

Appendix B

Environmental Report

ENVIRONMENTAL REPORT

**CAMP HALL RAIL PROJECT
BERKELEY COUNTY, SOUTH CAROLINA
SAC: 2016-01395**

PREPARED FOR:



**PALMETTO RAILWAYS
540 EAST BAY STREET
CHARLESTON, SOUTH CAROLINA**

JULY 25, 2017

1 EXECUTIVE SUMMARY

Development within the Camp Hall Commerce Park has increased the demand for rail service to interconnect the commerce park with the existing rail network of CSX Transportation, Inc. (CSXT) in Berkeley County, South Carolina, in a manner that is logistically feasible to better serve the needs of industry within the Camp Hall Commerce Park for transportation, distribution, and logistics. To accomplish this, Palmetto Railways has determined a need to construct a rail spur from the CSXT A-line with the intent to enhance distribution for the industrial development and the tenants that locate at Camp Hall Commerce Park.

Palmetto Railways is requesting regulatory approval to locate, build, own and operate an industrial rail line between Santee Cooper's Cross Generating Station and the Camp Hall Commerce Park in Berkeley County, South Carolina. The proposed rail line will service the new Volvo Cars manufacturing facility, as well as future proposed development within the Camp Hall Commerce Park.

A detailed Alternatives Analysis was conducted to evaluate potential routes from existing CSXT rail lines into the Camp Hall Commerce Park. The alternatives analysis reviewed potential impact environmental, economic, and socioeconomic resources, as well as cultural resources. Six alternative route alignments were considered under Level 1 of the alternatives analysis, four alignments were advanced to Level 2 of the alternatives analysis. It was determined that the Cross option, beginning near Santee Cooper's Cross Generating Station and terminating at the Camp Hall Commerce Park, was the preferred project corridor. Four separate Cross Route alignments were analyzed in Level 3 of the alternatives analysis, and Cross Route 3 (Proposed Project) is proposed as the most practical route with the least amount of overall impacts, as judged by the potential impacts to environmental, economic, and socioeconomic resources.

The Proposed Project is an approximately 22.7-mile by 200-ft corridor [0.85 square mile (544 acres)] that will connect to the CSXT rail network near the Santee Cooper Cross Generating Station and travel south and west to the Camp Hall Commerce Park. The proposed rail corridor will impact a total of 83.18 acres of jurisdictional wetlands, of which 77.49 acres of impacts are located with the Cooper Watershed and the remaining 5.76 acres of impacts are located with the Four Hole Swamp Watershed. In addition, approximately 0.06 acres and 169 feet of non-wetland waters (jurisdictional streams) will be impacted.

In the absence of suitable existing wetland mitigation bank or an in-lieu fee program for the watershed, all required compensatory mitigation for impacts to wetlands and waters of the United States will be obtained through off-site landscape scale permittee-responsible mitigation activities utilizing the watershed approach.

In conclusion, the Proposed Project is expected to provide significant logistical support to the Camp Hall Commerce Park. This Environmental Report addresses and meets requirements set forth under the National Environmental Policy Act, 42 U.S.C.A. §§ 4321 *et seq.* (NEPA) and is in compliance with the guidelines promulgated by the United States Environmental Protection Agency in conjunction with the Secretary of the Army under the authority of Section 404(b)(1) of the CWA (Guidelines) and NEPA. This Environmental Report has been prepared to assist the preparation of NEPA documentation by the US Army Corps of Engineers and the Surface Transportation Board.

