementation and maintenance of the mitigation site. Adaptive management and invasive species control measures will be implemented as needed.

4.6.1 Mitigation Units

Aquatic resources within the project area have been divided into mitigation units to address existing conditions, proposed activities, and target conditions. Figures 10a – 10f depict the overall mitigation approach. The unit delineations and attendant management prescriptions are derived from detailed forest stand inventory mapping maintained by the current landowner. The tract contains a variety of pine, hardwood, and mixed stands in various states of maturity. This beginning state is a critical factor for restoration planning in a forest management context. Extant site conditions drive the restoration approach, and are a good indicator of the anticipated vegetation response. These responses in turn, indicate the likely duration, intensity, and timeline of activities once management is initiated.

In most forest management cases within the Francis Marion National Forest, the long-term desired future conditions are mature longleaf pine woodland or savannah stands with fire-maintained wetland ecotones dominated by herbaceous groundcover and low shrubs. Tree basal areas will be from 40-70 ft²/acre, mid-story cover < 25%, and contiguous herbaceous cover > 65% with a 20% grass / sedge component.

The stand conditions were used to circumscribe mitigation units and the actions required to improve habitat and provide hydrologic and habitat quality uplifts to adjacent and internal wetlands. This approach produced five distinct wetland mitigation units and management strategies. The following section describes wetland mitigation units, potential enhancement and preservation acreage, and the management actions required to

generate uplift in wetland conditions and the overall ecosystem.

Unit 1: Enhance Altered Longleaf Pine – 79.2 Wetland Acres

Current Condition: Fairlawn C-1 contains 79.2 acres of predominant extant longleaf pine woodlands occurring within jurisdictional wetlands (Figure 10a). Loblolly pine and other species (primarily sweetgum) have formed in the mid-story and are interspersed throughout the Unit due to fire exclusion.

There are bottomland hardwood wetlands wholly contained within the natural longleaf unit. These are primarily cypress-gum ponds, and are excellent amphibian breeding and rare plant habitats, provided a recurrence of fire throughout the ecotones. These wetland areas are part of Unit 4 (Bottomland Hardwood Preservation).

Desired Condition: Thin species other than longleaf pine. Tree basal areas from 40-70 ft²/acre, mid-story cover < 25%, and herbaceous cover > 65% with a 20% grass / sedge component.

Management Action: Thin undesirable species (i.e. species other than longleaf pine). If needed, spot plant longleaf pine on an approximate 10 ft. x 10 ft. spacing where species are removed. Apply prescribed fire at appropriate intervals to be determined by a forester and depending upon overall stand age and condition.

Unit 2: Remove Bedded Loblolly Pine – 272.4 Wetland Acres

Current Condition: Fairlawn C-1 contains 272.4 acres of bedded loblolly pine plantation within jurisdictional wetlands, established at various dates (Figure 10b). These are closed stands with minimal sunlight penetration, and little mid-story or ground cover vegetation. The lack of sunlight suppresses understory herbaceous production and diversity, which reduces invertebrate production and food bases for longleaf-associated wildlife species like RCW and flatwoods salamander. Tight canopy closure also increases leaf litter accumulation. These factors reduce dissolved oxygen (hereinafter “DO”) levels and increase biological oxygen demand in wetland waters, which negatively affects the ability of these wetlands to support sensitive amphibian suites. Ambystomid salamanders like the frosted flatwoods salamander require DO > 4 mg/L during egg incubation and early larval stages.

All existing loblolly pine plantations are bedded. Several amphibian species are associated with fire-maintained landscapes and travel across flats and savannahs to breeding areas. There is evidence that intensive silviculture may detrimentally affect herpetofaunal populations (Enge and Marion 1986, Means, Palis, and Baggett 1996) because intensive silviculture relies on a series of raised parallel-aligned beds on which pine seedlings are planted. These raised beds may block migration routes. In addition, standing water in troughs between beds may cue amphibians to lay their eggs in these troughs (where the water is too ephemeral to support larval development) rather than in deeper, more permanently inundated and/or saturated areas.

Leaf area index and standing basal area are the critical variables of pine forest hydrology (McLaughlin, et al. 2013). Stream and wetland water yield from loblolly pine plantations at 100-120 ft²/acre are 4% of total annual water, thus consuming 96% of available water (Amatya et al. 2006). Even mixed longleaf-slash stands slightly overstocked at 80 ft²/acre basal area are more water-efficient, consuming 84-87% of annual water (Powell, et al. 2005) yielding 13-16% to streams and wetlands. Total annual water use in loblolly plantations is most pronounced in drier years, when nearby wetlands and streams are most vulnerable to water loss (Chescheir et al. 2003). Simple thinning of loblolly pine plantations can produce water yield increases of 50% or more,

which trend back to pre-thinning conditions if openness is not maintained (Amatya and Skaggs 2008). Tree density effects on hydrology in the Francis Marion National Forest were also documented after Hurricane Hugo (Wilson et al. 2006). Tree clearing by Hugo greatly increased water yield from two long-term monitored watersheds. The control watershed was dominated by loblolly pine, and quickly regenerated to closed stand conditions and pre-Hugo hydrology. The treatment watershed was salvage-logged, managed by planting and prescribed fire to a mixed longleaf-loblolly stand, and retained its higher water yield characteristics. In northern Florida, reducing pine basal areas produced proportional increases in ecosystem water yield from 21-64% over traditional plantation stocking, with clear additional yield benefits from adding a 3-year rotation of prescribed fire (McLaughlin, et al. 2013). Lastly, in bedded sites, duration and frequency of flooding are increased in troughs and decreased on beds relative to unaltered conditions; this in turn alters the rate, timing, and magnitude of biogeochemical processes.

Desired Condition: Restore a native hardwood wetland forest to areas converted to loblolly pine monoculture. Restore natural elevations and contours by leveling existing bedded areas and troughs. Increase ecosystem water yield over existing conditions.

Management Action: Clear-cut loblolly pine. Allow areas to “green-out”, then apply herbicide. Site preparation, to include mechanical removal of beds and troughs, removal of woody debris, and/or burn. Shear pine stumps below ground elevation or extract from the soil as necessary to achieve project goals. Root rake the area to remove debris. Plant cleared areas with native hardwood wetland seedlings at a density of approximately 440 stems per acre (10 ft. x 10 ft. spacing).

Several habitat improvements will result from the proposed management actions. For one, reduced canopy and mid-story cover will release herbaceous and low shrub elements, increasing wetland plant community functions. Fire from adjacent uplands will likely burn into the management unit, creating quality ecotonal habitat. This will further increase habitat quality for sensitive amphibians by reducing leaf litter and biochemical oxygen demand, and increasing grass stem cover, the preferred medium for egg mass attachment and early life stage rearing. In addition, leveling existing bedded areas and troughs to mimic natural elevations and contours will ensure that amphibian migration routes are not blocked and that overall habitat quality is sufficient to maintain amphibian breeding populations. Lastly, improving the vegetative community will translate to significantly greater water yield to the wetland community.

Unit 3: Bay Forest Preservation – 181.4 Wetland Acres

Current Condition: Fairlawn C-1 contains 181.4 acres of evergreen bay habitat (Figure 10c) located within intact and fully functional jurisdictional wetlands. Vegetation varies from dense *Lyonia lucida* shrub cover with scattered pond cypress (*Taxodium ascendens*) overstory to more forested types with natural loblolly pine overstory and sparser *Lyonia* mid-story layers. Note, this community type is not to be confused with a Carolina Bay, which has a particular geologic structure not seen here. The shrub cover is approximately 8-12 feet high and forms a continuous canopy beneath the scattered trees.

Desired Condition: Preserve and maintain wetland vegetation dominance, structure, and composition.

Management Action: No active vegetative management is currently necessary. Permanently protect and preserve the areas in perpetuity. Allow fire from fire management activities to encroach into the wetland fringe to improve ecotonal habitat.

Unit 4: Bottomland Hardwood Preservation – 340.6 Wetland Acres

Current Condition: The Fairlawn C-1 tract contains 340.6 acres of forested wetlands dominated by common wetland hardwood trees (Figure 10d) including bald cypress, pond cypress, tupelo, black gum, laurel oak (*Quercus laurifolia*), water oak, red maple and others.

All of these wetlands have been logged in the past, and currently lack desirable old-growth features of hardwood-dominated forested wetlands such as cavity trees, downed woody debris, canopy height diversity, and natural canopy gaps. Otherwise, the vegetative characteristics of these wetlands are in good condition, and a protection strategy will allow these wetlands to age into old-growth habitat, a habitat type in very short supply across the United States, and particularly in the eastern states.

Desired Condition: Old-growth forested wetlands (150+ years) providing cavity habitat, abundant downed woody debris, emergent canopy trees, and natural gaps through blow-downs, die-off, and natural disease processes. Improve ecotonal habitat.

Management Action: No active vegetative management is currently necessary. Permanently protect and preserve the areas in perpetuity. Allow fire from fire management activities to encroach into the wetland fringe to improve ecotonal habitat.

Unit 5: Replant Cutover Wetlands – 19.8 Wetland Acres

Current Condition: Approximately 19.8 acres within jurisdictional wetlands have been recently cutover (Figure 10e). Left unmanaged, these areas will mature into closed-canopy mixed pine-oak stands with little to no sunlight penetration or understory productivity.

Desired Condition: Restore a native hardwood wetland forest to cutover areas. Restore natural elevations and contours by leveling existing bedded areas and troughs.

Management Action: Apply herbicide. Mechanically remove beds and troughs. Shear pine stumps below ground elevation or extract from the soil as necessary. Root rake to remove woody debris and/or burn. Plant cleared areas with native hardwood wetland seedlings at a density of approximately 440 stems per acre (10 ft. x 10 ft. spacing).

Following a spring and summer of growth in the clear-cuts, a herbicide spray will be utilized to kill green vegetation and a site preparatory burn will be conducted to remove competing vegetation and woody debris (assuming site conditions allow for the burn).

4.6.2 Uplands

150-Foot Upland Buffer – 327 Upland Acres

Current Condition: Upland buffers proposed for enhancement consist of altered longleaf pine woodlands, loblolly pine plantation, or cutover (Figure 10f).

Desired Condition: A longleaf pine ecosystem with tree basal areas from 40-70 ft²/acre, mid-story cover < 25%, and herbaceous cover > 65% with a 20% grass / sedge component. Restore natural elevations and contours by leveling existing bedded areas and troughs. Increase ecosystem water yield to adjacent wetland areas over existing conditions. Quality ecotonal habitat.

Management Action: Place an average 150-foot upland buffer around all wetland resources. Construct a 10 ft. wide flat fire break in the upland buffer around the periphery of Mitigation Units 2 and 5 to limit the potential for unwanted fire from entering the newly planted hardwood areas.

Thin undesirable species (i.e. species other than longleaf pine) within altered longleaf pine woodlands. Spot plant (if needed) longleaf pine on an approximate 10 ft. x 10 ft. spacing where species are removed.

Clear-cut loblolly pine plantation areas. Allow areas to “green-out”, then apply herbicide. Mechanically remove beds and troughs. Shear pine stumps below ground elevation or extract from the soil as necessary. Root rake to remove woody debris and/or burn. Plant longleaf pine on an approximate 10 ft. x 10 ft. spacing.

Apply prescribed fire throughout the uplands at appropriate intervals to be determined by a forester and depending upon overall stand age and condition. Enhance ecotonal habitat.

Residual Uplands Enhancement – 138.6 Upland Acres

Current Condition: Residual uplands consist of altered longleaf pine woodlands, loblolly pine plantation, or cutover (Figure 11).

Desired Condition: A longleaf pine ecosystem with tree basal areas from 40-70 ft²/acre, mid-story cover < 25%, and herbaceous cover > 65% with a 20% grass / sedge component. Restore natural elevations and contours by leveling existing bedded areas and troughs. Increase ecosystem water yield to adjacent wetland areas over existing conditions. Quality ecotonal habitat.

Management Action: Enhance and preserve residual uplands.

Thin undesirable species (i.e. species other than longleaf pine) within altered longleaf pine woodlands. Spot plant (if needed) longleaf pine on an approximate 10 ft. x 10 ft. spacing where species are removed.

Clear-cut loblolly pine plantation areas. Allow areas to “green-out”, then apply herbicide. Mechanically remove beds and troughs. Shear pine stumps below ground elevation or extract from the soil as necessary. Root rake to remove woody debris and/or burn. Plant longleaf pine on an approximate 10 ft. x 10 ft. spacing.

Apply prescribed fire throughout the uplands at appropriate intervals to be determined by a forester and depending upon overall stand age and condition. Enhance ecotonal habitat.

4.6.3 Prescribed Burn Plan

A prescribed burn plan will be designed and implemented by a licensed forester during the monitoring period. After the site is transferred to the USFS, the USFS will continue to apply fire to the site according to the Francis Marion National Forest Final Revised Land Management Plan dated January 2017 (or current version).

4.6.4 Invasive Species Management

Invasive species threaten the diversity and abundance of native species populations through competition for

resources, predation, parasitism, interbreeding with native populations, transmission of diseases, and introduction of physical or chemical alterations to the invaded habitat. As a result, invasive species will be monitored and managed in a manner that will support the continued functions and values for which the mitigation site was established. This will include documenting the location and approximate coverage of invasive species during walk-through surveys. Additional actions to control invasive species will be evaluated and prioritized in coordination with the regulatory agencies.

4.6.5 Reference Site

For longleaf pine woodlands in wetland enhancement Mitigation Unit 1, monitoring plots will be selected, developed, and assessed through annual application of the Functional Capacity Index (hereinafter "FCI") for Plant Community (hereinafter "FCI_{plants}") as described in *A Regional Guidebook for Applying the Hydrogeomorphic Approach to Assessing Wetland Functions of Wet Pine Flats on Mineral Soils in the Atlantic and Gulf Coastal Plains* [ERDC/EL TR-02-9] (hereinafter referred to as "Guidebook") (Rheinhardt et al. 2002). The Guidebook characterizes mineral soil wet pine flats, documents the selection of wetland functions and the development of assessment methods, documents the location of reference wetlands and the use of reference wetland data in calibrating functional indices, and presents a method for applying functional indices to the assessment of wetland functions. In developing the Guidebook, field data was collected from a group of reference wetlands that represent the range of variability exhibited by regional subclasses of wet pine flats. Field data from reference wetlands was then used to calibrate variables and to fine-tune assessment models. Finally, a set of procedures for applying the functional indices to the assessment of wetland functions was developed. Model variables are assigned a sub-index ranging from 0.0 - 1.0 based on the degree to which a wetland's condition varies relative to the range of conditions exhibited by reference standard wetlands. When the condition of a variable is similar to the reference standard, it is assigned a sub-index of 1.0. The conditions of variables that deviate from the range of conditions exhibited by reference standard wetlands are assigned lower values, with lower values and functional capacities indicating a greater deviation from the reference standard. Therefore, a reference site should not be required for Mitigation Unit 1 since sub-index scores directly relate to a wetland's condition relative to the range of conditions exhibited by reference standard wetlands.

One forested bottomland hardwood wetland reference site has been identified within an on-site preservation area; refer to Figure 12 for the reference site location. This area represents the mitigation goals and has a similar hydrologic source, vegetative community, and ecological function as the desired condition for Units 2 and 5. The reference site will be monitored in the same manner as the Unit 2 and 5 vegetative enhancement sites. Refer to Section 4.9 for a discussion of the monitoring requirements.

4.6.6 Planting Methods and Palettes

Given that most vegetative communities within the mitigation site have been impacted to some extent over time by silvicultural activities (e.g., timber harvesting, abandonment, and reforestation), a literature review of natural communities was conducted to develop the species lists included below. The species lists were refined based on baseline data collection and observations of vegetation within the mitigation site to account for a range of natural habitats and vegetative composition.

Plants will be installed as bare-root seedlings or containerized trees during the dormant season (winter months) to maximize survival. Species will be planted on 10 ft. x 10 ft. spacing at a density of approximately 440 trees per acre or spot planted (if needed within Unit 1 or thinned upland buffer enhancement areas). All planted trees within vegetation quadrats will be tagged and labeled with an identification number and the

species.

The following describes the planting plan.

Unit 1: Enhance Altered Longleaf Pine, Upland Buffer Enhancement, and Residual Uplands

The planting plan for Unit 1, upland buffer enhancement areas, and residual uplands in need of planting (i.e. residual uplands consisting of either altered longleaf pine woodlands, loblolly pine plantation, or cutover) consists entirely of longleaf pine. Plantings will be installed on 10 ft. x 10 ft. spacing at a density of approximately 440 trees per acre. Plantings within Unit 1, thinned upland buffer enhancement areas, and residual uplands consisting of altered longleaf pine woodlands will be spot planted (if needed) where species are removed.

Unit 2: Remove Bedded Loblolly Pine and Unit 5: Replant Cutover Wetlands

The planting plan for Units 2 and 5 will focus on mast producing hardwood species typical of bottomland hardwoods and is based upon those species found in the on-site wetland reference site and preservation areas. Black gum, bald cypress, laurel oak, swamp chestnut oak, water oak, and willow oak are the target species to be planted in Units 2 and 5, pending availability. Any additional species selected for planting will be native and will meet the indicator status of Facultative, Facultative Wetland, or Obligate Wetland. Bare-root seedlings will either be hand-planted or machine planted on 10 ft. x 10 ft. spacing at a density of approximately 440 trees per acre.

4.7 Maintenance Plan

The following maintenance will be required during the monitoring phase of the project to ensure the continued viability of the mitigation site. Until success has been documented, the regulatory agencies will be notified if any issues develop on the mitigation site that requires maintenance. The extent of the issue, measures taken to correct the issue, and whether the issue has been resolved will be documented in an annual monitoring report.

Access Roads and Gates

Access to and within the mitigation site is necessary for purposes of long-term management and monitoring. Therefore, existing roads and gates that provide access to and within the mitigation site will be maintained and monitored. The condition of all roads and gates will be documented. Recommendations will be provided for correcting all identified deficiencies including, but not limited to, repairing or replacing gates and repairing eroded dirt roads. When necessary, recommendations for maintaining access roads and gates will be provided in the long-term management report. Actions specified in the recommendations will not be implemented until approval is received. Vehicular travel (including off-road motorcycles and all-terrain vehicles) within the mitigation site will be strictly prohibited except along existing roadways.

Signage

Signs will be posted and maintained at all access points and at regular intervals along the mitigation site boundary and internal access roads. Posted signs will state that the mitigation site is protected and that vehicular travel (including off-road motorcycles and all-terrain vehicles) is strictly prohibited, except along designated roadways. Posted signs will be inspected during walk-through assessments. Damaged signs will

be repaired or replaced on an as-needed basis.

Fire Breaks

A 10 ft. wide flat fire break will be constructed in the upland buffer around the periphery of Mitigation Units 2 and 5 to limit the potential for unwanted fire from entering the newly planted hardwood areas. This fire break will be maintained during the five-year monitoring period. Following the five-year monitoring period, the site will be managed pursuant to the Francis Marion National Forest Final Revised Land Management Plan dated January 2017 (or current version). At that time, and/or following maturation of the planted hardwood areas, prescribed fire may be allowed to encroach into Units 2 and 5 (as is the case for Units 3 and 4) as a natural process.

Planting Zones

Volunteer species will be documented in planting zones. Volunteer species are considered to be native hardwood wetland species comparable to those found in the reference site and that meet the indicator status of Facultative, Facultative Wetland, or Obligate Wetland. Maintenance may include removing or thinning unacceptable volunteers (to include loblolly pine and sweetgum) with the use of herbicide treatments and/or small mechanical equipment to ensure performance standards are being met.

Supplemental Plantings

Potential maintenance measures may include supplemental plantings within planting zones. If a planting area does not meet the vegetative performance standards, the reason for plant mortality will be identified and supplemental plantings will be added based on the specified density and palette.

4.8 Performance Standards

Ecologically-based performance standards are used to determine whether the mitigation site is achieving its objectives. In general, performance standards are developed with a goal of maintaining or improving post-construction site conditions over baseline conditions, thereby restoring or enhancing an ecosystem. The performance standards have been developed for Mitigation Units 1, 2, and 5 using the degree of existing impairment and are based on success of planted vegetation and volunteer species. Wetland performance standards were derived from data collected from on-site intact wetlands as well as from standard regulatory wetland performance criteria. When measuring performance of vegetation, desirable volunteer species will be factored into target density and vegetative success criteria, provided the volunteer species are native hardwood wetland species comparable to those found in the reference site, and provided the volunteer species meet the indicator status of Facultative, Facultative Wetland, or Obligate Wetland.

In order to maintain and/or establish the desired longleaf pine plant community, a prescribed burn plan will be implemented in longleaf pine woodlands. It is anticipated that prescribed burning activities will be implemented by USFS staff pursuant to the Francis Marion National Forest Final Revised Land Management Plan dated January 2017 (or current version). Fire intensity will be adjusted to provide the best results, and burns will be conducted when conditions favor fire across the range of forest communities, including ecotonal habitat and wetlands.

Specific success criteria by Mitigation Unit are described below.

Unit 1: Enhance Altered Longleaf Pine

For longleaf pine woodlands in wetland enhancement Mitigation Unit 1, monitoring plots will be selected, developed, and assessed through annual application of the Functional Capacity Index (hereinafter "FCI") for Plant Community (hereinafter "FCI_{plants}") as described in *A Regional Guidebook for Applying the Hydrogeomorphic Approach to Assessing Wetland Functions of Wet Pine Flats on Mineral Soils in the Atlantic and Gulf Coastal Plains* [ERDC/EL TR-02-9]. Successful scores should indicate a reduced canopy, mid-canopy and sub-canopy cover, and a release of herbaceous and low shrub elements. The benchmark of success is for 80% of plots to show improvement in FCI_{plants} scores after 5 years. Ideally, FCI_{plants} indicator scores will be 0.9 at year 5, indicating that the condition of the variable is similar to the reference standard as outlined in the Guidebook. Furthermore, planted longleaf pine (if any) must attain at least 70% survival after 3 years, and attain a minimum of 225 viable stems per acre at 5 years, including both planted and naturally recruited material. Planted material performance will be assessed for survival at 3 years and 5 years. Non-native or invasive species should cover less than 1% of the site.

Unit 2: Remove Bedded Loblolly Pine and Unit 5: Replant Cutover Wetlands

Bare-root seedlings will be planted on 10 ft. x 10 ft. spacing at a density of approximately 440 trees per acre. At the end of three growing seasons, there must be a density of 320 alive trees per acre; at the end of five growing seasons, there must be a density of 260 alive trees per acre. Non-native or invasive species should cover less than 1% of the site. In addition to the survival rate, vegetative monitoring should indicate that planted seedlings are showing a consistent increase in height, lateral growth, and root collar diameter throughout the five-year monitoring period. Refer to Table 9 for Unit 2 and Unit 5 performance standards.

Table 9. Unit 2 and Unit 5 Performance Standards

WETLAND MITIGATION	Vegetation							
	Monitoring Years 1 – 5	By the 3 rd Monitoring Year		By the 5 th Monitoring Year				
	Consistent increase in height, lateral growth, and root collar diameter	Density of 320 alive trees/ acre	Native species typical of bottomland hardwoods are dominant cover	Density of 260 alive trees/ acre	< 1% non-native or invasive species	Native species typical of bottomland hardwoods are dominant cover	Vigorous growth of vegetation (cover > 80% including all strata)	No more than 25% cover by any one species
Mitigation Units 2 and 5	✓	✓	✓	✓	✓	✓	✓	✓

Although uplands (to include upland buffers and residual uplands) will be planted to establish natural communities (refer to Section 4.6.2), mitigation credits are not being requested for upland buffer enhancement. Therefore, performance standards should not apply to these areas. However, planted upland areas will be visually inspected annually. Growth trends and colonization by invasive species will be generally documented in annual monitoring reports for these areas.

4.9 Monitoring Requirements

The monitoring protocol will be used to ensure that the mitigation achieves its goals and objectives. This

monitoring protocol standardizes methods for wetland mitigation monitoring, including visual assessments, photo documentation, and vegetation surveys. Standardized monitoring requirements will assist with review of the mitigation site, thereby allowing the USACE Charleston District and the resource agencies to effectively assess the status and success of compensatory mitigation.

Monitoring will be conducted in accordance with the 2008 USACE Compensatory Mitigation for Losses of Aquatic Resources: Final Rule (33 CFR Parts 325 and 332), USACE's Minimum Monitoring Requirements for Compensatory Mitigation Projects Involving the Restoration, Establishment, and/or Enhancement of Aquatic Resources (Regulatory Guidance Letter Number 08-03), USACE Charleston District's 2010 Guidelines for Preparing a Compensatory Mitigation Plan.

Baseline conditions have been described in Section 4.4 and are further documented in the Atlantic and Gulf Coastal Plain Wetland Determination Data Forms included in Appendix D. Data forms include baseline hydrologic, vegetation (species present and percent cover), and soil characteristics throughout the mitigation site.

Unit 1: Enhance Altered Longleaf Pine

Vegetative monitoring of Mitigation Unit 1 will apply the Characteristic Plant Community elements of *A Regional Guidebook for Applying the Hydrogeomorphic Approach to Assessing Wetland Functions of Wet Pine Flats on Mineral Soils in the Atlantic and Gulf Coastal Plains* [ERDC/EL TR-02-9]. Wetland Assessment Areas (hereinafter "WAAs") will be established within the mitigation unit. WAAs will represent relatively homogenous habitat and may be portioned based on hydrologic regime, vegetation structure, topography, soils, and successional stage. The capacity of a WAA to maintain the characteristic attributes of plant communities normally associated with natural, fire-maintained wet pine flat ecosystems will be monitored. Because the herbaceous community of wet pine flats is very sensitive to alteration (such as fire recurrence and/or intensity), its condition provides information on habitat quality. Therefore, monitoring and success of Mitigation Unit 1 will primarily focus on herbaceous monitoring, although other variables will be measured and reported.

FCI_{plants} will be assessed at one fixed location and one location chosen at random within each WAA. Random monitoring plots will be located using a grid system and random number table. Monitoring will be assessed in four nested plots at each location. A permanent pole placed vertically in the ground will mark the center of the nested plots of 1-meter radius, 2-meter radius, 10-meter radius, and 100-meter radius. The center of the monitoring plots will be permanently marked with a metal pipe or a steel fence post. Refer to Figure 13 for proposed plot locations. Note, these proposed locations may be modified pending field location.

Plot sampling of vegetation will be conducted annually during the late summer of each monitoring year. Precise plot locations will be located by GPS coordinates. Photographs of the monitoring sites will document conditions annually. Monitoring will be terminated after 5 years.

Specific applications of the HGM FCI_{PLANTS} model will include:

1. Herbaceous Indicator Score (V_{HERB}): Sampled in a 1m^2 plot; one point for each species below with 0.5 points for each additional species in a 2-meter radius. Divide the mean herbaceous indicator score of each WAA by 8.0; for Cypress/Pine Savanna (if cypress present) divide the mean indicator score by 7.0.

The group of indicator plants listed below was chosen to indicate the degree of alteration to the condition of the plant community. These indicator plants were selected in the Guidebook based on the following criteria: (1) they were initially identified as representing appropriate plant composition and overall site quality, (2) they can be easily identified in all seasons, and (3) they occur throughout most of the Reference Domain. This list may be modified (pending regulatory approval) during the five-year monitoring period to include more localized native species (such as *Andropogon* spp. and various species of *Eupatorium*) typically found in wet pine flats and longleaf pine ecosystems in the Francis Marion National Forest.

Indicator Herbs:

<i>Aletris</i> spp.	<i>Eriocaulon</i> spp.
<i>Aristida</i> spp.	<i>Eryngium integrifolium</i>
<i>Balduina</i> spp.	<i>Eupatorium leucolepis</i>
<i>Bigelovia nudata</i>	<i>Helianthus</i> spp.
<i>Carphephorus</i> spp.	<i>Lycopodium</i> spp.
<i>Chaptalia tomentosa</i>	<i>Muhlenbergia expansa</i>
<i>Coreopsis</i> spp.	<i>Rhexia</i> spp.
<i>Ctenium aromaticum</i>	<i>Sarracenia</i> spp.
<i>Dichromena</i> spp.	<i>Schizachyrium scoparium</i>
<i>Erigeron vernus</i>	<i>Xyris</i> spp.

2. Native Bunch Grasses (V_{NBG}): Sampled in a 2-meter radius; combined percent cover area of the following: *Andropogon glaucopsis**, *Aristida* spp., *Ctenium* spp., *Erianthus giganteus**, *Muhlenbergia* spp., *Sporobolus* spp., *Schizachyrium* spp. (* = added to the list as a typical species of wet pine flats in the Francis Marion National Forest)

Divide cover by 0.50 and average scores by WAA. Any WAA with more than 50% cover of native bunchgrasses is within the variation exhibited by relatively unaltered systems.

3. Sedges (V_{SEDGES}): Sampled in a 2-meter radius; combined percent cover area of the following: *Carex* spp., *Sclaria* spp., *Rynchospora* spp.

Divide by 0.50 and average scores by WAA.

4. Pine Density (V_{PINES}): Sampled in a 10-meter radial plot; count all stems > 15-centimeter Diameter at Breast Height (hereinafter "DBH") of *Pinus palustris*, *P. taeda*, or *P. serotina*.

Sum stem counts from a minimum of three plots, divide by number of plots, and multiply by 31.8 to obtain density of pines per hectare. (Note: V_{PINES} will only be applied if a monitoring site emerges as a pine switchcane savannah as described in pp. 58-60 of the Guidebook). Average scores by WAA.

5. Physiognomic Structure of Cypress (V_{CYPRESS}): Determine the distance to the closest individual in each size class from randomly selected points in the WAA. At each center point, measure the distance in meters from the center point to the nearest sapling (< 1-meter tall; < 7.5-centimeter

dbh), mid-canopy (> 1-meter tall and 7.5-15-centimeter dbh), and canopy (> 15-centimeter dbh) stems of pond cypress. Sample a minimum of three points, with more preferred. Determine the average distance to individuals in each of three size classes. Calculate density as follows: $\text{Density} = 10,000/[2 \times (\text{average distance})^2]$. Then, divide sapling, mid-canopy, and canopy densities by 250, 50, and 100 respectively to obtain scores. The mean of the three physiognomy scores determines the score of V_{CYPRESS} . Average scores by WAA.

6. Physiognomic Structure of Canopy Longleaf and Pond Pine (V_{LONGLEAF}): Sampled in a 10-meter radial plot; count all stems > 15-centimeter dbh of *Pinus palustris* or *P. serotina*. Sum stem counts from a minimum of three plots, divide by number of plots, and multiply by 31.8 to obtain density of pine per hectare. Average scores by WAA.
7. Subcanopy Density (V_{SUBC}): Sampled in a 10-meter radius; count all stems at one meter in height even if they originate from same plant. If Subcanopy < 200, then Subcanopy = 1.0, if Subcanopy is 201-300, then Subcanopy = 0.5, if Subcanopy > 300, then Subcanopy = 0 (Modified HGM)
8. Exotics (V_{EXOTIC}): Sampled in a 100-meter radius; estimate % aerial coverage of all invasive species. If exotics < 1%, then Exotics = 1.0, If exotics > 1%, then Exotics = $(1.0 - (\% \text{ coverage})/10)$.

Unit 2: Remove Bedded Loblolly Pine and Unit 5: Replant Cutover Wetlands

Vegetative monitoring quadrats (10-meter x 10-meter) will be established within Mitigation Units 2 and 5. The corners of the monitoring quadrats will be permanently marked. Data to be collected annually within each quadrat will include: vegetative structure and composition (i.e. density of planted and volunteer stems or trees, height of each stem, Diameter at Breast Height, composition and estimated coverage of shrubs and herbaceous species, richness, diversity, etc.), average shrub height, estimated coverage of all exotic species, and evidence of fire penetration. Photographs will be taken at two corners of each quadrat, facing towards the interior of the quadrat. Plot sampling of vegetation will be conducted during the late summer of each monitoring year. Monitoring will be terminated after 5 years.

Proposed monitoring quadrat locations are shown in Figure 13. Note, these proposed locations may be modified pending field location. Precise quadrat locations will be located by GPS coordinates. Vegetative performance will be assessed according to the performance standard described in Section 4.8.

Monitoring Report

An annual monitoring report will be submitted prior to March 1st of each year for a period of 5 years. If, after 5 years success has not been achieved, reporting will be continued at an interval to be determined by the regulatory agencies until all performance standards have been met. The report will include a narrative that provides an overview of site conditions and function, maps and photographs to illustrate site conditions, and functional assessments used to provide quantitative and qualitative measures of functions provided by the mitigation project. Photographs will be included with dates and clear labels with the direction from which the photo was taken. Maps will show the location of the mitigation site, management units, and the locations of photographic reference points and plots or quadrats. The following components will be included in each monitoring report submitted after construction.

1. Name of party responsible for conducting the monitoring and the date(s) of the inspection.

2. A brief description of the approved mitigation plan and the dates when specific mitigation activities were commenced and/or completed.
3. A paragraph describing whether the mitigation site is developing as expected. This summary will be supported by a detailed description of each mitigation unit and an explanation of whether or not each mitigation unit is developing as expected and meeting the necessary performance standards.
4. If one or more mitigation units are not meeting the necessary performance standards, a description of the existing condition will be submitted, the reason(s) that the mitigation unit is not meeting performance standards will be identified, and a proposal to conduct remedial actions and bring the mitigation unit into compliance with the approved mitigation plan will be submitted.
5. Dates of any corrective or maintenance activities conducted since the previous report submission.

The regulatory agencies will review the monitoring report and may conduct a site inspection to determine whether or not the mitigation site is meeting the performance standards.

4.10 Long-Term Management Plan

The primary goal of the mitigation site is to create a self-sustaining natural aquatic system that achieves the intended level of aquatic ecosystem functionality with minimal human intervention, including long-term maintenance. Natural changes to the vegetative community that occur after all performance standards have been met, other than changes caused by non-native/invasive weeds, are not expected to require remediation. Therefore, the purpose of the Long-Term Management Plan is to (1) monitor the mitigation site in order to identify potential problem areas that may jeopardize the capacity of the natural aquatic system to remain self-sustaining, (2) implement reasonable measures with the funding available to maintain the self-sustaining capacity of the natural aquatic system, (3) monitor and minimize human intervention (i.e., trespassing and trash disposal), and (4) maintain access to and within the mitigation site for purposes of long-term management and monitoring. This Long-Term Management Plan establishes objectives, priorities, and tasks to manage, monitor, maintain, and report on the status of wetlands and their associated buffers after all performance standards have been met.

4.10.1 Ownership of the Mitigation Site

Strategic Conservation Partners, LLC (hereinafter “SCP” or “Owner”) currently owns the mitigation site, including all property and water rights. SCP will own the mitigation site during the implementation phase of the mitigation plan and will deed the mitigation site to the USFS prior to project close-out, at which point the USFS will be responsible for fulfilling long-term management responsibilities.

4.10.2 Identity of Long-Term Manager

The USFS will be the Long-Term Manager (hereinafter “Manager”) of the mitigation site. The Manager will be responsible for management activities following completion of the monitoring period. Long-term management activities will maintain the aquatic resources within the mitigation site in perpetuity.

4.10.3 Identification of Long-Term Management Activities

The mitigation site will be managed in accordance with the Francis Marion National Forest Final Revised Land Management Plan dated January 2017 (or current version). In general, the approach to long-term management will be to conduct periodic site examinations and monitoring of selected characteristics to evaluate stability and ongoing trends of the preserved and enhanced wetlands and their associated buffers.

Long-term efforts include burning and planting in the uplands, removal of non-target and weedy species using manual and herbicidal methods, as well as removal of understory species that are necessary to reestablish the longleaf ecosystem. As needed, longleaf will be removed to support a healthy forest with an ideal basal area of 40-70 ft²/acre, mid-story cover < 25%, and contiguous herbaceous cover > 65% with a 20% grass / sedge component. While it is not anticipated that major management actions will be required due to the self-sustaining nature of the natural aquatic systems within the mitigation site, an objective of long-term management is to conduct monitoring to identify issues that may arise and to implement adaptive management when appropriate and approved.

4.10.4 Funding Mechanism

The property will ultimately be deeded to the USFS for long-term management in accordance with the Conservation Land Use Agreement with the USACE. The USFS is not requiring a long-term management fund to assume ownership and management of the property.

4.11 Adaptive Management

Open Space Institute Land Trust, Inc., Strategic Conservation Partners, LLC, and the USFS are committed conservation organizations with excellent track records as property managers and stewards. By engaging partners and stakeholders (such as The Nature Conservancy, USFS, Open Space Institute Land Trust, Inc., a licensed forester and the Forest Service's District Silviculturist) in the PRM Plan development and implementation, potential issues resulting in project failure should not occur. In the event one or more of the proposed mitigation activities fails to achieve the approved performance standards, a supplemental plan will be developed that meets the project requirements and the USACE will be notified prior to initiating corrective actions. Adaptive management activities may consist of corrective actions and additional monitoring of the mitigation site, implementation of a supplemental PRM Plan, or the purchase of mitigation credits from an approved mitigation bank or in-lieu fee program, if available. Failure to actively pursue and implement the approved mitigation plan or to develop and implement an adaptive management plan may be grounds for modification, suspension, or revocation of the associated Department of the Army authorization. Soil moisture regimes and initial responses to site preparation (including the mechanical removal of beds, an initial burn, and herbicide application) may be evaluated prior to thinning, cutting, planting, and/or monitoring to allow for time to evaluate initial site responses to management activities.

4.12 Financial Assurances

Financial assurances will be provided in the form of performance bonds for the mitigation activities. The bonds will assure performance of construction and monitoring work to restore, enhance, and/or preserve the aquatic resources. The penal sum amount of the bond will be sufficient to assure the completion of all mitigation work, including site preparation, herbicide treatment, planting, and maintenance and monitoring. The estimated project costs are shown in Table 10.

Table 10: Bond Amount Calculation

Activity (Implementation Phase)	Estimated Cost
Site Prep (herbicide, bed removal, install fire breaks, burns, etc)	\$122,000
Planting (plants and installation)	\$161,050
Activity (Monitoring Phase)	Estimated Cost
Supplemental Plantings (if needed)	\$37,500
Prescribed Burns and Fire Break Maintenance	\$81,000
Invasive Species Control	\$55,000
Cost of Monitoring	\$50,000
Total (Implementation and Monitoring Phases)	\$506,550

REFERENCES

Amatya, D.M., R.W. Skaggs, and J.W. Gilliam, 2006. Hydrology and water quality of a drained loblolly pine plantation in coastal North Carolina (<http://www.srs.fs.usda.gov/pubs/22415>).

Amatya, D.M. and R.W. Skaggs, 2008. Effects of thinning on hydrology and water quality of a drained pine forest in coastal North Carolina (<http://www.srs.fs.usda.gov/pubs/30582>).

Chescheir, G.M., M. E. Lebo, D.M. Amatya, J. Hughes, J. W. Gilliam, R. W. Skaggs, and R.B. Herrmann, 2005. Hydrology and water quality of forested lands in eastern North Carolina; Tech Bull. 320. North Carolina State University, Raleigh, NC; 81 pp.

Enge, K. M., and Marion, W. R. 1986. Effects of clear-cutting and site preparation on herpetofauna of a northern Florida flatwoods. *Forest Ecology and Management* 14, 177-92.

Frost. 2006. History and Future of the Longleaf Pine Ecosystem. Chapter 2. In Jose et al.

Gonzalez-Benecke, C.A., T.A. Martin, and W.P. Cropper, 2011. Whole-tree water relations of co-occurring mature *Pinus palustris* and *Pinus elliotii* var. *elliotii*. *Can. J. For. Res.* 41(3):509-523.

Griffith, G.E., et al. 2002, *Ecoregions of North Carolina and South Carolina*, (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,500,000).

Jose, S., Jokella, E., and D. Miller, Eds. 2006. Longleaf Pine Ecosystem: Ecology, Silviculture, and Restoration. 438 pp.

Kloot, R.W. and P.J. Thomas. 2007. *Summary of Natural Resource Concerns in South Carolina*. 124 pp.

Krueger, Eric. *Conceptual Mitigation Plan for the Fairlawn C1 Tract*. Director of Science and Stewardship, The Nature Conservancy. Mount Pleasant, SC.

McLaughlin, D. L., Kaplan, D. A., & Cohen, M. J. (2013). Managing Forests for Increased Regional Water Yield in the Southeastern US Coastal Plain. *JAWRA Journal of the American Water Resources Association*, 49(4), 953-965.

Means, D. B., Palis, J. G., and Baggett, M. 1996. Effects of slash pine silviculture on a Florida population of flatwoods salamander (*Ambystoma cingulatum*). *Conservation Biology* 10, 426-37.

NRCS, *An Assessment of the Cooper Subbasin*

Available online at: http://venus.esri.sc.edu/Projects/usda/conservation_documents/RWAs/Cooper.pdf

NRCS, NRCS Official Soil Series Descriptions

Available online at: https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/soils/home/?cid=nrcs142p2_053587

NRCS, *Summary of Natural Resource Concerns in South Carolina*

Available online at: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/sc/newsroom/?cid=nrcs142p2_015590

Nelson, J.B. 1986. *The Natural Communities of South Carolina*. South Carolina Wildlife & Marine Resources Department. 64 pp.

Petersen, Bo. 2013. Audubon South Carolina designates Fairlawn Plantation as important bird area. October 22, 2013. Post and Courier Newspaper.

Powell, T.L, G. Starr, K. L. Clark, T. A. Martin, and H. L. Gholz, 2005. Ecosystem and understory water and energy exchange for a mature, naturally regenerated pine flatwoods forest in north Florida. *Can. J. For. Res.* (35) 1568-1580.

Rheinhardt, R.D., Rheinhardt M.C. and M.M. Brinson. 2002. A Regional Guidebook for Applying the Hydrogeomorphic Approach to Assessing Wetland Functions of Wet Pine Flats on Mineral Soils in the Atlantic and Gulf Coastal Plain. USACE Engineer Research and Development Center.

SCDHEC 303(d) List

Document online at: <http://www.scdhec.gov/HomeAndEnvironment/Water/ImpairedWaters/Overview/>

SCDHEC, *Total Maximum Daily Load Revision for Charleston Harbor, Cooper, Ashley, and Wando Rivers*

Available online at: http://www.scdhec.gov/HomeAndEnvironment/Docs/Chas_Hbr_DO_TMDL.pdf

SCDHEC Water Quality Information Tool

Available online at: <http://www.scdhec.gov/environment/WaterQuality/>

SCDHEC Watershed Atlas

Available online at: <https://gis.dhec.sc.gov/watersheds/>

SCDHEC Watershed Water Quality Assessments

Available online at: <http://www.scdhec.gov/HomeAndEnvironment/Water/Watersheds/WatershedMap/>

SCDNR, *An Overview of the Eight Major River Basins of South Carolina*

Available online at: http://www.dnr.sc.gov/water/waterplan/pdf/Major_Basins_of_South_Carolina.pdf

SCDNR. South Carolina Department of Natural Resources 2005. *Comprehensive Wildlife Conservation Strategy (2005 - 2010)*. Columbia, SC. SCDNR.

Available online at: <http://www.dnr.sc.gov/cwcs>

SCDNR Rare, Threatened & Endangered Species Inventory database

Available online at: <http://www.dnr.sc.gov/species/index.html>

SCDNR Rare - Threatened - Endangered Species in South Carolina – June 2017 mapping tool

Available online at: <https://fusiontables.google.com/DataSource?docid=13yDWRiQ2eYcSZsyRBzuORCZ5IW0gx0wHjBJtFpcp#map:id=3>

Town of Mount Pleasant Comprehensive Plan 2009-2019, 2014 Update

Available online at: <https://experiencemountpleasant.com/wp-content/uploads/2016/08/2014ComprehensivePlanUpdate.pdf>

US Army Corps of Engineers, Charleston District, Regulatory website

Available online at: <http://www.sac.usace.army.mil/Missions/Regulatory.aspx>

US Army Corps of Engineers. *Guidelines for Preparing a Compensatory Mitigation Plan* (dated October 7, 2010).

US Army Corps of Engineers Permittee-Responsible Mitigation Plan Template (last revised October 7, 2010).

US Army Corps of Engineers Regulatory In-Lieu Fee and Bank Information Tracking System
Available online at: https://ribits.usace.army.mil/ribits_apex/f?p=107:2

United States Department of Agriculture – Forest Service. 2017. Final Revised Land Management Plan Francis Marion National Forest. USDA-FS Region 8, Washington DC.

US Department of Agriculture, Natural Resources Conservation Service. 2016. *Field Indicators of Hydric Soils in the United States*, Version 8.0. L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.

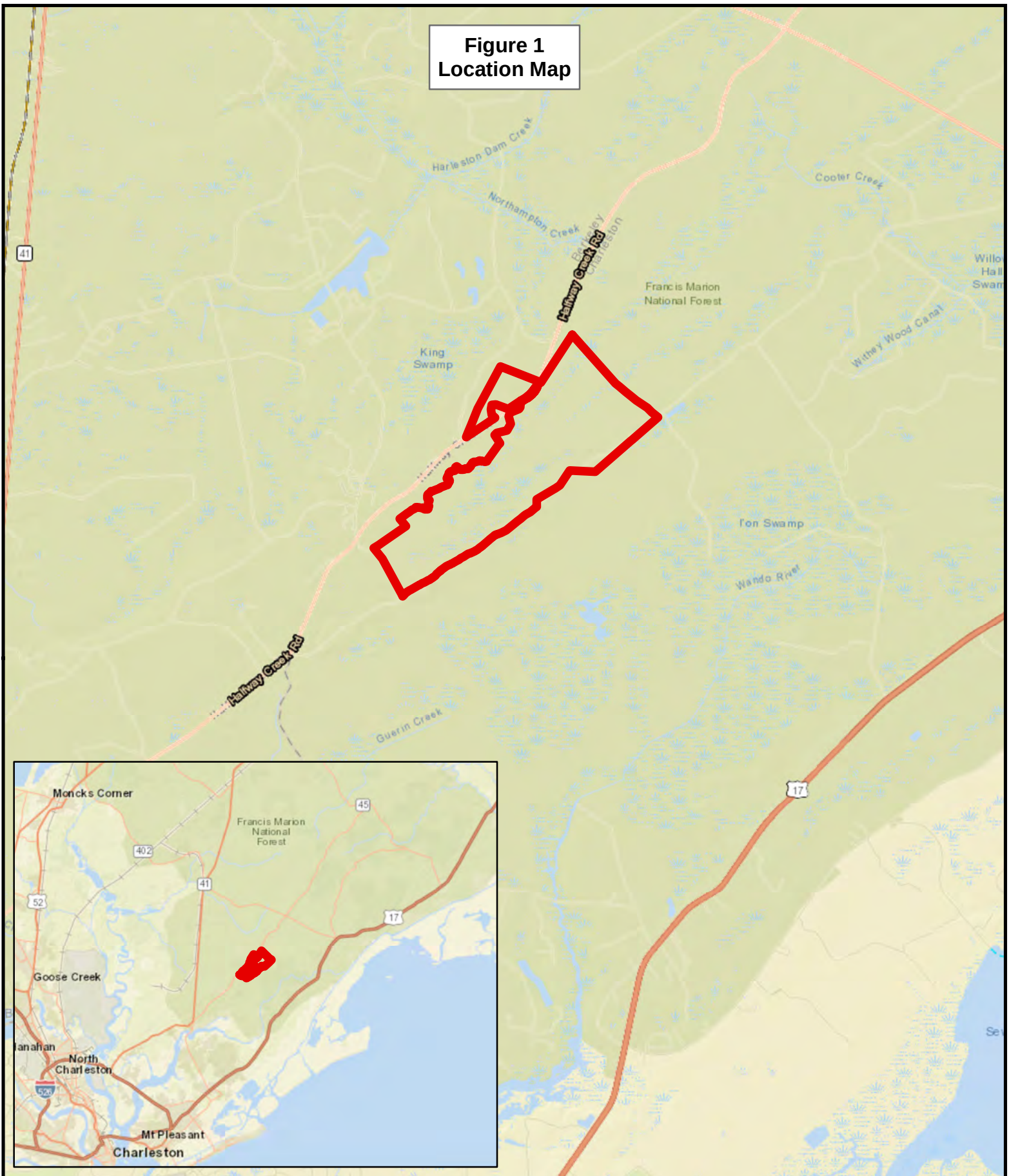
US Environmental Protection Agency Water Data and Tools
Available online at: <https://cfpub.epa.gov/surf/locate/index.cfm>

US Fish and Wildlife Service, Information for Planning and Conservation (hereinafter “IPaC”) database
Available online at: <https://ecos.fws.gov/ipac/>

Wilson, L., D.M. Amatya, T.J. Callahan, and C.C. Trettin. 2006. Hurricane Impact on Stream Flow and Nutrient Exports for a First-Order Forested Watershed of the Lower Coastal Plain, South Carolina. In: Proc. of the 2nd Int'l Conf. on Research on Watersheds, Coweeta Hydrologic Laboratory, Otto, NC.