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ACRONYMS

AAR	Association of American Railroads
AASHTO	American Association of State Highway Officials
ACE	Ashepoo, Combahee and Edisto Rivers
ADT	Average daily traffic
AIRS	Permitted Airs Facility Listing Environmental Database
APE	Area of potential effect
BFE	Base Flood Elevation
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best management practice
CBG	Census Block Group
CCD	Census County Division
CEQ	Council on Environmental Quality
C.F.R.	Code of Federal Regulations
CGP	Construction General Permit
CH	Critical Habitat
CO	Carbon monoxide
CSP	Conservation Stewardship Program
CSXT	CSX Transportation, Inc.
CWA	Clean Water Act
DA	Department of Army
dB	Decibel
dBA	A-weighted decibel
DO	Dissolved oxygen
EJ	Environmental Justice
EO	Executive Order
ESA	Endangered Species Act
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMNF	Francis Marion National Forest
FPPA	Farmland Protection Policy Act

ACRONYMS, cont'd

FR	Federal Register
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HTC	Home Telephone Company
HUC	Hydrologic unit code
HUD	Housing and Urban Development
IPAC	Information Planning and Conservation System
LCI	United States Geological Survey Land Cover Institute
LCP	Larger common plan
Ldn	Day/Night Levels
LEDPA	Least Environmentally Damaging Practicable Alternative
LOMR-F	Letter of Map Revision based on Fill
LOS	Level of service
LUST	Leaking Underground Storage Tank
LWCF	Land and Water Conservation Fund
MBTA	Migratory Bird Treaty Act
NAAQS	National Ambient Air Quality Standards
NCED	National Conservation Easement Database
NEI	National Emission Inventory
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Programs
NGO	Non-governmental Organization
NO2	Nitrogen Dioxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NS	Norfolk Southern
NWI	National Wetland Inventory
O3	Ozone
PAD-US	USGS Protected Areas Database of the United States
Pb	Lead

ACRONYMS, cont'd

PM	Particulate matter
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PM-2.5	Particulate matter < 2.5 micrometers
PM-10	Particulate matter < 10 micrometers
RCW	Red-cockaded woodpecker
REC	Recognized Environmental Condition
ROW	Right-of-way
RPW	Relatively Permanent Water
SC	South Carolina
SCDAH	South Carolina Department of Archives and History
SCDHEC	South Carolina Department of Health and Environmental Control
SCDNR	South Carolina Department of Natural Resources
SCDOT	South Carolina Department of Transportation
SCIAA	South Carolina Institute of Archaeology and Anthropology
SDTSA	State Designated Tribal Statistical Area
SHPO	State Historic Preservation Office
SHWS	State Hazardous Waste Sites Database
SO ₂	Sulfur Dioxide
STB	Surface Transportation Board
SWF/LF	Solid Waste Facilities/Landfill Database
SWPPP	Stormwater Pollution Prevention Plan
TIGER	United States Census Bureau Topology Integrated Geographic Encoding and Referencing dataset
TMDL	Total maximum daily load
TSS	Total suspended solids
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geologic Survey
WMA	Wildlife Management Area

2 INTRODUCTION

This document is prepared and submitted pursuant to the permitting jurisdiction of the Department of the Army, U.S. Army Corps of Engineers (USACE or Corps) under Section 404 of the Clean Water Act (CWA) and certain requirements set forth under the National Environmental Policy Act, 42 U.S.C.A. §§ 4321 *et seq.* (NEPA). The Surface Transportation Board (STB) will act as a co-lead agency with the USACE, under requirement from NEPA 42 U.S.C. 4331-4335, to examine the environmental impacts of actions subject to the STB's jurisdiction. Palmetto Railways will submit a Section 404 application for construction of a rail spur to connect the CSX Transportation, Inc. (CSXT) A-Line to the Camp Hall Commerce Park ("Proposed Project"). The analysis contained in this Environmental Report is drafted to ensure compliance with the guidelines put forth by the United States Environmental Protection Agency (USEPA) in conjunction with the Secretary of the Army under the authority of Section 404(b)(1) of the CWA and NEPA. Thus, the purpose of this document is, primarily, three-fold:

- To present the environmental documentation and information from which the USACE can make its Section 404(b)(1) compliance determination regarding the Proposed Project;
- To present environmental documentation and information to assist the USACE and STB in making the necessary determinations pursuant to NEPA regarding the Proposed Project; and
- To inform the public of the USACE and STB's decision-making process in evaluating the Proposed Project's compliance with Section 404(b)(1) and NEPA and to invite the public to participate and provide comments relevant to that evaluation.

2.1 Applicant's Proposed Project

Palmetto Railways serves as the applicant to locate, build, own, and operate an industrial rail line connecting the CSXT A-Line and the Camp Hall Commerce Park. The Proposed Project would involve the discharge of dredge and fill material into waters of the United States. Section 404 of the CWA established a regulatory program to regulate the discharge of dredge and fill material into waters of the United States, including wetlands, through issuance of Department of Army (DA) permits.

2.2 Project Background

The Proposed Project involves the construction and operation of an industrial rail line which will connect the Camp Hall Commerce Park to an existing railroad right-of-way (ROW), near the Santee Cooper Cross Generating Station in Berkeley County, South Carolina.

The Camp Hall Commerce Park comprises approximately 6,781 acres, of which 2,880 acres have been permitted by Berkeley County for development of Volvo Cars North America's ("Volvo Cars") first North American factory (Project Soter – SAC-2015-0476-SIR). An additional 1,387 acres of the Camp Hall Commerce Park is being permitted for industrial development by Santee Cooper (SAC-2015-01764). The Proposed Project is intended to bring industrial rail service to these developments. Industrial rail service is an additional transportation mode that enhances options for distribution and logistics for the industrial development and the customers that locate at the Camp Hall Commerce Park. In addition, the proposed industrial rail service will support the State of South Carolina and Berkeley County's infrastructure needs and will help alleviate highway congestion involving large commercial trucks.

2.2.1 Proposed Project Corridor

The corridor for the Proposed Project is an approximately 22.7-mile by 200-ft corridor (0.85 square mile) that will connect to the CSXT rail network near the Santee Cooper Cross Generating Station and travel south and west to the Camp Hall Commerce Park (Figure 1).

The Proposed Project corridor is located in the Middle Atlantic Coastal Plain region of South Carolina, which 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. Additionally, the Proposed Project area is located at the convergence of two distinct river basins: (1) the project area is located predominantly in the upper reaches of the Cypress Swamp Watershed of the Cooper River Basin and (2) a small portion of the project is on the lower boundary of the Lower Four Hole Swamp Watershed of the Edisto River Basin.

The climate of the Proposed Project corridor is considered temperate to subtropical, with warm, humid summers and mild winters. Average temperatures, by season, range from: (1) Spring, 58°F to 72°F; (2) Summer, 87°F to 91°F, with July being the warmest month of the year; (3) Fall, with an average temperature of 76°F in September, falling to 58°F by November; and (4) Winter, 47°F to 52°F, with January typically being the coldest average month of the year. Berkeley County has above-average levels of precipitation annually, when compared nationally, with 105 days of precipitation and an average annual rainfall of 47 inches. Freezing rain or snow occurs infrequently, with an average of 0.2 inches annually.

Land use within the project corridor is a mix of residential, commercial, silvicultural, and wetlands. The project corridor originates on Santee Cooper property adjacent to its Cross Generating Station, and crosses the Diversion Canal between Lake Marion and Lake Moultrie. South of the Diversion Canal. The project corridor includes the unincorporated rural community of Cross, with an estimated total population of 7,253 in 2015. Outside of the Cross

community, the corridor runs south through intensively managed pine plantation in short pulp rotations, and then into the Camp Hall Commerce Park.

2.3 The Federal Authority and Scope of Analysis

2.3.1 Section 404 of the Clean Water Act

The Proposed Project is subject to the jurisdiction of the USACE under Section 404 of the CWA based on its contemplated placement and discharge of dredged or fill material into navigable waters and/or wetlands of the United States. The USACE administers the Section 404 program on behalf of the Secretary of the Army. The USEPA has the authority to determine the scope of Section 404 jurisdiction, has issued guidelines on the discharge of dredged or fill material, and will generally prohibit a discharge if it determines under Section 404 that a discharge will result in unacceptable adverse effects on municipal water supplies, shellfish beds and fishery areas, wildlife, or recreational areas. The USEPA can exercise its Section 404(c) authority to veto the issuance of a Section 404 Permit of the USACE.