MAPS AND FIGURES

**Figure 1
Location Map**



**Fairlawn C1
Mitigation Plan**

Berkeley and Charleston County
South Carolina



Mitigation Boundary - 1,380 Acres

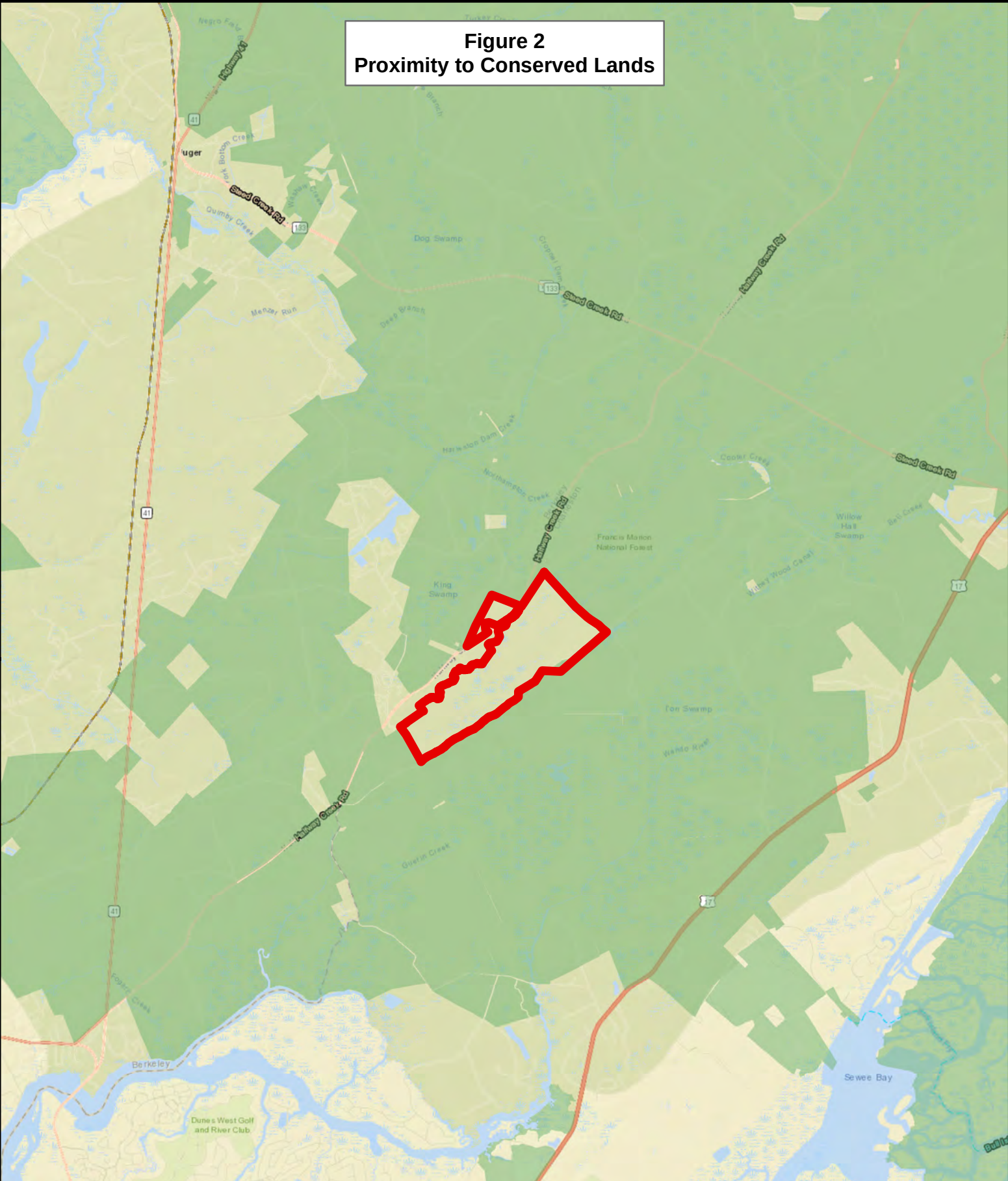


Notes:



0 5,000 10,000 Feet

Figure 2
Proximity to Conserved Lands



**Fairlawn C1
Mitigation Plan**
Berkeley and Charleston County
South Carolina


Mitigation Boundary - 1,380 Acres


Protected Lands



Notes:



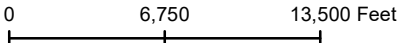


Figure 3
Watershed Map



Fairlawn C1 Mitigation Plan

**Berkeley and Charleston County
South Carolina**



Mitigation Boundary - 1,380 Acres

EPA Level III Ecoregion

SC 8-Digit HUCs



Notes:



0

27,000

54,000 Feet

Figure 4a
1989 Aerial



Fairlawn C1 Mitigation Plan

Berkeley and Charleston County
South Carolina



Mitigation Boundary - 1,380 Acres

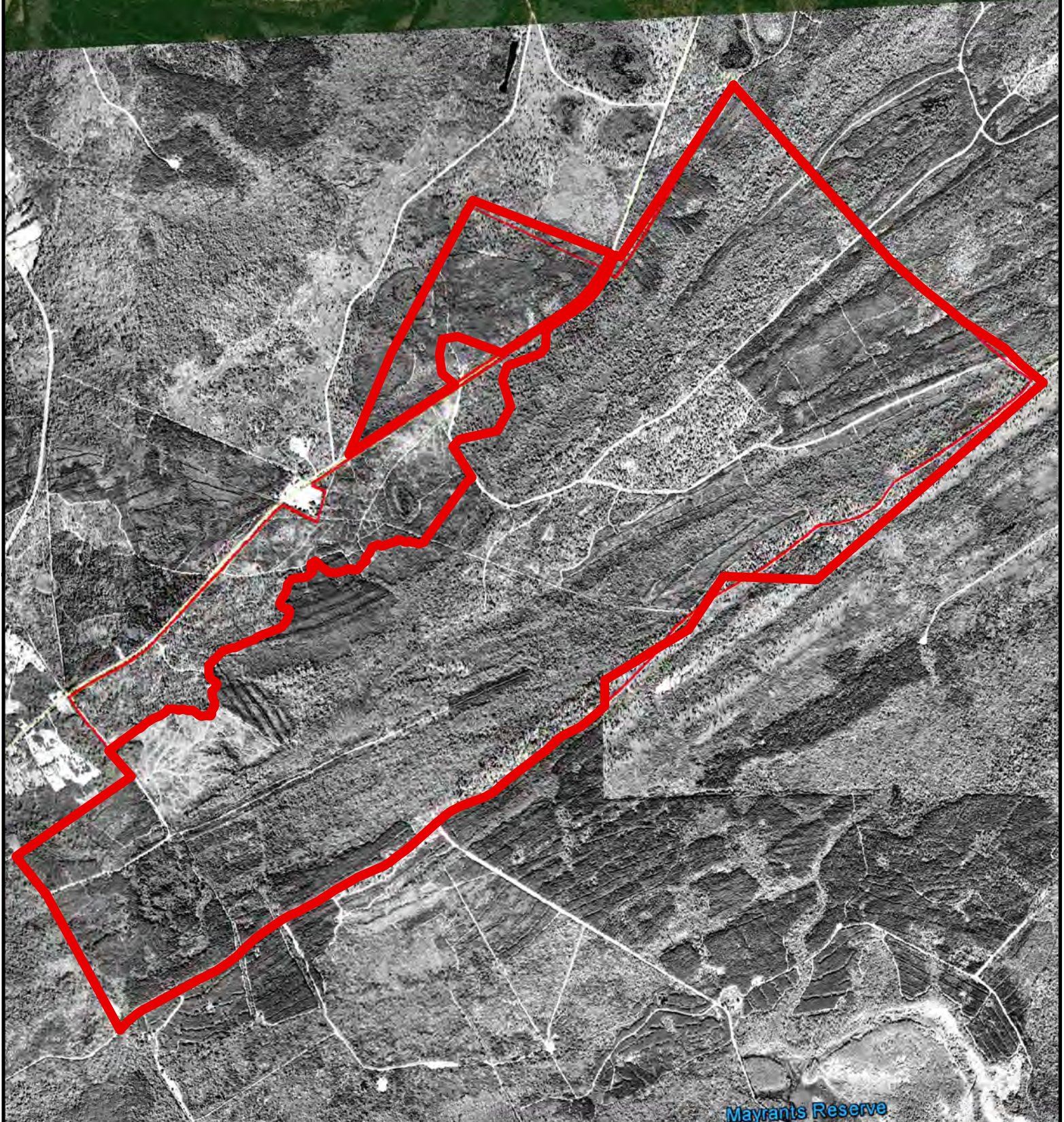


Notes:



0 1,500 3,000 Feet

Figure 4b
1999 Aerial



Mayrants Reserve

Fairlawn C1 Mitigation Plan

Berkeley and Charleston County
South Carolina



Mitigation Boundary - 1,380 Acres



Notes:



0 1,500 3,000 Feet

Figure 4c
2007 Aerial



Mayrants Reserve

Fairlawn C1 Mitigation Plan

Berkeley and Charleston County
South Carolina



Mitigation Boundary - 1,380 Acres



Notes:



0 1,500 3,000 Feet

Figure 4d
2018 Aerial



**Fairlawn C1
Mitigation Plan**

Berkeley and Charleston County
South Carolina



Mitigation Boundary - 1,380 Acres

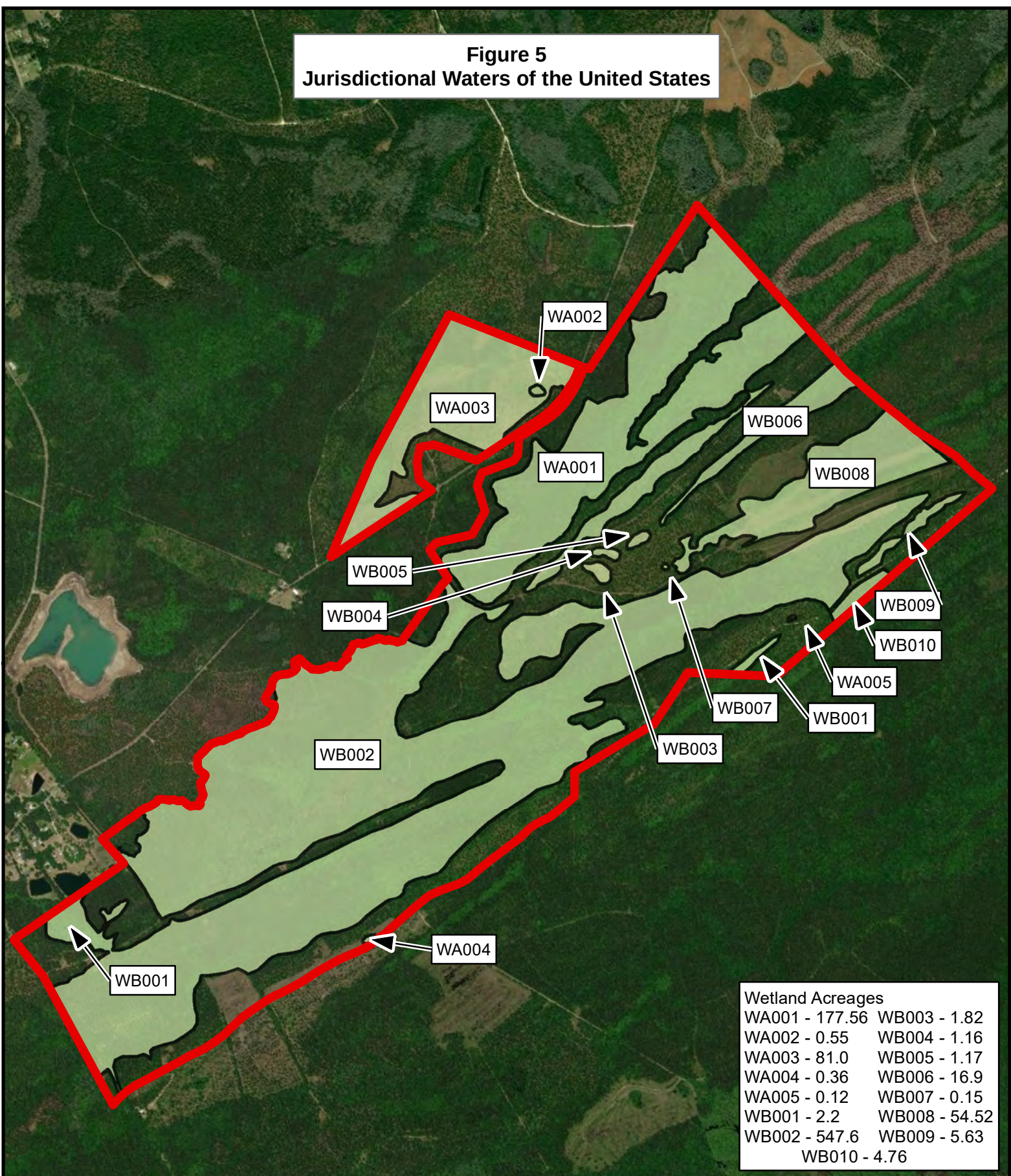


Notes:



0 1,500 3,000 Feet

Figure 5
Jurisdictional Waters of the United States



**Fairlawn C1
Mitigation Plan**

Berkeley and Charleston County
South Carolina

 Mitigation Boundary - 1,380 Acres
 Jurisdictional Wetlands - 895.5 Acres



Notes:

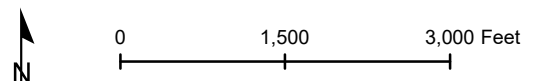
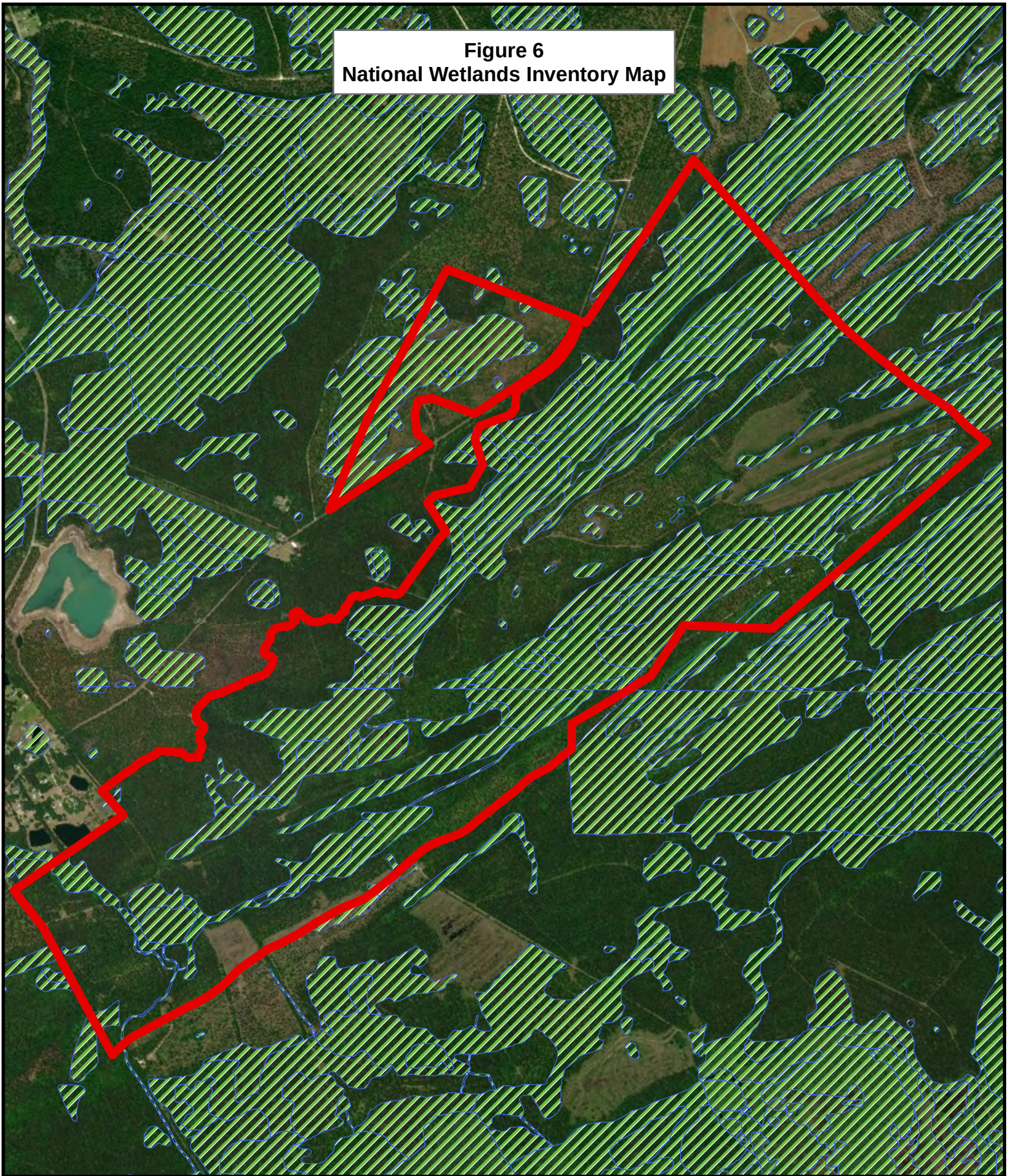


Figure 6
National Wetlands Inventory Map



**Fairlawn C1
Mitigation Plan**

Berkeley and Charleston County
South Carolina



Mitigation Boundary - 1,380 Acres



NWI Wetlands



Notes:

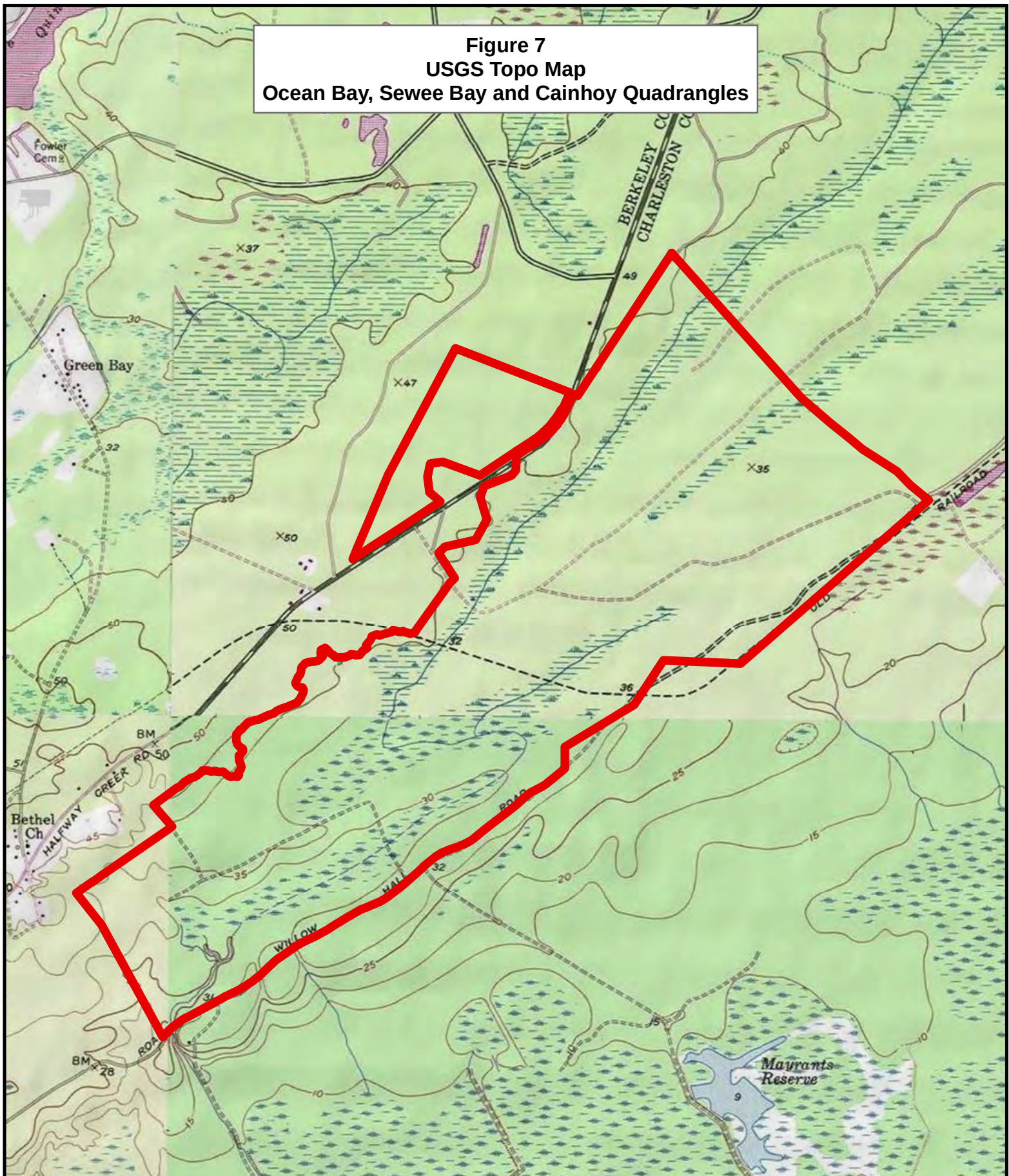


0

1,500

3,000 Feet

Figure 7
USGS Topo Map
Ocean Bay, Sewee Bay and Cainhoy Quadrangles



Fairlawn C1
Mitigation Plan

Berkeley and Charleston County
 South Carolina



Mitigation Boundary - 1,380 Acres

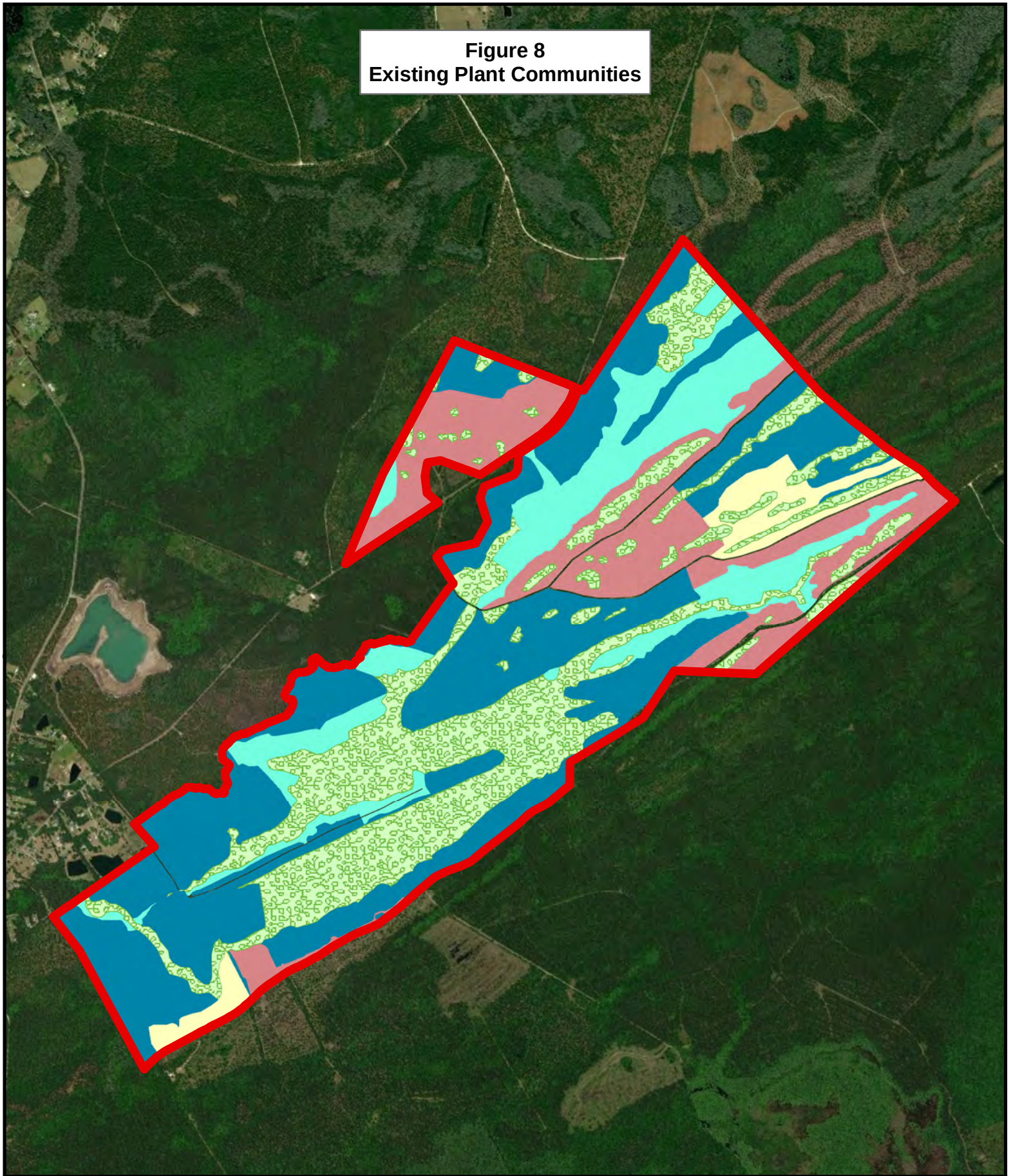


Notes:



0 1,500 3,000 Feet

Figure 8
Existing Plant Communities



**Fairlawn C1
Mitigation Plan**

Berkeley and Charleston County
South Carolina

-  Mitigation Boundary - 1,380 Acres
-  Bottomland Hardwood - 340.6 Acres
-  Cutover - 53 Acres
-  Bay Forest - 195 Acres
-  Loblolly Pine - 551.4 Acres
-  Longleaf Pine - 219 Acres



Notes: There are approximately 21 acres
of existing roads on site



0 1,500 3,000 Feet

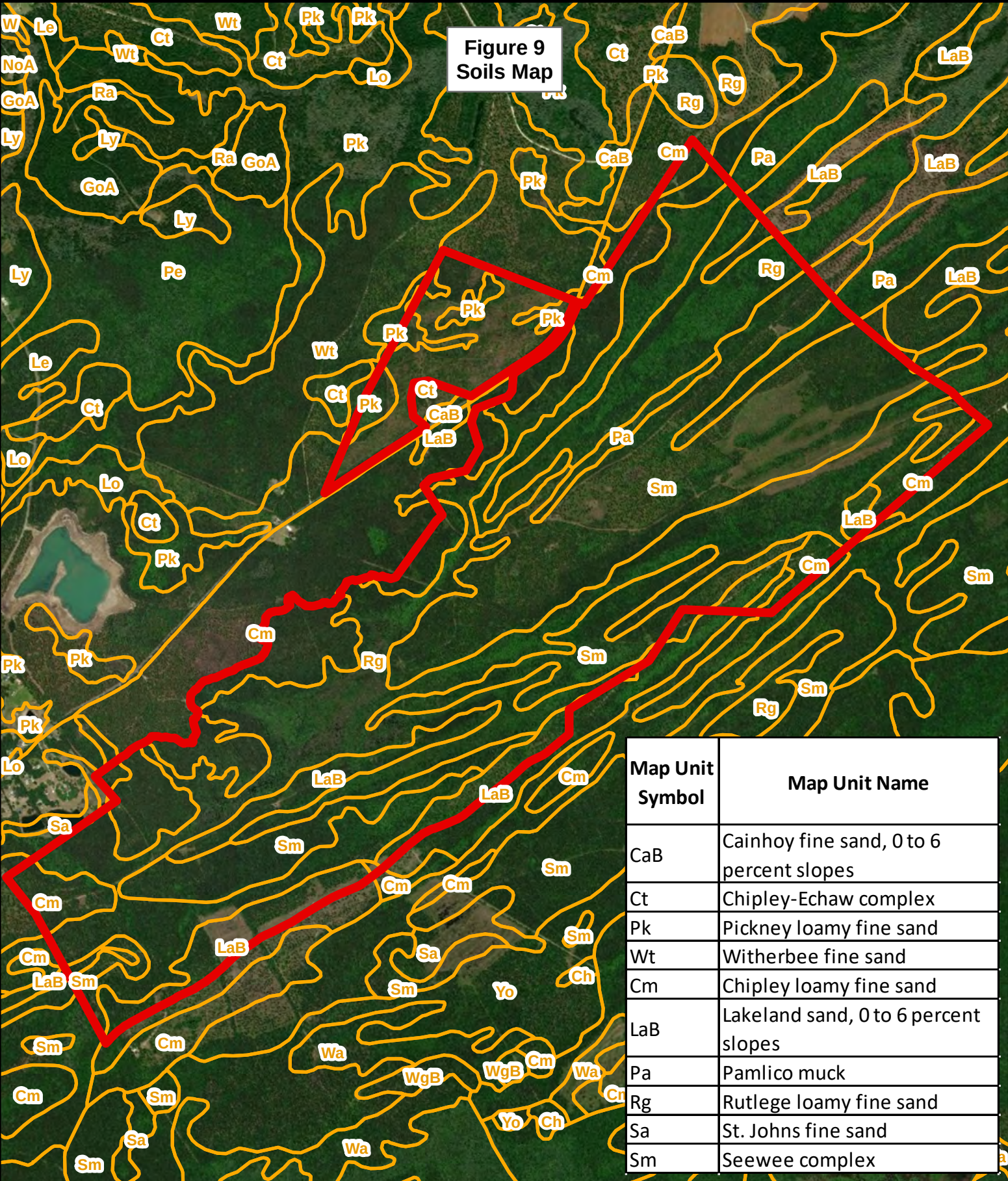


Figure 9
Soils Map

Map Unit Symbol	Map Unit Name
CaB	Cainhoy fine sand, 0 to 6 percent slopes
Ct	Chipley-Echaw complex
Pk	Pickney loamy fine sand
Wt	Witherbee fine sand
Cm	Chipley loamy fine sand
LaB	Lakeland sand, 0 to 6 percent slopes
Pa	Pamlico muck
Rg	Rutlege loamy fine sand
Sa	St. Johns fine sand
Sm	Seewee complex

**Fairlawn C1
Mitigation Plan**
Berkeley and Charleston County
South Carolina



Mitigation Boundary - 1,380 Acres



Soils

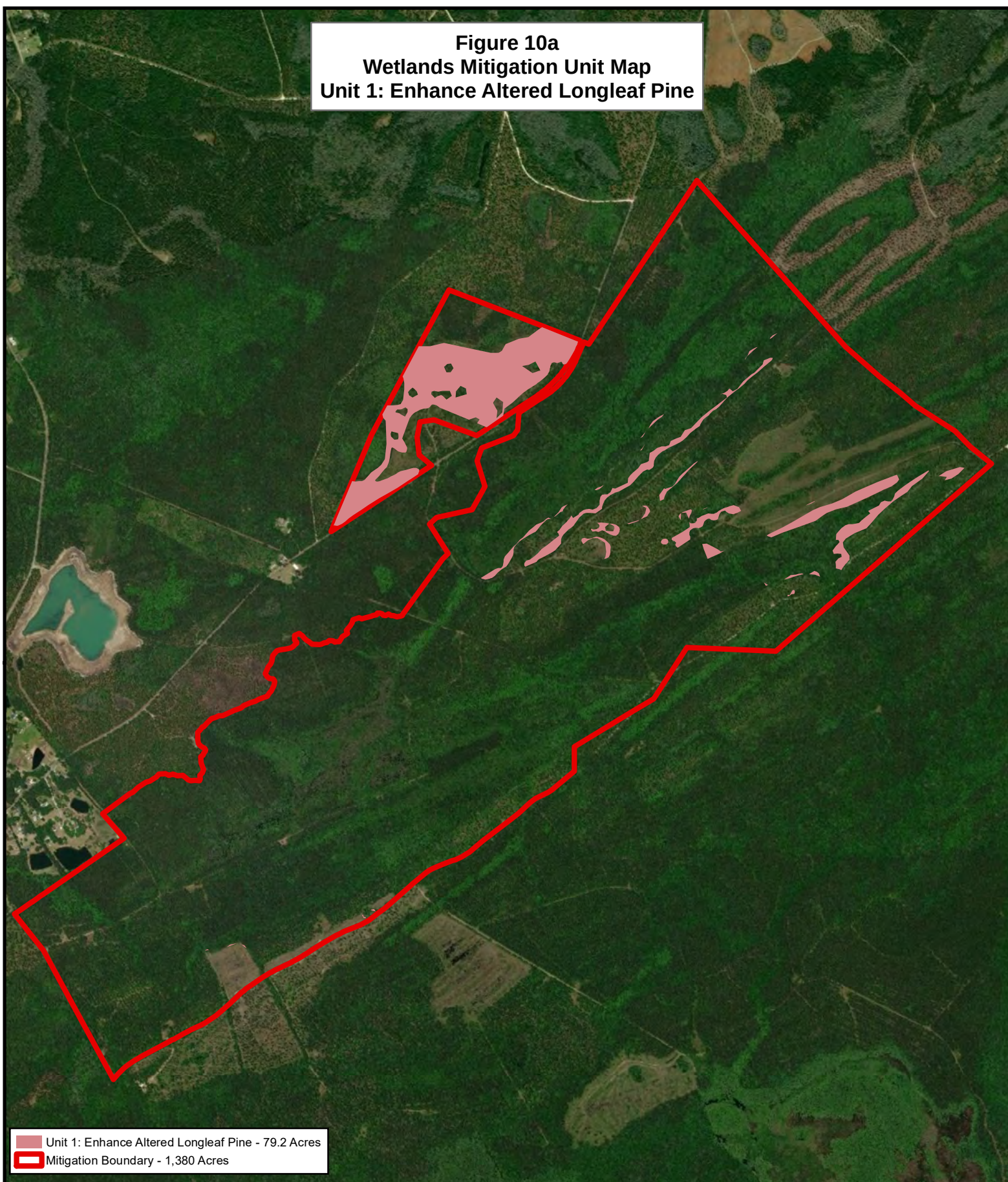


Notes:



01,5003,000 Feet

Figure 10a
Wetlands Mitigation Unit Map
Unit 1: Enhance Altered Longleaf Pine



Unit 1: Enhance Altered Longleaf Pine - 79.2 Acres
Mitigation Boundary - 1,380 Acres

**Fairlawn C1
Mitigation Plan**

Berkeley and Charleston County
South Carolina

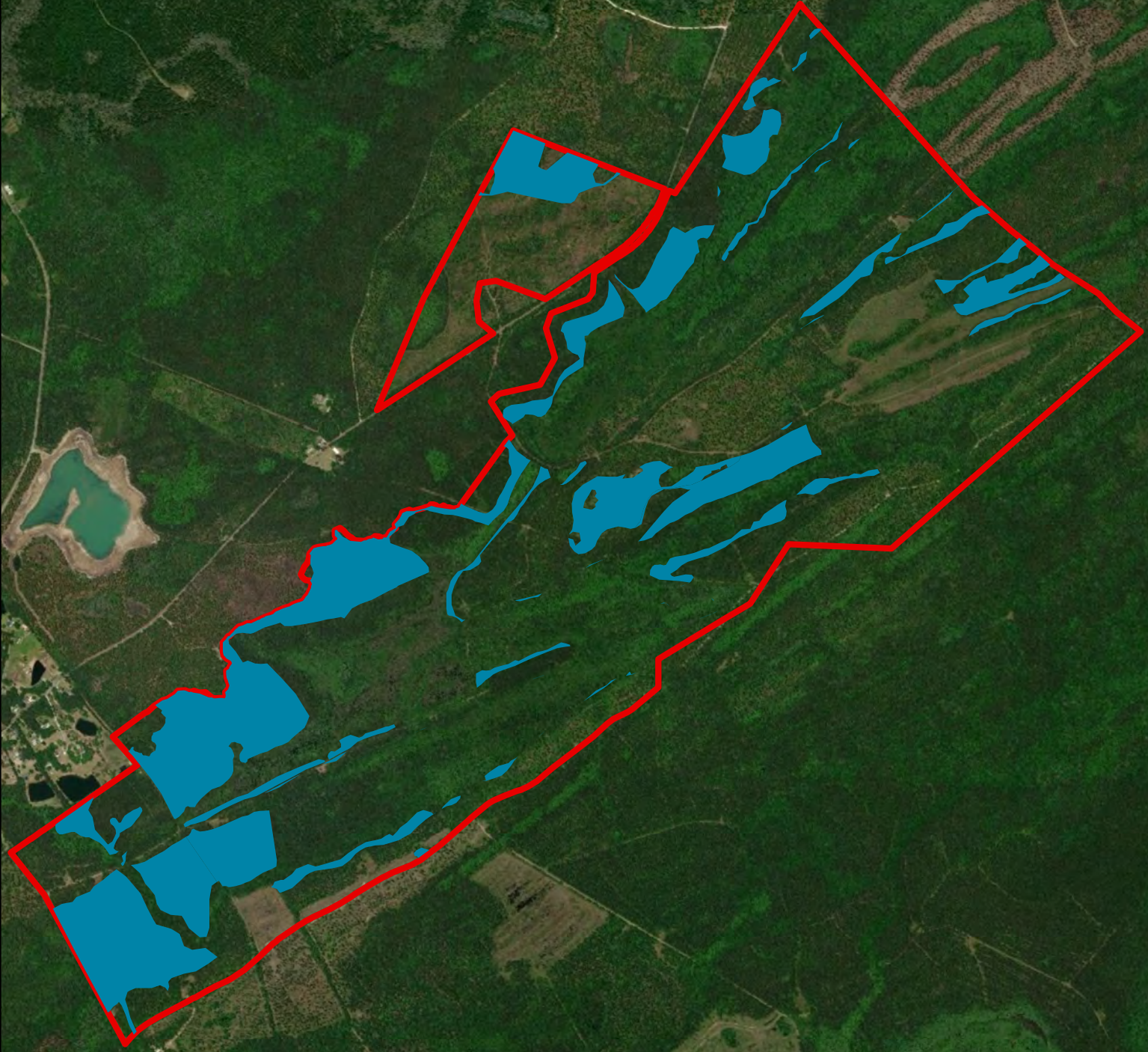


Notes:



0 1,500 3,000 Feet

Figure 10b
Wetlands Mitigation Unit Map
Unit 2: Remove Bedded Loblolly Pine



Unit 2: Remove Loblolly Pine - 272.4 Acres
Mitigation Boundary - 1,380 Acres

Fairlawn C1
Mitigation Plan

Berkeley and Charleston County
South Carolina



Notes:

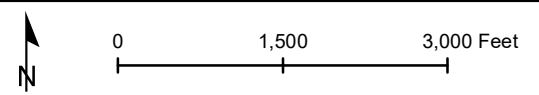
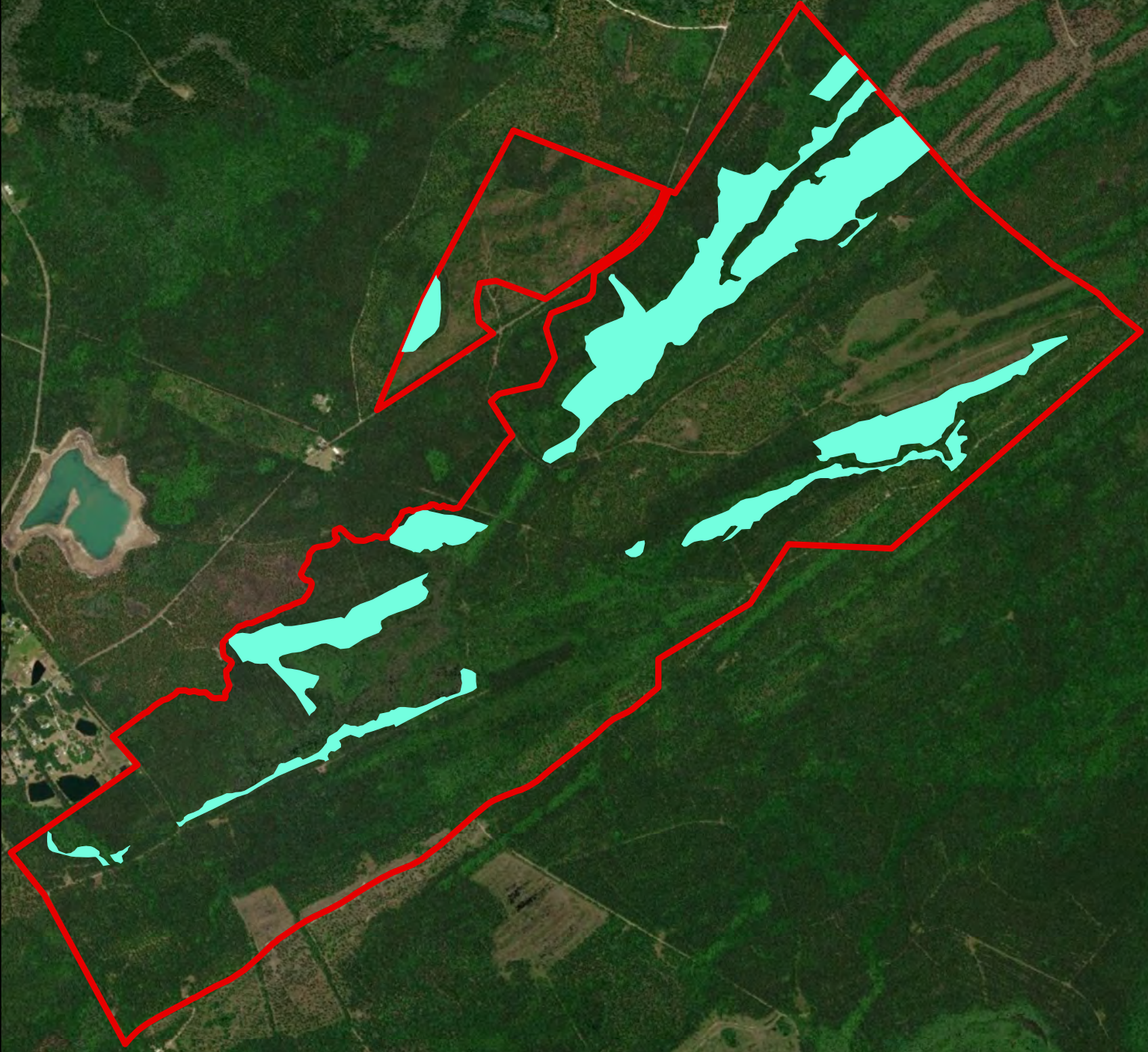


Figure 10c
Wetlands Mitigation Unit Map
Unit 3: Bay Forest Preservation



Unit 3: Bay Forest Preservation - 183.5 Acres
Mitigation Boundary - 1,380 Acres

**Fairlawn C1
Mitigation Plan**

Berkeley and Charleston County
South Carolina



Notes:

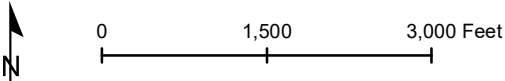
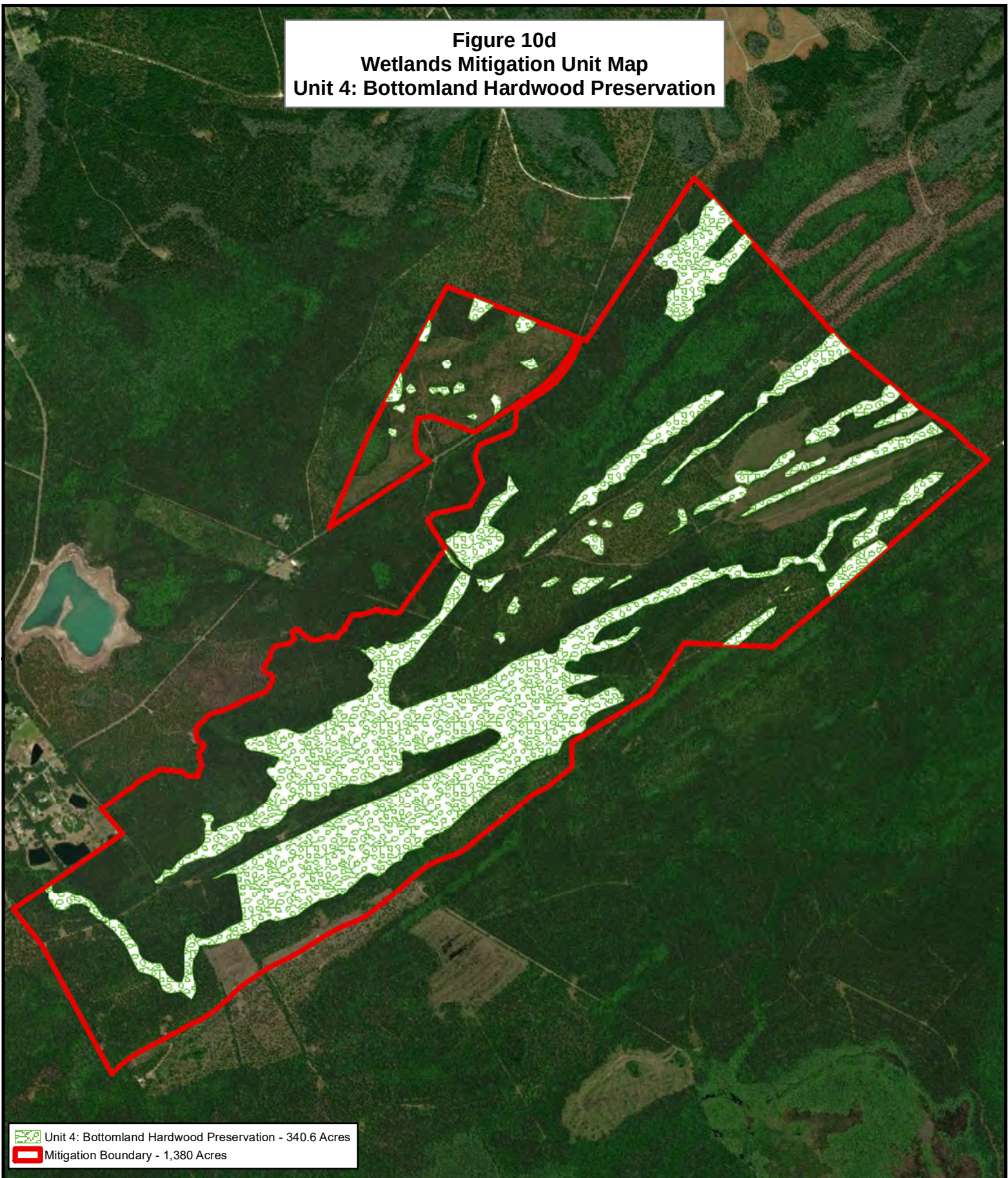


Figure 10d
Wetlands Mitigation Unit Map
Unit 4: Bottomland Hardwood Preservation



Fairlawn C1
Mitigation Plan

Berkeley and Charleston County
South Carolina



Notes:



0 1,500 3,000 Feet

Figure 10e
Wetlands Mitigation Unit Map
Unit 5: Replant Cutover Wetlands



Unit 5: Replant Cutover Wetlands - 19.8 Acres
Mitigation Boundary - 1,380 Acres

Fairlawn C1
Mitigation Plan

Berkeley and Charleston County
South Carolina



Notes:

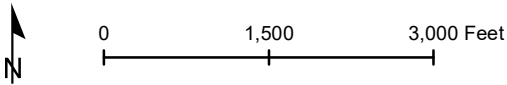
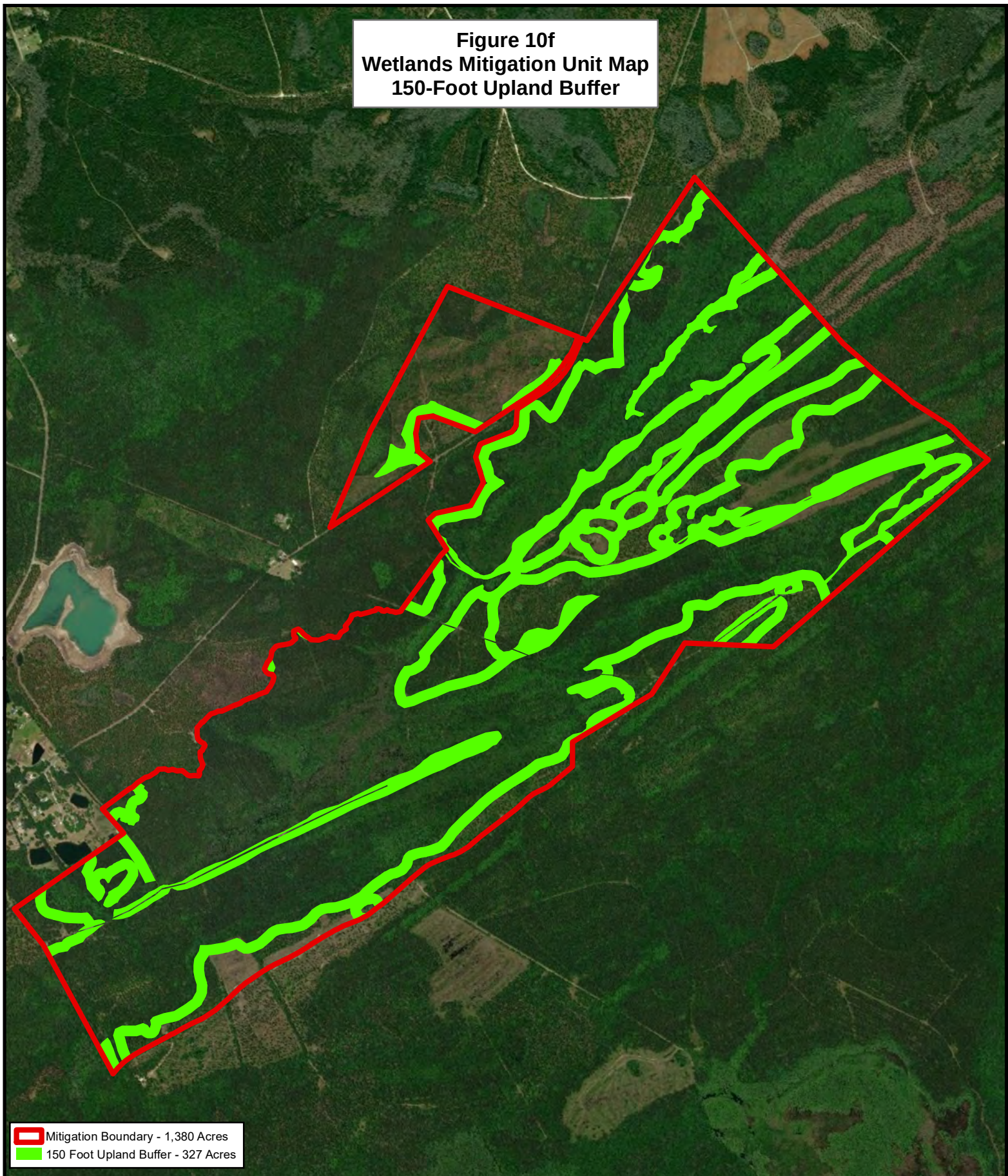


Figure 10f
Wetlands Mitigation Unit Map
150-Foot Upland Buffer



 Mitigation Boundary - 1,380 Acres
 150 Foot Upland Buffer - 327 Acres

Fairlawn C1
Mitigation Plan

Berkeley and Charleston County
South Carolina



Notes:



0 1,500 3,000 Feet

Figure 11
Residual Uplands Enhancement



**Fairlawn C1
Mitigation Plan**

Berkeley and Charleston County
South Carolina



Notes:

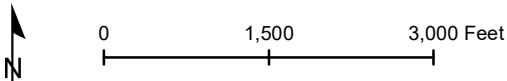
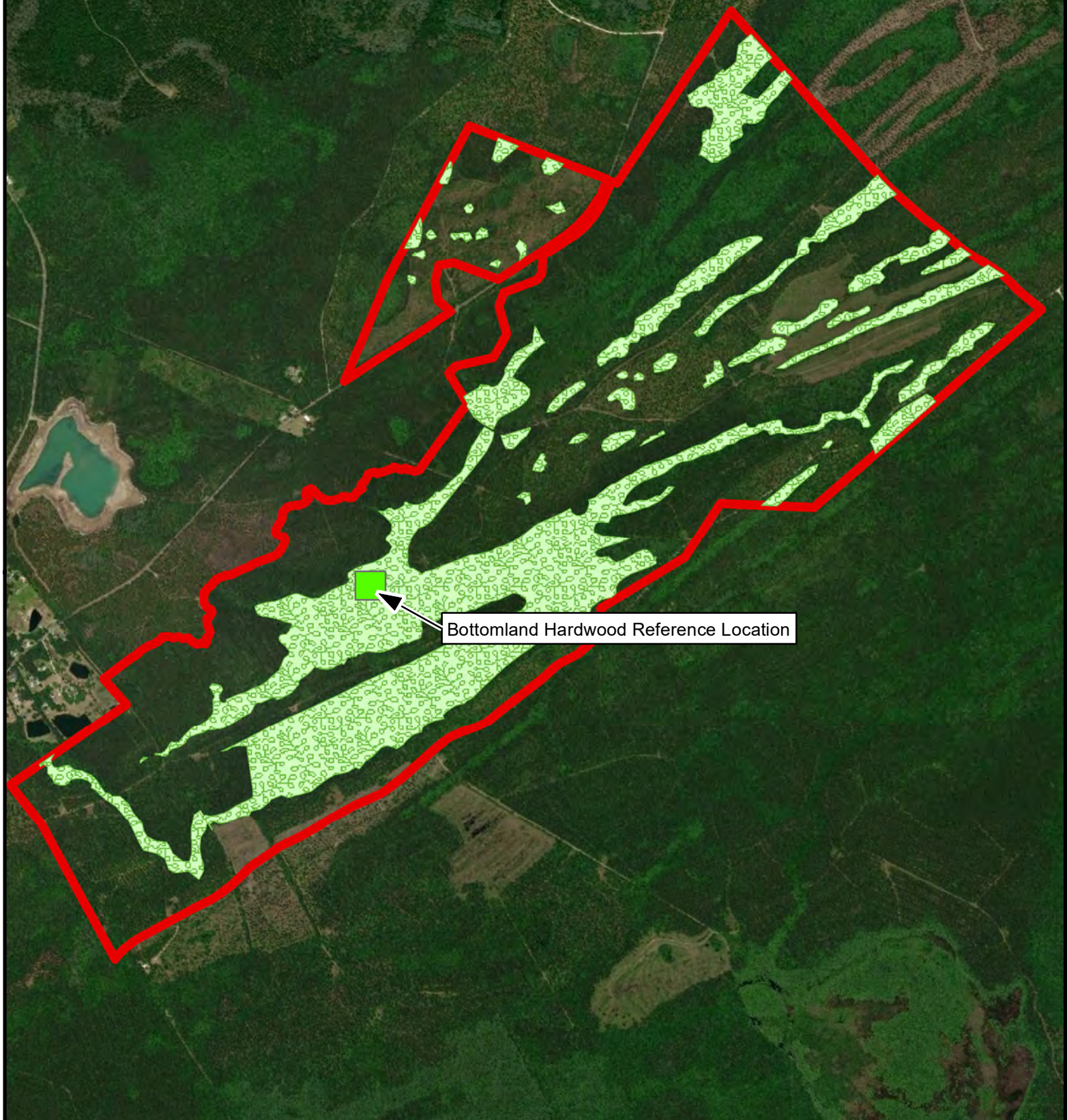


Figure 12
Reference Location Map - Bottomland Hardwood



Bottomland Hardwood Reference Location

Fairlawn C1
Mitigation Plan

Berkeley and Charleston County
South Carolina

 Bottomland Hardwood - 340.6 Acres

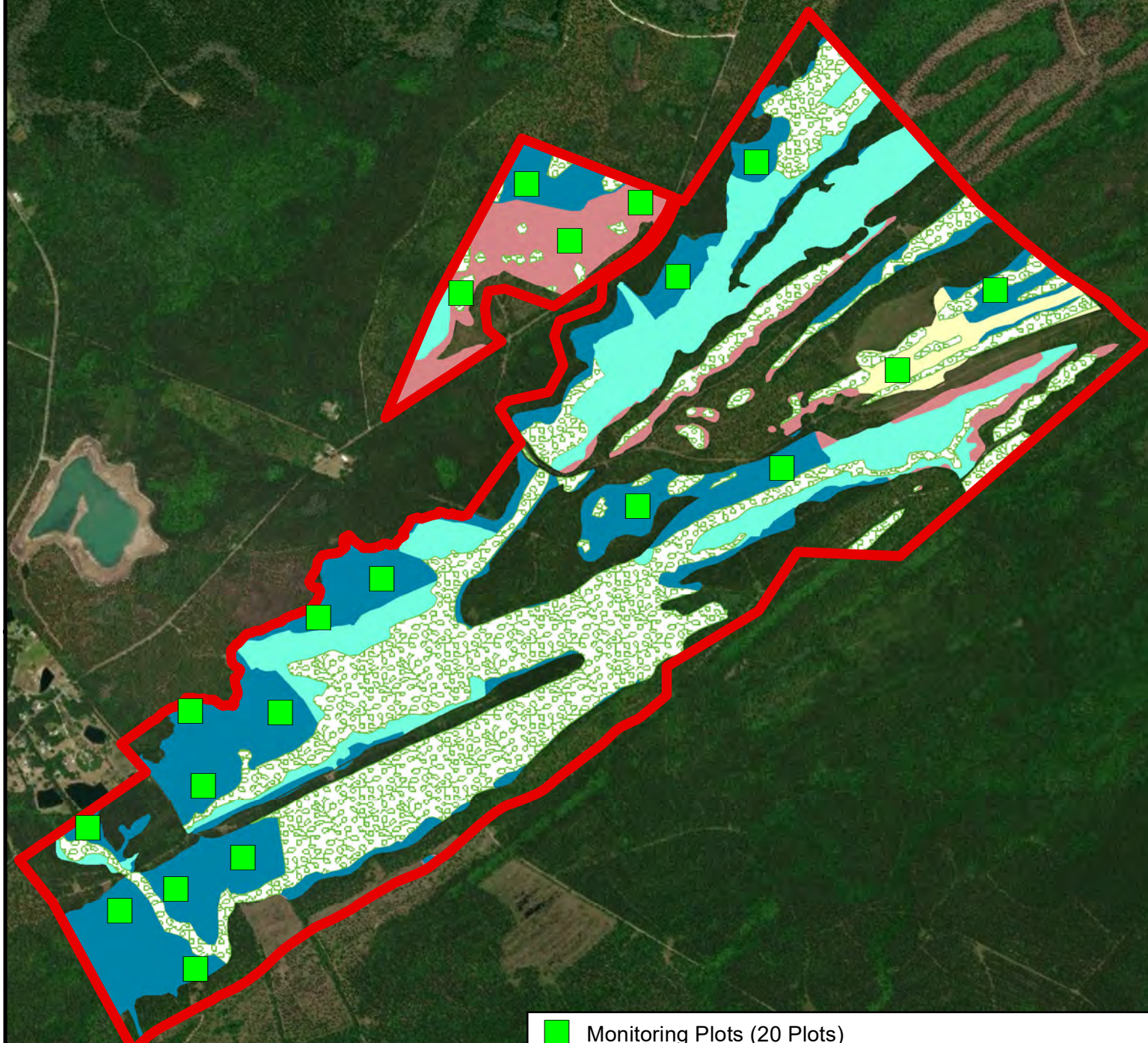


Notes: There are approximately 21 acres
of existing roads on site



0 1,400 2,800 Feet

Figure 13
Monitoring Plot Locations



- Monitoring Plots (20 Plots)
- Unit 1: Enhance Altered Longleaf Pine - 79.2 Acres
- Unit 2: Remove Loblolly Pine - 272.4 Acres
- Unit 3: Bay Forest Preservation - 183.5 Acres
- Unit 4: Bottomland Hardwood Preservation - 340.6 Acres
- Unit 5: Replant Cutover Wetlands - 19.8 Acres

Fairlawn C1
Mitigation Plan

Berkeley and Charleston County
South Carolina



Notes:



0 1,500 3,000 Feet

APPENDIX A
THREATENED AND ENDANGERED
SPECIES REPORT

The logo for the South Western Consulting Agency (SWCA) is positioned vertically on the left side of the page. It consists of the letters 'S', 'W', 'C', and 'A' in a large, stylized, light blue font, stacked one above the other.

Threatened and Endangered Species Report for the Fairlawn C-1 Site, Berkeley and Charleston Counties, South Carolina

SEPTEMBER 2018

PREPARED FOR
Palustrine Group

PREPARED BY
SWCA Environmental Consultants

**THREATENED AND ENDANGERED SPECIES REPORT
FOR THE FAIRLAWN C-1 SITE
BERKELEY AND CHARLESTON COUNTIES,
SOUTH CAROLINA**

Prepared for

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SWCA Project No. 50452

September 2018

CONTENTS

1	Introduction	1
2	Project Location and General Conditions.....	1
2.1	Land Cover.....	1
2.2	Soils.....	2
3	Methods.....	2
3.1	Species Identification.....	2
3.2	Species Evaluation.....	3
3.3	Field Reconnaissance.....	4
4	Results.....	4
4.1	Species Evaluation	4
4.1.1	Northern Long-Eared Bat	9
4.1.2	Rafinesque’s Big-Eared Bat.....	9
4.1.3	Spotted Turtle	9
4.1.4	Red-Cockaded Woodpecker	9
4.1.5	Wood Stork.....	10
4.1.6	Bald Eagle.....	10
4.1.7	American Swallow-Tailed Kite	11
4.1.8	American Chaffseed	11
4.1.9	Canby’s Dropwort.....	11
4.1.10	Pondberry	12
5	Summary and Conclusions	12
6	Literature Cited.....	13

Appendices

Appendix A. Figures

Appendix B. Federal and State Endangered Species Lists

Tables

Table 1.	NLCD Land Cover Data within the Project Area.....	1
Table 2.	NRCS-Mapped Soils and Their Hydric Characteristics.....	2
Table 3.	Species with Potential to Occur in the Project Area.....	3
Table 4.	Evaluation of Listed Species with Potential to Occur in the Project Area.....	5

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1 INTRODUCTION

Palustrine Group has retained the services of SWCA Environmental Consultants (SWCA) to evaluate the potential impact on federally listed threatened and endangered species for the Fairlawn C-1 Site (proposed project).

This report describes the methods used to conduct the evaluation and the results of the investigation. This report does not serve as a project clearance letter for the above-referenced project but provides a professional opinion on the potential for construction activities on the aforementioned site to impact federally listed threatened or endangered species known to inhabit Berkeley and Charleston Counties, South Carolina.

2 PROJECT LOCATION AND GENERAL CONDITIONS

The project area is a 1,381-acre parcel of primarily undeveloped land located north and south of Halfway Creek Road approximately 19 miles northeast of the City of Charleston, South Carolina (Appendix A, Figures 1 and 2). The project area is the proposed site of a potential wetland mitigation area.

2.1 Land Cover

National Land Cover Database (NLCD) land cover types within the project area consisted primarily of woody wetlands (Homer et al. 2015; Appendix A, Figure 3). As shown in Table 1, approximately 55.9 percent of the project area is composed of woody wetlands habitat and 32.4 percent of the project area is composed of evergreen forest habitat, while the remaining land cover types include shrub/scrub, wetlands, and other forest vegetation types. A detailed wetland delineation was conducted during the site reconnaissance and confirmed the general location and extents of wetland habitat present within the project area (Appendix A, Figure 4).

Table 1. NLCD Land Cover Data within the Project Area.

Cover Type	Acreage within Project Area	Percent of Project Area
Woody Wetlands	771.6	55.9
Evergreen Forest	447.7	32.4
Shrub/Scrub	64.6	4.7
Emergent Herbaceous Wetlands	64.3	4.7
Grassland/Herbaceous	17.7	1.3
Developed, Open Space	11.6	0.8
Mixed Forest	3.3	0.2
Total	1,380.8	100.0

Land cover observed within the project area during site reconnaissance was generally consistent with what is mapped on the NLCD database. A dense understory was observed in much of the forested area, indicating that prescribed burning has not been conducted within the project area in the recent past.

2.2 Soils

According to the Natural Resources Conservation Service (NRCS) soil survey for Berkeley and Charleston Counties, South Carolina (NRCS 2018), 10 soil map units are present within the area of investigation (AOI) (Table 2).

Table 2. NRCS-Mapped Soils and Their Hydric Characteristics.

Map Unit Name	Description
CaB – Cainhoy fine sand, 0 to 6 percent slopes	Somewhat excessively drained soils formed from sandy marine deposits. This soil is found on coastal plains and marine terraces. Slopes range from 0 to 6 percent. Approximately 0.1 acres is mapped within the project area.
Cm – Chipley loamy fine sand	Moderately well-drained soils formed from loamy marine deposits. This soil is found on coastal plains and marine terraces. Slopes range from 0 to 2 percent. Approximately 171.6 acres is mapped within the project area.
Ct – Chipley-Echaw complex	Somewhat poorly to moderately drained soils formed from sandy fluviomarine and sandy marine deposits. This soil is found on coastal plains, flats, and marine terraces. Slopes range from 0 to 2 percent. Approximately 72.4 acres is mapped within the project area.
LaB – Lakeland sand, 0 to 6 percent slopes	Moderately well-drained soils formed from sandy marine deposits. This soil is found on marine terraces and coastal plains. Slopes range from 0 to 6 percent. Approximately 115.7 acres is mapped within the project area.
Pa – Pamlico muck	Very poorly drained soils formed from loamy fluviomarine deposits. This soil is found on floodplains and coastal plains. Slopes range from 0 to 1 percent. Approximately 84.2 acres is mapped within the project area.
Pk – Pickney loamy fine sand	Very poorly drained soils formed from loamy fluviomarine deposits. This soil is found on floodplains and coastal plains. Slopes range from 0 to 2 percent. Approximately 23.5 acres is mapped within the project area.
Rg – Rutlege loamy fine sand	Very poorly drained soils formed from sandy fluviomarine deposits. This soil is found on marine terraces and coastal plains. Slopes range from 0 to 2 percent. Approximately 518.1 acres is mapped within the project area.
Sa – St. Johns fine sand	Poorly drained soils formed from loamy marine deposits. This soil is found on coastal plains and marine terraces. Slopes range from 0 to 2 percent. Approximately 0.2 acre is mapped within the project area.
Sm – Seewee complex	Somewhat poorly drained soils formed from sandy marine deposits. This soil is found on marine terraces and coastal plains. Slopes range from 0 to 2 percent. Approximately 395.3 acres is mapped within the project area.
Wt – Witherbee fine sand	Somewhat poorly drained soils formed from sandy marine deposits. This soil is found on marine terraces, coastal plains, and depressions. Slopes range from 0 to 2 percent. Approximately 0.1 acre is mapped within the project area.

3 METHODS

3.1 Species Identification

The species evaluated in this report were based upon information obtained from the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) database, as well as county lists maintained by the South Carolina Department of Natural Resources (SCDNR) (Appendix B).

Based on this evaluation, a habitat assessment was conducted for the species listed in Table 3. Excluded from this list are marine species with no potential to occur in the Project Area.

Table 3. Species with Potential to Occur in the Project Area.

Common Name	Scientific Name	State Status	Federal Status
Mammals			
Northern long-eared bat	<i>Myotis septentrionalis</i>	--	Threatened
Rafinesques's big-eared bat	<i>Corynorhinus rafinesquii</i>	Endangered	--
Amphibians			
Frosted flatwoods salamander	<i>Ambystoma cingulatum</i>	Endangered	Threatened
Gopher frog	<i>Lithobates capito</i>	Endangered	--
Broad-striped dwarf siren	<i>Pseudobranchius striatus</i>	Threatened	--
Reptiles			
Spotted turtle	<i>Clemmys guttata</i>	Threatened	--
Fish			
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	Endangered	Endangered
Atlantic sturgeon	<i>Acipenser oxyrinchus</i>	--	Endangered
Birds			
Bachman's warbler	<i>Vermivora bachmanii</i>	Endangered	Endangered
Kirtland's warbler	<i>Setophaga kirtlandii</i>	--	Endangered
Piping plover	<i>Charadrius melodus</i>	--	Threatened
Red knot	<i>Calidris canutus rufa</i>		Threatened
Red-cockaded woodpecker	<i>Picoides borealis</i>	Endangered	Endangered
Wood stork	<i>Mycteria americana</i>	Endangered	Threatened
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened	BGEPA*
American swallow-tailed kite	<i>Elanoides forficatus</i>	Endangered	--
Least tern	<i>Sterna antillarum</i>	Threatened	--
Wilson's plover	<i>Charadrius wilsonia</i>	Threatened	--
Plants			
American chaffseed	<i>Schwalbea americana</i>	--	Endangered
Canby's dropwort	<i>Oxypolis canbyi</i>	--	Endangered
Pondberry	<i>Lindera melissifolia</i>	--	Endangered
Seabeach amaranth	<i>Amaranthus pumilus</i>	--	Threatened

* BGEPA = Bald and Golden Eagle Protection Act

3.2 Species Evaluation

The potential for occurrence of each federally listed species was summarized according to the categories listed below. This methodology was also utilized to evaluate state-listed species. The rationale for category assignment is provided after each category in Table 4. Potential for occurrence categories are as follows:

- *Known to occur*—the species has been documented in the project area by a reliable observer.

- *May occur*—the project area is within the species’ currently known range, and habitat types within the project area resemble those known to be used by the species.
- *Unlikely to occur*—the project area is within the species’ currently known range, but habitat types within the project area do not resemble those known to be used by the species.
- *Does not occur*— the project area is clearly outside the species’ currently known range.

Those species listed by the USFWS as candidate, threatened, or endangered species were assigned to one of three or one of two categories of possible effect, following USFWS recommendations. The evaluation of impacts to species is limited to the project area and does not assess the impacts to the species or their habitats at regional or global levels. The effects determinations recommended by the USFWS (USFWS 2017a) include the following:

- *May affect, is likely to adversely affect/May impact*—adverse effects to listed species may occur as a direct or indirect result of the proposed project, and the effect is not discountable, insignificant, or beneficial.
- *May affect, is not likely to adversely affect/May impact*—the proposed project may affect listed species and/or critical habitat; however, the effects are expected to be discountable, insignificant, or completely beneficial.
- *No effect*—the proposed project will not affect federally listed species or critical habitat.

The BGEPA prohibits anyone, without the proper permit, from *taking* bald eagles or golden eagles, including their parts, nests, or eggs. The BGEPA defines *take* as to “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb.”

3.3 Field Reconnaissance

SWCA conducted a field reconnaissance of the project area from July 15 to July 21, 2018. SWCA utilized GPS data uploaded with the project area for general orientation and locating the project boundaries. The field reconnaissance consisted of pedestrian visual surveys to evaluate the absence or presence of suitable habitat and occurrences of listed species within the project area. SWCA was not contracted to conduct tailored presence/absence surveys specific to individual species.

4 RESULTS

4.1 Species Evaluation

SWCA evaluated impacts of the proposed project on those species identified in Table 3. Table 4 summarizes each species’ habitat requirements, potential for occurrence in the project area, and effect determination for each species. Biologists permitted by the USFWS (Federal Fish and Wildlife Permit TE-800611) or biologists under direct supervision of biologists permitted to complete red-cockaded woodpecker presence/absence surveys incidentally observed adult and juvenile red-cockaded woodpeckers (Appendix A, Figure 4). No other federally listed species were detected during field reconnaissance surveys in July 2018. Therefore, the effect determination for the remaining species is based on the field reconnaissance habitat assessment and best available literature and spatial data collected from resources cited in this report. A further evaluation is provided for species with potential to occur within the project area.

Table 4. Evaluation of Listed Species with Potential to Occur in the Project Area.

Common Name (Scientific Name)	Federal Status*	Range or Habitat Requirements	Potential for Occurrence in Project Area	Determination of Effect
Mammals				
Northern long-eared bat (<i>Myotis septentrionalis</i>)	T	The northern long-eared bat is a forest-dwelling species whose populations have dwindled since the onset of white-nose syndrome (WNS). This species forms small maternity colonies in trees that offer exfoliating bark, cracks, or crevices as breeding or roost sites during the summer and hibernate in caves or cave-like structures during the winter.	May occur. See Section 4.1.1.	May affect, is not likely to adversely affect/ May impact
Rafinesques's big-eared bat (<i>Corynorhinus rafinesquii</i>)	--	Winter habitat for this species in the southern U.S. is poorly known, but this species is not typically found in caves during winter. In the Coastal Plain they are suspected to use hollow trees for cold weather and possibly winter roosts; in the southern portions of the range these bats often roost in buildings year-round (NatureServe 2018a). Summer roosts are often in hollow trees or in abandoned buildings, under bridges or in culverts, and in or near wooded areas.	May occur. See Section 4.1.2.	May affect, is not likely to adversely affect/ May impact
Amphibians				
Frosted flatwoods salamander (<i>Ambystoma cingulatum</i>)	T	This species is fossorial; optimum habitat is open, mesic longleaf/slash pine flatwoods maintained by frequent fires. Breeding sites are ephemeral isolated wetlands typically composed of pond cypress and/or black tupelo (<i>Nyssa sylvatica</i>) and a diverse understory of native grasses and herbaceous vegetation (USFWS 2009a).	Unlikely to occur.	No effect
Gopher frog (<i>Lithobates capito</i>)	--	This species' primary habitat is native xeric upland habitats, particularly longleaf pine (<i>Pinus palustris</i>)–turkey oak (<i>Quercus cerris</i>) sandhill associations; also xeric to mesic longleaf pine flatwoods, sand pine scrub, xeric oak hammocks, and rudereal successional stages of these habitats (NatureServe 2018b).	Unlikely to occur.	No effect
Broad-striped dwarf siren (<i>Pseudobranchius striatus</i>)	--	This species is common in cypress ponds, hiding among plants or burrowing in the mud or muck of the bottom (NatureServe 2018c).	Unlikely to occur.	No effect

Common Name (Scientific Name)	Federal Status*	Range or Habitat Requirements	Potential for Occurrence in Project Area	Determination of Effect
Reptiles				
Spotted turtle (<i>Clemmys guttata</i>)	--	This species inhabits mostly unpolluted, shallow bodies of water with a soft bottom and aquatic vegetation, such as small marshes, marshy pastures, bogs, fens, woodland streams, swamps, small ponds, vernal pools, and lake margins; in some areas they occur in brackish tidal streams. Ponds surrounded by relatively undisturbed meadow or undergrowth are most favorable (NatureServe 2018d).	May occur. See Section 4.1.3.	May affect, is not likely to adversely affect/ May impact
Fish				
Shortnose sturgeon (<i>Acipenser brevirostrum</i>)	E	Shortnose sturgeons occur in rivers and coastal waters from Canada to Florida. They hatch in the freshwater of rivers and spend most of their time in the estuaries of these rivers (National Oceanic and Atmospheric Administration [NOAA] 2018a).	Unlikely to occur.	No effect
Atlantic sturgeon (<i>Acipenser oxyrinchus</i>)	E	Atlantic sturgeons occur in rivers and coastal waters from Canada to Florida. Hatched in the freshwater of rivers, Atlantic sturgeon head out to sea as juveniles, and return to their birthplace to spawn, or lay eggs, when they reach adulthood (NOAA 2018b).	Unlikely to occur.	No effect
Birds				
Bachman's warbler (<i>Vermivora bachmanii</i>)	E	Breeding habitat is described as palustrine forested wetlands (bottomland hardwoods) with a dense understory of palmetto (<i>Sabal minor</i>) or cane (<i>Arundanaria gigantea</i>). However, one of the most photographed and filmed Bachman's warblers was on territory in a predominantly longleaf pine (<i>Pinus palustris</i>) forest near brackish marsh just outside of Charleston, South Carolina (USFWS 2015).	Unlikely to occur – presumed extinct. Last documented occurrence 1962 (USFWS 2015).	No effect
Kirtland's warbler (<i>Setophaga kirtlandii</i>)	E	The Kirtland's warbler migration corridor passes over the project area. Migrating habitat is variable but can include woodlands and scrubland or developed areas such as fencerows or vegetated yards. Dense vegetation is preferred during migration (USFWS 2018).	Unlikely to occur.	No effect

Common Name (Scientific Name)	Federal Status*	Range or Habitat Requirements	Potential for Occurrence in Project Area	Determination of Effect
Piping plover (<i>Charadrius melodus</i>)	T	Coastal migration and wintering range habitat consists primarily of sound (bay or bayshore) beaches and sound islands for foraging and ocean beaches for roosting, preening, and being alert (USFWS 2009b).	Unlikely to occur.	No effect
Red knot (<i>Calidris canutus rufa</i>)	T	Red knots over-winter all along the South Carolina coast, primarily on sandy beaches and mud flats; they roost on inlets of barrier beaches and islands in South Carolina and feed on coquina (<i>Donax</i> sp.) clams in the fall and winter (SCDNR 2015a).	Unlikely to occur.	No effect
Red-cockaded woodpecker (<i>Picoides borealis</i>)	E	This species prefers two habitat types. One is primarily older open pine forests with particular pine species including longleaf and loblolly pine. Within this habitat this species inhabits cavities of living pine trees. The second habitat is used for foraging and requires an open mid-story with few to no hardwoods.	Known to occur. See Section 4.1.4.	May affect, is not likely to adversely affect/ May impact
Wood stork (<i>Mycteria americana</i>)	T	This species is typically associated with freshwater and brackish wetlands. Most nesting colonies in the southeast are located in woody vegetation, such as bald cypress, over standing water, or on islands surrounded by open water. Foraging habitat may include freshwater marshes, flooded pastures, and flooded ditches (USFWS 1992).	May occur. See Section 4.1.5.	May affect, is not likely to adversely affect/ May impact
Bald eagle (<i>Haliaeetus leucocephalus</i>)	BGEPA	Ranges throughout North America. Found in forested areas primarily near (within < 2.48 miles) large bodies of water with tall trees for roosting and nesting (NatureServe 2018e).	May occur. See Section 4.1.6.	May affect, is not likely to adversely affect/ May impact
American swallow-tailed kite (<i>Elanoides forficatus</i>)	--	In South Carolina, the swallow-tailed kite is closely associated with large tracts of forested wetlands of the Outer Coastal Plain, such as those found in the Francis Marion National Forest and along the lower Savannah, Edisto, Santee, Black, and Great Pee Dee Rivers (SCDNR 2015b).	May occur. See Section 4.1.7.	May affect, is not likely to adversely affect/ May impact
Least tern (<i>Sterna antillarum</i>)	--	This species is a summer/breeding resident of coastal South Carolina. In South Carolina, nesting occurs around mid-May. Terns nest in colonies on beaches and sandbars with abundant shells and pebbles and sparse vegetation (SCDNR 2015c).	Unlikely to occur.	No effect

Common Name (Scientific Name)	Federal Status*	Range or Habitat Requirements	Potential for Occurrence in Project Area	Determination of Effect
Wilson's plover (<i>Charadrius wilsonia</i>)	--	Wilson's plovers nest in open areas of sandy islands and inlets, often near dune edges or clumps of vegetation. The majority of Wilson's plovers in South Carolina nest on public beaches, often near inlets (SCDNR 2014).	Unlikely to occur.	No effect
Plants				
American chaffseed (<i>Schwalbea americana</i>)	E	This species occurs in fire-maintained longleaf pine flatwoods and savannas. It is often found in transition zones between peaty wetlands and xeric sandy soils. American chaffseed habitat has been described as open grass-sedge systems in moist acidic sandy loams or sandy peat loams (USFWS 2017b).	May occur. See Section 4.1.8.	May affect, is not likely to adversely affect/ May impact
Canby's dropwort (<i>Oxypolis canbyi</i>)	E	This species inhabits a variety of coastal plain communities, including pond cypress savannas, the shallows and edges of cypress/pond pine ponds, sloughs, and wet pine savannas (SCDNR 2015d).	May occur. See Section 4.1.9.	May affect, is not likely to adversely affect/ May impact
Pondberry (<i>Lindera melissifolia</i>)	E	The species inhabits pond margins, swampy depressions, sandy sinks, and seasonally flooded wetlands. In South Carolina, pondberry grows along the margins of limestone sinks and shallow depressions. This species also inhabits pinelands and recently burned open areas (SCDNR 2015e).	May occur. See Section 4.1.10.	May affect, is not likely to adversely affect/ May impact
Seabeach amaranth (<i>Amaranthus pumilus</i>)	T	This species occurs on barrier island beaches, where its primary habitat consists of overwash flats at accreting ends of islands and lower foredunes and upper strands of noneroding beaches (USFWS 1993).	Unlikely to occur.	No effect

*USFWS *Status Definitions

E = Endangered. The Endangered Species Act (ESA) specifically prohibits the take of a species listed as endangered. Take is defined by the ESA as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct.

T = Threatened. The ESA specifically prohibits the take of a species listed as threatened. Take is defined by the ESA as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to engage in any such conduct.

BGEPA = Bald and Golden Eagle Protection Act.

4.1.1 Northern Long-Eared Bat

The northern long-eared bat (*Myotis septentrionalis*) is found in the United States from Maine to North Carolina on the Atlantic Coast, westward to eastern Oklahoma and north through the Dakotas, extending southward to parts of southern states from Georgia to Louisiana, even reaching into eastern Montana and Wyoming (USFWS 2014). During the summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. This bat seems opportunistic in selecting roosts, using tree species based on suitability to retain bark or provide cavities or crevices (USFWS 2016). Suitable northern long-eared bat roosts are trees (live, dying, dead, or snag) with a diameter at breast height of 3 inches or greater that exhibits any of the following characteristics: exfoliating bark, crevices, cavities, or cracks. Isolated trees are considered suitable habitat when they exhibit the characteristics of a suitable roost tree and are less than 1,000 feet from the nearest suitable roost tree within a woodlot or wooded fencerow (USFWS 2014).

The predominance of pine trees and the dense understory observed within the project area indicate a low-quality habitat for the northern long-eared bat. Activities prescribed for the wetland mitigation plan, possibly including timber management and prescribed burns, may affect the northern long-eared bat. Timing these activities to occur during winter months may minimize overall impact to this species and eventually improve habitat.

4.1.2 Rafinesque's Big-Eared Bat

This species, easily identified by its very large ears, is limited to the Blue Ridge, Sandhills, Coastal Plain, and Coastal Zone Ecoregions. They typically inhabit mature bottomland forests, including stands of cypress and tupelo gum, as well as mature pine flatwoods. They roost in hollow trees in the summer, but are occasionally observed roosting in man-made structures including buildings and bridges. They hibernate in cave and cave-like structures during the winter, or enter torpor in the southern reaches of their range. In the Coastal Plains, where hibernacula are sparse or unavailable, the species remains in large hollow trees year-round (SCDNR 2017).

The predominance of pine trees and the dense understory observed within the project area indicate a low-quality habitat for the Rafinesque's big-eared bat. Activities prescribed for the wetland mitigation plan, possibly including timber management and prescribed burns, may affect the Rafinesque's big-eared bat. Timing these activities to occur during winter months may minimize overall impact to this species and eventually improve habitat.

4.1.3 Spotted Turtle

The spotted turtle is a semi-aquatic species that inhabits a variety of wetland types including small ponds, small streams, swamps, flooded forests, and other shallow bodies of water (Conant and Collins 1991; Ernst and Barbour 1989; Martof et al. 1980). This species is known to occur in the Francis Marion National Forest adjacent to the project area. Conditions observed during the site reconnaissance indicated that appropriate habitat may be present within the project area; consequently, this species has the potential to occur. The proposed wetland mitigation project would not likely adversely affect this species or its habitat.

4.1.4 Red-Cockaded Woodpecker

The red-cockaded woodpecker has an extensive range that includes much of the southeastern portion of the United States, including Berkeley and Charleston Counties. Suitable nesting habitat consists of longleaf pine, pine/hardwood, and hardwood/pine stands that contain pine trees greater than 70 years of

age that are contiguous with and located within 0.5 mile of suitable foraging habitat. Suitable foraging habitat for this species consists of longleaf pine and pine/hardwood forest stands in which 50 percent or more of the dominant trees are mature pines (greater than 30 years old, 10-inch diameter at breast height) (Kalisz and Boettcher 1991; USFWS 1980, 2003).

Red-cockaded woodpeckers were observed during the field reconnaissance (Appendix A, Figure 4) and are known to occur within and likely adjacent to the project area. According to data maintained by eBird (2018), additional sightings of red-cockaded woodpeckers were reported on adjacent properties to the northeast and southeast within 0.5 mile of the project area.

Overall, habitat observed within the project area was dominated by loblolly pine and sweetgum with several stands of longleaf pine in various stages of succession, which reflects typical habitat used by this species.

Given the presence of red-cockaded woodpeckers within the project area, further coordination with the USFWS will be conducted prior to project activities. Based on the nature of the proposed activities, it is the opinion of SWCA that the proposed project may affect, but will not likely adversely affect, the red-cockaded woodpecker.

4.1.5 Wood Stork

Wood storks are typically associated with freshwater and brackish wetlands. Most nesting colonies in the southeast are located in woody vegetation, such as bald cypress, over standing water, or on islands surrounded by open water. (USFWS 1992). Foraging habitat may include freshwater marshes, flooded pastures, and flooded ditches.

Potential nesting and foraging habitat was observed within the project area. No wood storks or wood stork rookeries were observed within the project area. Information maintained on the eBird website (eBird 2018) indicates that the nearest observation of a wood stork is approximately 1.15 miles east of the project area. Due to the availability of alternative foraging and nesting habitat on adjacent properties, the proposed project may affect, but is not likely to adversely affect, the species.

4.1.6 Bald Eagle

The bald eagle is protected under the Bald Eagle Protection Act as of June 8, 1940, as amended on October 23, 1972, and the Migratory Bird Treaty Act of 1918, and is listed as threatened by the SCDNR. Bald eagles below the 40th parallel were listed as endangered on March 11, 1967, and subsequently received protection under the Endangered Species Act of 1973. On February 14, 1978, listing status was changed to endangered throughout the lower United States except for Washington, Oregon, Minnesota, Wisconsin, and Michigan, where the bald eagle was designated as threatened. Bald eagles were reclassified as threatened in all lower 48 states on July 12, 1995, and were removed from the federal list of threatened and endangered species on August 8, 2007. Bald eagles remain protected under the Bald and Golden Eagle Protection Act.

In South Carolina, bald eagles return to the same nesting territory year after year in the fall. Egg laying generally occurs in December but ranges from November to March. Bald eagles select large trees with an open limb structure for nesting and are usually located on the forest/marsh ecotone within 0.62 mile of open water (SCDNR 2015f). The bald eagle is primarily associated with coasts, rivers, and lakes, usually nesting near bodies of water where it feeds. The bald eagle feeds primarily on fish but also takes a variety of birds, mammals, and turtles when fish are not available (USFWS 1989).

Portions of the project area could provide nesting and foraging habitat for bald eagles. SCDNR's Bald Eagle nest location database was used to identify documented nests in proximity to the project area, with the closest recorded nest being over 5 miles away (SCDNR 2015g). Information maintained on the eBird database (eBird 2018) indicates the nearest observation of a bald eagle approximately 0.5 mile west of the project area and an additional record 1 mile southeast of the project area (eBird 2018). Intensive silviculture historically practiced throughout the project area may have prevented timber from growing to the size required for nest trees. Due to past and present land uses and management, the proposed action may affect, but is not likely to "disturb", bald eagles as defined within the BGEPA.

4.1.7 American Swallow-Tailed Kite

The American swallow-tailed kite is found in floodplain forests and other large tracts of forested wetlands/mixed pine habits of the outer coastal plain from South Carolina to east Texas. It is closely associated with large tracts of forested wetlands such as those found at the Francis Marion National Forest. It shows a strong preference for nesting in dominant or codominant loblolly pines growing within or on the edges of wetland forests. It will also regularly use bald cypress, water tupelo, sweetgum, and willow oak (SCDNR 2015b).

The average dimensions of loblolly pine nest trees in the Francis Marion National Forest were 32 m (104 feet) tall with a 49-cm (19-inch) diameter at breast height. Pines were located within stands averaging 13.5 m²/hectare (60 feet/acre) in basal area and 61 years of age (SCDNR 2015b). Much of the habitat observed within the project area did not meet the preferred nesting habitat. No American swallow-tailed kites were observed during field surveys; however, eBird (2018) lists a documented siting within the project area. Due to the current lack of nesting habitat within the project area, project activities may affect, but is not likely to adversely affect, this species during roosting and foraging activities.

4.1.8 American Chaffseed

American chaffseed occurs in fire-maintained longleaf pine flatwoods and savannas. Often it is found in transition zones between peaty wetlands and xeric (dry) sandy soils. American chaffseed habitat has been described as open grass-sedge systems in moist acidic sandy loams or sandy peat loams. Chaffseed is dependent on factors such as fire, mowing, or fluctuating water tables to maintain the open to partly open conditions that it requires (USFWS 2017b).

Evidence of prescribed burn activities was observed within the project area; however, it appeared to have been some time since the last prescribed burn, as evidenced by the presence of an extensive shrub layer and woody vegetation. Due to the history of forestry within the project area and the infrequent burn activity, it is our opinion that the project may affect, but is not likely to adversely affect, American chaffseed.

4.1.9 Canby's Dropwort

Canby's dropwort has been found in a variety of coastal plain habitats, including natural ponds dominated by pond cypress, grass-sedge dominated Carolina bays, wet pine savannas, shallow pineland ponds and cypress-pine swamps or sloughs. The largest and most vigorous populations have been found in open bays or ponds that are wet throughout most of the year but that have little or no canopy cover. Soils are sandy loams or acidic peat mucks underlain by clay layers, which, along with the slight gradient of the areas, result in the retention of water (USFWS 2017c).

Soils mapped within the project area and observed during the site reconnaissance were consistent with those preferred by Canby's dropwort. However, the specific, open habitat requirements necessary for

Canby's dropwort were not observed within the project area. Due to this lack of suitable quality habitat, the proposed project may affect, but is not likely to adversely affect, Canby's dropwort.

4.1.10 Pondberry

Pondberry inhabits pond margins, swampy depressions, sandy sinks, and seasonally flooded wetlands. In South Carolina, pondberry grows along the margins of limestone sinks and shallow depressions. The species also inhabits pinelands and recently burned open areas (SCDNR 2015e). The plants generally grow in shaded areas but may also be found in full sun (USFWS 2017d).

Five populations are known within Berkeley County, all of which are on the adjacent Francis Marion National Forest (USFWS 2010). Conditions observed within the project area at the time of site reconnaissance indicated that a minimal amount of suitable habitat may be present within the project area. The history of forestry within the project area and the infrequent burn activity has resulted in a dense understory that would offer competition to pondberry. Project activities may affect, but are not likely to adversely affect, pondberry, and may ultimately create additional suitable habitat.

5 SUMMARY AND CONCLUSIONS

Based on our findings, we believe that the proposed action (1) “may affect, but is not likely to adversely affect” northern long-eared bat, Rafinesque's big-eared bat, spotted turtle, red-cockaded woodpecker, wood stork, American swallow-tailed kite, American chaffseed, Canby's dropwort, and pondberry; (2) will have no effect on frosted flatwoods salamander, gopher frog, broad-striped dwarf siren, shortnose sturgeon, Atlantic sturgeon, Bachman's warbler, Kirtland's warbler, piping plover, red knot, least tern, Wilson's plover, and seabeach amaranth; and (3) will not likely disturb bald eagles. Direct and indirect impacts from past silviculture activity and a lack of prescribed fire within the project area are the primary factors that likely negate the presence of the above listed species.

6 LITERATURE CITED

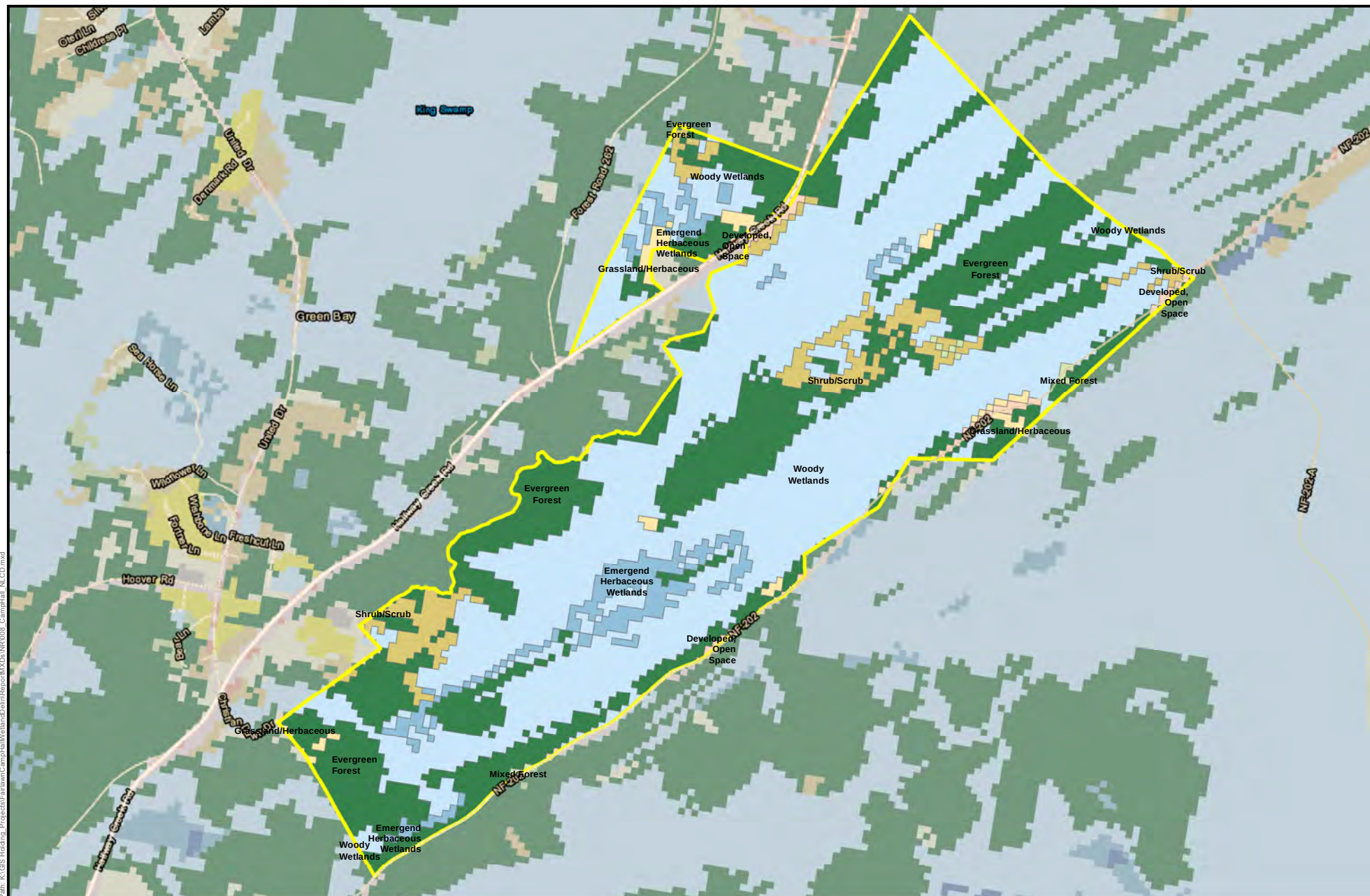
- Conant, R.C. and J.T. Collins. 1991. A Field Guide to Reptiles and Amphibians: Eastern and Central North America. Peterson Field Guide Series. Houghton Mifflin Co. Boston, Massachusetts.
- eBird. 2018. An online database of bird distribution and abundance (web application). eBird, Ithaca, New York. Available at <http://www.ebird.org>. Accessed July 2018.
- Homer, C.G., Dewitz, J.A., Yang, L., Jin, S., Danielson, P., Xian, G., Coulston, J., Herold, N.D., Wickham, J.D., and Megown, K. 2015. Completion of the 2011 National Land Cover Database for the conterminous United States-Representing a decade of land cover change information. Photogrammetric Engineering and Remote Sensing, v. 81, no. 5, pp. 345-354.
- Kalisz, P.J., and S.E. Boettcher. 1991. Active and abandoned red-cockaded woodpecker habitat in Kentucky. *Journal of Wildlife Management* 55. pp. 146-154.
- Martof, B.S., W.M. Palmer, J.R. Bailey and J.R. Harrison, III. 1980. Amphibians and Reptiles of the Carolinas and Virginia. University of North Carolina Press. Chapel Hill North Carolina.
- National Oceanic and Atmospheric Administration (NOAA). 2018a. Shortnose Sturgeon. Available at <https://www.fisheries.noaa.gov/species/shortnose-sturgeon>. Accessed July 2018.
- NOAA. 2018b. Atlantic Sturgeon. Available at <https://www.fisheries.noaa.gov/species/atlantic-sturgeon>. Accessed July 2018.
- Natural Resources Conservation Service (NRCS). 2018. Web Soil Survey. U.S. Department of Agriculture, Natural Resources Conservation Service. Available at: <http://websoilsurvey.nrcs.usda.gov>. Accessed July 2018.
- NatureServe. 2018a. NatureServe Explorer: An online encyclopedia of life [*Corynorhinus rafinesquii*]. Version 7.1. NatureServe, Arlington, Virginia. Available at <http://explorer.natureserve.org/>. Accessed July 2018.
- NatureServe. 2018b. NatureServe Explorer: An online encyclopedia of life [*Lithobates capito*]. Version 7.1. NatureServe, Arlington, Virginia. Available at <http://explorer.natureserve.org/>. Accessed July 2018.
- NatureServe. 2018c. NatureServe Explorer: An online encyclopedia of life [*Pseudobranchius striatus*]. Version 7.1. NatureServe, Arlington, Virginia. Available at <http://explorer.natureserve.org/>. Accessed July 2018.
- NatureServe. 2018d. NatureServe Explorer: An online encyclopedia of life [*Clemmys guttata*]. Version 7.1. NatureServe, Arlington, Virginia. Available at <http://explorer.natureserve.org/>. Accessed July 2018.
- NatureServe. 2018e. NatureServe Explorer: An online encyclopedia of life [*Haliaeetus leucocephalus*]. Version 7.1. NatureServe, Arlington, Virginia. Available at <http://explorer.natureserve.org/>. Accessed July 2018.