The USACE's review of the Proposed Project includes a determination of compliance with the guidelines contained in 40 C.F.R. Part 230, including review of four specific requirements:

- **40 C.F.R. § 230.10(a):** An evaluation of alternatives to the Proposed Project to determine whether there is a practicable alternative to the proposed discharge that would have less adverse impact on the aquatic ecosystem than of the Proposed Project, so long as the alternative does not have other significant adverse environmental consequences. The alternative identified by this test is referred to as the *least environmentally damaging practicable alternative*, or the Least Environmentally Damaging Practicable Alternative (LEDPA).
- **40 C.F.R. § 230.10(b):** Whether the discharge would violate any applicable state water quality standards, Section 307 of the CWA, the Endangered Species Act (ESA), or federal laws concerning marine sanctuaries.
- **40 C.F.R. § 230.10(c):** Whether the discharge would cause or contribute to significant degradation of waters of the United States.
- **40 C.F.R. § 230.10(d):** Whether appropriate and practicable steps have been taken that will minimize potential adverse impacts of the discharge on the aquatic ecosystem.

Evaluation of a Proposed Project under all four of the requirements set forth in the guidelines constitutes a determination of compliance with the Section 404(b)(1).

The Corps' regulations also address the relationship between the Corps and state and local land use planning agencies. The regulations expressly state that "the primary responsibility for determining zoning and local land use matters rest with state and local and tribal

authorities.” 33 C.F.R. § 320.4(j)(2). The regulations direct that upon compliance with the Corps’ rules and other applicable federal law, in the absence of “overriding national factors of the public interest” that may be revealed during a permit application, a permit “will be generally issued following receipt of a favorable state determination” 33 C.F.R. § 320.4(j)(4). While making a compliance determination, the Corps may gather information sufficient to support and make its decisions by soliciting comments from other federal, tribal, state, and local resource agencies and the public. Notwithstanding, the Corps is solely responsible for reaching a decision on the merits of the permit application, including determination of the project purpose, the extent of the alternatives analysis, which alternatives are practicable, the LEDPA, the amount and type of mitigation that is to be required, and all other aspects of the decision-making process.

2.3.2 STB Construction Authority

To build an extension of a rail line or to construct and operate a new rail line, Palmetto Railways must first apply to the STB for authority. Construction proposals are reviewed by STB under authority of the Interstate Commerce Act, and may also require an environmental review under NEPA. STB’s Office of Environmental Analysis (OEA) prepares an Environmental Assessment (EA), with the assistance of a third-party contractor. For this project, STB has selected ICF as the third-party contractor

2.3.3 National Environmental Policy Act

Because the Proposed Project will require permit authorization from the USACE for fills to waters of the US, it is considered a major federal action and therefore the federal permitting agencies, USACE and STB, must either prepare an Environmental Assessment (EA) for a determination of the significance of the environmental impacts or conduct an Environmental Impact Statement (EIS) pursuant to NEPA.

According to the guidelines, the alternatives analysis required in a NEPA evaluation is similar to that conducted for the USACE under the Section 404(b)(1):

For actions subject to NEPA, where the Corps of Engineers is the permitting agency, the analysis of alternatives required for NEPA environmental documents, including supplemental Corps NEPA documents, will in most cases provide the information for the evaluation of alternatives under these Guidelines. (40 C.F.R. § 230.10(a)(4))

Additionally, USACE program literature has recognized that “Districts should not conduct or document separate alternatives analyses for NEPA and the 404(b)(1) Guidelines.” See USACE, *Standard Operating Procedures for the USACE’s Regulatory Program* (July 2009) (USACE SOP).

To meet the requirements of the Guidelines under the USACE’s regulatory program, as well as satisfy the alternative requirements under NEPA, alternatives were developed to

determine the LEDPA, and no additional alternatives are necessary as part of the USACE's Guidelines evaluation process of the Proposed Project.