- South Carolina Department of Natural Resources (SCDNR). 2014. Coastal Birds in South Carolina: Wilson's Plover. Available at:
<http://dnr.sc.gov/wildlife/species/coastalbirds/shorebirds/WilsonsPlover.html>. Accessed July 2018.
- SCDNR. 2015a. Red Knot (*Calidris canutus*). Available at
<http://www.dnr.sc.gov/marine/mrri/acechar/speciesgallery/Birds/RedKnot/index.html>. Accessed July 2018.
- SCDNR. 2015b. Swallow-tailed Kite (*Elanoides forficatus*). Available at:
<http://www.dnr.sc.gov/swap/supplemental/birds/swallowtailedkite2015.pdf>. Accessed July 2018.
- SCDNR. 2015c. Least Tern (*Sterna antillarum*). Available at:
<http://www.dnr.sc.gov/marine/mrri/acechar/speciesgallery/Birds/LeastTern/index.html>. Accessed July 2018.
- SCDNR. 2015d. Canby's Dropwort (*Oxypolis canbyi*). Available at:
<http://www.dnr.sc.gov/marine/mrri/acechar/speciesgallery/Plants/CanbysDropwort/index.html>. Accessed July 2018.
- SCDNR. 2015e. Pondberry (*Lindera melissafolia*). Available at:
<http://www.dnr.sc.gov/marine/mrri/acechar/speciesgallery/Plants/Pondberry/index.html>. Accessed July 2018.
- SCDNR. 2015f. South Carolina's Bald Eagles – Biology. Available at:
<http://www.dnr.sc.gov/wildlife/baldeagle/biology.html>. Accessed July 2018.
- SCDNR. 2015g. South Carolina's Bald Eagles – Nest Locations. Available at:
<http://www.dnr.sc.gov/wildlife/baldeagle/locations.html>. Accessed July 2018.
- SCDNR. 2017. South Carolina Bat Conservation Plan. Columbia, South Carolina.
- U.S. Fish and Wildlife Service (USFWS). 1980. Selected vertebrate endangered species of the seacoast of the United States – the red-cockaded woodpecker. FWS/OBS-80/01.7.
- USFWS. 1989. Bald Eagle Recovery Plan. Atlanta, Georgia.
- USFWS. 1992. Endangered and Threatened Species of the Southeast United States. Prepared by Ecological Services, Division of Endangered Species, Southeast Region, Government Printing Office, Washington, D.C. (two volumes).
- USFWS. 1993. Federal Registry: *Amaranthus pumilus* (Seabeach Amaranth) Determined to be Threatened. Government Printing Office, Washington, D.C. pp. 18035-18042.
- USFWS. 2003. Recovery Plan for the Red-Cockaded Woodpecker (*Picoides borealis*). Rev. ed. Available at: <https://www.fws.gov/rcwrecovery/files/RecoveryPlan/finalrecoveryplan.pdf>. Accessed July 2018.
- USFWS. 2009a. Federal Registry: Determination of Endangered Status for Reticulated Flatwoods Salamander. Government Printing Office, Washington, D.C. Pages 6700-6774.
- USFWS. 2009b. Piping Plover (*Charadrius melodus*) 5-Year Review: Summary and Evaluation. Available at: https://ecos.fws.gov/docs/five_year_review/doc3009.pdf. Accessed July 2018.

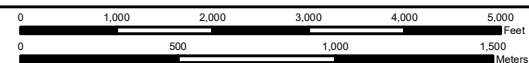
- USFWS. 2010. Pondberry (*Lindera melissifolia*) 5-Year Review: Summary and Evaluation. Available at: <https://www.fws.gov/southeast/pdf/five-year-reviews/pondberry.pdf>. Accessed July 2018.
- USFWS. 2014. Northern Long-Eared Bat Interim Conference and Planning Guidance. Available at: <https://www.fws.gov/northeast/virginiafield/pdf/NLEBinterimGuidance6Jan2014.pdf>. Accessed July 2018.
- USFWS. 2015. Bachman's Warbler (*Vermivora bachmanii*) 5-Year Review: Summary and Evaluation. Available at: https://ecos.fws.gov/docs/five_year_review/doc4548.pdf. Accessed July 2018.
- USFWS. 2016. Environmental Conservation Online System: Species Profile for Northern Long-Eared Bat. Available at: <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=A0JE>. Accessed July 2018.
- USFWS. 2017a. Section 7 Consultation Guidance for Preparing a Biological Assessment. Available at: https://www.fws.gov/midwest/endangered/section7/ba_guide.html. Accessed July 2018.
- USFWS. 2017b. American Chaffseed (*Schwalbea americana*). Available at: <https://www.fws.gov/southeast/wildlife/plants/american-chaffseed/>. Accessed July 2018.
- USFWS. 2017c. Canby's Dropwort (*Oxypolis canbyi*). Available at: https://www.fws.gov/raleigh/species/es_canbys_dropwort.html. Accessed July 2018.
- USFWS. 2017d. Pondberry (*Lindera melissifolia*). Available at: https://www.fws.gov/raleigh/species/es_pondberry.html. Accessed July 2018.
- USFWS. 2018. Species Information: Kirkland's Warbler. Available online at <https://www.fws.gov/verobeach/MSRPPDFs/Kirtlandswarbler.pdf>. Accessed July 2018.

APPENDIX A

Figures



FAIRLAWN C-1 SITE
2011 NATIONAL LAND COVER DATASET
Berkeley County and
Charleston County, South Carolina



2011 NLCD Cover Type

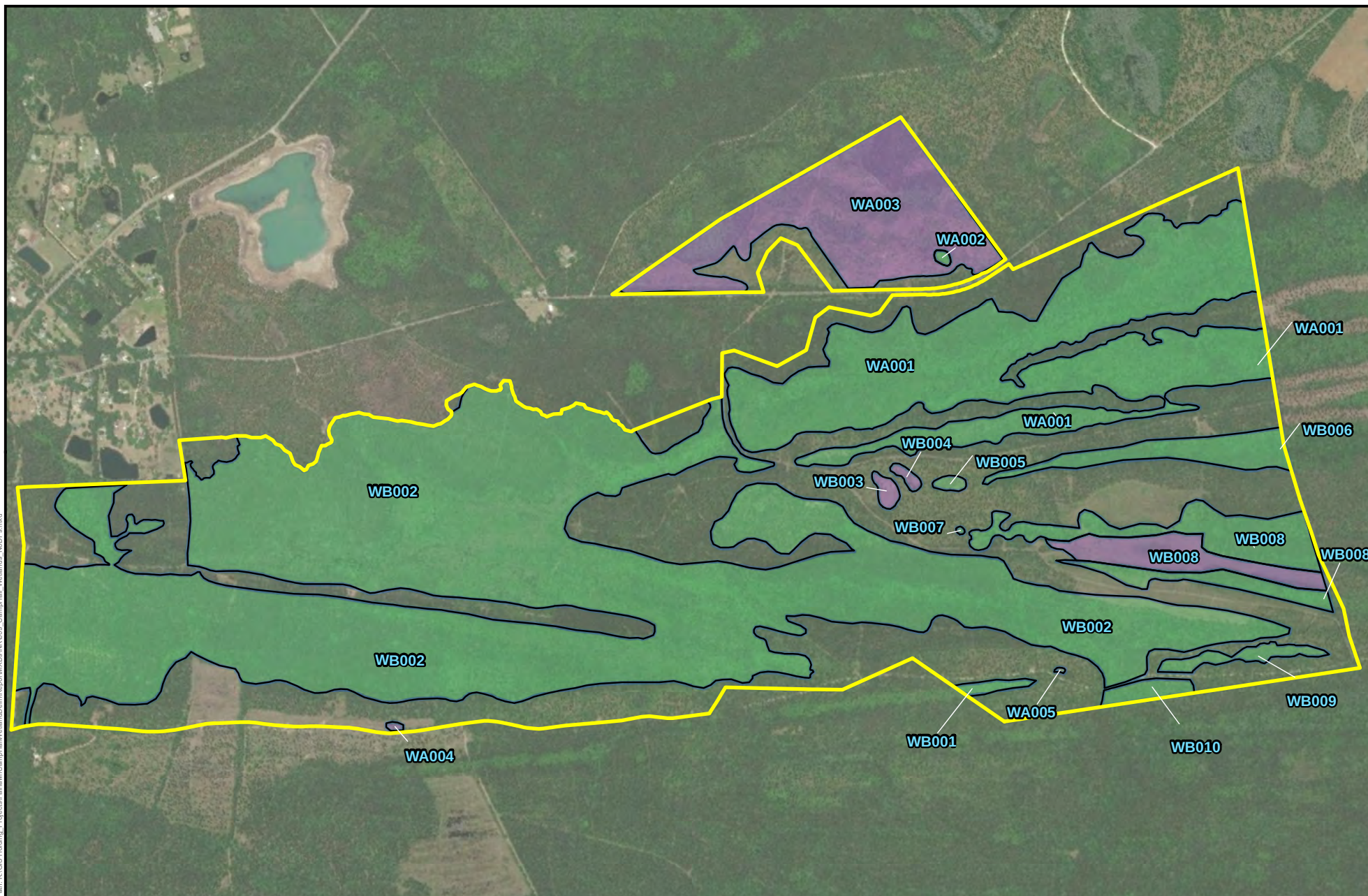
 Area of Investigation (AOI)	 Emergent Herbaceous Wetlands	 Mixed Forest
 Developed, Open Space	 Evergreen Forest	 Shrub/Scrub
	 Grassland/Herbaceous	 Woody Wetlands



Background:	USGS 7.5' Topographic Map
Scale:	1:24,000
Created By:	EWS
Approved By:	HSM
SWCA Project No.:	050452.00
Date Produced:	September 13, 2018

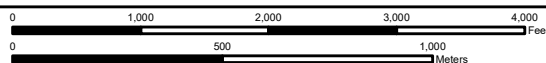
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200 Bursca Drive, Suite 207
(412) 839-1001 phone
(412) 839-1005 fax
www.swca.com

FAIRLAWN C-1 SITE
SWCA WETLAND DELINEATION
OVERVIEW MAP
Berkeley County and
Charleston County, South Carolina



- | | |
|-----------------------------|-------------|
| Area of Investigation (AOI) | PFO Wetland |
| PEM Wetland | PSS Wetland |



Background:	USGS 7.5' Topographic Map
Scale:	1:18,000
Created By:	EWS
Approved By:	HSM
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Date Produced:	September 13, 2018

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APPENDIX B

Federal and State Endangered Species Lists

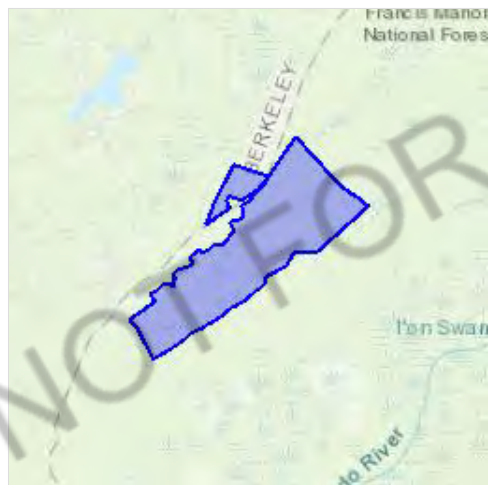
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Berkeley and Charleston counties, South Carolina



Local office

South Carolina Ecological Services

☎ (843) 727-4707

📠 (843) 727-4218

176 Croghan Spur Road, Suite 200
Charleston, SC 29407-7558

<http://www.fws.gov/charleston/>

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information.
2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME

STATUS

Northern Long-eared Bat *Myotis septentrionalis* Threatened
 No critical habitat has been designated for this species.
<https://ecos.fws.gov/ecp/species/9045>

West Indian Manatee *Trichechus manatus* Threatened
 There is **final** critical habitat for this species. Your location is outside the critical habitat.
<https://ecos.fws.gov/ecp/species/4469>
Marine mammal

Birds

NAME	STATUS
Bachman's Warbler (=wood) <i>Vermivora bachmanii</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3232	Endangered
Kirtland's Warbler <i>Setophaga kirtlandii</i> (= <i>Dendroica kirtlandii</i>) No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8078	Endangered
Piping Plover <i>Charadrius melodus</i> There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot <i>Calidris canutus rufa</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1864	Threatened
Red-cockaded Woodpecker <i>Picoides borealis</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7614	Endangered
Wood Stork <i>Mycteria americana</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8477	Threatened

Reptiles

NAME	STATUS
Green Sea Turtle <i>Chelonia mydas</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6199	Threatened

Kemp's Ridley Sea Turtle *Lepidochelys kempii* Endangered
 There is **proposed** critical habitat for this species. The location of the critical habitat is not available.
<https://ecos.fws.gov/ecp/species/5523>

Leatherback Sea Turtle *Dermochelys coriacea* Endangered
 There is **final** critical habitat for this species. Your location is outside the critical habitat.
<https://ecos.fws.gov/ecp/species/1493>

Loggerhead Sea Turtle *Caretta caretta* Threatened
 There is **final** critical habitat for this species. Your location is outside the critical habitat.
<https://ecos.fws.gov/ecp/species/1110>

Amphibians

NAME	STATUS
Frosted Flatwoods Salamander <i>Ambystoma cingulatum</i> There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/4981	Threatened

Flowering Plants

NAME	STATUS
American Chaffseed <i>Schwalbea americana</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1286	Endangered
Canby's Dropwort <i>Oxypolis canbyi</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7738	Endangered
Pondberry <i>Lindera melissifolia</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1279	Endangered
Seabeach Amaranth <i>Amaranthus pumilus</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8549	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A
BREEDING SEASON IS INDICATED
FOR A BIRD ON YOUR LIST, THE

BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

American Kestrel *Falco sparverius paulus*

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Breeds Apr 1 to Aug 31

Bachman's Sparrow *Aimophila aestivalis*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/6177>

Breeds May 1 to Sep 30

Bald Eagle *Haliaeetus leucocephalus*

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

<https://ecos.fws.gov/ecp/species/1626>

Breeds Sep 1 to Jul 31

Clapper Rail *Rallus crepitans*

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Breeds Apr 10 to Oct 31

Dunlin *Calidris alpina arctica*

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Breeds elsewhere

Golden Eagle *Aquila chrysaetos*

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

<https://ecos.fws.gov/ecp/species/1680>

Breeds elsewhere

Gull-billed Tern *Gelochelidon nilotica*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9501>

Breeds May 1 to Jul 31

Kentucky Warbler <i>Oporornis formosus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
King Rail <i>Rallus elegans</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8936	Breeds May 1 to Sep 5
Least Tern <i>Sterna antillarum</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Apr 20 to Sep 10
Prairie Warbler <i>Dendroica discolor</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Prothonotary Warbler <i>Protonotaria citrea</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird <i>Euphagus carolinus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Swallow-tailed Kite <i>Elanoides forficatus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8938	Breeds Mar 10 to Jun 30
Willet <i>Tringa semipalmata</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 5
Wilson's Plover <i>Charadrius wilsonia</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Aug 20

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ “Proper Interpretation and Use of Your Migratory Bird Report” before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

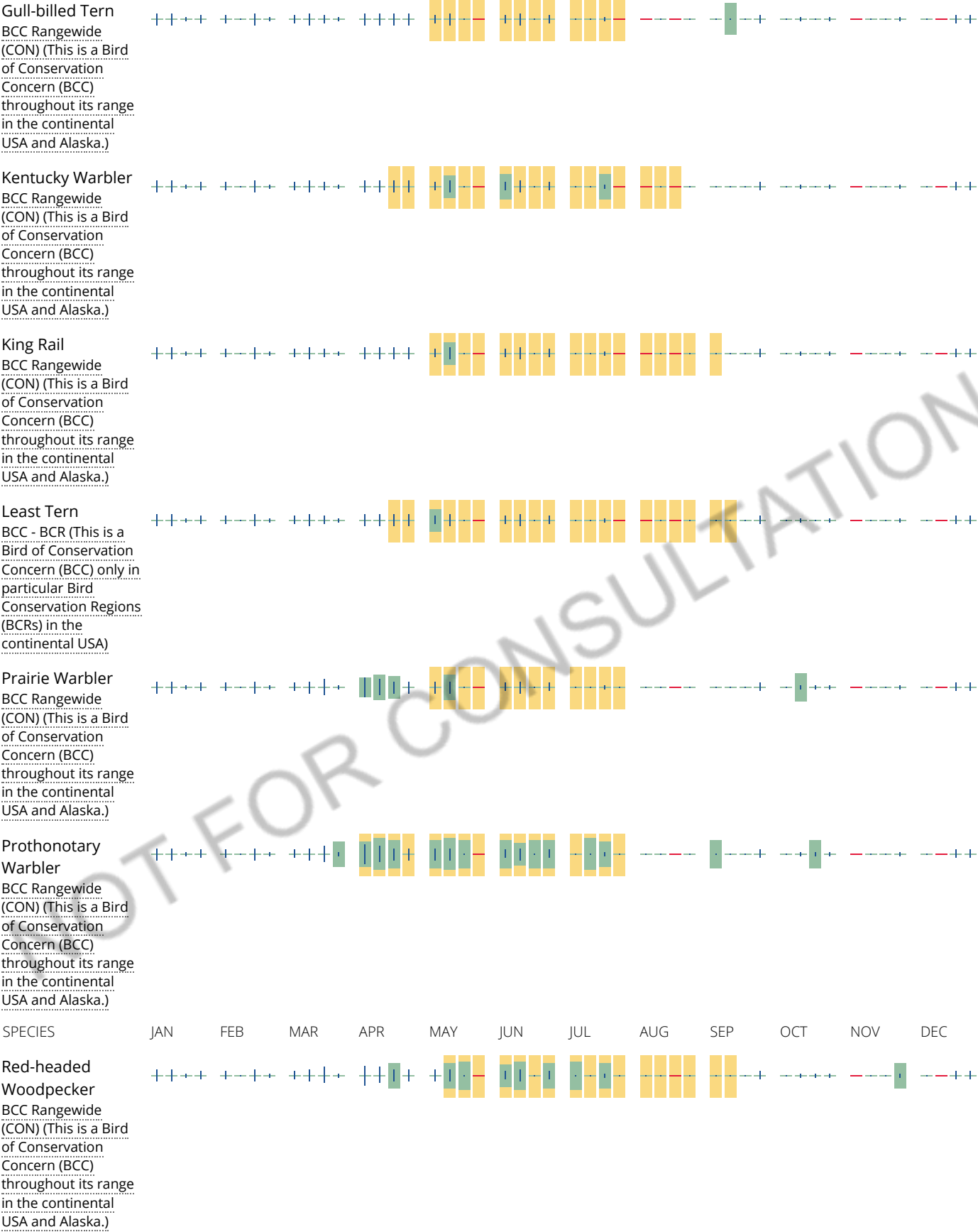
No Data (—)

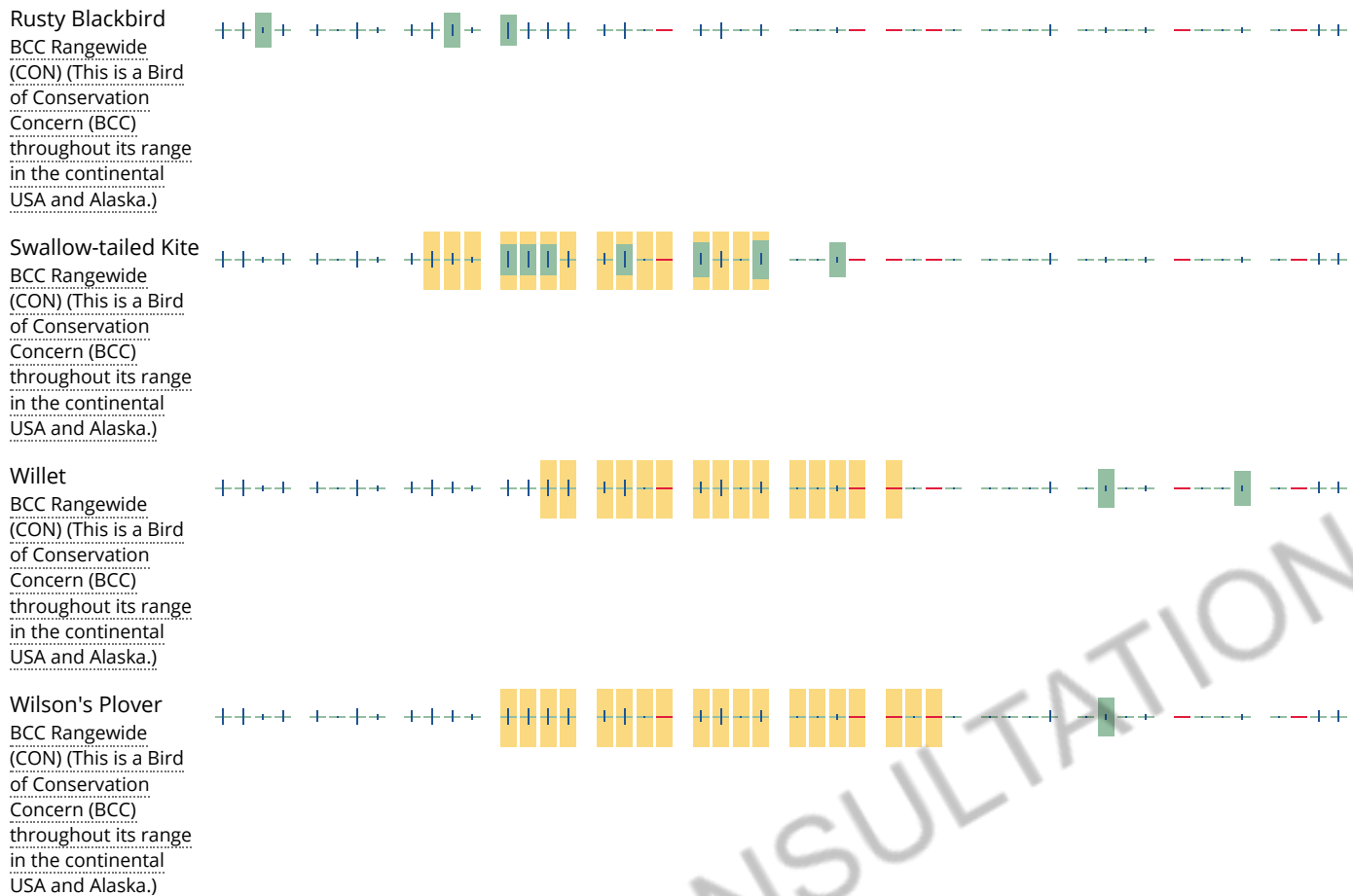
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.







Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) and/or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [E-bird Explore Data Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

NOT FOR CONSULTATION

Marine mammals

Marine mammals are protected under the [Marine Mammal Protection Act](#). Some are also protected under the Endangered Species Act¹ and the Convention on International Trade in Endangered Species of Wild Fauna and Flora².

The responsibilities for the protection, conservation, and management of marine mammals are shared by the U.S. Fish and Wildlife Service [responsible for otters, walruses, polar bears, manatees, and dugongs] and NOAA Fisheries³ [responsible for seals, sea lions, whales, dolphins, and porpoises]. Marine mammals under the responsibility of NOAA Fisheries are **not** shown on this list; for additional information on those species please visit the [Marine Mammals](#) page of the NOAA Fisheries website.

The Marine Mammal Protection Act prohibits the take (to harass, hunt, capture, kill, or attempt to harass, hunt, capture or kill) of marine mammals and further coordination may be necessary for project evaluation. Please contact the U.S. Fish and Wildlife Service Field Office shown.

1. The [Endangered Species Act](#) (ESA) of 1973.
2. The [Convention on International Trade in Endangered Species of Wild Fauna and Flora](#) (CITES) is a treaty to ensure that international trade in plants and animals does not threaten their survival in the wild.
3. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following marine mammals under the responsibility of the U.S. Fish and Wildlife Service are potentially affected by activities in this location:

NAME

West Indian Manatee *Trichechus manatus*
<https://ecos.fws.gov/ecp/species/4469>

Facilities

Wildlife refuges and fish hatcheries

REFUGE AND FISH HATCHERY INFORMATION IS NOT AVAILABLE AT THIS TIME

Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

[PEM1F](#)

[PEM1C](#)

FRESHWATER FORESTED/SHRUB WETLAND

[PSS3B](#)

[PFO1/SS3B](#)

[PFO1/2C](#)

[PSS3/4B](#)

[PSS4Ad](#)

[PFO1B](#)

[PFO4A](#)

[PFO1C](#)

[PFO3/1B](#)

[PFO1F](#)

[PSS4B](#)

[PSS1/EM1C](#)

[PFO1/2F](#)

[PFO4/1A](#)

[PFO3B](#)

[PFO4B](#)

[PSS1/2C](#)

[PFO1/SS4A](#)

[PFO1A](#)

[PFO4/SS3B](#)

[PSS4Bd](#)

[PSS2F](#)

[PSS1/3B](#)

[PFO1/4A](#)

[PSS1/4A](#)

[PSS1F](#)

[PSS4A](#)

[PSS1C](#)

RIVERINE

[R5UBH](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

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 wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Berkeley County

Animals

Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank
Acipenser brevirostrum	Shortnose Sturgeon	LE: Endangered	SE: Endangered	G3	S3
Acipenser oxyrinchus	Atlantic Sturgeon	LE: Endangered	--	G3	S3
Ambystoma cingulatum	Frosted Flatwoods Salamander	LT: Threatened	SE: Endangered	G2	S1
Ambystoma tigrinum tigrinum	Eastern Tiger Salamander	--	--	G5	S2S3
Clemmys guttata	Spotted Turtle	--	ST: Threatened	G5	S5
Corynorhinus rafinesquii	Rafinesque's Big-eared Bat	--	SE: Endangered	G3G4	S2
Elanoides forficatus	American Swallow-tailed Kite	--	SE: Endangered	G5	S2
Haliaeetus leucocephalus	Bald Eagle	--	ST: Threatened	G5	S2
Heterodon simus	Southern Hognose Snake	--	--	G2	SNR
Lithobates capito	Gopher Frog	--	SE: Endangered	G3	S1
Micrurus fulvius	Eastern or Harlequin Coral Snake	--	--	G5	S2
Myotis austroriparius	Southeastern Bat	--	--	G4	S1S2
Myotis septentrionalis	Northern Long-eared Bat	LT: Threatened	--	G1G2	S1
Neotoma floridana haematorea	Eastern Woodrat	--	--	G5T4Q	S3S4
Nerodia floridana	Florida Green Water Snake	--	--	G5	S2
Picoides borealis	Red-cockaded Woodpecker	LE: Endangered	SE: Endangered	G3	S2
Pituophis melanoleucus	Pine or Gopher Snake	--	--	G4	S3S4
Seminatrix pygaea	Black Swamp Snake	--	--	G5	SNR

<i>Sterna antillarum</i>	Least Tern	--	ST: Threatened	G4	S3
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Plants

Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank
<i>Agalinis aphylla</i>	Coastal Plain False-foxglove	--	--	G3G4	S1
<i>Agalinis linifolia</i>	Flax Leaf False-foxglove	--	--	G4?	SNR
<i>Agrimonia incisa</i>	Incised Groovebur	--	--	G3	S2
<i>Amphicarpum muehlenbergianum</i>	Blue Maiden-cane	--	--	G4	S2S3
<i>Andropogon gyrans</i> var. <i>stenophyllus</i>	Elliott's Bluestem	--	--	G5T4	S1
<i>Andropogon mohrii</i>	Broomsedge	--	--	G4?	S2
<i>Anthraenantia rufa</i>	Purple Silkyscale	--	--	G5	S2
<i>Aristida beyrichiana</i>	Beyrich's Three-awn	--	--	G5?	SNR
<i>Aristida condensata</i>	Piedmont Three-awned Grass	--	--	G4?	S2
<i>Asplenium heteroresiliens</i>	Wagner's Spleenwort	--	--	G2	S1
<i>Asplenium resiliens</i>	Black-stem Spleenwort	--	--	G5	S1
<i>Bacopa cyclophylla</i>	Coastal-plain Water-hyssop	--	--	G3G5	S1
<i>Burmannia biflora</i>	Northern Burmannia	--	--	G4G5	S2
<i>Calopogon barbatus</i>	Bearded Grass-pink	--	--	G4?	S2
<i>Calopogon multiflorus</i>	Many-flower Grass-pink	--	--	G2G3	S1
<i>Carex basiantha</i>	Widow Sedge	--	--	G5	S2
<i>Carex chapmanii</i>	Chapman's Sedge	--	--	G3	S1
<i>Carex crus-corvi</i>	Ravenfoot Sedge	--	--	G5	S2

<i>Carex elliotii</i>	Elliott's Sedge	--	--	G4?	S1
<i>Carex granularis</i>	Meadow Sedge	--	--	G5	S2
<i>Carya myristiciformis</i>	Nutmeg Hickory	--	--	G4	S2
<i>Castilleja coccinea</i>	Scarlet Indian-paintbrush	--	--	G5	S2
<i>Chamaedaphne calyculata</i>	Leatherleaf	--	--	G5	SNR
<i>Coreopsis gladiata</i>	Southeastern Tickseed	--	--	G4G5	SNR
<i>Coreopsis integrifolia</i>	Ciliate-leaf Tickseed	--	--	G1G2	S1
<i>Eleocharis robbinsii</i>	Robbins Spikerush	--	--	G4G5	S2
<i>Eleocharis tricostata</i>	Three-angle Spikerush	--	--	G4	S2?
<i>Epidendrum conopseum</i>	Green-fly Orchid	--	--	G4	S3?
<i>Eryngium aquaticum</i> var. <i>ravenelii</i>	Ravenel's Eryngo	--	--	G4T2T3	S1
<i>Eupatorium recurvans</i>	Coastal-plain Thorough- wort	--	--	G3G4Q	S1?
<i>Habenaria quinqueseta</i>	Long-horn Orchid	--	--	G4G5	S1
<i>Helenium pinnatifidum</i>	Southeastern Sneezeweed	--	--	G4	S2
<i>Iris hexagona</i>	Walter's Iris	--	--	G4G5	S1
<i>Lachnocaulon minus</i>	Small's Bog Button	--	--	G3G4	S1
<i>Liatris gracilis</i>	Slender Gayfeather	--	--	G5	S1
<i>Lindera melissifolia</i>	Pondberry	LE: Endangered	--	G3	S2
<i>Listera australis</i>	Southern Twayblade	--	--	G4	S2
<i>Litsea aestivalis</i>	Pondspice	--	--	G3?	S3
<i>Lobelia boykinii</i>	Boykin's Lobelia	--	--	G2G3	S3
<i>Ludwigia lanceolata</i>	Lance-leaf Seedbox	--	--	G3	S1
<i>Lysimachia hybrida</i>	Lance-leaf Loosestrife	--	--	G5	S1

<i>Melanthium virginicum</i>	Virginia Bunchflower	--	--	G5	S2
<i>Menispermum canadense</i>	Canada Moonseed	--	--	G5	S2S3
<i>Myriophyllum laxum</i>	Piedmont Water-milfoil	--	--	G3	S2
<i>Ophioglossum petiolatum</i>	Longstem Adder's-tongue Fern	--	--	G5	S1
<i>Oxypolis canbyi</i>	Canby's Dropwort	LE: Endangered	--	G2	S2
<i>Paspalum bifidum</i>	Bead-grass	--	--	G5	S2
<i>Peltandra sagittifolia</i>	Spoon-flower	--	--	G3G4	S2
<i>Physostegia leptophylla</i>	Slender-leaved Dragon-head	--	--	G4?	SNR
<i>Pilea fontana</i>	Springs Clearweed	--	--	G5	SNR
<i>Plantago sparsiflora</i>	Pineland Plantain	--	--	G3	S2
<i>Platanthera integra</i>	Yellow Fringeless Orchid	--	--	G3G4	S1
<i>Platanthera lacera</i>	Green-fringe Orchis	--	--	G5	S2
<i>Ponthieva racemosa</i>	Shadow-witch Orchid	--	--	G4G5	S2
<i>Pteroglossaspis ecristata</i>	Crestless Plume Orchid	--	--	G2G3	S2
<i>Quercus similis</i>	Bottom-land Post Oak	--	--	G4	S1
<i>Rhexia aristosa</i>	Awed Meadowbeauty	--	--	G3G4	S3
<i>Rhynchospora breviseta</i>	Short-bristle Baldrush	--	--	G3G4	S1
<i>Rhynchospora careyana</i>	Horned Beakrush	--	--	G4?Q	S3
<i>Rhynchospora cephalantha</i> var. <i>attenuata</i>	Pocosin Beaksedge	--	--	G5T3?	S1
<i>Rhynchospora harperi</i>	Harper Beakrush	--	--	G4?	S1
<i>Rhynchospora inundata</i>	Drowned Hornedrush	--	--	G4?	S2?

Rhynchospora oligantha	Few-flowered Beaked-rush	--	--	G4	S2
Rhynchospora pleiantha	Brown Beaked-rush	--	--	G2G3	S1
Rhynchospora scirpoides	Long-beaked Baldrush	--	--	G4	S1
Rhynchospora stenophylla	Chapman Beakrush	--	--	G4	S2
Rhynchospora tracyi	Tracy Beakrush	--	--	G4	S3
Rudbeckia heliopsisidis	Sun-facing Coneflower	--	--	G2	S1S2
Sarracenia rubra	Sweet Pitcher-plant	--	--	G4	S3S4
Schwalbea americana	Chaffseed	LE: Endangered	--	G2G3	S2
Scleria baldwinii	Baldwin Nutrush	--	--	G4	S2
Smilax biltmoreana	Biltmore Greenbrier	--	--	G4	S2
Spiranthes laciniata	Lace-lip Ladies'-tresses	--	--	G4G5	S1S2
Sporobolus curtissii	Pineland Dropseed	--	--	G3	S1
Sporobolus pinetorum	Carolina Dropseed	--	--	G3	S2
Thalictrum subrotundum	Reclined Meadow-rue	--	--	GUQ	S1S2
Tridens carolinianus	Carolina Fluff Grass	--	--	G3G4	S1
Trillium pusillum var. pusillum	Least Trillium	--	--	G3T2Q	S1
Triphora trianthophora	Nodding Pogonia	--	--	G3G4	S2
Utricularia macrorhiza	Greater Bladderwort	--	--	G5	S1
Xyris brevifolia	Short-leaved Yellow-eyed Grass	--	--	G4G5	S1
Xyris difformis var. floridana	Florida Yellow-eyed Grass	--	--	G5T4T5	S2
Xyris elliotii	Elliott Yellow-eyed Grass	--	--	G4	S2
Xyris flabelliformis	Savannah Yellow-eyed Grass	--	--	G4	S1

Charleston County

Animals

Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank
Acipenser brevirostrum	Shortnose Sturgeon	LE: Endangered	SE: Endangered	G3	S3
Acris crepitans	Northern Cricket Frog	--	--	G5	S5
Aimophila aestivalis	Bachman's Sparrow	--	--	G3	S3
Ambystoma cingulatum	Frosted Flatwoods Salamander	LT: Threatened	SE: Endangered	G2	S1
Ambystoma tigrinum tigrinum	Eastern Tiger Salamander	--	--	G5	S2S3
Caretta caretta	Loggerhead	LT: Threatened	ST: Threatened	G3	S3
Charadrius wilsonia	Wilson's Plover	--	ST: Threatened	G5	S3?
Clemmys guttata	Spotted Turtle	--	ST: Threatened	G5	S5
Condylura cristata	Star-nosed Mole	--	--	G5	S3?
Corynorhinus rafinesquii	Rafinesque's Big-eared Bat	--	SE: Endangered	G3G4	S2
Crotalus adamanteus	Eastern Diamondback Rattlesnake	--	--	G4	S3
Crotalus horridus	Timber Rattlesnake	--	--	G4	SNR
Dendroica virens waynei	Wayne's Black-throated Green Warbler	--	--	G5T3	SNRB
Elanoides forficatus	American Swallow-tailed Kite	--	SE: Endangered	G5	S2
Haliaeetus leucocephalus	Bald Eagle	--	ST: Threatened	G5	S2

<i>Heterodon simus</i>	Southern Hognose Snake	--	--	G2	SNR
<i>Ictinia mississippiensis</i>	Mississippi Kite	--	--	G5	S4
<i>Lasiurus cinereus</i>	Hoary Bat	--	--	G3G4	SNR
<i>Limnothlypis swainsonii</i>	Swainson's Warbler	--	--	G4	S4
<i>Lithobates capito</i>	Gopher Frog	--	SE: Endangered	G3	S1
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	--	--	G5	SNR
<i>Microtus pennsylvanicus</i>	Meadow Vole	--	--	G5	S3?
<i>Micrurus fulvius</i>	Eastern or Harlequin Coral Snake	--	--	G5	S2
<i>Mycteria americana</i>	Wood Stork	LT: Threatened	SE: Endangered	G4	S1S2
<i>Myotis austroriparius</i>	Southeastern Bat	--	--	G4	S1S2
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	LT: Threatened	--	G1G2	S1
<i>Neotoma floridana haematorea</i>	Eastern Woodrat	--	--	G5T4Q	S3S4
<i>Ophisaurus compressus</i>	Island Glass Lizard	--	--	G3G4	S1S2
<i>Pelecanus occidentalis</i>	Brown Pelican	--	--	G4	S1S2
<i>Phoca vitulina</i>	Harbor Seal	--	--	G5	SNA
<i>Picoides borealis</i>	Red-cockaded Woodpecker	LE: Endangered	SE: Endangered	G3	S2
<i>Plegadis falcinellus</i>	Glossy Ibis	--	--	G5	SHB,SNRN
<i>Pseudobranchius striatus</i>	Broad-striped Dwarf Siren	--	ST: Threatened	G5	S2
<i>Sciurus niger</i>	Southern Fox Squirrel	--	--	G5	S3S4
<i>Seminatrix pygaea</i>	Black Swamp Snake	--	--	G5	SNR

<i>Sterna antillarum</i>	Least Tern	--	ST: Threatened	G4	S3
<i>Tyto alba</i>	Barn-owl	--	--	G5	S4
<i>Ursus americanus</i>	Black Bear	--	--	G5	S5
<i>Vermivora bachmanii</i>	Bachman's Warbler	LE: Endangered	SE: Endangered	GH	SX

Plants

Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank
<i>Agalinis linifolia</i>	Flax Leaf False-foxglove	--	--	G4?	SNR
<i>Agrimonia incisa</i>	Incised Groovebur	--	--	G3	S2
<i>Amaranthus pumilus</i>	Seabeach Amaranth	LT: Threatened	--	G2	S1
<i>Amphicarpum muehlenbergianum</i>	Blue Maiden-cane	--	--	G4	S2S3
<i>Anthraenantia rufa</i>	Purple Silkyscale	--	--	G5	S2
<i>Asclepias pedicellata</i>	Savannah Milkweed	--	--	G4	S2
<i>Botrychium lunarioides</i>	Winter Grape-fern	--	--	G4?	S1
<i>Calopogon barbatus</i>	Bearded Grass-pink	--	--	G4?	S2
<i>Canna flaccida</i>	Bandana-of-the-everglades	--	--	G4?	S2
<i>Carex decomposita</i>	Cypress-knee Sedge	--	--	G3G4	S2
<i>Carex elliotii</i>	Elliott's Sedge	--	--	G4?	S1
<i>Chasmanthium nitidum</i>	Shiny Spikegrass	--	--	G3G4	S1
<i>Coreopsis gladiata</i>	Southeastern Tickseed	--	--	G4G5	SNR
<i>Coreopsis integrifolia</i>	Ciliate-leaf Tickseed	--	--	G1G2	S1
<i>Cornus racemosa</i>	Stiff Dogwood	--	--	G5	S1?
<i>Cyperus tetragonus</i>	Piedmont Flatsedge	--	--	G4?	S2

<i>Dionaea muscipula</i>	Venus' Fly-trap	ARS*: Risk, priority	--	G3	S3
<i>Eleocharis tricosata</i>	Three-angle Spikerush	--	--	G4	S2?
<i>Eleocharis vivipara</i>	Viviparous Spike-rush	--	--	G5	S1
<i>Eryngium aquaticum</i> var. <i>ravenelii</i>	Ravenel's Eryngo	--	--	G4T2T3	S1
<i>Eupatorium anomalum</i>	Florida Thorough-wort	--	--	G2G3	S1?
<i>Eupatorium fistulosum</i>	Hollow Joe-pye Weed	--	--	G5?	SNR
<i>Forestiera godfreyi</i>	Godfrey's Privet	--	--	G2	S1
<i>Galactia elliotii</i>	Elliott's Milkpea	--	--	G5	S1
<i>Helenium pinnatifidum</i>	Southeastern Sneezeweed	--	--	G4	S2
<i>Hypericum nitidum</i>	Carolina St. John's-wort	--	--	G4	S1
<i>Ipomoea macrorhiza</i>	Large-stem Morning-glory	--	--	G3G5	S1
<i>Ipomoea stolonifera</i>	Beach Morning-glory	--	--	G5?	SNR
<i>Iris hexagona</i>	Walter's Iris	--	--	G4G5	S1
<i>Lepuropetalon spathulatum</i>	Southern Lepuropetalon	--	--	G4G5	S2
<i>Lilaeopsis carolinensis</i>	Carolina Lilaeopsis	--	--	G3G5	S2
<i>Listera australis</i>	Southern Twayblade	--	--	G4	S2
<i>Litsea aestivalis</i>	Pondspice	--	--	G3?	S3
<i>Lobelia boykinii</i>	Boykin's Lobelia	--	--	G2G3	S3
<i>Ludwigia lanceolata</i>	Lance-leaf Seedbox	--	--	G3	S1
<i>Lysimachia hybrida</i>	Lance-leaf Loosestrife	--	--	G5	S1
<i>Monotropis odorata</i>	Sweet Pinesap	--	--	G3	S2
<i>Muhlenbergia filipes</i>	Bentgrass	--	--	G5T5?	S3S4
<i>Orobanche uniflora</i>	One-flowered Broomrape	--	--	G5	S2

<i>Oxypolis canbyi</i>	Canby's Dropwort	LE: Endangered	--	G2	S2
<i>Paspalum bifidum</i>	Bead-grass	--	--	G5	S2
<i>Peltandra sagittifolia</i>	Spoon-flower	--	--	G3G4	S2
<i>Physostegia leptophylla</i>	Slender-leaved Dragon-head	--	--	G4?	SNR
<i>Pieris phillyreifolia</i>	Climbing Fetter-bush	--	--	G3	S1
<i>Plantago sparsiflora</i>	Pineland Plantain	--	--	G3	S2
<i>Platanthera integra</i>	Yellow Fringeless Orchid	--	--	G3G4	S1
<i>Psilotum nudum</i>	Whisk Fern	--	--	G5	S1
<i>Pteroglossaspis ecristata</i>	Crestless Plume Orchid	--	--	G2G3	S2
<i>Quercus austrina</i>	Bluff Oak	--	--	G4?	S1
<i>Rhexia aristosa</i>	Awned Meadowbeauty	--	--	G3G4	S3
<i>Rhynchospora breviseta</i>	Short-bristle Baldrush	--	--	G3G4	S1
<i>Rhynchospora globularis</i> var. <i>pinetorum</i>	Beakrush	--	--	G5?T3?	S1
<i>Rhynchospora harperi</i>	Harper Beakrush	--	--	G4?	S1
<i>Rhynchospora inundata</i>	Drowned Hornedrush	--	--	G4?	S2?
<i>Rhynchospora tracyi</i>	Tracy Beakrush	--	--	G4	S3
<i>Sageretia minutiflora</i>	Tiny-leaved Buckthorn	--	--	G4	S3
<i>Sarracenia rubra</i>	Sweet Pitcher-plant	--	--	G4	S3S4
<i>Schwalbea americana</i>	Chaffseed	LE: Endangered	--	G2G3	S2
<i>Scleria baldwinii</i>	Baldwin Nutrush	--	--	G4	S2
<i>Spiranthes laciniata</i>	Lace-lip Ladies'-tresses	--	--	G4G5	S1S2
<i>Tridens carolinianus</i>	Carolina Fluff Grass	--	--	G3G4	S1
<i>Tridens chapmanii</i>	Chapman's Redtop	--	--	G5T3	S1

Triphora trianthophora	Nodding Pogonia	--	--	G3G4	S2
Xyris brevifolia	Short-leaved Yellow-eyed Grass	--	--	G4G5	S1
Xyris difformis var. floridana	Florida Yellow-eyed Grass	--	--	G5T4T5	S2
Xyris elliotii	Elliott Yellow-eyed Grass	--	--	G4	S2
Xyris stricta	Pineland Yellow-eyed Grass	--	--	G4	S1

APPENDIX B
CULTURAL RESOURCES ASSESSMENT



ENVIRONMENTAL CONSULTANTS

Sound Science. Creative Solutions.®

200 Bursca Drive, Suite 207
Bridgeville, Pennsylvania 15017
Tel 412.839.1001 Fax 412.839.1005
www.swca.com

July 31, 2018

Mr. Tommy Cousins, PWS
Palustrine Group
P.O. Box 31411
Charleston, South Carolina 29417

Re: Historic and Cultural Resource Review for the Fairlawn C-1 Site Project, Charleston and Berkeley Counties, South Carolina.

Dear Mr. Cousins:

As part of the environmental due diligence conducted for the Fairlawn C-1 Site Project (project), SWCA Environmental Consultants (SWCA) conducted a review to determine the likelihood of identifying historic or prehistoric cultural resources within the project area. As the project will not require a formal review by the South Carolina State Historic Preservation Office (SHPO), this document is intended for planning and scoping purposes only.

Project Description

The Palustrine Group is working to develop 1,480 acres in Charleston and Berkeley Counties, South Carolina—west of Awendaw, South Carolina, and south of Huger, South Carolina. The project is located adjacent to Halfway Creek Road.

Database Review

A detailed records review was undertaken to create a land-use history of the project area and identify any known cultural resources within the proposed project's limit of disturbance (LOD). The review focused on local histories, and historic maps and atlases. These sources allow for a better understanding of the landscape history of project area. The South Carolina SHPO and the South Carolina Institute of Archaeology and Anthropology's ArchSite GIS was also reviewed for recorded archaeological and historical resources within or directly adjacent to the project area. The ArchSite GIS shows the location of aboveground historic properties listed in or eligible for listing in the National Register of Historic Places (NRHP), historic districts listed in the NRHP, archeological sites, unevaluated historic resources, and the location of previous cultural resource surveys. Additionally, environmental data, such as geological and soil information, was reviewed to determine the likelihood of the project impacting previously unrecorded archaeological resources.

Land Use History

Historic maps, atlases, and aerial photographs provide a depiction of the project area and allow for a better understanding of the landscape history of the project LOD. While the Lowcountry of South Carolina has played an important role in regional and national history, the project area's remote location and swampy nature has greatly limited its use in the historic past.



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Eighteenth-century depictions of the project area show it as undeveloped wilderness. James Cook's 1773 *A Map of the Province of South Carolina* shows the area as undeveloped land, although a road connecting development along the coast and the Wando River to settlements around the East Branch of the Cooper River is depicted close to the project area. By the early nineteenth century, development in and around the project area was still minimal. The 1825 Robert Mills map, *Charleston District, South Carolina*, shows the project area as undeveloped, but more roads are depicted than shown on the 1773 map, as well as several bridges. The 1825 map depicts a landscape largely void of settlement, outside of areas along the coast, as well as near the Wando River. It is likely the project area remained relatively static throughout the nineteenth century. Maps created by Civil War cartographers do not depict the project area, but largely show a similar road system and a lack of development in the general vicinity of the project, potentially indicating little settlement in the swampy interior.

By the turn of the twentieth century the lumber industry had taken hold in the region, focusing on the area's vast pine forests. Peaking in the first quarter of the twentieth century, the lumber industry at the time left large tracts of barren cutover land. The project area was potentially first timbered in the early twentieth century. The 1919 Wando, South Carolina, U.S. Geological Survey (USGS) quadrangle shows a railroad running through the project area and various spurs running to the north and south of the mainline. On the 1919 map, the railroad is labeled as "Lumber RR" and was likely used to transport cut timber from the project area and surrounding lands to lumber mills near Charleston. The decline of the railroad is visible on the 1943 Ocean Bay, South Carolina, USGS quadrangle, which has the railroad labeled as "old railroad" likely indicating that it was no longer in use.

The small settlement around the intersection of United Drive and Halfway Creek Road, west of the project area, appears to have originated sometime in the early-to-mid-twentieth century. The 1919 Wando, South Carolina, USGS quadrangle shows a single structure along United Drive, north of the crossroads of United Drive and Halfway Creek Road. The structure, likely a church for the rural community, is currently the Bethel AME Church. The Berkeley County Property Card shows that the Bethel AME Church congregation purchased the property on June 10, 1929. It likely served as a community meeting point in and anchored the settlement that would grow around the crossroads during the next few decades. The 1943 Wando, South Carolina, USGS quadrangle shows considerable development around the crossroads, but no structures are depicted within the project area. For the remainder of the twentieth and into the twenty-first century, the project area appears to have remained undeveloped.

To summarize, throughout the late eighteenth and nineteenth centuries the project area was undeveloped and likely considered wilderness or unproductive land. Based on cartographic sources, sometime in the early nineteenth century, the road network around the project area became established. In the late nineteenth and early twentieth centuries, the project area was likely timbered, and a railroad line was constructed. The railroad was only used for a few decades before it fell into disuse, and the project area was planted in pine plantations or allowed to return to its natural state. For the remainder of the twentieth century and into the early twenty-first, the only disturbance to the project area would have been the occasional harvesting of the timber. Currently the project area is undeveloped and consists of planted pine forests and swamplands.

Historic Architectural Resources

A review of historic maps and atlases, and the ArchSite GIS did not identify any historic resources within or directly adjacent to the project's LOD. Outside of the Bethel AME Church, development around the intersection of Halfway Creek Road and United Drive appears to date to the mid-twentieth century and consist of vernacular

residential development. A review of 2018 Google Street View imagery of the Bethel AME Church shows that the structure has been modernized with what appears to be updated windows, roof, and siding. Based on this preliminary review of the structure, it does not appear to be eligible for the NRHP. Although a formal survey is needed to determine the NRHP status of the structure.

Based on a review of historic maps and relevant online sources there are no known recorded historic resources within or directly adjacent to the project area.

Archaeological Resources

A review of the ArchSite GIS did not identify any archaeological resources within the project's LOD. Within 1 mile of the project there are 51 archaeological resources recorded (Attachment A). Most of these resources have either been determined to be not eligible for the NRHP, or the NRHP status is unknown.

In 2016, a small portion of the project area was surveyed as part of the due diligence survey for the O.L. Thompson Mine Site located north of the project area and south of Halfway Creek Road. The reconnaissance-level survey did not identify any archaeological sites.

A review of the previously recorded sites and previous surveys in proximity to the project allow for a better understanding of the likelihood of encountering archaeological sites within the project area. Archaeologists have also identified a connection between archaeological sites being present and certain environmental factors, such as soil type, physiography, and distance to water.

Large portions of the project area are considered swampland and based on a review of the soils present within the project LOD, over 66 percent of the project is located on soils mapped as Seewee complex or Rutledge loamy fine sand. These soils range from somewhat poorly drained to very poorly drained and have a high-water table. A review of the physiography of the surrounding area in relation to site location shows a preference for sites to be located adjacent to areas of elevation change, and outside of low-lying depressions, as evidenced by the cluster of sites located southwest of the project area, south of Willow Hall Road (Figure 1).

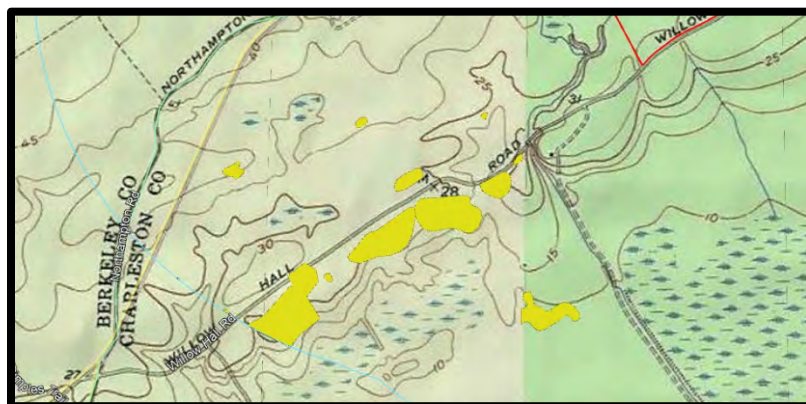


Figure 1. Sites located at elevation change, southwest of the project area.

Known disturbances to the archaeological recorded within the project area consist of historic and modern timber harvesting, damage caused by Hurricane Hugo, and the establishment of the historic logging railroad. Large



portions of the project area are currently planted with Loblolly pine trees, and a review of modern aerials from 1989 to present shows that timber harvesting has routinely impacted portions of the project area. The routine cutting of the project area has likely occurred since the late nineteenth to early twentieth century. As evidenced by the number of sites identified in the surrounding region, timber operations do not necessarily destroy archaeological sites, but the impact of industrial cutting of trees and the historic clear-cutting of the area would have greatly affected any archaeological sites present.

According to the U.S. Forest Service, in 1989 Hurricane Hugo heavily impacted one-third of the Francis Marion National Forest and likely caused some level of destruction and associated ground disturbance within the project area. Beside timbering and natural disasters, the establishment of the historic logging railroad would have destroyed any archaeological deposits present within the railroad alignment.

To summarize, only a very small portion of the project area has been previously surveyed. There are no previously recorded sites within the project area, but within a mile of the project there are 51 archaeological sites recorded (see Attachment A). Known disturbances within the project area consist of extensive lumber harvesting, natural disasters, and the construction of a railroad.

Based on this information, the probability of encountering unrecorded archaeological resources is low, although several areas within the project LOD should be considered to have a moderate-to-high likelihood of encountering archaeological deposits. Areas of moderate-to-high probability of encountering prehistoric archaeological sites, based off what is known about the surrounding region, would be limited to well-drained areas, likely adjacent to elevation changes. Within the project LOD the area north of the mapped wetland, north of Willow Hall Road, near the elevation change between 30 and 35 feet above mean sea level, as depicted on the 1992 Seewee Bay, South Carolina, USGS quadrangle, should be considered to have a moderate-to-high probability to contain prehistoric archaeological sites. Additionally, there is a moderate potential for historic archaeological resources in proximity to the historic railroad grade that runs through the project area.

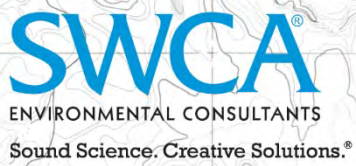
Conclusion

In conclusion, a review of the documentary record for the project area showed the project LOD has been largely undeveloped throughout the historic past. Historic development in the area was largely confined to the west of the project area, near the intersection of Halfway Creek Road and United Drive. There are no previously recorded historic resources or archaeological resources within the project area.

A review of environmental factors, past disturbances, and known archaeological sites near the project indicate that the overall project has a low probability of encountering archaeological resources eligible for listing on the NRHP, although some portions of the project have a moderate to high probability to contain prehistoric and historic archaeological deposits.

Should formal consultation under Section 106 of the National Historic Preservation Act be required, fieldwork would be necessary to determine the project's impact on cultural resources. At this time, the project will have no effect on any previously recorded historic properties.

This review was conducted by professionals who meet the Secretary of the Interior's Professional Qualification Standards (36 CFR 61) for archaeology and historic preservation.



If you have any questions about this material, please do not hesitate to contact our office.

Sincerely,

A handwritten signature in black ink, appearing to read "Jonathan Libbon", is located below the word "Sincerely,". The signature is fluid and cursive.

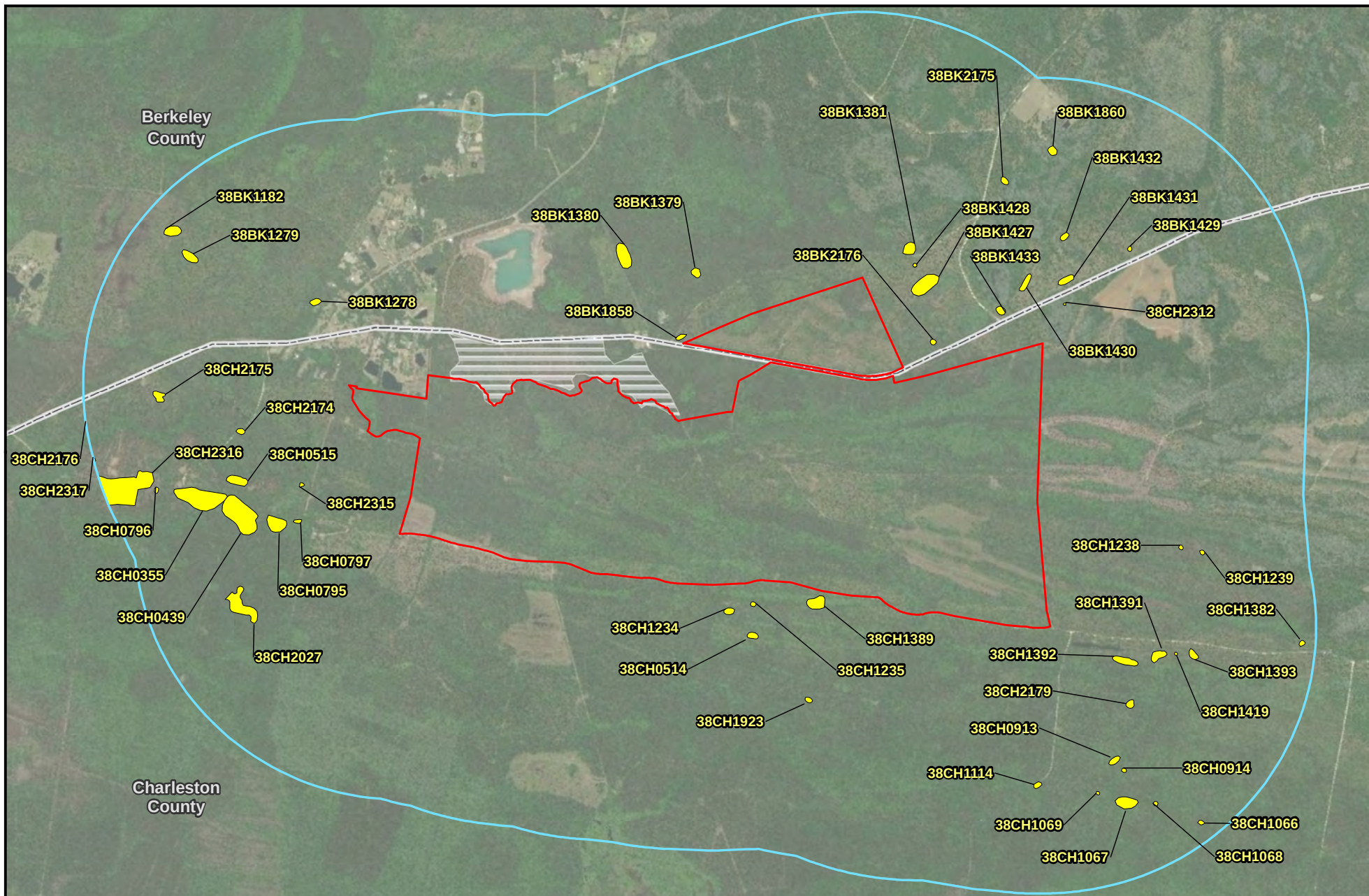
Jonathan Libbon, RPA
Principal Investigator

Attachment A – Previously Recorded Archaeological sites in Proximity to the Project Area

Attachment A

Previously Recorded Archaeological sites in Proximity to the Project Area

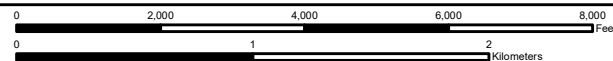
Path: K:\GIS Holding Projects\FairlawnCampHall\Wetland\Report\MXDs\CRCR_Report\Figure.mxd



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FAIRLAWN CAMP HALL WETLAND MITIGATION PROJECT CULTURAL RESOURCES REVIEW

Berkeley and Charleston Counties
South Carolina



- Area of Investigation (AOI)
- Desktop Review Buffer
- Archaeological Sites
- Previously Surveyed
- County Boundary



Background:	ESRI World Imagery (2017)
Scale:	1:32,000
Created By:	JLZ
Approved By:	JRL
SWCA Project No.:	050452.00
Date Produced:	July 26, 2018

NAD 1983 StatePlane South Carolina FIPS 3900 Feet

APPENDIX C
RESTRICTIVE COVENANTS

STATE OF SOUTH CAROLINA

DECLARATION OF
RESTRICTIVE COVENANTS

COUNTY OF BERKELEY
COUNTY OF CHARLESTON

THIS DECLARATION OF RESTRICTIVE COVENANTS is made this ____ day of August, 2018, by Strategic Conservation Partners, LLC., ("Declarant").

RECITALS

WHEREAS, Declarant is the owner of certain real property ("*real property*" includes *wetlands, any interest in submerged lands, uplands, associated riparian/littoral rights*) located in Charleston and Berkeley Counties, South Carolina, more particularly described as and depicted in the recorded plats referenced in Paragraph 9 and attached as Exhibit A ("Property"); and

WHEREAS, as compensatory mitigation under Federal and State law for Department of the Army permit number _____ ("Permit") issued by the U.S. Army Corps of Engineers, Charleston District ("Corps" or "Charleston District," to include any successor agency), and certification(s) and/or permit(s) issued by the S.C. Department of Health and Environmental Control ("DHEC," to include any successor agency), and in recognition of the continuing benefit to the permitted property, and for the protection of waters of the United States and scenic, resource, environmental, and general property values, Declarant has agreed to place certain restrictive covenants on the Property, in order to assure compliance with SAC Permit _____ and the terms of the Final Mitigation Plan, dated _____, 2018, as revised, prepared for Palmetto Railways and approved by the Corps and DHEC ("Plan") as it relates to the Property, and so that the Property shall remain substantially in its natural condition forever.

NOW THEREFORE, Declarant hereby declares that the Property shall be held, transferred, conveyed, leased, occupied or otherwise disposed of and used subject to the following restrictive covenants, which shall run with the land and be binding on all heirs, successors, assigns (they are included in the term, "Declarant," below), lessees, or other occupiers and users during the term of their respective ownership or occupation of the Property.

1. **Prohibitions.** Declarant is and shall be prohibited from the following: filling, draining, flooding, dredging, impounding, clearing, burning, cutting or destroying vegetation, cultivating, excavating, erecting, constructing, releasing wastes, or otherwise doing any work on the Property; introducing exotic species into the Property (except biological controls preapproved in writing by the Corps and DHEC); and from changing the grade or elevation, impairing the flow or circulation of waters, reducing the reach of waters, and any other discharge or activity requiring a permit under clean water or water pollution control laws and regulations, as amended. The following are expressly excepted from this paragraph: a) cumulatively very small impacts associated with hunting (excluding planting or burning), fishing, and similar recreational or educational activities, consistent with the continuing natural condition of the Property; b) removal or trimming of vegetation hazardous to person or property, or of timber downed or damaged due to natural disaster; c) restoration or mitigation required under law and pursuant to Permit SAC _____ and the Plan.

2. **Amendment.** After recording, these restrictive covenants may only be amended by a recorded document signed by the Corps and DHEC and Declarant. The recorded document, as amended, shall be consistent with the Charleston District model conservation restrictions at the

time of amendment. Amendment shall be allowed at the discretion of the Corps *and* DHEC, in consultation with resource agencies as appropriate, and then only in exceptional circumstances. Compensatory mitigation for any adverse impacts associated with an amendment will be required pursuant to Charleston District mitigation policy at the time of amendment. There shall be no obligation to allow an amendment. Consistent with the terms and conditions of Permit SAC _____, these restrictive covenants shall be released and removed in their entirety at such time as the United States Forest Service becomes the owner of the Property, and so long as such removal is accomplished by a recorded document signed by the Corps and DHEC and the Declarant. Thereafter, these covenants shall be of no further force and effect.

3. **Notice to Government.** Any permit application, or request for certification or modification, which may affect the Property, made to any governmental entity with authority over wetlands or other waters of the United States, shall expressly reference and include a copy (with the recording stamp) of these restrictive covenants.

4. **Reserved Rights.** It is expressly understood and agreed that these restrictive covenants do not grant or convey to members of the general public any rights of ownership, entry or use of the Property. These restrictive covenants are created solely for the protection of the Property, and for the consideration and values set forth above, and Declarant reserves the ownership of the fee simple estate and all rights appertaining thereto, including without limitation the rights to exclude others and to use the property for all purposes not inconsistent with these restrictive covenants.

5. **Compliance Inspections.** Upon prior notice to the Declarant, the Corps, DHEC, and their authorized agents shall have the right to enter and go upon the lands of Declarant, to inspect the Property and take actions necessary to verify compliance with these restrictive covenants.

6. **Enforcement.** The Declarant grants to the Corps, the U.S. Department of Justice, and/or DHEC, a discretionary right to enforce these restrictive covenants in a judicial action against any person(s) or other entity(ies) violating or attempting to violate these restrictive covenants; provided, however, that no violation of these restrictive covenants shall result in a forfeiture or reversion of title. In any enforcement action, an enforcing agency shall be entitled to a complete restoration for any violation, as well as any other judicial remedy such as civil penalties. Nothing herein shall limit the right of the Corps to modify, suspend, or revoke the Permit.

7. **Property Transfers.** Except where ownership of the Property transfers to the United States Forest Service consistent with Permit SAC _____, Declarant shall include the following notice on all deeds, mortgages, plats, or any other legal instruments used to convey any interest in the Property (failure to comply with this paragraph does not impair the validity or enforceability of these restrictive covenants):

NOTICE: This Property Subject to Declaration of Restrictive
Covenants Recorded at *[insert book and page references,*
county(ies), and date of recording].

8. **Marking of Property.** The perimeter of the Property shall at all times be plainly marked by permanent signs saying, "Protected Natural Area," or by an equivalent, permanent marking system.

9. **Recording of Plat.** A plat depicting the boundaries of the Property subject to these restrictive covenants shall be recorded in the deed records office for each county in which the Property is situated prior to the recording of these restrictive covenants. The plat(s) are recorded at L17-0597 and 0678-834, Charleston County, 11/8/2017.

10. **Long-Term Management.** In accordance with 33 C.F.R. Part 332, Declarant is responsible for any long-term management activities that are necessary to ensure that the Property sustain the aquatic resource functions with the Cooper River watershed, HUC code: 03050201. These activities include but are not limited to management activities (invasive species, prescribed fire, etc) and maintenance and/or replacement of structures (fences, ditch plugs, weirs, etc).

11. **Separability Provision.** Should any separable part of these restrictive covenants be held contrary to law, the remainder shall continue in full force and effect.

IN WITNESS WHEREOF, the Declarant has duly executed this Declaration of Restrictive Covenants the date written above.

[SIGNATURE PAGES TO FOLLOW]

IN THE PRESENCE OF:

Declarant – Strategic Conservation Partners, LLC.

Printed Name: _____

By: _____
[TYPE NAME]

Its: _____

Printed Name: _____

STATE OF SOUTH CAROLINA)
) ss.
COUNTY OF _____)

I, a Notary Public, do hereby certify that _____ personally
appeared before me this day and acknowledged the due execution of the foregoing instrument.

WITNESS my hand and seal this _____ day of _____, 2018.

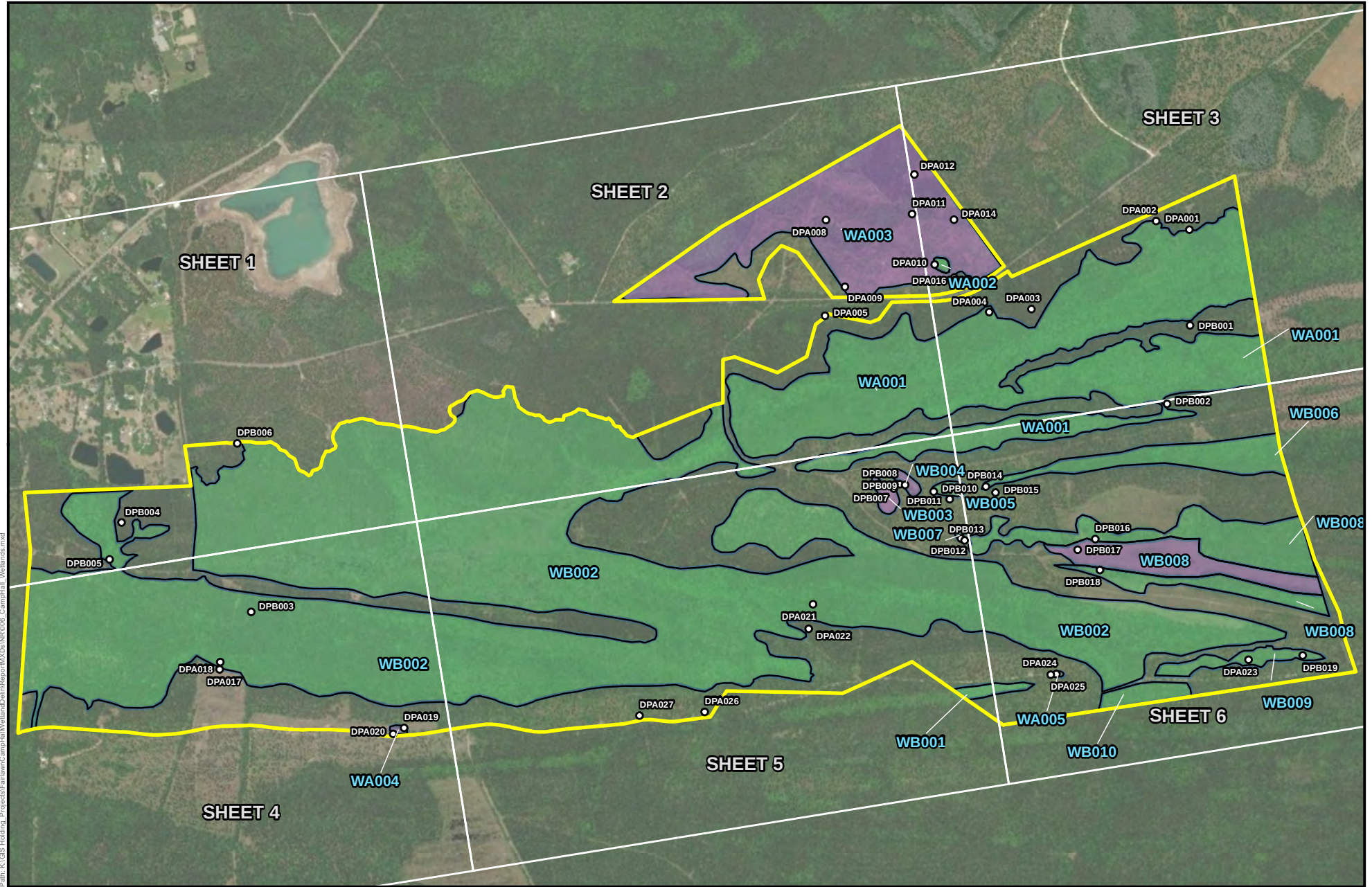
(Signature of Notary Public)

(Typed/Printed name of Notary Public)

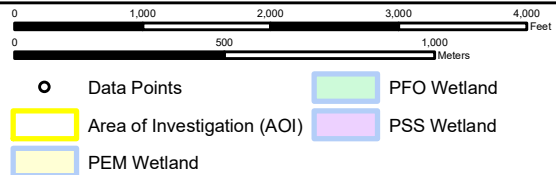
NOTARY PUBLIC FOR SOUTH CAROLINA

My Commission Expires: _____

APPENDIX D
WETLAND DELINEATION OVERVIEW MAP AND
WETLAND DELINEATION DATA FORMS



FAIRLAWN C-1 SITE
SWCA WETLAND DELINEATION
OVERVIEW MAP
Berkeley County and
Charleston County, South Carolina



Background:	USGS 7.5' Topographic Map
Scale:	1:18,000
Created By:	EWS
Approved By:	HSM
SWCA Project No.:	050452.00
Date Produced:	September 13, 2018

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 16, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA001
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.01865 Long: -79.72391 Datum: NAD 83
 Soil Map Unit Name: Rg – Rutlege loamy fine sand NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: This point was determined not to be within a wetland due to the lack of hydric soils and wetland hydrology. Upland datapoint associated with WA001	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

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

 Sampling Point: DPA001

	Absolute % cover	Dominant Species?	Indicator Status																													
Tree Stratum (Plot size: <u>30 ft.</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																												
1. <u>None Observed</u>																																
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
			= Total Cover																													
50% of total cover: _____			20% of total cover: _____																													
Sapling Stratum (Plot size: <u>30 ft.</u>)					Prevalence Index Worksheet: <table style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2">Total % Cover of:</td> <td colspan="2">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td><u>0</u></td> <td>x 1 =</td> <td><u>0</u></td> </tr> <tr> <td>FACW species</td> <td><u>0</u></td> <td>x 2 =</td> <td><u>0</u></td> </tr> <tr> <td>FAC species</td> <td><u>65</u></td> <td>x 3 =</td> <td><u>195</u></td> </tr> <tr> <td>FACU species</td> <td><u>0</u></td> <td>x 4 =</td> <td><u>0</u></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x 5 =</td> <td><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td><u>65</u></td> <td>(A)</td> <td><u>195</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.00</u>	Total % Cover of:		Multiply by:		OBL species	<u>0</u>	x 1 =	<u>0</u>	FACW species	<u>0</u>	x 2 =	<u>0</u>	FAC species	<u>65</u>	x 3 =	<u>195</u>	FACU species	<u>0</u>	x 4 =	<u>0</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>65</u>	(A)
Total % Cover of:		Multiply by:																														
OBL species	<u>0</u>	x 1 =	<u>0</u>																													
FACW species	<u>0</u>	x 2 =	<u>0</u>																													
FAC species	<u>65</u>	x 3 =	<u>195</u>																													
FACU species	<u>0</u>	x 4 =	<u>0</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>65</u>	(A)	<u>195</u> (B)																													
1. <u>Pinus taeda</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>																													
2. <u>Liquidambar styraciflua</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>																													
3. _____																																
4. _____																																
5. _____																																
6. _____																																
			= Total Cover																													
50% of total cover: <u>25</u>			20% of total cover: <u>10</u>																													
Shrub Stratum (Plot size: <u>30 ft.</u>)				Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤ 3.0 ¹ <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)																												
1. <u>Morella cerifera</u>	<u>5</u>	<u>No</u>	<u>FAC</u>																													
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
			= Total Cover																													
50% of total cover: <u>2.5</u>			20% of total cover: <u>1</u>																													
Herb Stratum (Plot size: <u>30 ft.</u>)					Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.																											
1. <u>None Observed</u>																																
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
7. _____																																
8. _____																																
9. _____																																
10. _____																																
11. _____																																
			= Total Cover																													
50% of total cover: _____			20% of total cover: _____																													
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				Hydrophytic Vegetation Present? Yes <u>X</u> No _____																												
1. <u>Vitis rotundifolia</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>																													
2. _____																																
3. _____																																
4. _____																																
5. _____																																
			= Total Cover																													
50% of total cover: <u>5</u>			20% of total cover: <u>2</u>																													

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 3/1	100	None	—	—	—	Sand	
6-20	10YR 5/3	100	None	—	—	—	Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 16, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA002
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.01831 Long: -79.72511 Datum: NAD 83
 Soil Map Unit Name: Rg - Rutledge loamy fine sand NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria. Wetland datapoint is classified as a PFO and is associated with WA001	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) <u>X</u> High Water Table (A2) _____ Marl Deposits (B15) (LRR U) <u>X</u> Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>6"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>1</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

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

 Sampling Point: DPA002

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status															
1. <u>Pinus taeda</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
30 = Total Cover				Prevalence Index Worksheet: <table style="width: 100%;"> <tr> <th style="text-align: left;">Total % Cover of:</th> <th style="text-align: right;">Multiply by:</th> </tr> <tr> <td>OBL species <u>40</u></td> <td>x 1 = <u>40</u></td> </tr> <tr> <td>FACW species <u>20</u></td> <td>x 2 = <u>40</u></td> </tr> <tr> <td>FAC species <u>60</u></td> <td>x 3 = <u>180</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>120</u></td> <td>(A) <u>260</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.17</u>	Total % Cover of:	Multiply by:	OBL species <u>40</u>	x 1 = <u>40</u>	FACW species <u>20</u>	x 2 = <u>40</u>	FAC species <u>60</u>	x 3 = <u>180</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>120</u>	(A) <u>260</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>40</u>	x 1 = <u>40</u>																	
FACW species <u>20</u>	x 2 = <u>40</u>																	
FAC species <u>60</u>	x 3 = <u>180</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>120</u>	(A) <u>260</u> (B)																	
50% of total cover: <u>15</u> 20% of total cover: <u>6</u>																		
Sapling Stratum (Plot size: <u>30 ft.</u>)																		
1. <u>None Observed</u>	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
_____ = Total Cover																		
50% of total cover: _____ 20% of total cover: _____																		
Shrub Stratum (Plot size: <u>30 ft.</u>)																		
1. <u>None Observed</u>	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
_____ = Total Cover																		
50% of total cover: _____ 20% of total cover: _____																		
Herb Stratum (Plot size: <u>30 ft.</u>)																		
1. <u>Carex glaucescens</u>	<u>40</u>	<u>Yes</u>	<u>OBL</u>															
2. <u>Andropogon virginicus</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>															
3. <u>Clethra alnifolia</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
90 = Total Cover																		
50% of total cover: <u>45</u> 20% of total cover: <u>18</u>																		
Woody Vine Stratum (Plot size: <u>30 ft.</u>)																		
1. <u>None Observed</u>	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
_____ = Total Cover																		
50% of total cover: _____ 20% of total cover: _____																		

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index is ≤ 3.0¹

_____ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation

Present? Yes X No _____

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	7.5YR 2.5/1	95	7.5YR 3/3	5	C	PL	Sandy Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐**Remarks:**

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 17, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA003
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.01393 Long: -79.72721 Datum: NAD 83
 Soil Map Unit Name: Rg - Rutlege loamy fine sand NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: This point was determined not to be within a wetland due to the lack of hydric soils and wetland hydrology. Upland datapoint associated with WA001	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) _____ Drainage Patterns (B10) <u>X</u> _____ 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)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>9</u> (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

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

 Sampling Point: DPA003

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status																													
1. <u>Liquidambar styraciflua</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67%</u> (A/B)																												
2. <u>Magnolia virginiana</u>	<u>10</u>	<u>No</u>	<u>FACW</u>																													
3. <u>Pinus taeda</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
80 = Total Cover																																
50% of total cover: <u>40</u>		20% of total cover: <u>16</u>																														
Sapling Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>None Observed</u>	_____	_____	_____	Prevalence Index Worksheet: <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">Total % Cover of:</td> <td style="width: 10%;"></td> <td style="width: 10%;">Multiply by:</td> <td style="width: 40%;"></td> </tr> <tr> <td>OBL species</td> <td><u>0</u></td> <td>x 1 =</td> <td><u>0</u></td> </tr> <tr> <td>FACW species</td> <td><u>20</u></td> <td>x 2 =</td> <td><u>40</u></td> </tr> <tr> <td>FAC species</td> <td><u>90</u></td> <td>x 3 =</td> <td><u>270</u></td> </tr> <tr> <td>FACU species</td> <td><u>20</u></td> <td>x 4 =</td> <td><u>80</u></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x 5 =</td> <td><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td><u>130</u></td> <td>(A)</td> <td><u>390</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.00</u>	Total % Cover of:		Multiply by:		OBL species	<u>0</u>	x 1 =	<u>0</u>	FACW species	<u>20</u>	x 2 =	<u>40</u>	FAC species	<u>90</u>	x 3 =	<u>270</u>	FACU species	<u>20</u>	x 4 =	<u>80</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>130</u>	(A)	<u>390</u> (B)
Total % Cover of:		Multiply by:																														
OBL species	<u>0</u>	x 1 =	<u>0</u>																													
FACW species	<u>20</u>	x 2 =	<u>40</u>																													
FAC species	<u>90</u>	x 3 =	<u>270</u>																													
FACU species	<u>20</u>	x 4 =	<u>80</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>130</u>	(A)	<u>390</u> (B)																													
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
_____ = Total Cover																																
50% of total cover: _____		20% of total cover: _____																														
Shrub Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>Callicarpa americana</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤ 3.0 ¹ <u>_____</u> Problematic Hydrophytic Vegetation ¹ (Explain)																												
2. <u>Magnolia virginiana</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
20 = Total Cover																																
50% of total cover: <u>10</u>		20% of total cover: <u>4</u>																														
Herb Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>Deparia acrostichoides</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.																												
2. <u>Callicarpa americana</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
20 = Total Cover																																
50% of total cover: <u>10</u>		20% of total cover: <u>4</u>																														
Woody Vine Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>Vitis rotundifolia</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Present? Yes <u>X</u> No _____																												
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
10 = Total Cover																																
50% of total cover: <u>5</u>		20% of total cover: <u>2</u>																														

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3							Organic Soil Layer	
3-8	10YR 4/1	100	None	—	—	—	Sand	
8-9	10YR 4/2	100	None	—	—	—	Sand	
9-20	10YR 2/2	100	None	—	—	—	Sandy Loam	saturated

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 17, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA004
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.01314 Long: -79.72845 Datum: NAD 83
 Soil Map Unit Name: Rg - Rutlege loamy fine sand NWI Classification: PFO4A
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria. Wetland datapoint is classified as PFO and is associated with WA001	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) <u>X</u> _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) <u>X</u> _____ Inundation Visible on Aerial Imagery (B7) <u>X</u> _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> _____ FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

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

 Sampling Point: DPA004

Tree Stratum	Plot size: <u>30 ft.</u>	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Fraxinus pennsylvanica</i>		30	Yes	FACW
2. <i>Liquidambar styraciflua</i>		30	Yes	FAC
3. <i>Quercus nigra</i>		10	No	FAC
4. <i>Pinus taeda</i>		10	No	FAC
5. <i>Acer rubrum</i>		10	No	FAC
6. <i>Magnolia virginiana</i>		10	No	FACW
		100 = Total Cover		
50% of total cover:		50	20% of total cover:	20

Sapling Stratum	Plot size: <u>30 ft.</u>	Absolute % cover	Dominant Species?	Indicator Status
1. <i>None Observed</i>				
2.				
3.				
4.				
5.				
6.				
		= Total Cover		
50% of total cover:			20% of total cover:	

Shrub Stratum	Plot size: <u>30 ft.</u>	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Fraxinus pennsylvanica</i>		30	Yes	FACW
2. <i>Liquidambar styraciflua</i>		30	Yes	FAC
3. <i>Quercus nigra</i>		10	No	FAC
4. <i>Pinus taeda</i>		10	No	FAC
5. <i>Acer rubrum</i>		10	No	FAC
6. <i>Magnolia virginiana</i>		10	No	FACW
		100 = Total Cover		
50% of total cover:		50	20% of total cover:	20

Herb Stratum	Plot size: <u>30 ft.</u>	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Deparia acrostichoides</i>		5	Yes	FAC
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
		5 = Total Cover		
50% of total cover:		2.5	20% of total cover:	1

Woody Vine Stratum	Plot size: <u>30 ft.</u>	Absolute % cover	Dominant Species?	Indicator Status
1. <i>None Observed</i>				
2.				
3.				
4.				
5.				
		= Total Cover		
50% of total cover:			20% of total cover:	

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% (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>80</u>	x 2 = <u>160</u>
FAC species <u>125</u>	x 3 = <u>375</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>205</u>	(A) <u>535</u> (B)

Prevalence Index = B/A = 2.61

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index is ≤ 3.0¹

 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation

Present? Yes X No

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3							Organic Soil Layer	
3-9	10YR 3/1	100	None	—	—	—	Loamy Sand	
9-20	10YR 3/2	95	10YR 5/8	5	C	M	Loamy Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)**

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR S, T, U)
☐ Histic Epipedon (A2)	☐ Thin Dark Surface (S9) (LRR S, T, U)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (LRR O)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5)	☐ Depleted Matrix (F3)
☐ Organic Bodies (A6) (LRR P, T, U)	☐ Redox Dark Surface (F6)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)	☐ Depleted Dark Surface (F7)
☐ Muck Presence (A8) (LRR U)	☐ Redox Depressions (F8)
☐ 1 cm Muck (A9) (LRR P, T)	☐ Marl (F10) (LRR U)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Ochric (F11) (MLRA 151)
☐ Thick Dark Surface (A12)	☐ Iron-Manganese Masses (F12) (LRR O, P, T)
☐ Coast Prairie Redox (A16) (MLRA 150A)	☐ Umbric Surface (F13) (LRR P, T, U)
☐ Sandy Mucky Mineral (S1) (LRR O, S)	☐ Delta Ochric (F17) (MLRA 151)
☐ Sandy Gleyed Matrix (S4)	☐ Reduced Vertic (F18) (MLRA 150A, 150B)
☒ Sandy Redox (S5)	☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
☐ Stripped Matrix (S6)	☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)
☐ Dark Surface (S7) (LRR P, S, T, U)	

Indicators for Problematic Hydric Soils³:

☐ 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)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**
 Type: _____
 Depth (inches): _____
Hydric Soil Present? Yes ☒ No ☐**Remarks:**

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 17, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA005
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): None Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.01028 Long: -79.73345 Datum: NAD 83
 Soil Map Unit Name: Cm - Chipley-Echaw complex NWI Classification: PFO4B
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: This point was determined not to be within a wetland due to the lack of wetland hydrology. Upland datapoint associated with WA001	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

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

 Sampling Point: DPA005

Tree Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Pinus taeda</i>		5	Yes	FAC
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
		5 = Total Cover		
50% of total cover:		2.5	20% of total cover: 1	

Sapling Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>None Observed</i>		_____	_____	_____
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
		_____ = Total Cover		
50% of total cover:		_____	20% of total cover: _____	

Shrub Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Ilex cassine</i>		50	Yes	FACW
2. <i>Quercus nigra</i>		20	Yes	FAC
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
		70 = Total Cover		
50% of total cover:		35	20% of total cover: 14	

Herb Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Deparia acrostichoides</i>		5	Yes	FAC
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
7. _____		_____	_____	_____
8. _____		_____	_____	_____
9. _____		_____	_____	_____
10. _____		_____	_____	_____
11. _____		_____	_____	_____
		5 = Total Cover		
50% of total cover:		2.5	20% of total cover: 1	

Woody Vine Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>None Observed</i>		_____	_____	_____
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
		_____ = Total Cover		
50% of total cover:		_____	20% of total cover: _____	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>50</u>	x 2 = <u>100</u>
FAC species <u>30</u>	x 3 = <u>90</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>80</u>	(A) <u>190</u> (B)

 Prevalence Index = B/A = 2.38
Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☒ 3 - Prevalence Index is ≤ 3.0¹
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic
Vegetation

Present? Yes X No

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR 5/2	98	10YR 5/8	2	C	M	Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐**Remarks:**

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Berkeley Sampling Date: July 17, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA008
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): Convex Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.01279 Long: -79.73534 Datum: NAD 83
 Soil Map Unit Name: Pk - Pickney loamy fine sand NWI Classification: PSS3B
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria.	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>1</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

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

 Sampling Point: DPA008

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status																													
1. <u>None Observed</u>				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75%</u> (A/B)																												
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
		= Total Cover																														
50% of total cover: _____		20% of total cover: _____																														
Sapling Stratum (Plot size: <u>30 ft.</u>)				Prevalence Index Worksheet: <table style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: right;">Total % Cover of:</td> <td colspan="2" style="text-align: right;">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td style="text-align: center;"><u>0</u></td> <td>x 1 =</td> <td style="text-align: center;"><u>0</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align: center;"><u>30</u></td> <td>x 2 =</td> <td style="text-align: center;"><u>60</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align: center;"><u>45</u></td> <td>x 3 =</td> <td style="text-align: center;"><u>135</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align: center;"><u>10</u></td> <td>x 4 =</td> <td style="text-align: center;"><u>40</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align: center;"><u>0</u></td> <td>x 5 =</td> <td style="text-align: center;"><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align: center;"><u>85</u></td> <td>(A)</td> <td style="text-align: center;"><u>235</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.76</u>	Total % Cover of:		Multiply by:		OBL species	<u>0</u>	x 1 =	<u>0</u>	FACW species	<u>30</u>	x 2 =	<u>60</u>	FAC species	<u>45</u>	x 3 =	<u>135</u>	FACU species	<u>10</u>	x 4 =	<u>40</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>85</u>	(A)	<u>235</u> (B)
Total % Cover of:		Multiply by:																														
OBL species	<u>0</u>	x 1 =	<u>0</u>																													
FACW species	<u>30</u>	x 2 =	<u>60</u>																													
FAC species	<u>45</u>	x 3 =	<u>135</u>																													
FACU species	<u>10</u>	x 4 =	<u>40</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>85</u>	(A)	<u>235</u> (B)																													
1. <u>Vaccinium arboreum</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>																													
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
		= Total Cover																														
50% of total cover: <u>5</u>		20% of total cover: <u>2</u>																														
Shrub Stratum (Plot size: <u>30 ft.</u>)				Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤ 3.0 ¹ <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)																												
1. <u>Liquidambar styraciflua</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>																													
2. <u>Ilex cassine</u>	<u>30</u>	<u>Yes</u>	<u>FACW</u>																													
3. <u>Morella cerifera</u>	<u>5</u>	<u>No</u>	<u>FAC</u>																													
4. <u>Pinus taeda</u>	<u>5</u>	<u>No</u>	<u>FAC</u>																													
5. _____																																
6. _____																																
		= Total Cover																														
50% of total cover: <u>35</u>		20% of total cover: <u>14</u>																														
Herb Stratum (Plot size: <u>30 ft.</u>)				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.																												
1. <u>Andropogon virginicus</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>																													
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
7. _____																																
8. _____																																
9. _____																																
10. _____																																
11. _____																																
		= Total Cover																														
50% of total cover: <u>2.5</u>		20% of total cover: <u>1</u>																														
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				Hydrophytic Vegetation Present? Yes <u>X</u> No _____																												
1. <u>None Observed</u>																																
2. _____																																
3. _____																																
4. _____																																
5. _____																																
		= Total Cover																														
50% of total cover: _____		20% of total cover: _____																														

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 3/1	98	7.5YR 5/4	2	C	M	Loamy Sand	
6-20	10YR 5/6	100					Loamy Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)**

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR S, T, U)
☐ Histic Epipedon (A2)	☐ Thin Dark Surface (S9) (LRR S, T, U)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (LRR O)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5)	☐ Depleted Matrix (F3)
☐ Organic Bodies (A6) (LRR P, T, U)	☐ Redox Dark Surface (F6)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)	☐ Depleted Dark Surface (F7)
☐ Muck Presence (A8) (LRR U)	☐ Redox Depressions (F8)
☐ 1 cm Muck (A9) (LRR P, T)	☐ Marl (F10) (LRR U)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Ochric (F11) (MLRA 151)
☐ Thick Dark Surface (A12)	☐ Iron-Manganese Masses (F12) (LRR O, P, T)
☐ Coast Prairie Redox (A16) (MLRA 150A)	☐ Umbric Surface (F13) (LRR P, T, U)
☐ Sandy Mucky Mineral (S1) (LRR O, S)	☐ Delta Ochric (F17) (MLRA 151)
☐ Sandy Gleyed Matrix (S4)	☐ Reduced Vertic (F18) (MLRA 150A, 150B)
☒ Sandy Redox (S5)	☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
☐ Stripped Matrix (S6)	☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)
☐ Dark Surface (S7) (LRR P, S, T, U)	

Indicators for Problematic Hydric Soils³:

☐ 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)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**
 Type: _____
 Depth (inches): _____
Hydric Soil Present? Yes ☒ No ☐**Remarks:**

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Berkeley Sampling Date: July 17, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA009
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.01136 Long: -79.73342 Datum: NAD 83
 Soil Map Unit Name: Ct - Chipley-Echaw complex NWI Classification: PFO1C
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria.	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <u>X</u> Surface Water (A1) _____ Aquatic Fauna (B13) <u>X</u> High Water Table (A2) _____ Marl Deposits (B15) (LRR U) <u>X</u> Saturation (A3) <u>X</u> Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>3</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>1</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____	

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

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

 Sampling Point: DPA009

Tree Stratum	Absolute % cover	Dominant Species?	Indicator Status	Dominance Test worksheet:																												
(Plot size: <u>30 ft.</u>)																																
1. <u>None Observed</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)																												
2. _____																																
3. _____				Total Number of Dominant Species Across All Strata: <u>2</u> (B)																												
4. _____																																
5. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																												
6. _____																																
= Total Cover																																
50% of total cover: _____ 20% of total cover: _____																																
Sapling Stratum (Plot size: <u>30 ft.</u>)				Prevalence Index Worksheet:																												
1. <u>None Observed</u>				<table border="0" style="width: 100%;"> <tr> <td colspan="2">Total % Cover of:</td> <td colspan="2">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td><u>0</u></td> <td>x 1 =</td> <td><u>0</u></td> </tr> <tr> <td>FACW species</td> <td><u>30</u></td> <td>x 2 =</td> <td><u>60</u></td> </tr> <tr> <td>FAC species</td> <td><u>25</u></td> <td>x 3 =</td> <td><u>75</u></td> </tr> <tr> <td>FACU species</td> <td><u>5</u></td> <td>x 4 =</td> <td><u>20</u></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x 5 =</td> <td><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td><u>60</u></td> <td>(A)</td> <td><u>155</u> (B)</td> </tr> </table>	Total % Cover of:		Multiply by:		OBL species	<u>0</u>	x 1 =	<u>0</u>	FACW species	<u>30</u>	x 2 =	<u>60</u>	FAC species	<u>25</u>	x 3 =	<u>75</u>	FACU species	<u>5</u>	x 4 =	<u>20</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>60</u>	(A)	<u>155</u> (B)
Total % Cover of:		Multiply by:																														
OBL species	<u>0</u>	x 1 =	<u>0</u>																													
FACW species	<u>30</u>	x 2 =	<u>60</u>																													
FAC species	<u>25</u>	x 3 =	<u>75</u>																													
FACU species	<u>5</u>	x 4 =	<u>20</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>60</u>	(A)	<u>155</u> (B)																													
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
= Total Cover				Prevalence Index = B/A = <u>2.58</u>																												
50% of total cover: _____ 20% of total cover: _____																																
Shrub Stratum (Plot size: <u>30 ft.</u>)				Hydrophytic Vegetation Indicators:																												
1. <u>None Observed</u>				<u>1</u> - Rapid Test for Hydrophytic Vegetation ☒ <u>2</u> - Dominance Test is >50% ☒ <u>3</u> - Prevalence Index is ≤ 3.0 ¹ _____ Problematic Hydrophytic Vegetation ¹ (Explain)																												
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
= Total Cover				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																												
50% of total cover: _____ 20% of total cover: _____																																
Herb Stratum (Plot size: <u>30 ft.</u>)				Definitions of Five Vegetation Strata:																												
1. <u>Rhynchospora microcephala</u>	<u>30</u>	<u>Yes</u>	<u>FACW</u>	Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).																												
2. <u>Deparia acrostichoides</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.																												
3. <u>Andropogon virginicus</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.																												
4. <u>Sorghum halepense</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height.																												
5. _____				Woody vine - All woody vines, regardless of height.																												
6. _____																																
7. _____																																
8. _____																																
9. _____																																
10. _____																																
11. _____																																
60 = Total Cover																																
50% of total cover: <u>30</u> 20% of total cover: <u>12</u>																																
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				Hydrophytic Vegetation																												
1. <u>None Observed</u>				Present? Yes <u>X</u> No _____																												
2. _____																																
3. _____																																
4. _____																																
5. _____																																
= Total Cover																																
50% of total cover: _____ 20% of total cover: _____																																

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2								Organic Layer
2-4	10YR 3/1	100	None	—	—	—	Sand	
4-16	10YR 4/1	100	None	—	—	—	Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Berkeley Sampling Date: July 18, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA010
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.01345 Long: -79.73108 Datum: NAD 83
 Soil Map Unit Name: Ct - Chipley-Echaw complex NWI Classification: PSS1/2C
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria. Wetland is classified as a PFO wetland and is associated with wetland WA002	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <u>X</u> Surface Water (A1) _____ Aquatic Fauna (B13) <u>X</u> High Water Table (A2) _____ Marl Deposits (B15) (LRR U) <u>X</u> Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) <u>X</u> Oxidized Rhizospheres on Living Roots (C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) _____ Drainage Patterns (B10) <u>X</u> Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>3</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>6</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>Surface</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

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

 Sampling Point: DPA010

Tree Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Quercus nigra</i>		30	Yes	FAC
2. <i>Pinus taeda</i>		10	Yes	FAC
3. _____				
4. _____				
5. _____				
6. _____				
		40 = Total Cover		
50% of total cover:		20	20% of total cover:	8
Sapling Stratum (Plot size: <u>30 ft.</u>)				
1. <i>None Observed</i>				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
50% of total cover:			20% of total cover:	
Shrub Stratum (Plot size: <u>30 ft.</u>)				
1. <i>Ilex cassine</i>		20	Yes	FACW
2. <i>Liquidambar styraciflua</i>		5	No	FAC
3. <i>Morella cerifera</i>		5	No	FAC
4. <i>Pinus taeda</i>		5	No	FAC
5. _____				
6. _____				
		35 = Total Cover		
50% of total cover:		17.5	20% of total cover:	7
Herb Stratum (Plot size: <u>30 ft.</u>)				
1. <i>Andropogon virginicus</i>		30	Yes	FAC
2. <i>Deparia acrostichoides</i>		10	Yes	FAC
3. <i>Carex glaucescens</i>		10	Yes	OBL
4. <i>Rhynchospora microcephala</i>		10	Yes	FACW
5. <i>Clethra alnifolia</i>		5	No	FACW
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
		65 = Total Cover		
50% of total cover:		32.5	20% of total cover:	13
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. <i>None Observed</i>				
2. _____				
3. _____				
4. _____				
5. _____				
50% of total cover:			20% of total cover:	

Dominance Test worksheet:			
Number of Dominant Species That Are OBL, FACW, or FAC: <u>7</u> (A)			
Total Number of Dominant Species Across All Strata: <u>7</u> (B)			
Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)			
Prevalence Index Worksheet:			
Total % Cover of:		Multiply by:	
OBL species	<u>10</u>	x 1 =	<u>10</u>
FACW species	<u>35</u>	x 2 =	<u>70</u>
FAC species	<u>95</u>	x 3 =	<u>285</u>
FACU species	<u>0</u>	x 4 =	<u>0</u>
UPL species	<u>0</u>	x 5 =	<u>0</u>
Column Totals:	<u>140</u>	(A)	<u>365</u> (B)
Prevalence Index = B/A = <u>2.61</u>			
Hydrophytic Vegetation Indicators:			
<u>1</u> - Rapid Test for Hydrophytic Vegetation			
☒ <u>2</u> - Dominance Test is >50%			
☒ <u>3</u> - Prevalence Index is ≤ 3.0 ¹			
<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)			
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.			
Definitions of Five Vegetation Strata:			
Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).			
Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.			
Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.			
Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height.			
Woody vine - All woody vines, regardless of height.			
Hydrophytic Vegetation			
Present?	Yes	<u>X</u>	No <u> </u>

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR 2/1	98	10YR 3/6	2	C	PL	Sandy Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐**Remarks:**

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Berkeley Sampling Date: July 18, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA011
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.01439 Long: -79.73279 Datum: NAD 83
 Soil Map Unit Name: Ct - Chipley-Echaw complex NWI Classification: PSS3B
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria. Upland datapoint for NWI disprove	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <u>X</u> Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>1</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		

Remarks: A positive indication of wetland hydrology was observed (at least one primary indicator).
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VEGETATION (Five Strata) - Use scientific names of plants.