The STB will act as co-lead with the USACE in development of the NEPA documentation pursuant to their environmental rules (49 CFR 1105). The STB's environmental rules are designed to ensure adequate consideration of environmental factors in the STB's decision-making process.

3 FINDING OF PRACTICABLE ALTERNATIVES

3.1 Practicable Alternatives Framework (40 C.F.R. § 230.10 (a))

This chapter forms the basis of the USACE's analysis of practicable alternatives for the Guidelines evaluation. The first requirement of the Guidelines provides:

(a) Except as provided under Section 404(b)(2), no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.

(1) For the purpose of this requirement, practicable alternatives include, but are not limited to:

(i) Activities which do not involve a discharge of dredged or fill material into the waters of the United States or ocean waters;

(ii) Discharges of dredged or fill material at other locations in waters of the United States or ocean waters;

(2) An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. If it is otherwise a practicable alternative, an area not presently owned by the applicant which could reasonably be obtained, utilized, expanded or managed in order to fulfill the basic purpose of the proposed activity may be considered.

(3) Where the activity associated with a discharge which is proposed for a special aquatic site (as defined in subpart E)¹ does not require access or proximity to or siting within the special aquatic site in question to fulfill its basic purpose (i.e., is not "water dependent"), practicable alternatives that do not involve special aquatic sites are presumed to be available, unless clearly demonstrated otherwise. In addition, where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge

¹ *Special aquatic sites* are geographic areas, large or small, possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values. These areas are generally recognized as significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region. 40 C.F.R. § 230.3. These include sanctuaries and refuges (§ 230.40), wetlands (§ 230.41), mudflats (§ 230.42), vegetated shallows (§ 230.43), coral reefs (§ 230.44), and riffle and pool complexes (§ 230.45). Because the Proposed Project involves the discharge into and fill of wetlands, these more restrictive provisions apply to the Proposed Project.

which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise.

3.1.1 40 C.F.R. § 230.10(a).

As provided above, the Guidelines prohibits the discharge of dredged or fill material in a special aquatic site unless it can be shown that there is no practicable alternative which would have less adverse impact on the aquatic ecosystem. A practicable alternative is subject to reasonable interpretation; however, the Guidelines generally define a practicable alternative as one that is “available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.” 40 C.F.R. § 230.10(a)(2).

Under subsection (a)(3), an initial determination must be made by the USACE with respect to whether the proposed discharges are “water dependent.” The Guidelines provide that, when an activity associated with the discharge of dredged or fill material in a special aquatic site does not require access or proximity to that special aquatic site to fulfill its basic purpose, the activity is not “water dependent.” A determination by the USACE that a proposed discharge is *not* water dependent carries with it two inherent presumptions that must be rebutted by a successful applicant.

The first presumption is that practicable alternatives that do not include impacts on special aquatic sites exist and are available to the applicant. It is thus incumbent upon the applicant to clearly demonstrate otherwise. The determination of water dependency by the USACE must be preceded by a clear understanding of the purpose of the Proposed Project, both the “overall project purpose” and the “basic purpose,” taking into consideration the stated purpose and need provided herein by Palmetto Railways.

After evaluating the water dependency of a Proposed Project, the USACE must then consider the full range of practicable alternatives that are capable of achieving the overall project purpose. The second inherent presumption created by a non-water dependency determination is that all practicable alternatives (not including the proposed discharge) which do not involve a discharge of dredged or fill material into a special aquatic site (wetland), are presumed as having less of an adverse impact on the aquatic ecosystem than the proposed discharge, unless clearly demonstrated otherwise.

The evaluation of practicable alternatives is based on the range of reasonable alternatives set forth in Section 3.3. This process was developed and implemented in a manner cognizant of the requirements of the Guidelines and NEPA. See USACE (Jax. Dist.), *Information for Preparing an Alternatives Analysis Under Section 404* (June 2014); USACE (Sav. Dist.), *Guidelines For Preparation of Analysis of Section 404 Permit Applications Pursuant to the Section 404(b)(1) Guidelines of The Clean Water Act (40 C.F.R., Section 230)*. Thus, the

alternatives analysis forms the basis from which the USACE will identify practicable alternatives and determine whether Palmetto Railway's Proposed Project is the LEDPA.

3.2 Project Purpose

As discussed above, establishing the underlying purpose and need for a project is a key initial step in the USACE's process of evaluating the Proposed Project's compliance with the Guidelines. USACE regulations establish a three-part process for developing the official purpose of a project. As described below, one statement is provided by the applicant, and the other two are determined by the USACE:

- The Applicant develops and clearly states an overall purpose and need in the application to the USACE;
- The USACE determines the "basic" purpose of the project, which informs the conclusion as to whether the project is water dependent under Section 404(b)(1) of the CWA; and
- The USACE determines the "overall" purpose of the project.

These three statements of the Proposed Project's purpose and need form the basis by which the USACE will evaluate compliance of the Project with the Guidelines, including the range of practicable alternatives to the Proposed Project. These statements are also used as part of the analysis required under NEPA. Although the three statements were developed to meet distinct objectives within the USACE's evaluation of compliance with the Guidelines, it is expected that the alternatives analysis will overlap with and may, in most cases, provide the information required for the evaluation of alternatives under NEPA. Additionally, while consideration may be given to the applicant's pronouncement of the Proposed Project's basic and overall purpose, the USACE is the ultimate arbiter of that conclusion and is entitled to determine the final statements without undue influence of the Applicant's views.

3.2.1 Applicant's Stated Purpose and Need

An applicant's stated purpose and need is an expression of the underlying goals for a Proposed Project. The USACE takes an applicant's purpose and need into account when determining the USACE's overall purpose.

Palmetto Railways respectfully submits that the purpose of the Proposed Project is to locate, build, own, and operate an industrial rail line that will connect to the existing Class 1 rail line with the Camp Hall Commerce Park. The need for the Proposed Project derives from the development within 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.

3.2.2 The USACE's Basic Project Purpose and Determination of Water Dependency

The Guidelines require that the USACE determine whether a project is water dependent. *Water dependent* means that the project by its very nature requires access or proximity to, or siting within, a special aquatic site to fulfill its “basic purpose.”

The regulations further require that the USACE alternatives analysis identify the LEDPA.

Palmetto Railways respectfully submits that the basic purpose of the Proposed Project resulting in the discharge of dredged or fill material is:

- To build, own and operate an industrial rail line to serve a commerce park that includes an advanced manufacturing facility.

Based on the standard used by the USACE, the Proposed Project is not water dependent. Accordingly, as a part of the alternatives analysis contained herein, the application will rebut the presumptions employed by the USACE, as discussed in Section 3.1.

3.2.3 The USACE's Overall Project Purpose and Alternatives Analysis

Under NEPA regulations, alternatives to be evaluated must be reasonable. The Guidelines also require evaluation of practicable alternatives. The Corps uses the overall project purpose to identify the range of potential alternatives that will be evaluated. If an alternative does not meet the applicant's need, as determined by the Corps, it may be rejected from further consideration.

The Corps' regulatory guidelines further provide:

[T]he applicant's needs, and the type of project being proposed should be considered. The overall project purpose should be specific enough to define the applicant's needs, but not so restrictive as to constrain the range of alternatives that must be considered under the 404(b)(1) guidelines (USACE SOP).

Taking into consideration the above criteria, Palmetto Railways respectfully submits that the overall purpose of the Proposed Project is:

To build, own and operate rail service to interconnect the Camp Hall Commerce Park with an existing Class 1 rail network in a manner that is logistically feasible

to better serve the needs for transportation, distribution, and logistics of industry within the Camp Hall Commerce Park.