 Sampling Point: DPA011

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status																													
1. <u>None Observed</u>				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67%</u> (A/B)																												
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
		= Total Cover																														
50% of total cover: _____		20% of total cover: _____																														
Sapling Stratum (Plot size: <u>30 ft.</u>)				Prevalence Index Worksheet: <table style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: center;">Total % Cover of:</td> <td colspan="2" style="text-align: center;">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td style="text-align: center;"><u>0</u></td> <td>x 1 =</td> <td style="text-align: center;"><u>0</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align: center;"><u>55</u></td> <td>x 2 =</td> <td style="text-align: center;"><u>110</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align: center;"><u>25</u></td> <td>x 3 =</td> <td style="text-align: center;"><u>75</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align: center;"><u>10</u></td> <td>x 4 =</td> <td style="text-align: center;"><u>40</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align: center;"><u>0</u></td> <td>x 5 =</td> <td style="text-align: center;"><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align: center;"><u>90</u></td> <td>(A)</td> <td style="text-align: center;"><u>225</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.50</u>	Total % Cover of:		Multiply by:		OBL species	<u>0</u>	x 1 =	<u>0</u>	FACW species	<u>55</u>	x 2 =	<u>110</u>	FAC species	<u>25</u>	x 3 =	<u>75</u>	FACU species	<u>10</u>	x 4 =	<u>40</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>90</u>	(A)	<u>225</u> (B)
Total % Cover of:		Multiply by:																														
OBL species	<u>0</u>	x 1 =	<u>0</u>																													
FACW species	<u>55</u>	x 2 =	<u>110</u>																													
FAC species	<u>25</u>	x 3 =	<u>75</u>																													
FACU species	<u>10</u>	x 4 =	<u>40</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>90</u>	(A)	<u>225</u> (B)																													
1. <u>Ilex cassine</u>	50	Yes	FACW																													
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
		= Total Cover																														
50% of total cover: _____		20% of total cover: <u>10</u>																														
Shrub Stratum (Plot size: <u>30 ft.</u>)				Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤ 3.0 ¹ <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)																												
1. <u>Magnolia grandiflora</u>	20	Yes	FAC																													
2. <u>Morella cerifera</u>	5	No	FAC																													
3. <u>Ilex cassine</u>	5	No	FACW																													
4. <u>Vaccinium arboreum</u>	10	Yes	FACU																													
5. _____																																
6. _____																																
		= Total Cover																														
50% of total cover: _____		20% of total cover: <u>8</u>																														
Herb Stratum (Plot size: <u>30 ft.</u>)				Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.																												
1. <u>None Observed</u>																																
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
7. _____																																
8. _____																																
9. _____																																
10. _____																																
11. _____																																
		= Total Cover																														
50% of total cover: _____		20% of total cover: _____																														
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				Hydrophytic Vegetation Present? Yes <u>X</u> No _____																												
1. <u>None Observed</u>																																
2. _____																																
3. _____																																
4. _____																																
5. _____																																
		= Total Cover																														
50% of total cover: _____		20% of total cover: _____																														

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR 2/1	98	10YR 3/6	2	C	M	Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Berkeley Sampling Date: July 19, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA012
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 00-06
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.01547 Long: -79.73351 Datum: NAD 84
 Soil Map Unit Name: Ct - Chipley-Echaw complex NWI Classification: PFO1/2F
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria.	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) <u>X</u> Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) <u>X</u> Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____	

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

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

 Sampling Point: DPA012

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status																													
1. <u>None Observed</u>				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																												
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
		= Total Cover																														
50% of total cover: _____		20% of total cover: _____																														
Sapling Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>None Observed</u>				Prevalence Index Worksheet: <table style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: right;">Total % Cover of:</td> <td colspan="2" style="text-align: right;">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td style="text-align: center;"><u>5</u></td> <td>x 1 =</td> <td style="text-align: center;"><u>5</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align: center;"><u>20</u></td> <td>x 2 =</td> <td style="text-align: center;"><u>40</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align: center;"><u>65</u></td> <td>x 3 =</td> <td style="text-align: center;"><u>195</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align: center;"><u>0</u></td> <td>x 4 =</td> <td style="text-align: center;"><u>0</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align: center;"><u>0</u></td> <td>x 5 =</td> <td style="text-align: center;"><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align: center;"><u>90</u></td> <td>(A)</td> <td style="text-align: center;"><u>240</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.67</u>	Total % Cover of:		Multiply by:		OBL species	<u>5</u>	x 1 =	<u>5</u>	FACW species	<u>20</u>	x 2 =	<u>40</u>	FAC species	<u>65</u>	x 3 =	<u>195</u>	FACU species	<u>0</u>	x 4 =	<u>0</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>90</u>	(A)	<u>240</u> (B)
Total % Cover of:		Multiply by:																														
OBL species	<u>5</u>	x 1 =	<u>5</u>																													
FACW species	<u>20</u>	x 2 =	<u>40</u>																													
FAC species	<u>65</u>	x 3 =	<u>195</u>																													
FACU species	<u>0</u>	x 4 =	<u>0</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>90</u>	(A)	<u>240</u> (B)																													
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
		= Total Cover																														
50% of total cover: _____		20% of total cover: _____																														
Shrub Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>Taxodium distichum</u>	30	Yes	FAC	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤ 3.0 ¹ <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)																												
2. <u>Pinus taeda</u>	10	Yes	FAC																													
3. <u>Liquidambar styraciflua</u>	5	No	FAC																													
4. <u>Morella cerifera</u>	5	No	FAC																													
5. _____																																
6. _____																																
		50 = Total Cover																														
50% of total cover: <u>25</u>		20% of total cover: <u>10</u>																														
Herb Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>Rhynchospora microcephala</u>	20	Yes	FACW	Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.																												
2. <u>Deparia acrostichoides</u>	15	Yes	FAC																													
3. <u>Iris virginica</u>	5	No	OBL																													
4. _____																																
5. _____																																
6. _____																																
7. _____																																
8. _____																																
9. _____																																
10. _____																																
11. _____																																
		40 = Total Cover																														
50% of total cover: <u>20</u>		20% of total cover: <u>8</u>																														
Woody Vine Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>None Observed</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____																												
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
		= Total Cover																														
50% of total cover: _____		20% of total cover: _____																														

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	7.5YR 2.5/1	100	None	—	—	—	Loamy Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)**

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR S, T, U)
☐ Histic Epipedon (A2)	☐ Thin Dark Surface (S9) (LRR S, T, U)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (LRR O)
☒ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5)	☐ Depleted Matrix (F3)
☐ Organic Bodies (A6) (LRR P, T, U)	☐ Redox Dark Surface (F6)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)	☐ Depleted Dark Surface (F7)
☐ Muck Presence (A8) (LRR U)	☐ Redox Depressions (F8)
☐ 1 cm Muck (A9) (LRR P, T)	☐ Marl (F10) (LRR U)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Ochric (F11) (MLRA 151)
☐ Thick Dark Surface (A12)	☐ Iron-Manganese Masses (F12) (LRR O, P, T)
☐ Coast Prairie Redox (A16) (MLRA 150A)	☐ Umbric Surface (F13) (LRR P, T, U)
☐ Sandy Mucky Mineral (S1) (LRR O, S)	☐ Delta Ochric (F17) (MLRA 151)
☐ Sandy Gleyed Matrix (S4)	☐ Reduced Vertic (F18) (MLRA 150A, 150B)
☐ Sandy Redox (S5)	☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
☐ Stripped Matrix (S6)	☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)
☐ Dark Surface (S7) (LRR P, S, T, U)	

Indicators for Problematic Hydric Soils³:

☐ 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)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**
 Type: _____
 Depth (inches): _____
Hydric Soil Present? Yes ☒ No ☐**Remarks:**

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Berkeley Sampling Date: July 18, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA014
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.01495 Long: -79.73138 Datum: NAD 83
 Soil Map Unit Name: Ct - Chipley-Echaw complex NWI Classification: PFO1/2F
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria. Wetland datapoint is classified as a PSS and is associated with WA003	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) <u>X</u> High Water Table (A2) _____ Marl Deposits (B15) (LRR U) <u>X</u> Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) <u>X</u> Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>2</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>2</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

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

 Sampling Point: DPA014

Tree Stratum	Absolute % cover	Dominant Species?	Indicator Status																													
(Plot size: <u>30 ft.</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																												
1. <i>None Observed</i>																																
2.																																
3.																																
4.																																
5.																																
6.																																
			= Total Cover	Prevalence Index Worksheet: <table style="width: 100%;"> <tr> <td colspan="2">Total % Cover of:</td> <td colspan="2">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td><u>15</u></td> <td>x 1 =</td> <td><u>15</u></td> </tr> <tr> <td>FACW species</td> <td><u>40</u></td> <td>x 2 =</td> <td><u>80</u></td> </tr> <tr> <td>FAC species</td> <td><u>15</u></td> <td>x 3 =</td> <td><u>45</u></td> </tr> <tr> <td>FACU species</td> <td><u>0</u></td> <td>x 4 =</td> <td><u>0</u></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x 5 =</td> <td><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td><u>70</u></td> <td>(A)</td> <td><u>140</u> (B)</td> </tr> </table>	Total % Cover of:		Multiply by:		OBL species	<u>15</u>	x 1 =	<u>15</u>	FACW species	<u>40</u>	x 2 =	<u>80</u>	FAC species	<u>15</u>	x 3 =	<u>45</u>	FACU species	<u>0</u>	x 4 =	<u>0</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>70</u>	(A)	<u>140</u> (B)
Total % Cover of:		Multiply by:																														
OBL species	<u>15</u>	x 1 =	<u>15</u>																													
FACW species	<u>40</u>	x 2 =	<u>80</u>																													
FAC species	<u>15</u>	x 3 =	<u>45</u>																													
FACU species	<u>0</u>	x 4 =	<u>0</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>70</u>	(A)	<u>140</u> (B)																													
50% of total cover: _____			20% of total cover: _____																													
Sapling Stratum (Plot size: <u>30 ft.</u>)																																
1. <i>None Observed</i>																																
2.																																
3.																																
4.																																
5.																																
6.																																
			= Total Cover																													
50% of total cover: _____			20% of total cover: _____																													
Shrub Stratum (Plot size: <u>30 ft.</u>)																																
1. <i>Ilex cassine</i>	<u>40</u>	<u>Yes</u>	<u>FACW</u>																													
2. <i>Taxodium distichum</i>	<u>15</u>	<u>Yes</u>	<u>OBL</u>																													
3. <i>Liquidambar styraciflua</i>	<u>5</u>	<u>No</u>	<u>FAC</u>																													
4. <i>Morella cerifera</i>	<u>5</u>	<u>No</u>	<u>FAC</u>																													
5. <i>Magnolia grandiflora</i>	<u>5</u>	<u>No</u>	<u>FAC</u>																													
6.																																
			= Total Cover																													
50% of total cover: <u>35</u>			20% of total cover: <u>14</u>																													
Herb Stratum (Plot size: <u>30 ft.</u>)																																
1. <i>None Observed</i>																																
2.																																
3.																																
4.																																
5.																																
6.																																
7.																																
8.																																
9.																																
10.																																
11.																																
			= Total Cover																													
50% of total cover: _____			20% of total cover: _____																													
Woody Vine Stratum (Plot size: <u>30 ft.</u>)																																
1. <i>None Observed</i>																																
2.																																
3.																																
4.																																
5.																																
			= Total Cover																													
50% of total cover: _____			20% of total cover: _____																													

Hydrophytic Vegetation Indicators:
1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤ 3.0¹
 _____ Problematic Hydrophytic Vegetation¹ (Explain)

Definitions of Five Vegetation Strata:
Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation
 Present? Yes X No _____

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4		100	None	—	—	—	Muck	
4-20	10YR 3/1	100	None	—	—	—	Sandy Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Berkeley Sampling Date: July 18, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA016
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Rise Local relief (concave, convex, none): None Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.01345 Long: -79.73022 Datum: NAD 83
 Soil Map Unit Name: Pk - Pickney loamy fine sand NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: This point was determined not to be within a wetland due to the lack of hydric soils and wetland hydrology. Upland datapoint associated with WA002	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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 <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>	

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

Remarks:

No positive indication of wetland hydrology was observed.

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

 Sampling Point: DPA016

Tree Stratum	Absolute % cover	Dominant Species?	Indicator Status																													
(Plot size: <u>30 ft.</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67%</u> (A/B)																												
1. <u>None Observed</u>																																
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
			= Total Cover																													
50% of total cover: _____			20% of total cover: _____																													
(Plot size: <u>30 ft.</u>)				Prevalence Index Worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Total % Cover of:</th> <th colspan="2">Multiply by:</th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td style="text-align: center;"><u>5</u></td> <td>x 1 =</td> <td style="text-align: center;"><u>5</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align: center;"><u>40</u></td> <td>x 2 =</td> <td style="text-align: center;"><u>80</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align: center;"><u>55</u></td> <td>x 3 =</td> <td style="text-align: center;"><u>165</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align: center;"><u>5</u></td> <td>x 4 =</td> <td style="text-align: center;"><u>20</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align: center;"><u>0</u></td> <td>x 5 =</td> <td style="text-align: center;"><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align: center;"><u>105</u></td> <td>(A)</td> <td style="text-align: center;"><u>270</u> (B)</td> </tr> </tbody> </table> Prevalence Index = B/A = <u>2.57</u>	Total % Cover of:		Multiply by:		OBL species	<u>5</u>	x 1 =	<u>5</u>	FACW species	<u>40</u>	x 2 =	<u>80</u>	FAC species	<u>55</u>	x 3 =	<u>165</u>	FACU species	<u>5</u>	x 4 =	<u>20</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>105</u>	(A)	<u>270</u> (B)
Total % Cover of:		Multiply by:																														
OBL species	<u>5</u>	x 1 =	<u>5</u>																													
FACW species	<u>40</u>	x 2 =	<u>80</u>																													
FAC species	<u>55</u>	x 3 =	<u>165</u>																													
FACU species	<u>5</u>	x 4 =	<u>20</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>105</u>	(A)	<u>270</u> (B)																													
1. <u>None Observed</u>																																
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
			= Total Cover																													
50% of total cover: _____			20% of total cover: _____																													
(Plot size: <u>30 ft.</u>)				Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤ 3.0 ¹ <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)																												
1. <u>Ilex cassine</u>	<u>30</u>	<u>Yes</u>	<u>FACW</u>																													
2. <u>Pinus taeda</u>	<u>10</u>	<u>No</u>	<u>FAC</u>																													
3. <u>Magnolia virginiana</u>	<u>10</u>	<u>No</u>	<u>FACW</u>																													
4. <u>Liquidambar styraciflua</u>	<u>5</u>	<u>No</u>	<u>FAC</u>																													
5. _____																																
6. _____																																
			= Total Cover																													
50% of total cover: <u>27.5</u>			20% of total cover: <u>11</u>																													
(Plot size: <u>30 ft.</u>)				Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.																												
1. <u>Andropogon virginicus</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>																													
2. <u>Carex glaucescens</u>	<u>5</u>	<u>No</u>	<u>OBL</u>																													
3. _____																																
4. _____																																
5. _____																																
6. _____																																
7. _____																																
8. _____																																
9. _____																																
10. _____																																
11. _____																																
			= Total Cover																													
50% of total cover: <u>22.5</u>			20% of total cover: <u>9</u>																													
(Plot size: <u>30 ft.</u>)				Hydrophytic Vegetation Present? Yes <u>X</u> No _____																												
1. <u>Rubus trivialis</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>																													
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
			= Total Cover																													
50% of total cover: <u>2.5</u>			20% of total cover: <u>1</u>																													

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-10	10YR 3/1	100	None	—	—	—	Sandy Loam	
10-20	10YR 4/1	100	None	—	—	—	Sandy Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 18, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA017
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Prairie Local relief (concave, convex, none): Convex Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 32.99088 Long: -79.74511 Datum: NAD 83
 Soil Map Unit Name: Rg - Rutledge loamy fine sands NWI Classification: Herbaceous Upland
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: This point was determined not to be within a wetland due to the lack of hydric soils and wetland hydrology. Upland datapoint associated with WB002	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>	

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

Remarks:

No positive indication of wetland hydrology was observed.

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

 Sampling Point: DPA017

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status																													
1. <u>None Observed</u>				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																												
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
		= Total Cover																														
50% of total cover: _____		20% of total cover: _____																														
Sapling Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>None Observed</u>				Prevalence Index Worksheet: <table style="width: 100%;"> <tr> <td colspan="2" style="text-align: center;">Total % Cover of:</td> <td colspan="2" style="text-align: center;">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td style="text-align: center;"><u>0</u></td> <td>x 1 =</td> <td style="text-align: center;"><u>0</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align: center;"><u>20</u></td> <td>x 2 =</td> <td style="text-align: center;"><u>40</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align: center;"><u>25</u></td> <td>x 3 =</td> <td style="text-align: center;"><u>75</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align: center;"><u>0</u></td> <td>x 4 =</td> <td style="text-align: center;"><u>0</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align: center;"><u>0</u></td> <td>x 5 =</td> <td style="text-align: center;"><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align: center;"><u>45</u></td> <td>(A)</td> <td style="text-align: center;"><u>115</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.56</u>	Total % Cover of:		Multiply by:		OBL species	<u>0</u>	x 1 =	<u>0</u>	FACW species	<u>20</u>	x 2 =	<u>40</u>	FAC species	<u>25</u>	x 3 =	<u>75</u>	FACU species	<u>0</u>	x 4 =	<u>0</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>45</u>	(A)	<u>115</u> (B)
Total % Cover of:		Multiply by:																														
OBL species	<u>0</u>	x 1 =	<u>0</u>																													
FACW species	<u>20</u>	x 2 =	<u>40</u>																													
FAC species	<u>25</u>	x 3 =	<u>75</u>																													
FACU species	<u>0</u>	x 4 =	<u>0</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>45</u>	(A)	<u>115</u> (B)																													
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
		= Total Cover																														
50% of total cover: _____		20% of total cover: _____																														
Shrub Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>Pinus taeda</u>	15	Yes	FAC	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤ 3.0 ¹ <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)																												
2. <u>Ilex cassine</u>	10	Yes	FACW																													
3. _____																																
4. _____																																
5. _____																																
6. _____																																
		25 = Total Cover																														
50% of total cover: 12.5		20% of total cover: 5																														
Herb Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>Deparia acrostichoides</u>	10	Yes	FAC	Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.																												
2. <u>Andropogon glomeratus</u>	10	Yes	FACW																													
3. _____																																
4. _____																																
5. _____																																
6. _____																																
7. _____																																
8. _____																																
9. _____																																
10. _____																																
11. _____																																
		20 = Total Cover																														
50% of total cover: 10		20% of total cover: 4																														
Woody Vine Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>None Observed</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____																												
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
		= Total Cover																														
50% of total cover: _____		20% of total cover: _____																														

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 2/1	100	None	—	—	—	Sandy Loam	
6-20	10YR 2/2	50					Sandy Loam	dual matrix
6-20	10YR 3/2	47	10YR 4/6	3	C	M	Sandy Loam	dual matrix

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 18, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA018
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Swamp Local relief (concave, convex, none): Concave Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 32.99109 Long: -79.74524 Datum: NAD 83
 Soil Map Unit Name: Rg - Rutlege loamy fine sands NWI Classification: PFO1F
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria. Wetland datapoint associated with WB002. Wetland is classified as PFO	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) <u>X</u> High Water Table (A2) _____ Marl Deposits (B15) (LRR U) <u>X</u> Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) <u>X</u> Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) _____ Drainage Patterns (B10) <u>X</u> Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>6</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>Surface</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____	

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

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

 Sampling Point: DPA018

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status																																				
1. <i>Fraxinus pennsylvanica</i>	70	Yes	FACW	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																																			
2. <i>Acer rubrum</i>	5	No	FAC																																				
3. <i>Pinus taeda</i>	5	No	FAC																																				
4. _____	_____	_____	_____																																				
5. _____	_____	_____	_____																																				
6. _____	_____	_____	_____																																				
80 = Total Cover																																							
50% of total cover: <u>40</u>		20% of total cover: <u>16</u>																																					
Sapling Stratum (Plot size: <u>30 ft.</u>)																																							
1. <i>None Observed</i>	_____	_____	_____	Prevalence Index Worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Total % Cover of:</th> <th style="width: 10%;"></th> <th style="width: 10%;">Multiply by:</th> <th style="width: 10%;"></th> <th style="width: 10%;"></th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td><u>0</u></td> <td>x 1 =</td> <td><u>0</u></td> <td></td> </tr> <tr> <td>FACW species</td> <td><u>70</u></td> <td>x 2 =</td> <td><u>140</u></td> <td></td> </tr> <tr> <td>FAC species</td> <td><u>10</u></td> <td>x 3 =</td> <td><u>30</u></td> <td></td> </tr> <tr> <td>FACU species</td> <td><u>0</u></td> <td>x 4 =</td> <td><u>0</u></td> <td></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x 5 =</td> <td><u>0</u></td> <td></td> </tr> <tr> <td>Column Totals:</td> <td><u>80</u></td> <td>(A)</td> <td><u>170</u></td> <td>(B)</td> </tr> </tbody> </table> Prevalence Index = B/A = <u>2.13</u>	Total % Cover of:		Multiply by:			OBL species	<u>0</u>	x 1 =	<u>0</u>		FACW species	<u>70</u>	x 2 =	<u>140</u>		FAC species	<u>10</u>	x 3 =	<u>30</u>		FACU species	<u>0</u>	x 4 =	<u>0</u>		UPL species	<u>0</u>	x 5 =	<u>0</u>		Column Totals:	<u>80</u>	(A)	<u>170</u>	(B)
Total % Cover of:		Multiply by:																																					
OBL species	<u>0</u>	x 1 =	<u>0</u>																																				
FACW species	<u>70</u>	x 2 =	<u>140</u>																																				
FAC species	<u>10</u>	x 3 =	<u>30</u>																																				
FACU species	<u>0</u>	x 4 =	<u>0</u>																																				
UPL species	<u>0</u>	x 5 =	<u>0</u>																																				
Column Totals:	<u>80</u>	(A)	<u>170</u>	(B)																																			
2. _____	_____	_____	_____																																				
3. _____	_____	_____	_____																																				
4. _____	_____	_____	_____																																				
5. _____	_____	_____	_____																																				
6. _____	_____	_____	_____																																				
_____ = Total Cover																																							
50% of total cover: _____		20% of total cover: _____																																					
Shrub Stratum (Plot size: <u>30 ft.</u>)																																							
1. <i>None Observed</i>	_____	_____	_____	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤ 3.0 ¹ _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																																			
2. _____	_____	_____	_____																																				
3. _____	_____	_____	_____																																				
4. _____	_____	_____	_____																																				
5. _____	_____	_____	_____																																				
6. _____	_____	_____	_____																																				
_____ = Total Cover																																							
50% of total cover: _____		20% of total cover: _____																																					
Herb Stratum (Plot size: <u>30 ft.</u>)																																							
1. <i>None Observed</i>	_____	_____	_____	Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.																																			
2. _____	_____	_____	_____																																				
3. _____	_____	_____	_____																																				
4. _____	_____	_____	_____																																				
5. _____	_____	_____	_____																																				
6. _____	_____	_____	_____																																				
7. _____	_____	_____	_____																																				
8. _____	_____	_____	_____																																				
9. _____	_____	_____	_____																																				
10. _____	_____	_____	_____																																				
11. _____	_____	_____	_____																																				
_____ = Total Cover																																							
50% of total cover: _____		20% of total cover: _____																																					
Woody Vine Stratum (Plot size: <u>30 ft.</u>)																																							
1. <i>None Observed</i>	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____																																			
2. _____	_____	_____	_____																																				
3. _____	_____	_____	_____																																				
4. _____	_____	_____	_____																																				
5. _____	_____	_____	_____																																				
_____ = Total Cover																																							
50% of total cover: _____		20% of total cover: _____																																					

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

SOIL

Sampling Point: DPA018

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1							Organic Soil Layer	
0-20	10YR 2/1	100	None	—	—	—	Silty Clay Loam	organics present
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.					² Location: PL=Pore Lining, M=Matrix.			
Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.) ☐ Histosol (A1) ☐ Polyvalue Below Surface (S8) (LRR S, T, U) ☐ Histic Epipedon (A2) ☐ Thin Dark Surface (S9) (LRR S, T, U) ☐ Black Histic (A3) ☐ Loamy Mucky Mineral (F1) (LRR O) ☒ Hydrogen Sulfide (A4) ☐ Loamy Gleyed Matrix (F2) ☐ Stratified Layers (A5) ☐ Depleted Matrix (F3) ☐ Organic Bodies (A6) (LRR P, T, U) ☐ Redox Dark Surface (F6) ☐ 5 cm Mucky Mineral (A7) (LRR P, T, U) ☐ Depleted Dark Surface (F7) ☐ Muck Presence (A8) (LRR U) ☐ Redox Depressions (F8) ☐ 1 cm Muck (A9) (LRR P, T) ☐ Marl (F10) (LRR U) ☐ Depleted Below Dark Surface (A11) ☐ Depleted Ochric (F11) (MLRA 151) ☐ Thick Dark Surface (A12) ☐ Iron-Manganese Masses (F12) (LRR O, P, T) ☐ Coast Prairie Redox (A16) (MLRA 150A) ☐ Umbric Surface (F13) (LRR P, T, U) ☐ Sandy Mucky Mineral (S1) (LRR O, S) ☐ Delta Ochric (F17) (MLRA 151) ☐ Sandy Gleyed Matrix (S4) ☐ Reduced Vertic (F18) (MLRA 150A, 150B) ☐ Sandy Redox (S5) ☐ Piedmont Floodplain Soils (F19) (MLRA 149A) ☐ Stripped Matrix (S6) ☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D) ☐ Dark Surface (S7) (LRR P, S, T, U)						Indicators for Problematic Hydric Soils³: ☐ 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 observed): Type: _____ Depth (inches): _____						Hydric Soil Present? Yes ☒ No _____		
Remarks: A positive indication of hydric soil was observed.								

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 18, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA019
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 32.99246 Long: -79.72825 Datum: NAD 83
 Soil Map Unit Name: LaB - Lakeland sand, 0 to 6 percent slopes NWI Classification: PFO4/1A
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria. Wetland datapoint is associated with WB005. Wetland is classified as PSS.	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <u>X</u> Surface Water (A1) _____ Aquatic Fauna (B13) <u>X</u> High Water Table (A2) _____ Marl Deposits (B15) (LRR U) <u>X</u> Saturation (A3) <u>X</u> Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) <u>X</u> Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) <u>X</u> Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) <u>X</u> Inundation Visible on Aerial Imagery (B7) <u>X</u> Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) _____ Drainage Patterns (B10) <u>X</u> Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>2</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>6</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>Surface</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
---	---

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

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

 Sampling Point: DPA019

Tree Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>None Observed</i>				
2.				
3.				
4.				
5.				
6.				
		= Total Cover		
50% of total cover:			20% of total cover:	
Sapling Stratum (Plot size: <u>30 ft.</u>)				
1. <i>Fraxinus pennsylvanica</i>		5	Yes	FACW
2.				
3.				
4.				
5.				
6.				
		5	= Total Cover	
50% of total cover:		2.5	20% of total cover: 1	
Shrub Stratum (Plot size: <u>30 ft.</u>)				
1. <i>Quercus nigra</i>		20	Yes	FAC
2. <i>Fraxinus pennsylvanica</i>		20	Yes	FACW
3. <i>Liquidambar styraciflua</i>		5	No	FAC
4.				
5.				
6.				
		45	= Total Cover	
50% of total cover:		22.5	20% of total cover: 9	
Herb Stratum (Plot size: <u>30 ft.</u>)				
1. <i>None Observed</i>				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
			= Total Cover	
50% of total cover:			20% of total cover:	
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. <i>None Observed</i>				
2.				
3.				
4.				
5.				
			= Total Cover	
50% of total cover:			20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>25</u>	x 2 = <u>50</u>
FAC species <u>25</u>	x 3 = <u>75</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>50</u>	(A) <u>125</u> (B)

 Prevalence Index = B/A = 2.50
Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☒ 3 - Prevalence Index is ≤ 3.0¹
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic
Vegetation

Present? Yes X No

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1							Organic Soil Layer	
0-20	10YR 2/1	100	None	—	—	—	Silty Clay Loam	organics present

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐**Remarks:**

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 18, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA020
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 32.99212 Long: -79.73847 Datum: NAD 83
 Soil Map Unit Name: LaB - Lakeland sand, 0 to 6 percent slopes NWI Classification: Scrub-Shrub Upland
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: This point was determined not to be within a wetland due to the lack of hydric soils and wetland hydrology. Upland datapoint associated with WB005.	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

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

 Sampling Point: DPA020

Tree Stratum	Absolute % cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30 ft.</u>)				
1. <i>None Observed</i>				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
		= Total Cover		
50% of total cover: _____		20% of total cover: _____		
Sapling Stratum (Plot size: <u>30 ft.</u>)				
1. <i>Ilex cassine</i>	10	Yes	FACW	
2. <i>Pinus taeda</i>	5	Yes	FAC	
3. _____				
4. _____				
5. _____				
6. _____				
		15 = Total Cover		
50% of total cover: 7.5		20% of total cover: 3		
Shrub Stratum (Plot size: <u>30 ft.</u>)				
1. <i>Quercus nigra</i>	20	Yes	FAC	
2. <i>Morella cerifera</i>	10	Yes	FAC	
3. <i>Liquidambar styraciflua</i>	10	Yes	FAC	
4. <i>Pinus taeda</i>	5	No	FAC	
5. _____				
6. _____				
		45 = Total Cover		
50% of total cover: 22.5		20% of total cover: 9		
Herb Stratum (Plot size: <u>30 ft.</u>)				
1. <i>None Observed</i>				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
		= Total Cover		
50% of total cover: _____		20% of total cover: _____		
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. <i>None Observed</i>				
2. _____				
3. _____				
4. _____				
5. _____				
		= Total Cover		
50% of total cover: _____		20% of total cover: _____		

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% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	<u>0</u>	x 1 =	<u>0</u>
FACW species	<u>10</u>	x 2 =	<u>20</u>
FAC species	<u>50</u>	x 3 =	<u>150</u>
FACU species	<u>0</u>	x 4 =	<u>0</u>
UPL species	<u>0</u>	x 5 =	<u>0</u>
Column Totals:	<u>60</u>	(A)	<u>170</u> (B)

Prevalence Index = B/A = 2.83

Hydrophytic Vegetation Indicators:
1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤ 3.0¹
 _____ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:
Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation
 Present? Yes X No _____

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR 2/1	100	None	—	—	—	Sandy Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 19, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA021
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.00255 Long: -79.72807 Datum: NAD 83
 Soil Map Unit Name: Sm - Seewee complex NWI Classification: PFO1/SS3B
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria. Wetland datapoint associated with WB002. Wetland is classified as PFO	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) <u>X</u> High Water Table (A2) _____ Marl Deposits (B15) (LRR U) <u>X</u> Saturation (A3) <u>X</u> Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) <u>X</u> Inundation Visible on Aerial Imagery (B7) <u>X</u> Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) _____ Drainage Patterns (B10) <u>X</u> Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>2</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>Surface</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____	

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

Sampling Point: **DPA021**

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1							Organic Soil Layer	
0-20	10YR 2/1	100	None	—	—	—	Silty Clay Loam	organics present

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)**

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR S, T, U)
☐ Histic Epipedon (A2)	☐ Thin Dark Surface (S9) (LRR S, T, U)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (LRR O)
☒ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5)	☐ Depleted Matrix (F3)
☐ Organic Bodies (A6) (LRR P, T, U)	☐ Redox Dark Surface (F6)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)	☐ Depleted Dark Surface (F7)
☐ Muck Presence (A8) (LRR U)	☐ Redox Depressions (F8)
☐ 1 cm Muck (A9) (LRR P, T)	☐ Marl (F10) (LRR U)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Ochric (F11) (MLRA 151)
☐ Thick Dark Surface (A12)	☐ Iron-Manganese Masses (F12) (LRR O, P, T)
☐ Coast Prairie Redox (A16) (MLRA 150A)	☐ Umbric Surface (F13) (LRR P, T, U)
☐ Sandy Mucky Mineral (S1) (LRR O, S)	☐ Delta Ochric (F17) (MLRA 151)
☐ Sandy Gleyed Matrix (S4)	☐ Reduced Vertic (F18) (MLRA 150A, 150B)
☐ Sandy Redox (S5)	☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
☐ Stripped Matrix (S6)	☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)
☐ Dark Surface (S7) (LRR P, S, T, U)	

Indicators for Problematic Hydric Soils³:

☐ 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)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**
 Type: _____
 Depth (inches): _____
Hydric Soil Present? Yes ☒ No ☐**Remarks:**

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 19, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA022
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.00184 Long: -79.72772 Datum: NAD 83
 Soil Map Unit Name: Sm - Seewee complex NWI Classification: PSS4Ad
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: This point was determined not to be within a wetland due to the lack of hydric soils and wetland hydrology. Upland datapoint associated with WB002	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
---	---

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

Remarks:

No positive indication of wetland hydrology was observed.

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

 Sampling Point: DPA022

Tree Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Magnolia grandiflora</i>		30	Yes	FAC
2. <i>Pinus taeda</i>		15	Yes	FAC
3. <i>Quercus nigra</i>		10	No	FAC
4. <i>Liquidambar styraciflua</i>		5	No	FAC
5. _____				
6. _____				
		60 = Total Cover		
50% of total cover:		30	20% of total cover:	12
Sapling Stratum (Plot size: <u>30 ft.</u>)				
1. <i>Magnolia grandiflora</i>		20	Yes	FAC
2. <i>Morella cerifera</i>		10	Yes	FAC
3. _____				
4. _____				
5. _____				
6. _____				
		30 = Total Cover		
50% of total cover:		15	20% of total cover:	6
Shrub Stratum (Plot size: <u>30 ft.</u>)				
1. <i>None Observed</i>				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
50% of total cover:			20% of total cover:	
Herb Stratum (Plot size: <u>30 ft.</u>)				
1. <i>None Observed</i>				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
50% of total cover:			20% of total cover:	
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. <i>None Observed</i>				
2. _____				
3. _____				
4. _____				
5. _____				
50% of total cover:			20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>90</u>	x 3 = <u>270</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>90</u>	(A) <u>270</u> (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index is ≤ 3.0¹

 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic
Vegetation

Present? Yes X No

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR 3/1	100	None	—	—	—	Sandy Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 19, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA023
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Rise Local relief (concave, convex, none): Convex Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.00843 Long: -79.71349 Datum: NAD 83
 Soil Map Unit Name: Cm - Chipley loamy fine sand NWI Classification: PFO3B
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: This point was determined not to be within a wetland due to the lack of hydric soils and wetland hydrology. Upland datapoint associated with WB002	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>	

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

Remarks:

No positive indication of wetland hydrology was observed.

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

 Sampling Point: DPA023

	Absolute % cover	Dominant Species?	Indicator Status																													
Tree Stratum (Plot size: <u>30 ft.</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																												
1. <u>Quercus nigra</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>																													
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
	<u>5</u> = Total Cover																															
50% of total cover: <u>2.5</u>		20% of total cover: <u>1</u>																														
Sapling Stratum (Plot size: <u>30 ft.</u>)				Prevalence Index Worksheet: <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">Total % Cover of:</td> <td style="width: 10%;"></td> <td style="width: 10%;">Multiply by:</td> <td style="width: 40%;"></td> </tr> <tr> <td>OBL species</td> <td><u>0</u></td> <td>x 1 =</td> <td><u>0</u></td> </tr> <tr> <td>FACW species</td> <td><u>85</u></td> <td>x 2 =</td> <td><u>170</u></td> </tr> <tr> <td>FAC species</td> <td><u>15</u></td> <td>x 3 =</td> <td><u>45</u></td> </tr> <tr> <td>FACU species</td> <td><u>5</u></td> <td>x 4 =</td> <td><u>20</u></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x 5 =</td> <td><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td><u>105</u></td> <td>(A)</td> <td><u>235</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.24</u>	Total % Cover of:		Multiply by:		OBL species	<u>0</u>	x 1 =	<u>0</u>	FACW species	<u>85</u>	x 2 =	<u>170</u>	FAC species	<u>15</u>	x 3 =	<u>45</u>	FACU species	<u>5</u>	x 4 =	<u>20</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>105</u>	(A)	<u>235</u> (B)
Total % Cover of:		Multiply by:																														
OBL species	<u>0</u>	x 1 =	<u>0</u>																													
FACW species	<u>85</u>	x 2 =	<u>170</u>																													
FAC species	<u>15</u>	x 3 =	<u>45</u>																													
FACU species	<u>5</u>	x 4 =	<u>20</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>105</u>	(A)	<u>235</u> (B)																													
1. <u>None Observed</u>	_____	_____	_____																													
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
	_____ = Total Cover																															
50% of total cover: _____		20% of total cover: _____																														
Shrub Stratum (Plot size: <u>30 ft.</u>)				Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤ 3.0 ¹ <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)																												
1. <u>Vaccinium corymbosum</u>	<u>85</u>	<u>Yes</u>	<u>FACW</u>																													
2. <u>Liquidambar styraciflua</u>	<u>10</u>	<u>No</u>	<u>FAC</u>																													
3. <u>Quercus rubra</u>	<u>5</u>	<u>No</u>	<u>FACU</u>																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
	<u>100</u> = Total Cover																															
50% of total cover: <u>50</u>		20% of total cover: <u>20</u>																														
Herb Stratum (Plot size: <u>30 ft.</u>)				Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.																												
1. <u>None Observed</u>	_____	_____	_____																													
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
7. _____	_____	_____	_____																													
8. _____	_____	_____	_____																													
9. _____	_____	_____	_____																													
10. _____	_____	_____	_____																													
11. _____	_____	_____	_____																													
	_____ = Total Cover																															
50% of total cover: _____		20% of total cover: _____																														
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				Hydrophytic Vegetation Present? Yes <u>X</u> No _____																												
1. <u>None Observed</u>	_____	_____	_____																													
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
	_____ = Total Cover																															
50% of total cover: _____		20% of total cover: _____																														

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 3/1	100	None	—	—	—	Sandy Loam	
6-20	10YR 4/4	100	None	—	—	—	Sandy Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)**

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR S, T, U)
☐ Histic Epipedon (A2)	☐ Thin Dark Surface (S9) (LRR S, T, U)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (LRR O)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5)	☐ Depleted Matrix (F3)
☐ Organic Bodies (A6) (LRR P, T, U)	☐ Redox Dark Surface (F6)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)	☐ Depleted Dark Surface (F7)
☐ Muck Presence (A8) (LRR U)	☐ Redox Depressions (F8)
☐ 1 cm Muck (A9) (LRR P, T)	☐ Marl (F10) (LRR U)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Ochric (F11) (MLRA 151)
☐ Thick Dark Surface (A12)	☐ Iron-Manganese Masses (F12) (LRR O, P, T)
☐ Coast Prairie Redox (A16) (MLRA 150A)	☐ Umbric Surface (F13) (LRR P, T, U)
☐ Sandy Mucky Mineral (S1) (LRR O, S)	☐ Delta Ochric (F17) (MLRA 151)
☐ Sandy Gleyed Matrix (S4)	☐ Reduced Vertic (F18) (MLRA 150A, 150B)
☐ Sandy Redox (S5)	☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
☐ Stripped Matrix (S6)	☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)
☐ Dark Surface (S7) (LRR P, S, T, U)	

Indicators for Problematic Hydric Soils³:

☐ 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)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**
 Type: _____
 Depth (inches): _____
Hydric Soil Present? Yes _____ No **X****Remarks:**

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 19, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA024
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.00483 Long: -79.71915 Datum: NAD 83
 Soil Map Unit Name: LaB - Lakeland sand, 0 to 6 percent slopes NWI Classification: PSS1F
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria. Wetland datapoint associated with WB006. Wetland is classified as PEM.	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <u>X</u> Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) <u>X</u> Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> Geomorphic Position (D2) _____ Shallow Aquitard (D3) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>6</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

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

 Sampling Point: DPA024

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status																																				
1. <u>None Observed</u>				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																																			
2. _____																																							
3. _____																																							
4. _____																																							
5. _____																																							
6. _____																																							
		= Total Cover																																					
50% of total cover: _____		20% of total cover: _____																																					
Sapling Stratum (Plot size: <u>30 ft.</u>)																																							
1. <u>None Observed</u>				Prevalence Index Worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Total % Cover of:</th> <th style="width: 10%;"></th> <th style="width: 10%;">Multiply by:</th> <th style="width: 10%;"></th> <th style="width: 10%;"></th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td><u>50</u></td> <td>x 1 =</td> <td><u>50</u></td> <td></td> </tr> <tr> <td>FACW species</td> <td><u>15</u></td> <td>x 2 =</td> <td><u>30</u></td> <td></td> </tr> <tr> <td>FAC species</td> <td><u>0</u></td> <td>x 3 =</td> <td><u>0</u></td> <td></td> </tr> <tr> <td>FACU species</td> <td><u>0</u></td> <td>x 4 =</td> <td><u>0</u></td> <td></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x 5 =</td> <td><u>0</u></td> <td></td> </tr> <tr> <td>Column Totals:</td> <td><u>65</u></td> <td>(A)</td> <td><u>80</u></td> <td>(B)</td> </tr> </tbody> </table> Prevalence Index = B/A = <u>1.23</u>	Total % Cover of:		Multiply by:			OBL species	<u>50</u>	x 1 =	<u>50</u>		FACW species	<u>15</u>	x 2 =	<u>30</u>		FAC species	<u>0</u>	x 3 =	<u>0</u>		FACU species	<u>0</u>	x 4 =	<u>0</u>		UPL species	<u>0</u>	x 5 =	<u>0</u>		Column Totals:	<u>65</u>	(A)	<u>80</u>	(B)
Total % Cover of:		Multiply by:																																					
OBL species	<u>50</u>	x 1 =	<u>50</u>																																				
FACW species	<u>15</u>	x 2 =	<u>30</u>																																				
FAC species	<u>0</u>	x 3 =	<u>0</u>																																				
FACU species	<u>0</u>	x 4 =	<u>0</u>																																				
UPL species	<u>0</u>	x 5 =	<u>0</u>																																				
Column Totals:	<u>65</u>	(A)	<u>80</u>	(B)																																			
2. _____																																							
3. _____																																							
4. _____																																							
5. _____																																							
6. _____																																							
		= Total Cover																																					
50% of total cover: _____		20% of total cover: _____																																					
Shrub Stratum (Plot size: <u>30 ft.</u>)																																							
1. <u>None Observed</u>				Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤ 3.0 ¹ <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)																																			
2. _____																																							
3. _____																																							
4. _____																																							
5. _____																																							
6. _____																																							
		= Total Cover																																					
50% of total cover: _____		20% of total cover: _____																																					
Herb Stratum (Plot size: <u>30 ft.</u>)																																							
1. <u>Carex glaucescens</u>	<u>50</u>	<u>Yes</u>	<u>OBL</u>	Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.																																			
2. <u>Rhynchospora microcephala</u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>																																				
3. _____																																							
4. _____																																							
5. _____																																							
6. _____																																							
7. _____				Hydrophytic Vegetation Present? Yes <u>X</u> No _____																																			
8. _____																																							
9. _____																																							
10. _____																																							
11. _____																																							
		= Total Cover																																					
50% of total cover: <u>32.5</u>		20% of total cover: <u>13</u>																																					
Woody Vine Stratum (Plot size: <u>30 ft.</u>)																																							
1. <u>None Observed</u>																																							
2. _____																																							
3. _____																																							
4. _____																																							
5. _____																																							
		= Total Cover																																					
50% of total cover: _____		20% of total cover: _____																																					