3.3 Alternatives Development

Having established the basic and overall purposes of the Proposed Project, it is incumbent upon the applicant to identify and evaluate a full range of alternatives in light of the overall purpose of the Proposed Project. The goal of this process is to identify and consider the broadest range of possible alternatives, working to narrow the scope of alternatives to the range of reasonable and practicable alternatives that could meet the overall purpose of the Proposed Project. Based on the requirements imposed under NEPA, regulations developed by the CEQ, and the USACE, Palmetto Railways initially considered all available alternatives for the Proposed Project.² Through the process of developing the purpose and need, as well as the overall project purpose, Palmetto Railways applied those basic project concepts to the full array of available alternatives in order to guide the identification of a “reasonable range” of alternatives as required by NEPA. Under NEPA, reasonable alternatives include those that are practical or feasible from a technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant (46 Fed. Reg. 18026 (March 23, 1981)). In identifying and developing this list of alternatives,³ Palmetto Railways has considered and included alternatives falling within the following categories:

- The proposed alternative;
- Alternatives that would involve no discharges of dredged or fill material into the waters of the United States (such as the “no action” alternative);
- Alternative alignment locations, including those that might involve less adverse impact to waters of the United States;
- On-route alternatives that would involve less adverse impact to waters of the United States (which would include modifications to the alignment or design options in the

² The NEPA alternatives analysis requires consideration of all alternatives for a project has its roots in the fact that NEPA is a procedural statute, rather than one dictating substantive analysis or mandating a particular outcome. At its core, NEPA is a “stop, look, and listen” statute that is intended to result in an informed agency decision making process. As discussed below, the Guidelines impose a stricter, substantive standard to the range of reasonable alternatives identified under NEPA that is designed to arrive at a practicable alternative that has the least adverse impact on the aquatic ecosystem.

³ This analysis considers a range of alternatives which might enhance environmental quality or have a less detrimental effect on the environment than the proposed activity and demonstrates that there is no *feasible* and *prudent* alternative that will have a less environmentally damaging effect. An alternative is *feasible* if it is available and consistent with sound engineering principles, such that the alternative can be successfully constructed or implemented. An alternative is *prudent* if it is economically reasonable in light of the benefits the activity would provide, but cost alone does not render an alternative imprudent.

physical layout and operation of the project to reduce the amount of impacts to the waters of the United States); and

- Alternatives that would involve greater adverse impact to waters of the United States but avoid or minimize other significant adverse environmental consequences including offsite and onsite options.

The range of potential reasonable alternatives that was considered also included alternative routes and alternative alignments. The range of reasonable alternatives identified in the initial NEPA analysis (through application of the above purpose and need and overall project purpose to the full panoply of alternatives) screened out unreasonable alternatives resulting in the reasonable alternatives addressed in the Level 1 analysis.

In addition to meeting the initial “reasonability” requirement under NEPA, the Guidelines impose further restrictions and deliberation on practicability considerations related to the range of reasonable alternatives. Under the Guidelines, the USACE typically only considers those alternatives that are available to the applicant and meet the overall purpose.⁴ The intent of this further iterative process is to consider the range of reasonable alternatives, but eliminate infeasible and unreasonable concepts and alternatives early in the process, in order to allow the USACE to focus on practicable alternatives that are capable of achieving the overall purpose of the Proposed Project. The range of reasonable alternatives identified below forms the starting point for the evaluation of practicable alternatives for the project and determination of the LEDPA, which will become the proposed alternative. In support of the identified alternatives, Palmetto Railways is providing documentation that demonstrates that the proposed alternative is the most practical route that requires the least amount of overall impacts, as judged by the potential impacts to environmental, economic, and socioeconomic resources. By examining the full scope of possible alternatives under NEPA and then narrowing down potential alternatives to incorporate all reasonable alternatives in this analysis, the desire is to provide the USACE with a range from which a determination can be reached that the proposed alternative of the Proposed Project is the LEDPA. Palmetto Railways believes that it has captured each reasonable alternative and component necessary for the USACE to reach its decision on the LEDPA as well as satisfy its obligations under NEPA.