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1							Organic Soil Layer	
0-20	10YR 2/1	100	None	—	—	—	Silty Clay Loam	organics present

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)**

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR S, T, U)
☐ Histic Epipedon (A2)	☐ Thin Dark Surface (S9) (LRR S, T, U)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (LRR O)
☒ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5)	☐ Depleted Matrix (F3)
☐ Organic Bodies (A6) (LRR P, T, U)	☐ Redox Dark Surface (F6)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)	☐ Depleted Dark Surface (F7)
☐ Muck Presence (A8) (LRR U)	☐ Redox Depressions (F8)
☐ 1 cm Muck (A9) (LRR P, T)	☐ Marl (F10) (LRR U)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Ochric (F11) (MLRA 151)
☐ Thick Dark Surface (A12)	☐ Iron-Manganese Masses (F12) (LRR O, P, T)
☐ Coast Prairie Redox (A16) (MLRA 150A)	☐ Umbric Surface (F13) (LRR P, T, U)
☐ Sandy Mucky Mineral (S1) (LRR O, S)	☐ Delta Ochric (F17) (MLRA 151)
☐ Sandy Gleyed Matrix (S4)	☐ Reduced Vertic (F18) (MLRA 150A, 150B)
☐ Sandy Redox (S5)	☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
☐ Stripped Matrix (S6)	☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)
☐ Dark Surface (S7) (LRR P, S, T, U)	

Indicators for Problematic Hydric Soils³:

☐ 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)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**
 Type: _____
 Depth (inches): _____
Hydric Soil Present? Yes ☒ No ☐**Remarks:**

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 19, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA025
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.00472 Long: -79.71932 Datum: NAD 83
 Soil Map Unit Name: LaB - Lakeland sand, 0 to 6 percent slopes NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: This point was determined not to be within a wetland due to the lack of hydric soils and wetland hydrology. Upland datapoint associated with WB006	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

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

 Sampling Point: DPA025

Tree Stratum	Absolute % cover	Dominant Species?	Indicator Status																																	
1. <i>Pinus taeda</i>	5	Yes	FAC	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																																
2. _____	_____	_____	_____																																	
3. _____	_____	_____	_____																																	
4. _____	_____	_____	_____																																	
5. _____	_____	_____	_____																																	
6. _____	_____	_____	_____																																	
5 = Total Cover				Prevalence Index Worksheet: <table style="width: 100%;"> <tr> <td colspan="2">Total % Cover of:</td> <td colspan="2">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td><u>0</u></td> <td>x 1 =</td> <td><u>0</u></td> </tr> <tr> <td>FACW species</td> <td><u>50</u></td> <td>x 2 =</td> <td><u>100</u></td> </tr> <tr> <td>FAC species</td> <td><u>30</u></td> <td>x 3 =</td> <td><u>90</u></td> </tr> <tr> <td>FACU species</td> <td><u>0</u></td> <td>x 4 =</td> <td><u>0</u></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x 5 =</td> <td><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td><u>80</u></td> <td>(A)</td> <td><u>190</u> (B)</td> </tr> <tr> <td colspan="4" style="text-align: center;">Prevalence Index = B/A = <u>2.38</u></td> </tr> </table>	Total % Cover of:		Multiply by:		OBL species	<u>0</u>	x 1 =	<u>0</u>	FACW species	<u>50</u>	x 2 =	<u>100</u>	FAC species	<u>30</u>	x 3 =	<u>90</u>	FACU species	<u>0</u>	x 4 =	<u>0</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>80</u>	(A)	<u>190</u> (B)	Prevalence Index = B/A = <u>2.38</u>			
Total % Cover of:		Multiply by:																																		
OBL species	<u>0</u>	x 1 =	<u>0</u>																																	
FACW species	<u>50</u>	x 2 =	<u>100</u>																																	
FAC species	<u>30</u>	x 3 =	<u>90</u>																																	
FACU species	<u>0</u>	x 4 =	<u>0</u>																																	
UPL species	<u>0</u>	x 5 =	<u>0</u>																																	
Column Totals:	<u>80</u>	(A)	<u>190</u> (B)																																	
Prevalence Index = B/A = <u>2.38</u>																																				
50% of total cover: <u>2.5</u>		20% of total cover: <u>1</u>																																		
Sapling Stratum (Plot size: <u>30 ft.</u>)																																				
1. <i>None Observed</i>	_____	_____	_____																																	
2. _____	_____	_____	_____																																	
3. _____	_____	_____	_____																																	
4. _____	_____	_____	_____																																	
5. _____	_____	_____	_____																																	
6. _____	_____	_____	_____																																	
_____ = Total Cover																																				
50% of total cover: _____		20% of total cover: _____																																		
Shrub Stratum (Plot size: <u>30 ft.</u>)																																				
1. <i>Ilex cassine</i>	50	Yes	FACW																																	
2. <i>Magnolia grandiflora</i>	20	Yes	FAC																																	
3. <i>Pinus taeda</i>	5	No	FAC																																	
4. _____	_____	_____	_____																																	
5. _____	_____	_____	_____																																	
6. _____	_____	_____	_____																																	
75 = Total Cover																																				
50% of total cover: <u>37.5</u>		20% of total cover: <u>15</u>																																		
Herb Stratum (Plot size: <u>30 ft.</u>)																																				
1. <i>None Observed</i>	_____	_____	_____																																	
2. _____	_____	_____	_____																																	
3. _____	_____	_____	_____																																	
4. _____	_____	_____	_____																																	
5. _____	_____	_____	_____																																	
6. _____	_____	_____	_____																																	
7. _____	_____	_____	_____																																	
8. _____	_____	_____	_____																																	
9. _____	_____	_____	_____																																	
10. _____	_____	_____	_____																																	
11. _____	_____	_____	_____																																	
_____ = Total Cover																																				
50% of total cover: _____		20% of total cover: _____																																		
Woody Vine Stratum (Plot size: <u>30 ft.</u>)																																				
1. <i>None Observed</i>	_____	_____	_____																																	
2. _____	_____	_____	_____																																	
3. _____	_____	_____	_____																																	
4. _____	_____	_____	_____																																	
5. _____	_____	_____	_____																																	
_____ = Total Cover																																				
50% of total cover: _____		20% of total cover: _____																																		

Hydrophytic Vegetation Indicators:
1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤ 3.0¹
 _____ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:
Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation
 Present? Yes X No _____

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR 2/1	100	None	—	—	—	Sandy Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 19, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA026
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Rise Local relief (concave, convex, none): None Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 32.99793 Long: -79.72927 Datum: NAD 83
 Soil Map Unit Name: LaB - Lakeland sand, 0 to 6 percent slopes NWI Classification: PFO1B
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: This point was determined not to be within a wetland due to the lack of hydric soils and wetland hydrology. Upland datapoint for NWI disprove	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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 <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

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

 Sampling Point: DPA026

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status																													
1. <u>Quercus nigra</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																												
2. <u>Pinus taeda</u>	<u>5</u>	<u>No</u>	<u>FAC</u>																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
65 = Total Cover																																
50% of total cover: <u>32.5</u>		20% of total cover: <u>13</u>																														
Sapling Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>None Observed</u>	_____	_____	_____	Prevalence Index Worksheet: <table style="width: 100%;"> <tr> <td colspan="2">Total % Cover of:</td> <td colspan="2">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td><u>0</u></td> <td>x 1 =</td> <td><u>0</u></td> </tr> <tr> <td>FACW species</td> <td><u>0</u></td> <td>x 2 =</td> <td><u>0</u></td> </tr> <tr> <td>FAC species</td> <td><u>75</u></td> <td>x 3 =</td> <td><u>225</u></td> </tr> <tr> <td>FACU species</td> <td><u>0</u></td> <td>x 4 =</td> <td><u>0</u></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x 5 =</td> <td><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td><u>75</u></td> <td>(A)</td> <td><u>225</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.00</u>	Total % Cover of:		Multiply by:		OBL species	<u>0</u>	x 1 =	<u>0</u>	FACW species	<u>0</u>	x 2 =	<u>0</u>	FAC species	<u>75</u>	x 3 =	<u>225</u>	FACU species	<u>0</u>	x 4 =	<u>0</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>75</u>	(A)	<u>225</u> (B)
Total % Cover of:		Multiply by:																														
OBL species	<u>0</u>	x 1 =	<u>0</u>																													
FACW species	<u>0</u>	x 2 =	<u>0</u>																													
FAC species	<u>75</u>	x 3 =	<u>225</u>																													
FACU species	<u>0</u>	x 4 =	<u>0</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>75</u>	(A)	<u>225</u> (B)																													
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
_____ = Total Cover																																
50% of total cover: _____		20% of total cover: _____																														
Shrub Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>Cornus alternifolia</u>	<u>10</u>	_____	<u>FAC</u>	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤ 3.0 ¹ _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																												
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
10 = Total Cover																																
50% of total cover: <u>5</u>		20% of total cover: <u>2</u>																														
Herb Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>None Observed</u>	_____	_____	_____	Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.																												
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
7. _____	_____	_____	_____																													
8. _____	_____	_____	_____																													
9. _____	_____	_____	_____																													
10. _____	_____	_____	_____																													
11. _____	_____	_____	_____																													
_____ = Total Cover																																
50% of total cover: _____		20% of total cover: _____																														
Woody Vine Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>None Observed</u>	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____																												
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
_____ = Total Cover																																
50% of total cover: _____		20% of total cover: _____																														

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR 4/4	98	10YR 5/8	2	C	M	Sandy Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No **X** _____

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 19, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPA027
 Investigator(s): B.Whitley and K.Snipes Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Rise Local relief (concave, convex, none): None Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 32.99674 Long: -79.73121 Datum: NAD 83
 Soil Map Unit Name: LaB - Lakeland sand, 0 to 6 percent slopes NWI Classification: PSS3B
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) YES (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: This point was determined not to be within a wetland due to the lack of wetland hydrology. Upland datapoint for NWI disprove	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

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

 Sampling Point: DPA027

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status																													
1. <u>None Observed</u>				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																												
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
		= Total Cover																														
50% of total cover: _____		20% of total cover: _____																														
Sapling Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>Pinus taeda</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index Worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: left;">Total % Cover of:</th> <th colspan="2" style="text-align: left;">Multiply by:</th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td style="text-align: center;"><u>0</u></td> <td>x 1 =</td> <td style="text-align: center;"><u>0</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align: center;"><u>0</u></td> <td>x 2 =</td> <td style="text-align: center;"><u>0</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align: center;"><u>35</u></td> <td>x 3 =</td> <td style="text-align: center;"><u>105</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align: center;"><u>0</u></td> <td>x 4 =</td> <td style="text-align: center;"><u>0</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align: center;"><u>0</u></td> <td>x 5 =</td> <td style="text-align: center;"><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align: center;"><u>35</u></td> <td>(A)</td> <td style="text-align: center;"><u>105</u> (B)</td> </tr> </tbody> </table> Prevalence Index = B/A = <u>3.00</u>	Total % Cover of:		Multiply by:		OBL species	<u>0</u>	x 1 =	<u>0</u>	FACW species	<u>0</u>	x 2 =	<u>0</u>	FAC species	<u>35</u>	x 3 =	<u>105</u>	FACU species	<u>0</u>	x 4 =	<u>0</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>35</u>	(A)	<u>105</u> (B)
Total % Cover of:		Multiply by:																														
OBL species	<u>0</u>	x 1 =	<u>0</u>																													
FACW species	<u>0</u>	x 2 =	<u>0</u>																													
FAC species	<u>35</u>	x 3 =	<u>105</u>																													
FACU species	<u>0</u>	x 4 =	<u>0</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>35</u>	(A)	<u>105</u> (B)																													
2. <u>Liquidambar styraciflua</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>																													
3. _____																																
4. _____																																
5. _____																																
6. _____																																
		= Total Cover																														
50% of total cover: <u>5</u>		20% of total cover: <u>2</u>																														
Shrub Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>Quercus nigra</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤ 3.0 ¹ <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)																												
2. <u>Pinus taeda</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>																													
3. <u>Liquidambar styraciflua</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>																													
4. _____																																
5. _____																																
6. _____																																
		= Total Cover																														
50% of total cover: <u>12.5</u>		20% of total cover: <u>5</u>																														
Herb Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>None Observed</u>				Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.																												
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
7. _____																																
8. _____																																
9. _____																																
10. _____																																
11. _____																																
		= Total Cover																														
50% of total cover: _____		20% of total cover: _____																														
Woody Vine Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>None Observed</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____																												
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
		= Total Cover																														
50% of total cover: _____		20% of total cover: _____																														

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-20	10YR 4/2	98	10YR 4/6	2	C	M	Sandy Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 17, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPB001
 Investigator(s): H. McFeeters and R. Barnhill Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Rise Local relief (concave, convex, none): none Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.01616 Long: -79.72198 Datum: NAD 83
 Soil Map Unit Name: LaB - Lakeland Sand, 0 to 6 percent slopes NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: This point was determined not to be within a wetland due to the lack of hydric soils and wetland hydrology. Upland data point associated with WA001 Datapoint located next to old historic logging road	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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 <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)		Wetland Hydrology Present? Yes _____ No <u>X</u>

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

Remarks:

No positive indication of wetland hydrology was observed.

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

 Sampling Point: DPB001

Tree Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Pinus taeda</i>		40	Yes	FAC
2. <i>Liquidambar styraciflua</i>		15	Yes	FAC
3. _____				
4. _____				
5. _____				
6. _____				
		55 = Total Cover		
50% of total cover:		27.5	20% of total cover:	11

Sapling Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>None Observed</i>				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
50% of total cover:			20% of total cover:	

Shrub Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Hamamelis virginiana</i>		10	Yes	FACU
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
		10 = Total Cover		
50% of total cover:		5	20% of total cover:	2

Herb Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Hamamelis virginiana</i>		15	Yes	FACU
2. <i>Arundinaria tecta</i>		10	Yes	FACW
3. <i>Botrychium virginianum</i>		10	Yes	FACU
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
		35 = Total Cover		
50% of total cover:		17.5	20% of total cover:	7

Woody Vine Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Vitis rotundifolia</i>		25	Yes	FAC
2. _____				
3. _____				
4. _____				
5. _____				
		25 = Total Cover		
50% of total cover:		12.5	20% of total cover:	5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 57% (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>10</u>	x 2 = <u>20</u>
FAC species <u>80</u>	x 3 = <u>240</u>
FACU species <u>35</u>	x 4 = <u>140</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>125</u>	(A) <u>400</u> (B)

 Prevalence Index = B/A = 3.20
Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤ 3.0¹
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic
Vegetation

Present? Yes X No

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	7.5YR 5/1	100	None	—	—	—	Sand	
3-6	7.5YR 5/4	100	None	—	—	—	Sand	
6-16	7.5YR 6/4	100	None	—	—	—	Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 17, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPB002
 Investigator(s): H. McFeeters and R. Barnhill Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Rise Local relief (concave, convex, none): none Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.01373 Long: -79.72113 Datum: NAD 83
 Soil Map Unit Name: Rg - Rutlege loamy fine sand NWI Classification: PFO1/SS3B
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: This point was determined not to be within a wetland due to the lack of hydric soils and wetland hydrology. Upland data point associated with WA001	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>	

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

Remarks:

No positive indication of wetland hydrology was observed.

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

 Sampling Point: DPB002

Tree Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <u>Quercus nigra</u>		<u>40</u>	<u>Yes</u>	<u>FAC</u>
2. <u>Pinus taeda</u>		<u>30</u>	<u>Yes</u>	<u>FAC</u>
3. <u>Liquidambar styraciflua</u>		<u>10</u>	<u>No</u>	<u>FAC</u>
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
		<u>80</u> = Total Cover		
50% of total cover:		<u>40</u>	20% of total cover:	<u>16</u>
Sapling Stratum (Plot size: <u>30 ft.</u>)				
1. <u>Liquidambar styraciflua</u>		<u>25</u>	<u>Yes</u>	<u>FAC</u>
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
		<u>25</u> = Total Cover		
50% of total cover:		<u>12.5</u>	20% of total cover:	<u>5</u>
Shrub Stratum (Plot size: <u>30 ft.</u>)				
1. <u>Magnolia virginiana</u>		<u>15</u>	<u>Yes</u>	<u>FACW</u>
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
		<u>15</u> = Total Cover		
50% of total cover:		<u>7.5</u>	20% of total cover:	<u>3</u>
Herb Stratum (Plot size: <u>30 ft.</u>)				
1. <u>None Observed</u>		_____	_____	_____
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
7. _____		_____	_____	_____
8. _____		_____	_____	_____
9. _____		_____	_____	_____
10. _____		_____	_____	_____
11. _____		_____	_____	_____
		_____ = Total Cover		
50% of total cover:		_____	20% of total cover:	_____
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. <u>Vitis rotundifolia</u>		<u>10</u>	<u>Yes</u>	<u>FAC</u>
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
		<u>10</u> = Total Cover		
50% of total cover:		<u>5</u>	20% of total cover:	<u>2</u>

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% (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>15</u>	x 2 = <u>30</u>
FAC species <u>115</u>	x 3 = <u>345</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>130</u>	(A) <u>375</u> (B)

 Prevalence Index = B/A = 2.88
Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☒ 3 - Prevalence Index is ≤ 3.0¹
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic
Vegetation

Present? Yes X No _____

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 2/1	100	None	—	—	—	Sand	
3-4	10YR 5/1	100	None	—	—	—	Sand	
4-18	10YR 4/6	100	None	—	—	—	Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)**

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR S, T, U)
☐ Histic Epipedon (A2)	☐ Thin Dark Surface (S9) (LRR S, T, U)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (LRR O)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5)	☐ Depleted Matrix (F3)
☐ Organic Bodies (A6) (LRR P, T, U)	☐ Redox Dark Surface (F6)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)	☐ Depleted Dark Surface (F7)
☐ Muck Presence (A8) (LRR U)	☐ Redox Depressions (F8)
☐ 1 cm Muck (A9) (LRR P, T)	☐ Marl (F10) (LRR U)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Ochric (F11) (MLRA 151)
☐ Thick Dark Surface (A12)	☐ Iron-Manganese Masses (F12) (LRR O, P, T)
☐ Coast Prairie Redox (A16) (MLRA 150A)	☐ Umbric Surface (F13) (LRR P, T, U)
☐ Sandy Mucky Mineral (S1) (LRR O, S)	☐ Delta Ochric (F17) (MLRA 151)
☐ Sandy Gleyed Matrix (S4)	☐ Reduced Vertic (F18) (MLRA 150A, 150B)
☐ Sandy Redox (S5)	☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
☐ Stripped Matrix (S6)	☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)
☐ Dark Surface (S7) (LRR P, S, T, U)	

Indicators for Problematic Hydric Soils³:

☐ 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)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**
 Type: _____
 Depth (inches): _____
Hydric Soil Present? Yes _____ No X**Remarks:**

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 18, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPB003
 Investigator(s): H. McFeeters and R. Barnhill Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 32.99292 Long: -79.74528 Datum: NAD 83
 Soil Map Unit Name: Sm - Seewee complex NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria. Wetland datapoint associated with WB002	

HYDROLOGY

Wetland hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is 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 on Living Roots (C3) ☐ Presence of Reduced Iron (C4) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Thin Muck Surface (C7) ☐ Other (Explain in Remarks)	☐ 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 <u>X</u>	Depth (inches): <u>N/A</u>	Wetland Hydrology Present? Yes <u>X</u> No _____
Water Table Present?	Yes <u>X</u> No _____	Depth (inches): <u>9</u>	
Saturation Present? (includes capillary fringe)	Yes <u>X</u> No _____	Depth (inches): <u>surface</u>	

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

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

 Sampling Point: DPB003

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status	Dominance Test worksheet:																												
1. <u><i>Pinus taeda</i></u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																												
2. <u><i>Acer rubrum</i></u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>																													
3. <u><i>Liquidambar styraciflua</i></u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
75 = Total Cover																																
50% of total cover: <u>37.5</u>			20% of total cover: <u>15</u>																													
Sapling Stratum (Plot size: <u>30 ft.</u>)				Prevalence Index Worksheet: <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">Total % Cover of:</td> <td style="width: 10%;"></td> <td style="width: 10%;">Multiply by:</td> <td style="width: 40%;"></td> </tr> <tr> <td>OBL species</td> <td><u>5</u></td> <td>x 1 =</td> <td><u>5</u></td> </tr> <tr> <td>FACW species</td> <td><u>25</u></td> <td>x 2 =</td> <td><u>50</u></td> </tr> <tr> <td>FAC species</td> <td><u>90</u></td> <td>x 3 =</td> <td><u>270</u></td> </tr> <tr> <td>FACU species</td> <td><u>0</u></td> <td>x 4 =</td> <td><u>0</u></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x 5 =</td> <td><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td><u>120</u></td> <td>(A)</td> <td><u>325</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.71</u>	Total % Cover of:		Multiply by:		OBL species	<u>5</u>	x 1 =	<u>5</u>	FACW species	<u>25</u>	x 2 =	<u>50</u>	FAC species	<u>90</u>	x 3 =	<u>270</u>	FACU species	<u>0</u>	x 4 =	<u>0</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>120</u>	(A)	<u>325</u> (B)
Total % Cover of:		Multiply by:																														
OBL species	<u>5</u>	x 1 =	<u>5</u>																													
FACW species	<u>25</u>	x 2 =	<u>50</u>																													
FAC species	<u>90</u>	x 3 =	<u>270</u>																													
FACU species	<u>0</u>	x 4 =	<u>0</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>120</u>	(A)	<u>325</u> (B)																													
1. <u><i>None Observed</i></u>	_____	_____	_____																													
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
_____ = Total Cover																																
50% of total cover: _____			20% of total cover: _____																													
Shrub Stratum (Plot size: <u>30 ft.</u>)																																
1. <u><i>Ilex cassine</i></u>	<u>25</u>	<u>Yes</u>	<u>FACW</u>																													
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
25 = Total Cover																																
50% of total cover: <u>12.5</u>			20% of total cover: <u>5</u>																													
Herb Stratum (Plot size: <u>30 ft.</u>)																																
1. <u><i>Carex glaucescens</i></u>	<u>5</u>	<u>Yes</u>	<u>OBL</u>																													
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
7. _____	_____	_____	_____																													
8. _____	_____	_____	_____																													
9. _____	_____	_____	_____																													
10. _____	_____	_____	_____																													
11. _____	_____	_____	_____																													
5 = Total Cover																																
50% of total cover: <u>2.5</u>			20% of total cover: <u>1</u>																													
Woody Vine Stratum (Plot size: <u>30 ft.</u>)																																
1. <u><i>Vitis rotundifolia</i></u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>																													
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
15 = Total Cover																																
50% of total cover: <u>7.5</u>			20% of total cover: <u>3</u>																													

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index is ≤ 3.0¹

_____ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation

Present? Yes X No _____

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 2/1	95	10YR 3/6	5	C	M	Sand	
6-12	10YR 5/4	75	10YR 4/6	25	C	M	Sand	
12-18	10YR 7/1	100	None	—	—	—	Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)**

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR S, T, U)
☐ Histic Epipedon (A2)	☐ Thin Dark Surface (S9) (LRR S, T, U)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (LRR O)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5)	☐ Depleted Matrix (F3)
☐ Organic Bodies (A6) (LRR P, T, U)	☐ Redox Dark Surface (F6)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)	☐ Depleted Dark Surface (F7)
☐ Muck Presence (A8) (LRR U)	☐ Redox Depressions (F8)
☐ 1 cm Muck (A9) (LRR P, T)	☐ Marl (F10) (LRR U)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Ochric (F11) (MLRA 151)
☐ Thick Dark Surface (A12)	☐ Iron-Manganese Masses (F12) (LRR O, P, T)
☐ Coast Prairie Redox (A16) (MLRA 150A)	☐ Umbric Surface (F13) (LRR P, T, U)
☐ Sandy Mucky Mineral (S1) (LRR O, S)	☐ Delta Ochric (F17) (MLRA 151)
☐ Sandy Gleyed Matrix (S4)	☐ Reduced Vertic (F18) (MLRA 150A, 150B)
☒ Sandy Redox (S5)	☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
☐ Stripped Matrix (S6)	☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)
☐ Dark Surface (S7) (LRR P, S, T, U)	

Indicators for Problematic Hydric Soils³:

☐ 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)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**
 Type: _____
 Depth (inches): _____
Hydric Soil Present? Yes ☒ No ☐**Remarks:**

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 18, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPB004
 Investigator(s): H. McFeeters and R. Barnhill Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Rise Local relief (concave, convex, none): none Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 32.99307 Long: -79.75108 Datum: NAD 83
 Soil Map Unit Name: Rg - Rutlege loamy fine sand NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: This point was determined not to be within a wetland due to the lack of hydric soils and wetland hydrology. Upland datapoint associated with WB001	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

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

 Sampling Point: DPB004

Tree Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Pinus taeda</i>		70	Yes	FAC
2. <i>Magnolia virginiana</i>		20	Yes	FACW
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
		90 = Total Cover		
50% of total cover:		45	20% of total cover: 18	

Sapling Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>None Observed</i>		_____	_____	_____
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
		_____ = Total Cover		
50% of total cover:		_____	20% of total cover: _____	

Shrub Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>None Observed</i>		_____	_____	_____
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
		_____ = Total Cover		
50% of total cover:		_____	20% of total cover: _____	

Herb Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Arundinaria tecta</i>		10	Yes	FACW
2. <i>Onoclea sensibilis</i>		10	Yes	FACW
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
7. _____		_____	_____	_____
8. _____		_____	_____	_____
9. _____		_____	_____	_____
10. _____		_____	_____	_____
11. _____		_____	_____	_____
		20 = Total Cover		
50% of total cover:		10	20% of total cover: 4	

Woody Vine Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>None Observed</i>		_____	_____	_____
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
		_____ = Total Cover		
50% of total cover:		_____	20% of total cover: _____	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>40</u>	x 2 = <u>80</u>
FAC species <u>70</u>	x 3 = <u>210</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>110</u>	(A) <u>290</u> (B)

 Prevalence Index = B/A = 2.64
Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☒ 3 - Prevalence Index is ≤ 3.0¹
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic
Vegetation

Present? Yes X No

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 2/1	100	None	—	—	—	Sandy Loam	
4-6	10YR 4/1	100	None	—	—	—	Sand	
6-16	10YR 2/1	100	None	—	—	—	Sandy Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 18, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPB005
 Investigator(s): H. McFeeters and R. Barnhill Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 32.99191 Long: -79.75071 Datum: NAD 83
 Soil Map Unit Name: Cm - Chipley-Echaw complex NWI Classification: PFO1C
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria. Wetland datapoint associated with WB001	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) <u>X</u> _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) <u>X</u> _____ Inundation Visible on Aerial Imagery (B7) <u>X</u> _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) _____ Drainage Patterns (B10) <u>X</u> _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) <u>X</u> _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) <u>X</u> _____ FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

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

 Sampling Point: DPB005

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status																																				
1. <u>Liquidambar styraciflua</u>	<u>45</u>	<u>Yes</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>8</u> (A) Total Number of Dominant Species Across All Strata: <u>8</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																																			
2. <u>Acer negundo</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>																																				
3. <u>Magnolia virginiana</u>	<u>10</u>	<u>No</u>	<u>FACW</u>																																				
4. _____	_____	_____	_____																																				
5. _____	_____	_____	_____																																				
6. _____	_____	_____	_____																																				
70 = Total Cover																																							
50% of total cover: <u>35</u>		20% of total cover: <u>14</u>																																					
Sapling Stratum (Plot size: <u>30 ft.</u>)																																							
1. <u>None Observed</u>	_____	_____	_____	Prevalence Index Worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Total % Cover of:</th> <th style="width: 10%;"></th> <th style="width: 10%;">Multiply by:</th> <th style="width: 10%;"></th> <th style="width: 10%;"></th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td><u>0</u></td> <td>x 1 =</td> <td><u>0</u></td> <td></td> </tr> <tr> <td>FACW species</td> <td><u>50</u></td> <td>x 2 =</td> <td><u>100</u></td> <td></td> </tr> <tr> <td>FAC species</td> <td><u>70</u></td> <td>x 3 =</td> <td><u>210</u></td> <td></td> </tr> <tr> <td>FACU species</td> <td><u>0</u></td> <td>x 4 =</td> <td><u>0</u></td> <td></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x 5 =</td> <td><u>0</u></td> <td></td> </tr> <tr> <td>Column Totals:</td> <td><u>120</u></td> <td>(A)</td> <td><u>310</u></td> <td>(B)</td> </tr> </tbody> </table> Prevalence Index = B/A = <u>2.58</u>	Total % Cover of:		Multiply by:			OBL species	<u>0</u>	x 1 =	<u>0</u>		FACW species	<u>50</u>	x 2 =	<u>100</u>		FAC species	<u>70</u>	x 3 =	<u>210</u>		FACU species	<u>0</u>	x 4 =	<u>0</u>		UPL species	<u>0</u>	x 5 =	<u>0</u>		Column Totals:	<u>120</u>	(A)	<u>310</u>	(B)
Total % Cover of:		Multiply by:																																					
OBL species	<u>0</u>	x 1 =	<u>0</u>																																				
FACW species	<u>50</u>	x 2 =	<u>100</u>																																				
FAC species	<u>70</u>	x 3 =	<u>210</u>																																				
FACU species	<u>0</u>	x 4 =	<u>0</u>																																				
UPL species	<u>0</u>	x 5 =	<u>0</u>																																				
Column Totals:	<u>120</u>	(A)	<u>310</u>	(B)																																			
2. _____	_____	_____	_____																																				
3. _____	_____	_____	_____																																				
4. _____	_____	_____	_____																																				
5. _____	_____	_____	_____																																				
6. _____	_____	_____	_____																																				
_____ = Total Cover																																							
50% of total cover: _____		20% of total cover: _____																																					
Shrub Stratum (Plot size: <u>30 ft.</u>)																																							
1. <u>Magnolia virginiana</u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤ 3.0 ¹ <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)																																			
2. <u>Ilex opaca</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>																																				
3. _____	_____	_____	_____																																				
4. _____	_____	_____	_____																																				
5. _____	_____	_____	_____																																				
6. _____	_____	_____	_____																																				
20 = Total Cover																																							
50% of total cover: <u>10</u>		20% of total cover: <u>4</u>																																					
Herb Stratum (Plot size: <u>30 ft.</u>)																																							
1. <u>Onoclea sensibilis</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.																																			
2. <u>Lysimachia minima</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>																																				
3. _____	_____	_____	_____																																				
4. _____	_____	_____	_____																																				
5. _____	_____	_____	_____																																				
6. _____	_____	_____	_____																																				
20 = Total Cover																																							
50% of total cover: <u>10</u>		20% of total cover: <u>4</u>																																					
Woody Vine Stratum (Plot size: <u>30 ft.</u>)																																							
1. <u>Vitis rotundifolia</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Present? Yes <u>X</u> No _____																																			
2. <u>Smilax laurifolia</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>																																				
3. _____	_____	_____	_____																																				
4. _____	_____	_____	_____																																				
5. _____	_____	_____	_____																																				
6. _____	_____	_____	_____																																				
10 = Total Cover																																							
50% of total cover: <u>5</u>		20% of total cover: <u>2</u>																																					

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4							Organic Soil Layer	organic peat
4-12	10YR 2/1	100	None	—	—	—	Sandy Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)**

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR S, T, U)
☐ Histic Epipedon (A2)	☐ Thin Dark Surface (S9) (LRR S, T, U)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (LRR O)
☒ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5)	☐ Depleted Matrix (F3)
☐ Organic Bodies (A6) (LRR P, T, U)	☐ Redox Dark Surface (F6)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)	☐ Depleted Dark Surface (F7)
☐ Muck Presence (A8) (LRR U)	☐ Redox Depressions (F8)
☐ 1 cm Muck (A9) (LRR P, T)	☐ Marl (F10) (LRR U)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Ochric (F11) (MLRA 151)
☐ Thick Dark Surface (A12)	☐ Iron-Manganese Masses (F12) (LRR O, P, T)
☐ Coast Prairie Redox (A16) (MLRA 150A)	☐ Umbric Surface (F13) (LRR P, T, U)
☐ Sandy Mucky Mineral (S1) (LRR O, S)	☐ Delta Ochric (F17) (MLRA 151)
☐ Sandy Gleyed Matrix (S4)	☐ Reduced Vertic (F18) (MLRA 150A, 150B)
☐ Sandy Redox (S5)	☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
☐ Stripped Matrix (S6)	☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)
☐ Dark Surface (S7) (LRR P, S, T, U)	

Indicators for Problematic Hydric Soils³:

☐ 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)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**

Type: roots

Depth (inches): 12 inches

Hydric Soil Present? Yes ☒ No ☐**Remarks:**

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 19, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPB006
 Investigator(s): H. McFeeters and R. Barnhill Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Rise Local relief (concave, convex, none): none Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 32.99707 Long: -79.74908 Datum: NAD 83
 Soil Map Unit Name: Cm - Cainhoy fine sand, 0 to 6 percent slopes NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) Yes (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: This point was determined not to be within a wetland due to the lack of hydric soils and wetland hydrology. Upland datapoint associated with WB002	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>16"</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

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

 Sampling Point: DPB006

Tree Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Pinus palustris</i>		70	Yes	FACW
2. <i>Magnolia virginiana</i>		10	No	FACU
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
		80 = Total Cover		
50% of total cover:		40	20% of total cover: 16	

Sapling Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Quercus nigra</i>		15	Yes	FAC
2. <i>Magnolia virginiana</i>		15	Yes	FAC
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
		30 = Total Cover		
50% of total cover:		15	20% of total cover: 6	

Shrub Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>None Observed</i>		_____	_____	_____
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
		_____ = Total Cover		
50% of total cover:		_____	20% of total cover: _____	

Herb Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Clethra alnifolia</i>		40	Yes	FACW
2. <i>Botrypus virginianus</i>		30	Yes	FACU
3. <i>Schizachyrium scoparium</i>		10	No	FACU
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
7. _____		_____	_____	_____
8. _____		_____	_____	_____
9. _____		_____	_____	_____
10. _____		_____	_____	_____
11. _____		_____	_____	_____
		80 = Total Cover		
50% of total cover:		40	20% of total cover: 16	

Woody Vine Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>None Observed</i>		_____	_____	_____
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
		_____ = Total Cover		
50% of total cover:		_____	20% of total cover: _____	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>110</u>	x 2 = <u>220</u>
FAC species <u>30</u>	x 3 = <u>90</u>
FACU species <u>50</u>	x 4 = <u>200</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>190</u> (A)	<u>510</u> (B)

Prevalence Index = B/A = 2.68

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index is ≤ 3.0¹

 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic
Vegetation

Present? Yes X No

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1								organic material
1-6	10YR 4/2	100	None	—	—	—	Sand	
6-18	10YR 6/4	100	None	—	—	—	Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 21, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPB007
 Investigator(s): H. McFeeters and R. Barnhill Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 30.00693 Long: -79.72788 Datum: NAD 83
 Soil Map Unit Name: Sm - Seewee complex NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
 Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> Is the Sampled Area within a Wetland? </td> <td style="width: 50%; padding: 5px;"> Yes <u>X</u> No _____ </td> </tr> </table>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No _____
Is the Sampled Area within a Wetland?	Yes <u>X</u> No _____		
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria. Wetland datapoint associated with WB003 Normal circumstances are not present due to significant rainfall in past 24 hours. Vegetation is disturbed due to historic logging.			

HYDROLOGY

Wetland hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
☐ Surface Water (A1)	☐ Aquatic Fauna (B13)	☐ Surface Soil Cracks (B6)
☒ High Water Table (A2)	☐ Marl Deposits (B15) (LRR U)	☐ Sparsely Vegetated Concave Surface (B8)
☒ Saturation (A3)	☐ Hydrogen Sulfide Odor (C1)	☐ Drainage Patterns (B10)
☐ Water Marks (B1)	☐ Oxidized Rhizospheres on Living Roots (C3)	☐ Moss Trim Lines (B16)
☐ Sediment Deposits (B2)	☐ Presence of Reduced Iron (C4)	☐ Dry-Season Water Table (C2)
☐ Drift Deposits (B3)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Crayfish Burrows (C8)
☐ Algal Mat or Crust (B4)	☐ Thin Muck Surface (C7)	☒ Saturation Visible on Aerial Imagery (C9)
☐ Iron Deposits (B5)	☐ Other (Explain in Remarks)	☒ Geomorphic Position (D2)
☐ Inundation Visible on Aerial Imagery (B7)		☒ Shallow Aquitard (D3)
☒ Water-Stained Leaves (B9)		☒ FAC-Neutral Test (D5)
		☐ Sphagnum moss (D8) (LRR T, U)

Field Observations:			
Surface Water Present?	Yes _____ No <u>X</u>	Depth (inches): <u>N/A</u>	Wetland Hydrology Present? Yes <u>X</u> No _____
Water Table Present?	Yes <u>X</u> No _____	Depth (inches): <u>5"</u>	
Saturation Present? (includes capillary fringe)	Yes <u>X</u> No _____	Depth (inches): <u>Surface</u>	

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

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

 Sampling Point: DPB007

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status																													
1. <u>None Observed</u>				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>83%</u> (A/B)																												
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
			= Total Cover																													
50% of total cover:			20% of total cover:																													
Sapling Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>None Observed</u>				Prevalence Index Worksheet: <table style="width: 100%;"> <tr> <td colspan="2">Total % Cover of:</td> <td colspan="2">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td><u>0</u></td> <td>x 1 =</td> <td><u>0</u></td> </tr> <tr> <td>FACW species</td> <td><u>80</u></td> <td>x 2 =</td> <td><u>160</u></td> </tr> <tr> <td>FAC species</td> <td><u>35</u></td> <td>x 3 =</td> <td><u>105</u></td> </tr> <tr> <td>FACU species</td> <td><u>25</u></td> <td>x 4 =</td> <td><u>100</u></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x 5 =</td> <td><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td><u>140</u></td> <td>(A)</td> <td><u>365</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.61</u>	Total % Cover of:		Multiply by:		OBL species	<u>0</u>	x 1 =	<u>0</u>	FACW species	<u>80</u>	x 2 =	<u>160</u>	FAC species	<u>35</u>	x 3 =	<u>105</u>	FACU species	<u>25</u>	x 4 =	<u>100</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>140</u>	(A)	<u>365</u> (B)
Total % Cover of:		Multiply by:																														
OBL species	<u>0</u>	x 1 =	<u>0</u>																													
FACW species	<u>80</u>	x 2 =	<u>160</u>																													
FAC species	<u>35</u>	x 3 =	<u>105</u>																													
FACU species	<u>25</u>	x 4 =	<u>100</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>140</u>	(A)	<u>365</u> (B)																													
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
			= Total Cover																													
50% of total cover:			20% of total cover:																													
Shrub Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>Ilex glabra</u>	<u>30</u>	<u>Yes</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤ 3.0 ¹ <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)																												
2. <u>Magnolia virginiana</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>																													
3. _____																																
4. _____																																
5. _____																																
6. _____																																
			= Total Cover																													
50% of total cover:			20% of total cover:																													
Herb Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>Rhynchospora microcephala</u>	<u>30</u>	<u>Yes</u>	<u>FACW</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																												
2. <u>Schizachyrium scoparium</u>	<u>25</u>	<u>Yes</u>	<u>FACU</u>																													
3. <u>Arundinaria tecta</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>																													
4. <u>Deparia acrostichoides</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>																													
5. _____																																
6. _____																																
			= Total Cover																													
50% of total cover:			20% of total cover:																													
Woody Vine Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>None Observed</u>				Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.																												
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
			= Total Cover																													
50% of total cover:			20% of total cover:																													

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1								Organic material
1-4	10Y 3/1	100	None	—	—	—	Sandy Loam	
4-8	10Y 5/1	100	None	—	—	—	Sandy Loam	
8-14	10YR 3/2	100	None	—	—	—	Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)**

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR S, T, U)
☐ Histic Epipedon (A2)	☐ Thin Dark Surface (S9) (LRR S, T, U)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (LRR O)
☐ Hydrogen Sulfide (A4)	☒ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5)	☐ Depleted Matrix (F3)
☐ Organic Bodies (A6) (LRR P, T, U)	☐ Redox Dark Surface (F6)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)	☐ Depleted Dark Surface (F7)
☐ Muck Presence (A8) (LRR U)	☐ Redox Depressions (F8)
☐ 1 cm Muck (A9) (LRR P, T)	☐ Marl (F10) (LRR U)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Ochric (F11) (MLRA 151)
☐ Thick Dark Surface (A12)	☐ Iron-Manganese Masses (F12) (LRR O, P, T)
☐ Coast Prairie Redox (A16) (MLRA 150A)	☐ Umbric Surface (F13) (LRR P, T, U)
☐ Sandy Mucky Mineral (S1) (LRR O, S)	☐ Delta Ochric (F17) (MLRA 151)
☐ Sandy Gleyed Matrix (S4)	☐ Reduced Vertic (F18) (MLRA 150A, 150B)
☐ Sandy Redox (S5)	☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
☐ Stripped Matrix (S6)	☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)
☐ Dark Surface (S7) (LRR P, S, T, U)	

Indicators for Problematic Hydric Soils³:

☐ 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)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**
 Type: _____
 Depth (inches): _____
Hydric Soil Present? Yes ☒ No ☐**Remarks:**

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 21, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPB008
 Investigator(s): H. McFeeters and R. Barnhill Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Rise Local relief (concave, convex, none): none Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.00715 Long: -79.72778 Datum: NAD 83
 Soil Map Unit Name: Sm - Seewee complex NWI Classification: PFO4A
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
 Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: This point was determined not to be within a wetland due to the lack of hydric soils. Upland datapoint associated with WB003 and WB004 Normal circumstances are not present due to significant rainfall in past 24 hours. Vegetation is disturbed due to historic logging.	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) <u>X</u> High Water Table (A2) _____ Marl Deposits (B15) (LRR U) <u>X</u> Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>10"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>10"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
---	---

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

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

 Sampling Point: DPB008

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status																													
1. <u><i>Pinus palustris</i></u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>7</u> (A) Total Number of Dominant Species Across All Strata: <u>8</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>88%</u> (A/B)																												
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
15 = Total Cover																																
50% of total cover: <u>7.5</u>		20% of total cover: <u>3</u>																														
Sapling Stratum (Plot size: <u>30 ft.</u>)																																
1. <u><i>Liquidambar styraciflua</i></u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index Worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Total % Cover of:</th> <th style="width: 10%;"></th> <th style="width: 10%;">Multiply by:</th> <th style="width: 40%;"></th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td><u>0</u></td> <td>x 1 =</td> <td><u>0</u></td> </tr> <tr> <td>FACW species</td> <td><u>95</u></td> <td>x 2 =</td> <td><u>190</u></td> </tr> <tr> <td>FAC species</td> <td><u>40</u></td> <td>x 3 =</td> <td><u>120</u></td> </tr> <tr> <td>FACU species</td> <td><u>35</u></td> <td>x 4 =</td> <td><u>140</u></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x 5 =</td> <td><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td><u>170</u></td> <td>(A)</td> <td><u>450</u> (B)</td> </tr> </tbody> </table> Prevalence Index = B/A = <u>2.65</u>	Total % Cover of:		Multiply by:		OBL species	<u>0</u>	x 1 =	<u>0</u>	FACW species	<u>95</u>	x 2 =	<u>190</u>	FAC species	<u>40</u>	x 3 =	<u>120</u>	FACU species	<u>35</u>	x 4 =	<u>140</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>170</u>	(A)	<u>450</u> (B)
Total % Cover of:		Multiply by:																														
OBL species	<u>0</u>	x 1 =	<u>0</u>																													
FACW species	<u>95</u>	x 2 =	<u>190</u>																													
FAC species	<u>40</u>	x 3 =	<u>120</u>																													
FACU species	<u>35</u>	x 4 =	<u>140</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>170</u>	(A)	<u>450</u> (B)																													
2. <u><i>Magnolia virginiana</i></u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
40 = Total Cover																																
50% of total cover: <u>20</u>		20% of total cover: <u>8</u>																														
Shrub Stratum (Plot size: <u>30 ft.</u>)																																
1. <u><i>Ilex glabra</i></u>	<u>25</u>	<u>Yes</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤ 3.0 ¹ <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)																												
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
25 = Total Cover																																
50% of total cover: <u>12.5</u>		20% of total cover: <u>5</u>																														
Herb Stratum (Plot size: <u>30 ft.</u>)																																
1. <u><i>Botrypus virginianus</i></u>	<u>35</u>	<u>Yes</u>	<u>FACU</u>	Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.																												
2. <u><i>Rhexia mariana</i></u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>																													
3. <u><i>Rhynchospora microcephala</i></u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>																													
4. <u><i>Panicum dichotomiflorum</i></u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>																													
5. <u><i>Polygala lutea</i></u>	<u>10</u>	<u>No</u>	<u>FACW</u>																													
6. _____	_____	_____	_____																													
7. _____	_____	_____	_____																													
8. _____	_____	_____	_____																													
9. _____	_____	_____	_____																													
10. _____	_____	_____	_____																													
11. _____	_____	_____	_____																													
90 = Total Cover																																
50% of total cover: <u>45</u>		20% of total cover: <u>18</u>																														
Woody Vine Stratum (Plot size: <u>30 ft.</u>)																																
1. <u><i>None Observed</i></u>	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____																												
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
_____ = Total Cover																																
50% of total cover: _____		20% of total cover: _____																														

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 4/1	100	None	—	—	—	Sand	
2-4	10YR 5/1	100	None	—	—	—	Sand	
4-14	10YR 6/2	100	None	—	—	—	Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)**

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR S, T, U)
☐ Histic Epipedon (A2)	☐ Thin Dark Surface (S9) (LRR S, T, U)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (LRR O)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5)	☐ Depleted Matrix (F3)
☐ Organic Bodies (A6) (LRR P, T, U)	☐ Redox Dark Surface (F6)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)	☐ Depleted Dark Surface (F7)
☐ Muck Presence (A8) (LRR U)	☐ Redox Depressions (F8)
☐ 1 cm Muck (A9) (LRR P, T)	☐ Marl (F10) (LRR U)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Ochric (F11) (MLRA 151)
☐ Thick Dark Surface (A12)	☐ Iron-Manganese Masses (F12) (LRR O, P, T)
☐ Coast Prairie Redox (A16) (MLRA 150A)	☐ Umbric Surface (F13) (LRR P, T, U)
☐ Sandy Mucky Mineral (S1) (LRR O, S)	☐ Delta Ochric (F17) (MLRA 151)
☐ Sandy Gleyed Matrix (S4)	☐ Reduced Vertic (F18) (MLRA 150A, 150B)
☐ Sandy Redox (S5)	☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
☐ Stripped Matrix (S6)	☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)
☐ Dark Surface (S7) (LRR P, S, T, U)	

Indicators for Problematic Hydric Soils³:

☐ 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)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**
 Type: _____
 Depth (inches): _____
Hydric Soil Present? Yes _____ No X**Remarks:**

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 21, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPB009
 Investigator(s): H. McFeeters and R. Barnhill Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.00722 Long: -79.72761 Datum: NAD 83
 Soil Map Unit Name: Sm - Seewee complex NWI Classification: PFO4A
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
 Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria. Wetland datapoint associated with WB004 Normal circumstances are not present due to significant rainfall in past 24 hours. Vegetation is disturbed due to historic logging.	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators</u> (minimum of one is required; check all that apply)		<u>Secondary Indicators</u> (minimum of two required)
<u>X</u> Surface Water (A1)	_____ Aquatic Fauna (B13)	_____ Surface Soil Cracks (B6)
<u>X</u> High Water Table (A2)	_____ Marl Deposits (B15) (LRR U)	_____ Sparsely Vegetated Concave Surface (B8)
<u>X</u> Saturation (A3)	_____ Hydrogen Sulfide Odor (C1)	_____ Drainage Patterns (B10)
_____ Water Marks (B1)	_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Moss Trim Lines (B16)
_____ Sediment Deposits (B2)	_____ Presence of Reduced Iron (C4)	_____ Dry-Season Water Table (C2)
_____ Drift Deposits (B3)	_____ Recent Iron Reduction in Tilled Soils (C6)	_____ Crayfish Burrows (C8)
_____ Algal Mat or Crust (B4)	_____ Thin Muck Surface (C7)	_____ Saturation Visible on Aerial Imagery (C9)
_____ Iron Deposits (B5)	_____ Other (Explain in Remarks)	<u>X</u> Geomorphic Position (D2)
_____ Inundation Visible on Aerial Imagery (B7)		_____ Shallow Aquitard (D3)
<u>X</u> Water-Stained Leaves (B9)		<u>X</u> FAC-Neutral Test (D5)
		_____ Sphagnum moss (D8) (LRR T, U)

Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>1/2"</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>4"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>Surface</u> (includes capillary fringe)				Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

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

 Sampling Point: DPB009

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status																													
1. <u><i>Pinus palustris</i></u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>86%</u> (A/B)																												
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
15 = Total Cover																																
50% of total cover: <u>7.5</u>		20% of total cover: <u>3</u>																														
Sapling Stratum (Plot size: <u>30 ft.</u>)																																
1. <u><i>Liquidambar styraciflua</i></u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index Worksheet: <table style="width: 100%;"> <tr> <td colspan="2">Total % Cover of:</td> <td colspan="2">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td><u>30</u></td> <td>x 1 =</td> <td><u>30</u></td> </tr> <tr> <td>FACW species</td> <td><u>45</u></td> <td>x 2 =</td> <td><u>90</u></td> </tr> <tr> <td>FAC species</td> <td><u>70</u></td> <td>x 3 =</td> <td><u>210</u></td> </tr> <tr> <td>FACU species</td> <td><u>15</u></td> <td>x 4 =</td> <td><u>60</u></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x 5 =</td> <td><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td><u>160</u></td> <td>(A)</td> <td><u>390</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.44</u>	Total % Cover of:		Multiply by:		OBL species	<u>30</u>	x 1 =	<u>30</u>	FACW species	<u>45</u>	x 2 =	<u>90</u>	FAC species	<u>70</u>	x 3 =	<u>210</u>	FACU species	<u>15</u>	x 4 =	<u>60</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>160</u>	(A)	<u>390</u> (B)
Total % Cover of:		Multiply by:																														
OBL species	<u>30</u>	x 1 =	<u>30</u>																													
FACW species	<u>45</u>	x 2 =	<u>90</u>																													
FAC species	<u>70</u>	x 3 =	<u>210</u>																													
FACU species	<u>15</u>	x 4 =	<u>60</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>160</u>	(A)	<u>390</u> (B)																													
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
25 = Total Cover																																
50% of total cover: <u>12.5</u>		20% of total cover: <u>5</u>																														
Shrub Stratum (Plot size: <u>30 ft.</u>)																																
1. <u><i>Morella cerifera</i></u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤ 3.0 ¹ <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)																												
2. <u><i>Ilex glabra</i></u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
50 = Total Cover																																
50% of total cover: <u>25</u>		20% of total cover: <u>10</u>																														
Herb Stratum (Plot size: <u>30 ft.</u>)																																
1. <u><i>Rhynchospora microcephala</i></u>	<u>25</u>	<u>Yes</u>	<u>FACW</u>	Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.																												
2. <u><i>Hydrocotyle umbellata</i></u>	<u>20</u>	<u>Yes</u>	<u>OBL</u>																													
3. <u><i>Andropogon virginicus</i></u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>																													
4. <u><i>Thelypteris palustris</i></u>	<u>10</u>	<u>No</u>	<u>OBL</u>																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
7. _____	_____	_____	_____																													
8. _____	_____	_____	_____																													
9. _____	_____	_____	_____																													
10. _____	_____	_____	_____																													
11. _____	_____	_____	_____																													
70 = Total Cover																																
50% of total cover: <u>35</u>		20% of total cover: <u>14</u>																														
Woody Vine Stratum (Plot size: <u>30 ft.</u>)																																
1. <u><i>None Observed</i></u>	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____																												
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
_____ = Total Cover																																
50% of total cover: _____		20% of total cover: _____																														

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 3/1	100	None	—	—	—	Sand	
2-4	10YR 4/1	100	None	—	—	—	Sand	
4-14	10YR 6/2	90	10YR 7/3	10	C	M	Sandy Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 21, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPB010
 Investigator(s): H. McFeeters and R. Barnhill Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.00752 Long: -79.72659 Datum: NAD 83
 Soil Map Unit Name: Sm - Seewee complex NWI Classification: PFO1/2F
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
 Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria. Wetland datapoint associated with WB005 Normal circumstances are not present due to significant rainfall in past 24 hours. Vegetation is disturbed due to historic logging.	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) <u>X</u> High Water Table (A2) _____ Marl Deposits (B15) (LRR U) <u>X</u> Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> Geomorphic Position (D2) _____ Shallow Aquitard (D3) <u>X</u> FAC-Neutral Test (D5) <u>X</u> Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>10"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>10"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

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

 Sampling Point: DPB010

Tree Stratum	(Plot size: 30 ft.)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Taxodium distichum</i>		35	Yes	OBL
2. <i>Pinus palustris</i>		25	Yes	FACU
3. _____				
4. _____				
5. _____				
6. _____				
		60 = Total Cover		
50% of total cover:		30	20% of total cover:	12
Sapling Stratum (Plot size: 30 ft.)				
1. <i>Liquidambar styraciflua</i>		30	Yes	FAC
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
		30 = Total Cover		
50% of total cover:		15	20% of total cover:	6
Shrub Stratum (Plot size: 30 ft.)				
1. <i>Ilex glabra</i>		20	Yes	FACW
2. <i>Morella cerifera</i>		15	Yes	FAC
3. _____				
4. _____				
5. _____				
6. _____				
		35 = Total Cover		
50% of total cover:		17.5	20% of total cover:	7
Herb Stratum (Plot size: 30 ft.)				
1. <i>Carex glaucescens</i>		40	Yes	OBL
2. <i>Lycopodium clavatum</i>		20	Yes	FAC
3. <i>Liquidambar styraciflua</i>		15	No	FAC
4. <i>Andropogon virginicus</i>		15	No	FAC
5. <i>Taxodium distichum</i>		5	No	OBL
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
		95 = Total Cover		
50% of total cover:		47.5	20% of total cover:	19
Woody Vine Stratum (Plot size: 30 ft.)				
1. <i>None Observed</i>				
2. _____				
3. _____				
4. _____				
5. _____				
50% of total cover:			20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 86% (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species <u>80</u>	x 1 = <u>80</u>
FACW species <u>20</u>	x 2 = <u>40</u>
FAC species <u>95</u>	x 3 = <u>285</u>
FACU species <u>25</u>	x 4 = <u>100</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>220</u>	(A) <u>505</u> (B)

 Prevalence Index = B/A = 2.30
Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☒ 3 - Prevalence Index is ≤ 3.0¹
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic
Vegetation

Present? Yes X No _____

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 2/1	100	None	—	—	—	Sand	
4-14	10Y 5/1	100	None	—	—	—	Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

- ☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 21, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPB011
 Investigator(s): H. McFeeters and R. Barnhill Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Rise Local relief (concave, convex, none): none Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.00760 Long: -79.72594 Datum: NAD 83
 Soil Map Unit Name: Sm - Seewee complex NWI Classification: PFO1/2F
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
 Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: This point was determined not to be within a wetland due to the lack of all three wetland criteria. Upland datapoint associated with WB005 Normal circumstances are not present due to significant rainfall in past 24 hours. Vegetation is disturbed due to historic logging.	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>14"</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>14"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

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

 Sampling Point: DPB011

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status																																				
1. <u><i>Pinus palustris</i></u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)																																			
2. _____	_____	_____	_____																																				
3. _____	_____	_____	_____																																				
4. _____	_____	_____	_____																																				
5. _____	_____	_____	_____																																				
6. _____	_____	_____	_____																																				
20 = Total Cover																																							
50% of total cover: <u>10</u>		20% of total cover: <u>4</u>																																					
Sapling Stratum (Plot size: <u>30 ft.</u>)																																							
1. <u><i>Liquidambar styraciflua</i></u>	<u>45</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index Worksheet: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Total % Cover of:</th> <th style="width: 10%;"></th> <th style="width: 10%;">Multiply by:</th> <th style="width: 10%;"></th> <th style="width: 10%;"></th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td><u>0</u></td> <td>x 1 =</td> <td><u>0</u></td> <td></td> </tr> <tr> <td>FACW species</td> <td><u>10</u></td> <td>x 2 =</td> <td><u>20</u></td> <td></td> </tr> <tr> <td>FAC species</td> <td><u>90</u></td> <td>x 3 =</td> <td><u>270</u></td> <td></td> </tr> <tr> <td>FACU species</td> <td><u>95</u></td> <td>x 4 =</td> <td><u>380</u></td> <td></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x 5 =</td> <td><u>0</u></td> <td></td> </tr> <tr> <td>Column Totals:</td> <td><u>195</u></td> <td>(A)</td> <td><u>670</u></td> <td>(B)</td> </tr> </tbody> </table> Prevalence Index = B/A = <u>3.44</u>	Total % Cover of:		Multiply by:			OBL species	<u>0</u>	x 1 =	<u>0</u>		FACW species	<u>10</u>	x 2 =	<u>20</u>		FAC species	<u>90</u>	x 3 =	<u>270</u>		FACU species	<u>95</u>	x 4 =	<u>380</u>		UPL species	<u>0</u>	x 5 =	<u>0</u>		Column Totals:	<u>195</u>	(A)	<u>670</u>	(B)
Total % Cover of:		Multiply by:																																					
OBL species	<u>0</u>	x 1 =	<u>0</u>																																				
FACW species	<u>10</u>	x 2 =	<u>20</u>																																				
FAC species	<u>90</u>	x 3 =	<u>270</u>																																				
FACU species	<u>95</u>	x 4 =	<u>380</u>																																				
UPL species	<u>0</u>	x 5 =	<u>0</u>																																				
Column Totals:	<u>195</u>	(A)	<u>670</u>	(B)																																			
2. <u><i>Quercus nigra</i></u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>																																				
3. _____	_____	_____	_____																																				
4. _____	_____	_____	_____																																				
5. _____	_____	_____	_____																																				
6. _____	_____	_____	_____																																				
65 = Total Cover																																							
50% of total cover: <u>32.5</u>		20% of total cover: <u>13</u>																																					
Shrub Stratum (Plot size: <u>30 ft.</u>)																																							
1. <u><i>Morella cerifera</i></u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>2</u> - Dominance Test is >50% <u>3</u> - Prevalence Index is ≤ 3.0 ¹ <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)																																			
2. _____	_____	_____	_____																																				
3. _____	_____	_____	_____																																				
4. _____	_____	_____	_____																																				
5. _____	_____	_____	_____																																				
6. _____	_____	_____	_____																																				
15 = Total Cover																																							
50% of total cover: <u>7.5</u>		20% of total cover: <u>3</u>																																					
Herb Stratum (Plot size: <u>30 ft.</u>)																																							
1. <u><i>Botrypus virginianus</i></u>	<u>50</u>	<u>Yes</u>	<u>FACU</u>	Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.																																			
2. <u><i>Ilex opaca</i></u>	<u>25</u>	<u>Yes</u>	<u>FACU</u>																																				
3. <u><i>Ilex glabra</i></u>	<u>10</u>	<u>No</u>	<u>FACW</u>																																				
4. <u><i>Liquidambar styraciflua</i></u>	<u>10</u>	<u>No</u>	<u>FAC</u>																																				
5. _____	_____	_____	_____																																				
6. _____	_____	_____	_____																																				
7. _____	_____	_____	_____																																				
8. _____	_____	_____	_____																																				
9. _____	_____	_____	_____																																				
10. _____	_____	_____	_____																																				
11. _____	_____	_____	_____																																				
95 = Total Cover																																							
50% of total cover: <u>47.5</u>		20% of total cover: <u>19</u>																																					
Woody Vine Stratum (Plot size: <u>30 ft.</u>)																																							
1. <u><i>None Observed</i></u>	_____	_____	_____	Hydrophytic Vegetation Present? Yes _____ No <u>X</u>																																			
2. _____	_____	_____	_____																																				
3. _____	_____	_____	_____																																				
4. _____	_____	_____	_____																																				
5. _____	_____	_____	_____																																				
_____ = Total Cover																																							
50% of total cover: _____		20% of total cover: _____																																					

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

No positive indication of hydrophytic vegetation was observed (≥50% of dominant species indexed as FAC- or drier).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 2/2	100	None	—	—	—	Sand	
2-4	10YR 4/3	100	None	—	—	—	Sand	
4-14	10YR 6/4	100	None	—	—	—	Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 21, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPB012
 Investigator(s): H. McFeeters and R. Barnhill Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.00677 Long: -79.72481 Datum: NAD 83
 Soil Map Unit Name: Sm - Seewee complex NWI Classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
 Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria. Wetland datapoint associated with WB007 Normal circumstances are not present due to significant rainfall in past 24 hours. Vegetation is disturbed due to historic logging.	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u>		<u>Secondary Indicators (minimum of two required)</u>
<u>X</u> Surface Water (A1)	_____ Aquatic Fauna (B13)	_____ Surface Soil Cracks (B6)
<u>X</u> High Water Table (A2)	_____ Marl Deposits (B15) (LRR U)	_____ Sparsely Vegetated Concave Surface (B8)
<u>X</u> Saturation (A3)	_____ Hydrogen Sulfide Odor (C1)	_____ Drainage Patterns (B10)
_____ Water Marks (B1)	_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Moss Trim Lines (B16)
<u>X</u> Sediment Deposits (B2)	_____ Presence of Reduced Iron (C4)	_____ Dry-Season Water Table (C2)
_____ Drift Deposits (B3)	_____ Recent Iron Reduction in Tilled Soils (C6)	_____ Crayfish Burrows (C8)
_____ Algal Mat or Crust (B4)	_____ Thin Muck Surface (C7)	_____ Saturation Visible on Aerial Imagery (C9)
_____ Iron Deposits (B5)	_____ Other (Explain in Remarks)	<u>X</u> Geomorphic Position (D2)
_____ Inundation Visible on Aerial Imagery (B7)		_____ Shallow Aquitard (D3)
<u>X</u> Water-Stained Leaves (B9)		<u>X</u> FAC-Neutral Test (D5)
		_____ Sphagnum moss (D8) (LRR T, U)

Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>1"</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>7"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>4"</u> (includes capillary fringe)				Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

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

 Sampling Point: DPB012

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status																													
1. <i>Nyssa biflora</i>	30	Yes	OBL	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																												
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
30 = Total Cover																																
50% of total cover: <u>15</u>		20% of total cover: <u>6</u>																														
Sapling Stratum (Plot size: <u>30 ft.</u>)																																
1. <i>Liquidambar styraciflua</i>	40	Yes	FAC	Prevalence Index Worksheet: <table style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2" style="text-align: left;">Total % Cover of:</th> <th colspan="2" style="text-align: left;">Multiply by:</th> </tr> <tr> <td>OBL species</td> <td style="text-align: center;"><u>80</u></td> <td>x 1 =</td> <td style="text-align: center;"><u>80</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align: center;"><u>10</u></td> <td>x 2 =</td> <td style="text-align: center;"><u>20</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align: center;"><u>40</u></td> <td>x 3 =</td> <td style="text-align: center;"><u>120</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align: center;"><u>0</u></td> <td>x 4 =</td> <td style="text-align: center;"><u>0</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align: center;"><u>0</u></td> <td>x 5 =</td> <td style="text-align: center;"><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align: center;"><u>130</u></td> <td>(A)</td> <td style="text-align: center;"><u>220</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.69</u>	Total % Cover of:		Multiply by:		OBL species	<u>80</u>	x 1 =	<u>80</u>	FACW species	<u>10</u>	x 2 =	<u>20</u>	FAC species	<u>40</u>	x 3 =	<u>120</u>	FACU species	<u>0</u>	x 4 =	<u>0</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>130</u>	(A)	<u>220</u> (B)
Total % Cover of:		Multiply by:																														
OBL species	<u>80</u>	x 1 =	<u>80</u>																													
FACW species	<u>10</u>	x 2 =	<u>20</u>																													
FAC species	<u>40</u>	x 3 =	<u>120</u>																													
FACU species	<u>0</u>	x 4 =	<u>0</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>130</u>	(A)	<u>220</u> (B)																													
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
40 = Total Cover																																
50% of total cover: <u>20</u>		20% of total cover: <u>8</u>																														
Shrub Stratum (Plot size: <u>30 ft.</u>)																																
1. <i>None Observed</i>	_____	_____	_____	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤ 3.0 ¹ <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)																												
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
_____ = Total Cover																																
50% of total cover: _____		20% of total cover: _____																														
Herb Stratum (Plot size: <u>30 ft.</u>)																																
1. <i>Carex glaucescens</i>	30	Yes	OBL	Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.																												
2. <i>Thelypteris palustris</i>	20	Yes	OBL																													
3. <i>Ilex glabra</i>	10	No	FACW																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
7. _____	_____	_____	_____																													
8. _____	_____	_____	_____																													
9. _____	_____	_____	_____																													
10. _____	_____	_____	_____																													
11. _____	_____	_____	_____																													
60 = Total Cover																																
50% of total cover: <u>30</u>		20% of total cover: <u>12</u>																														
Woody Vine Stratum (Plot size: <u>30 ft.</u>)																																
1. <i>None Observed</i>	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____																												
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
_____ = Total Cover																																
50% of total cover: _____		20% of total cover: _____																														

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1	10YR 2/1	100	None	—	—	—	Sand	
2-16	10Y 5/1	85	10YR 5/1	15	D	M	Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)**

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR S, T, U)
☐ Histic Epipedon (A2)	☐ Thin Dark Surface (S9) (LRR S, T, U)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (LRR O)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5)	☐ Depleted Matrix (F3)
☐ Organic Bodies (A6) (LRR P, T, U)	☐ Redox Dark Surface (F6)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)	☐ Depleted Dark Surface (F7)
☐ Muck Presence (A8) (LRR U)	☐ Redox Depressions (F8)
☐ 1 cm Muck (A9) (LRR P, T)	☐ Marl (F10) (LRR U)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Ochric (F11) (MLRA 151)
☐ Thick Dark Surface (A12)	☐ Iron-Manganese Masses (F12) (LRR O, P, T)
☐ Coast Prairie Redox (A16) (MLRA 150A)	☐ Umbric Surface (F13) (LRR P, T, U)
☐ Sandy Mucky Mineral (S1) (LRR O, S)	☐ Delta Ochric (F17) (MLRA 151)
☒ Sandy Gleyed Matrix (S4)	☐ Reduced Vertic (F18) (MLRA 150A, 150B)
☐ Sandy Redox (S5)	☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
☐ Stripped Matrix (S6)	☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)
☐ Dark Surface (S7) (LRR P, S, T, U)	

Indicators for Problematic Hydric Soils³:

☐ 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)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**
 Type: _____
 Depth (inches): _____
Hydric Soil Present? Yes ☒ No ☐**Remarks:**

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 21, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPB013
 Investigator(s): H. McFeeters and R. Barnhill Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Rise Local relief (concave, convex, none): none Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.00677 Long: -79.72465 Datum: NAD 83
 Soil Map Unit Name: Sm - Seewee complex NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
 Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: This point was determined not to be within a wetland due to the lack of hydric soils and wetland hydrology. Upland datapoint associated with WB007 and WB008 Normal circumstances are not present due to significant rainfall in past 24 hours. Vegetation is disturbed due to historic logging.	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>14"</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

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

 Sampling Point: DPB013

Tree Stratum	Absolute % cover	Dominant Species?	Indicator Status	
(Plot size: <u>30 ft.</u>)				
1. <u><i>Pinus palustris</i></u>	<u>35</u>	<u>Yes</u>	<u>FACU</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
	<u>35</u> = Total Cover			
	50% of total cover: <u>17.5</u>	20% of total cover: <u>7</u>		
Sapling Stratum (Plot size: <u>30 ft.</u>)				
1. <u><i>Liquidambar styraciflua</i></u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
	<u>40</u> = Total Cover			
	50% of total cover: <u>20</u>	20% of total cover: <u>8</u>		
Shrub Stratum (Plot size: <u>30 ft.</u>)				
1. <u><i>Ilex glabra</i></u>	<u>30</u>	<u>Yes</u>	<u>FACW</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
	<u>30</u> = Total Cover			
	50% of total cover: <u>15</u>	20% of total cover: <u>6</u>		
Herb Stratum (Plot size: <u>30 ft.</u>)				
1. <u><i>Botrypus virginianus</i></u>	<u>50</u>	<u>Yes</u>	<u>FACU</u>	
2. <u><i>Liquidambar styraciflua</i></u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
3. <u><i>Andropogon virginicus</i></u>	<u>15</u>	<u>No</u>	<u>FAC</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
	<u>85</u> = Total Cover			
	50% of total cover: <u>42.5</u>	20% of total cover: <u>17</u>		
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. <u><i>None Observed</i></u>	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
	_____ = Total Cover			
	50% of total cover: _____	20% of total cover: _____		

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

 Total Number of Dominant Species Across All Strata: 5 (B)

 Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>30</u>	x 2 = <u>60</u>
FAC species <u>75</u>	x 3 = <u>225</u>
FACU species <u>85</u>	x 4 = <u>340</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>190</u> (A)	<u>625</u> (B)

Prevalence Index = B/A = 3.29

Hydrophytic Vegetation Indicators:
1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
3 - Prevalence Index is ≤ 3.0¹
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:
Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation
 Present? Yes X No _____

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1	10YR 3/2	100	None	—	—	—	Sand	
1-4	10YR 4/3	100	None	—	—	—	Sand	
4-16	10YR 5/4	100	None	—	—	—	Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 21, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPB014
 Investigator(s): H. McFeeters and R. Barnhill Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.00853 Long: -79.72507 Datum: NAD 83
 Soil Map Unit Name: Sm - Seewee complex NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
 Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria. Wetland datapoint associated with WB006 Normal circumstances are not present due to significant rainfall in past 24 hours. Vegetation is disturbed due to historic logging.	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) <u>X</u> High Water Table (A2) _____ Marl Deposits (B15) (LRR U) <u>X</u> Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) <u>X</u> Inundation Visible on Aerial Imagery (B7) <u>X</u> Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> Geomorphic Position (D2) _____ Shallow Aquitard (D3) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>10"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>6"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

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

 Sampling Point: DPB014

Tree Stratum	Absolute % cover	Dominant Species?	Indicator Status	
(Plot size: <u>30 ft.</u>)				
1. <u>Pinus taeda</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Liquidambar styraciflua</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
	<u>50</u> = Total Cover			
	50% of total cover: <u>25</u>	20% of total cover: <u>10</u>		
Sapling Stratum (Plot size: <u>30 ft.</u>)				
1. <u>Liquidambar styraciflua</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Quercus nigra</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
	<u>30</u> = Total Cover			
	50% of total cover: <u>15</u>	20% of total cover: <u>6</u>		
Shrub Stratum (Plot size: <u>30 ft.</u>)				
1. <u>Ilex glabra</u>	<u>40</u>	<u>Yes</u>	<u>FACW</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
	<u>40</u> = Total Cover			
	50% of total cover: <u>20</u>	20% of total cover: <u>8</u>		
Herb Stratum (Plot size: <u>30 ft.</u>)				
1. <u>Hydrocotyle umbellata</u>	<u>15</u>	<u>Yes</u>	<u>OBL</u>	
2. <u>Arundinaria tecta</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
	<u>25</u> = Total Cover			
	50% of total cover: <u>12.5</u>	20% of total cover: <u>5</u>		
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. <u>None Observed</u>	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
	_____ = Total Cover			
	50% of total cover: _____	20% of total cover: _____		

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

 Total Number of Dominant Species Across All Strata: 7 (B)

 Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species <u>15</u>	x 1 = <u>15</u>
FACW species <u>50</u>	x 2 = <u>100</u>
FAC species <u>80</u>	x 3 = <u>240</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>145</u>	(A) <u>355</u> (B)

Prevalence Index = B/A = 2.45

Hydrophytic Vegetation Indicators:
1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☒ 3 - Prevalence Index is ≤ 3.0¹
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:
Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation
 Present? Yes X No _____

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1							Organic Soil Layer	
1-3	10YR 3/1	100	None	—	—	—	Sandy Loam	
3-16	10YR 4/1	95	10YR 6/4	5	C	M	Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐**Remarks:**

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 21, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPB015
 Investigator(s): H. McFeeters and R. Barnhill Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Rise Local relief (concave, convex, none): none Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.00853 Long: -79.72466 Datum: NAD 83
 Soil Map Unit Name: Sm - Seewee complex NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
 Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: This point was determined not to be within a wetland due to the lack of hydric soils and wetland hydrology. Upland datapoint associated with WB006. Normal circumstances are not present due to significant rainfall in past 24 hours. Vegetation is disturbed due to historic logging.	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) _____ Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No positive indication of wetland hydrology was observed.

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

 Sampling Point: DPB015

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status																													
1. <i>Pinus palustris</i>	35	Yes	FACU	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>71%</u> (A/B)																												
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
35 = Total Cover																																
50% of total cover: <u>17.5</u>		20% of total cover: <u>7</u>																														
Sapling Stratum (Plot size: <u>30 ft.</u>)																																
1. <i>Liquidambar styraciflua</i>	15	Yes	FAC	Prevalence Index Worksheet: <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">Total % Cover of:</td> <td style="width: 10%;"></td> <td style="width: 10%;">Multiply by:</td> <td style="width: 40%;"></td> </tr> <tr> <td>OBL species</td> <td><u>5</u></td> <td>x 1 =</td> <td><u>5</u></td> </tr> <tr> <td>FACW species</td> <td><u>25</u></td> <td>x 2 =</td> <td><u>50</u></td> </tr> <tr> <td>FAC species</td> <td><u>60</u></td> <td>x 3 =</td> <td><u>180</u></td> </tr> <tr> <td>FACU species</td> <td><u>65</u></td> <td>x 4 =</td> <td><u>260</u></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x 5 =</td> <td><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td><u>155</u></td> <td>(A)</td> <td><u>495</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.19</u>	Total % Cover of:		Multiply by:		OBL species	<u>5</u>	x 1 =	<u>5</u>	FACW species	<u>25</u>	x 2 =	<u>50</u>	FAC species	<u>60</u>	x 3 =	<u>180</u>	FACU species	<u>65</u>	x 4 =	<u>260</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>155</u>	(A)	<u>495</u> (B)
Total % Cover of:		Multiply by:																														
OBL species	<u>5</u>	x 1 =	<u>5</u>																													
FACW species	<u>25</u>	x 2 =	<u>50</u>																													
FAC species	<u>60</u>	x 3 =	<u>180</u>																													
FACU species	<u>65</u>	x 4 =	<u>260</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>155</u>	(A)	<u>495</u> (B)																													
2. <i>Quercus nigra</i>	10	Yes	FAC																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
25 = Total Cover																																
50% of total cover: <u>12.5</u>		20% of total cover: <u>5</u>																														
Shrub Stratum (Plot size: <u>30 ft.</u>)																																
1. <i>Ilex glabra</i>	25	Yes	FACW	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>3</u> - Prevalence Index is ≤ 3.0 ¹ <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)																												
2. <i>Morella cerifera</i>	20	Yes	FAC																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
45 = Total Cover																																
50% of total cover: <u>22.5</u>		20% of total cover: <u>9</u>																														
Herb Stratum (Plot size: <u>30 ft.</u>)																																
1. <i>Botrypus virginianus</i>	30	Yes	FACU	Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.																												
2. <i>Andropogon virginicus</i>	15	Yes	FAC																													
3. <i>Carex glaucescens</i>	5	No	OBL																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
7. _____	_____	_____	_____																													
8. _____	_____	_____	_____																													
9. _____	_____	_____	_____																													
10. _____	_____	_____	_____																													
11. _____	_____	_____	_____																													
50 = Total Cover																																
50% of total cover: <u>25</u>		20% of total cover: <u>10</u>																														
Woody Vine Stratum (Plot size: <u>30 ft.</u>)																																
1. <i>None Observed</i>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____																												
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
_____ = Total Cover																																
50% of total cover: _____		20% of total cover: _____																														

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1	10YR 3/1	100	None	—	—	—	Sandy Loam	
1-4	10YR 3/2	100	None	—	—	—	Sand	
4-16	10YR 5/3	100	None	—	—	—	Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)**

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR S, T, U)
☐ Histic Epipedon (A2)	☐ Thin Dark Surface (S9) (LRR S, T, U)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (LRR O)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5)	☐ Depleted Matrix (F3)
☐ Organic Bodies (A6) (LRR P, T, U)	☐ Redox Dark Surface (F6)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)	☐ Depleted Dark Surface (F7)
☐ Muck Presence (A8) (LRR U)	☐ Redox Depressions (F8)
☐ 1 cm Muck (A9) (LRR P, T)	☐ Marl (F10) (LRR U)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Ochric (F11) (MLRA 151)
☐ Thick Dark Surface (A12)	☐ Iron-Manganese Masses (F12) (LRR O, P, T)
☐ Coast Prairie Redox (A16) (MLRA 150A)	☐ Umbric Surface (F13) (LRR P, T, U)
☐ Sandy Mucky Mineral (S1) (LRR O, S)	☐ Delta Ochric (F17) (MLRA 151)
☐ Sandy Gleyed Matrix (S4)	☐ Reduced Vertic (F18) (MLRA 150A, 150B)
☐ Sandy Redox (S5)	☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
☐ Stripped Matrix (S6)	☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)
☐ Dark Surface (S7) (LRR P, S, T, U)	

Indicators for Problematic Hydric Soils³:

☐ 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)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**
 Type: _____
 Depth (inches): _____
Hydric Soil Present? Yes _____ No X**Remarks:**

No positive indication of hydric soils was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 21, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPB016
 Investigator(s): H. McFeeters and R. Barnhill Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.00901 Long: -79.72064 Datum: NAD 83
 Soil Map Unit Name: Sm - Seewee complex NWI Classification: PSS1/2C
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
 Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria. Wetland datapoint associated with WB008 Normal circumstances are not present due to significant rainfall in past 24 hours. Vegetation is disturbed due to historic logging.	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators</u> (minimum of one is required; check all that apply)		<u>Secondary Indicators</u> (minimum of two required)
<u>X</u> Surface Water (A1)	_____ Aquatic Fauna (B13)	_____ Surface Soil Cracks (B6)
<u>X</u> High Water Table (A2)	_____ Marl Deposits (B15) (LRR U)	_____ Sparsely Vegetated Concave Surface (B8)
<u>X</u> Saturation (A3)	<u>X</u> Hydrogen Sulfide Odor (C1)	_____ Drainage Patterns (B10)
_____ Water Marks (B1)	_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Moss Trim Lines (B16)
_____ Sediment Deposits (B2)	_____ Presence of Reduced Iron (C4)	_____ Dry-Season Water Table (C2)
_____ Drift Deposits (B3)	_____ Recent Iron Reduction in Tilled Soils (C6)	_____ Crayfish Burrows (C8)
_____ Algal Mat or Crust (B4)	_____ Thin Muck Surface (C7)	_____ Saturation Visible on Aerial Imagery (C9)
_____ Iron Deposits (B5)	_____ Other (Explain in Remarks)	<u>X</u> Geomorphic Position (D2)
_____ Inundation Visible on Aerial Imagery (B7)		_____ Shallow Aquitard (D3)
<u>X</u> Water-Stained Leaves (B9)		<u>X</u> FAC-Neutral Test (D5)
		_____ Sphagnum moss (D8) (LRR T, U)

Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>1"</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>6"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>3"</u> (includes capillary fringe)				Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

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

 Sampling Point: DPB016

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status																													
1. <u>Liquidambar styraciflua</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																												
2. <u>Pinus palustris</u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>																													
3. <u>Magnolia virginiana</u>	<u>10</u>	<u>No</u>	<u>FACW</u>																													
4. <u>Pinus taeda</u>	<u>10</u>	<u>No</u>	<u>FAC</u>																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
60 = Total Cover																																
50% of total cover: <u>30</u>		20% of total cover: <u>12</u>																														
Sapling Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>Liquidambar styraciflua</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index Worksheet: <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">Total % Cover of:</td> <td style="width: 10%;"></td> <td style="width: 10%;">Multiply by:</td> <td style="width: 40%;"></td> </tr> <tr> <td>OBL species</td> <td><u>0</u></td> <td>x 1 =</td> <td><u>0</u></td> </tr> <tr> <td>FACW species</td> <td><u>45</u></td> <td>x 2 =</td> <td><u>90</u></td> </tr> <tr> <td>FAC species</td> <td><u>75</u></td> <td>x 3 =</td> <td><u>225</u></td> </tr> <tr> <td>FACU species</td> <td><u>0</u></td> <td>x 4 =</td> <td><u>0</u></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x 5 =</td> <td><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td><u>120</u></td> <td>(A)</td> <td><u>315</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.63</u>	Total % Cover of:		Multiply by:		OBL species	<u>0</u>	x 1 =	<u>0</u>	FACW species	<u>45</u>	x 2 =	<u>90</u>	FAC species	<u>75</u>	x 3 =	<u>225</u>	FACU species	<u>0</u>	x 4 =	<u>0</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>120</u>	(A)	<u>315</u> (B)
Total % Cover of:		Multiply by:																														
OBL species	<u>0</u>	x 1 =	<u>0</u>																													
FACW species	<u>45</u>	x 2 =	<u>90</u>																													
FAC species	<u>75</u>	x 3 =	<u>225</u>																													
FACU species	<u>0</u>	x 4 =	<u>0</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>120</u>	(A)	<u>315</u> (B)																													
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
15 = Total Cover																																
50% of total cover: <u>7.5</u>		20% of total cover: <u>3</u>																														
Shrub Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>Ilex glabra</u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤ 3.0 ¹ <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)																												
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
15 = Total Cover																																
50% of total cover: <u>7.5</u>		20% of total cover: <u>3</u>																														
Herb Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>Morella cerifera</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	Definitions of Five Vegetation Strata: Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine - All woody vines, regardless of height.																												
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
25 = Total Cover																																
50% of total cover: <u>12.5</u>		20% of total cover: <u>5</u>																														
Woody Vine Stratum (Plot size: <u>30 ft.</u>)																																
1. <u>Smilax laurifolia</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>	Hydrophytic Vegetation Present? Yes <u>X</u> No _____																												
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
5 = Total Cover																																
50% of total cover: <u>2.5</u>		20% of total cover: <u>1</u>																														

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 2/1	100	None	—	—	—	Sandy Loam	
2-4	10YR 4/1	100	None	—	—	—	Sand	
4-16	10YR 5/2	95	7.5YR 4/6	5	C	M	Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)**

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR S, T, U)
☐ Histic Epipedon (A2)	☐ Thin Dark Surface (S9) (LRR S, T, U)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (LRR O)
☒ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5)	☐ Depleted Matrix (F3)
☐ Organic Bodies (A6) (LRR P, T, U)	☐ Redox Dark Surface (F6)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)	☐ Depleted Dark Surface (F7)
☐ Muck Presence (A8) (LRR U)	☐ Redox Depressions (F8)
☐ 1 cm Muck (A9) (LRR P, T)	☐ Marl (F10) (LRR U)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Ochric (F11) (MLRA 151)
☐ Thick Dark Surface (A12)	☐ Iron-Manganese Masses (F12) (LRR O, P, T)
☐ Coast Prairie Redox (A16) (MLRA 150A)	☐ Umbric Surface (F13) (LRR P, T, U)
☐ Sandy Mucky Mineral (S1) (LRR O, S)	☐ Delta Ochric (F17) (MLRA 151)
☐ Sandy Gleyed Matrix (S4)	☐ Reduced Vertic (F18) (MLRA 150A, 150B)
☒ Sandy Redox (S5)	☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
☐ Stripped Matrix (S6)	☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)
☐ Dark Surface (S7) (LRR P, S, T, U)	

Indicators for Problematic Hydric Soils³:

☐ 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)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐**Remarks:**

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 21, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPB017
 Investigator(s): H. McFeeters and R. Barnhill Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): none Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.00844 Long: -79.72097 Datum: NAD 83
 Soil Map Unit Name: Sm - Seewee complex NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria. Wetland datapoint associated with WB009. Normal circumstances are not present due to significant rainfall in past 24 hours.	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) <u>X</u> High Water Table (A2) _____ Marl Deposits (B15) (LRR U) <u>X</u> Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots(C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>10"</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>8"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

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

 Sampling Point: DPB017

Tree Stratum (Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status	
1. <u>None Observed</u>				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
				= Total Cover
50% of total cover: _____				20% of total cover: _____
Sapling Stratum (Plot size: <u>30 ft.</u>)				
1. <u>Liquidambar styraciflua</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Pinus palustris</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	
3. _____				
4. _____				
5. _____				
6. _____				
				= Total Cover
50% of total cover: <u>15</u>				20% of total cover: <u>6</u>
Shrub Stratum (Plot size: <u>30 ft.</u>)				
1. <u>Ilex glabra</u>	<u>30</u>	<u>Yes</u>	<u>FACW</u>	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
				= Total Cover
50% of total cover: <u>15</u>				20% of total cover: <u>6</u>
Herb Stratum (Plot size: <u>30 ft.</u>)				
1. <u>Andropogon virginicus</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Rhynchospora microcephala</u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>	
3. <u>Deparia acrostichoides</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	
4. <u>Hydrocotyle umbellata</u>	<u>10</u>	<u>No</u>	<u>OBL</u>	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
				= Total Cover
50% of total cover: <u>27.5</u>				20% of total cover: <u>11</u>
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. <u>None Observed</u>				
2. _____				
3. _____				
4. _____				
5. _____				
				= Total Cover
50% of total cover: _____				20% of total cover: _____

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

 Total Number of Dominant Species Across All Strata: 5 (B)

 Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species <u>10</u>	x 1 = <u>10</u>
FACW species <u>45</u>	x 2 = <u>90</u>
FAC species <u>50</u>	x 3 = <u>150</u>
FACU species <u>10</u>	x 4 = <u>40</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>115</u>	(A) <u>290</u> (B)

Prevalence Index = B/A = 2.52

Hydrophytic Vegetation Indicators:
1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☒ 3 - Prevalence Index is ≤ 3.0¹
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:
Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation
 Present? Yes X No

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR	100	None	—	—	—	Sand	
3-16	10YR	95	7.5YR 4/6	5	C	M	Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐**Remarks:**

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 21, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPB018
 Investigator(s): H. McFeeters and R. Barnhill Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.00828 Long: -79.71991 Datum: NAD 83
 Soil Map Unit Name: _____ NWI Classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria. Wetland datapoint associated with WB008 Normal circumstances are not present due to significant rainfall in past 24 hours.	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) <u>X</u> High Water Table (A2) _____ Marl Deposits (B15) (LRR U) <u>X</u> Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) <u>X</u> Inundation Visible on Aerial Imagery (B7) <u>X</u> Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> _____ 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) <u>X</u> Geomorphic Position (D2) _____ Shallow Aquitard (D3) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum moss (D8) (LRR T, U)
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Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>N/A</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>5</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>4</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

A positive indication of wetland hydrology was observed (at least two secondary indicators).

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

 Sampling Point: DPB018

Tree Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Pinus taeda</i>		30	Yes	FAC
2. <i>Taxodium distichum</i>		20	Yes	OBL
3. <i>Nyssa biflora</i>		10	No	OBL
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
		60 = Total Cover		
50% of total cover:		30	20% of total cover: 12	

Sapling Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Magnolia virginiana</i>		15	Yes	FACW
2. <i>Liquidambar styraciflua</i>		15	Yes	FAC
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
		30 = Total Cover		
50% of total cover:		15	20% of total cover: 6	

Shrub Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>None Observed</i>		_____	_____	_____
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
		_____ = Total Cover		
50% of total cover:		_____	20% of total cover: _____	

Herb Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Arundinaria tecta</i>		20	Yes	FACW
2. <i>Thelypteris palustris</i>		10	Yes	OBL
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
6. _____		_____	_____	_____
7. _____		_____	_____	_____
8. _____		_____	_____	_____
9. _____		_____	_____	_____
10. _____		_____	_____	_____
11. _____		_____	_____	_____
		30 = Total Cover		
50% of total cover:		15	20% of total cover: 6	

Woody Vine Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Vitis rotundifolia</i>		15	Yes	FAC
2. _____		_____	_____	_____
3. _____		_____	_____	_____
4. _____		_____	_____	_____
5. _____		_____	_____	_____
		15 = Total Cover		
50% of total cover:		7.5	20% of total cover: 3	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species <u>40</u>	x 1 = <u>40</u>
FACW species <u>35</u>	x 2 = <u>70</u>
FAC species <u>60</u>	x 3 = <u>180</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>135</u>	(A) <u>290</u> (B)

 Prevalence Index = B/A = 2.15
Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☒ 3 - Prevalence Index is ≤ 3.0¹
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic
Vegetation

Present? Yes X No

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 2/1	100	None	—	—	—	Sandy Loam	
3-12	10Y 5/1	100	None	—	—	—	Sand	
12-16	10YR 5/2	100	None	—	—	—	Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils 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 Soils³:

☐ 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)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

A positive indication of hydric soil was observed.

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Camp Hall Rail Wetland Mitigation Project County: Charleston Sampling Date: July 21, 2018
 Applicant/Owner: Palustrine Group State: SC Sample Point: DPB019
 Investigator(s): H. McFeeters and R. Barnhill Section, Township, Range: #N/A
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 00-05
 Subregion (LRR or MLRA): MLRA 153 Atlantic Coast Flatwoods Lat: 33.00948 Long: -79.71191 Datum: NAD 83
 Soil Map Unit Name: Rg - Rutledge loamy fine sand NWI Classification: PFO3B
 Are climatic / hydrologic conditions on the site typical for this time of year? (Yes / No) No (if no, explain in Remarks.)
 Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes No X
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No <u> </u> Hydric Soil Present? Yes <u>X</u> No <u> </u> Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Remarks: This point was determined to be within a wetland due to the presence of all 3 wetland criteria. Wetland datapoint associated with WB009. Normal circumstances are not present due to significant rainfall in past 24 hours. Vegetation is disturbed due to historic logging.	

HYDROLOGY

Wetland hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <u>X</u> Surface Water (A1) <u> </u> Aquatic Fauna (B13) <u>X</u> High Water Table (A2) <u> </u> Marl Deposits (B15) (LRR U) <u>X</u> Saturation (A3) <u>X</u> Hydrogen Sulfide Odor (C1) <u> </u> Water Marks (B1) <u> </u> Oxidized Rhizospheres on Living Roots (C3) <u> </u> Sediment Deposits (B2) <u> </u> Presence of Reduced Iron (C4) <u> </u> Drift Deposits (B3) <u> </u> Recent Iron Reduction in Tilled Soils (C6) <u> </u> Algal Mat or Crust (B4) <u> </u> Thin Muck Surface (C7) <u> </u> Iron Deposits (B5) <u> </u> Other (Explain in Remarks) <u> </u> Inundation Visible on Aerial Imagery (B7) <u> </u> Water-Stained Leaves (B9)		<u>Secondary Indicators (minimum of two required)</u> <u> </u> Surface Soil Cracks (B6) <u> </u> Sparsely Vegetated Concave Surface (B8) <u> </u> Drainage Patterns (B10) <u> </u> Moss Trim Lines (B16) <u> </u> Dry-Season Water Table (C2) <u> </u> Crayfish Burrows (C8) <u> </u> Saturation Visible on Aerial Imagery (C9) <u>X</u> Geomorphic Position (D2) <u> </u> Shallow Aquitard (D3) <u> </u> FAC-Neutral Test (D5) <u> </u> Sphagnum moss (D8) (LRR T, U)
Field Observations: Surface Water Present? Yes <u>X</u> No <u> </u> Depth (inches): <u>1"</u> Water Table Present? Yes <u>X</u> No <u> </u> Depth (inches): <u>4"</u> Saturation Present? Yes <u>X</u> No <u> </u> Depth (inches): <u>surface</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

Tree Stratum	(Plot size: <u>30 ft.</u>)	Absolute % cover	Dominant Species?	Indicator Status
1. <i>Liquidambar styraciflua</i>		25	Yes	FAC
2. <i>Pinus taeda</i>		25	Yes	FAC
3. _____				
4. _____				
5. _____				
6. _____				
		50 = Total Cover		
50% of total cover:		25	20% of total cover:	10
Sapling Stratum (Plot size: <u>30 ft.</u>)				
1. <i>Liquidambar styraciflua</i>		20	Yes	FAC
2. <i>Magnolia virginiana</i>		10	Yes	FACW
3. _____				
4. _____				
5. _____				
6. _____				
		30 = Total Cover		
50% of total cover:		15	20% of total cover:	6
Shrub Stratum (Plot size: <u>30 ft.</u>)				
1. <i>None Observed</i>				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
50% of total cover:			20% of total cover:	
Herb Stratum (Plot size: <u>30 ft.</u>)				
1. <i>Andropogon virginicus</i>		15	Yes	FAC
2. <i>Deparia acrostichoides</i>		10	Yes	FAC
3. <i>Botrypus virginianus</i>		10	Yes	FACU
4. <i>Sarracenia flava</i>		10	Yes	OBL
5. <i>Carex glaucescens</i>		5	No	OBL
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
		50 = Total Cover		
50% of total cover:		25	20% of total cover:	10
Woody Vine Stratum (Plot size: <u>30 ft.</u>)				
1. <i>None Observed</i>				
2. _____				
3. _____				
4. _____				
5. _____				
50% of total cover:			20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species
That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant
Species Across All Strata: 8 (B)

Percent of Dominant Species
That Are OBL, FACW, or FAC: 88% (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL species <u>15</u>	x 1 = <u>15</u>
FACW species <u>10</u>	x 2 = <u>20</u>
FAC species <u>95</u>	x 3 = <u>285</u>
FACU species <u>10</u>	x 4 = <u>40</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>130</u>	(A) <u>360</u> (B)

Prevalence Index = B/A = 2.77**Hydrophytic Vegetation Indicators:**

- 1 - Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☒ 3 - Prevalence Index is ≤ 3.0¹
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20 ft (6m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic**Vegetation**

Present? Yes X No

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

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

A positive indication of hydrophytic vegetation was observed (Prevalence Index is ≤ 3.00).

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 2/1	100	None	—	—	—	Sandy Loam	
2-16	10YR 5/1	90	10YR 6/4	10	C	M	Sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)**

☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR S, T, U)
☐ Histic Epipedon (A2)	☐ Thin Dark Surface (S9) (LRR S, T, U)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (LRR O)
☒ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)
☐ Stratified Layers (A5)	☐ Depleted Matrix (F3)
☐ Organic Bodies (A6) (LRR P, T, U)	☐ Redox Dark Surface (F6)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)	☐ Depleted Dark Surface (F7)
☐ Muck Presence (A8) (LRR U)	☐ Redox Depressions (F8)
☐ 1 cm Muck (A9) (LRR P, T)	☐ Marl (F10) (LRR U)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Ochric (F11) (MLRA 151)
☐ Thick Dark Surface (A12)	☐ Iron-Manganese Masses (F12) (LRR O, P, T)
☐ Coast Prairie Redox (A16) (MLRA 150A)	☐ Umbric Surface (F13) (LRR P, T, U)
☐ Sandy Mucky Mineral (S1) (LRR O, S)	☐ Delta Ochric (F17) (MLRA 151)
☐ Sandy Gleyed Matrix (S4)	☐ Reduced Vertic (F18) (MLRA 150A, 150B)
☒ Sandy Redox (S5)	☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
☐ Stripped Matrix (S6)	☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)
☐ Dark Surface (S7) (LRR P, S, T, U)	

Indicators for Problematic Hydric Soils³:

☐ 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)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**
 Type: _____
 Depth (inches): _____
Hydric Soil Present? Yes ☒ No ☐**Remarks:**

A positive indication of hydric soil was observed.

APPENDIX E
PHOTOGRAPHIC LOG



Photo #1: PSS Wetland 8, DPB007 facing north (7/21/2018 by R. Barnhill).



Photo #2: PSS Wetland 8, DPB007 facing west (7/21/2018 by R. Barnhill).



Photo #3: PFO Wetland 1 DPB003 facing south (7/17/2018 by R. Barnhill).



Photo #4: PFO Wetland 1 DPB003 facing north (7/17/2018 by R. Barnhill).



Photo #5: PEM Wetland 1 DPA024 facing north (7/19/2018 by K. Snipes).



Photo #6: PEM Wetland 1 DPA024 facing north (7/19/2018 by K. Snipes).



Photo #7: Forested Upland DPA022 facing west (7/19/2018 by K. Snipes).



Photo #8: Forested Upland DPA003 facing east (7/17/2018 by K. Snipes).



Photo #9: Scrub- Shrub Upland DPA016 facing east (7/17/2018 by K. Snipes).



Photo #10: Scrub - Shrub Upland DPA025 facing south (7/19/2018 by K. Snipes).



Photo #11: Herbaceous Upland DPA017 facing east (7/18/2018 by K. Snipes).



Photo #12: Herbaceous Upland DPA017 facing south (7/18/2018 by K. Snipes).