⁴ See 40 C.F.R. § 230.10(a)(2) (“If it is otherwise a practicable alternative, an area not presently owned by the applicant which could reasonably be obtained, utilized, expanded, or managed in order to fulfill the basic purpose of the proposed activity may be considered.”). By contrast, a NEPA analysis often requires consideration of alternatives that are not available to the applicant. See USACE SOP. The alternatives analysis undertaken by Palmetto Railways satisfies the requirements of both the Guidelines and NEPA alternatives analyses.

Once the appropriate range of reasonable alternatives is identified, the practicability analysis of the project alternatives is conducted in three levels:

1. Level 1 Analysis is a screening process used to refine a larger number of identified reasonable alternatives with respect to consistency with the Proposed Project's purpose and need, as defined by Palmetto Railways, as well as the overall project purpose, as defined by the USACE.
2. Level 2 Analysis reviews those alternatives that survive Level 1 Analysis and employs the more rigorous practicability standards under the Guidelines, including their potential to impact environmental, economic, and socioeconomic resources, as well as cultural resources. The goal of Level 2 Analysis is to identify the preferred project corridor.
3. Level 3 Analysis reviews different route alignments within the preferred project corridor.
4. Taking into consideration all of the above, the final step of the alternatives practicability analysis is to identify the LEDPA from among the Level 3 alignments within the preferred project corridor.

3.4 Identification of Alternatives

The range of alternatives included in this analysis was generated in order to satisfy the purpose and need of the Proposed Project.

3.4.1 Proposed Project Criteria

Palmetto Railways recognizes that certain criteria are necessary specifying the minimum needs and conditions that would meet the operational requirements for rail service to advanced manufacturing facilities within the Camp Hall Commerce Park. Ultimately, the LEDPA must be able to accommodate the logistical and operational as well as budgetary needs of the end clients in order for the Proposed Project to be viable. The Proposed Project requires, at a minimum, a rail route that meets the following characteristics and criteria:

- Direct connectivity to a single Class 1 freight carrier main line, accessing the freight

carrier's inland/domestic network,⁵ as well as the Port of Charleston.⁶

- Sufficient rail access and capacity to serve both phases of the Volvo Cars site.⁷
- Sufficient rail access and capacity to service future growth and needs of additional industrial sites within the remaining portions of Camp Hall such that the portion of the proposed rail spur located within Camp Hall does not limit access to the site while in use or require grade separation.⁸

⁵ "A rail-served site is a must if you are in automotive assembly ... [t]here should be some preference for a connection to a main-line carrier..." Ed McCallum, *What's Driving Automotive Assembly Plant Locations?*, Business Facilities (July 2004); see also Mark M. Sweeney, *Covering the Ground on Transportation Issues*, Ask the Expert, Business Facilities (March 2010) ("If your project is industrial (distribution or manufacturing), then road and rail may be the most critical elements of transportation. Many industrial clients are now favoring locations with good access to all modes ... [Industrial site customers] may be served by a short line ... working through the short line may create a more competitive negotiating environment.").

⁶ "The need for water borne transportation will vary with each project depending on where your components are sourced. In some cases, power train components may be coming from either Asia or Europe. A link to a deepwater port via rail and interstate highways is important if this is the case. For international vehicle product distribution, the port must be reliable and efficient and well served for the product market. Adequate storage capability and roll on/roll off (RO/RO) containerized truck trailers capability are required as well." Ed McCallum, *What's Driving Automotive Assembly Plant Locations?*, Business Facilities (July 2004); see also Mark M. Sweeney, *Covering the Ground on Transportation Issues*, Ask the Expert, Business Facilities (March 2010) ("[U]sing water movements to source supply and/or access to end users may provide a low cost [] alternative. Water transportation resources to evaluate include access, ingress and egress, port capacity, crane capacity, container or break bulk focus, speed of entry and processing, and labor management relations. [T]he emergence and continued evolution of global supply chains calls for greater flexibility in logistics planning. It is likely that over time, your source mix for raw materials, and possibly your end market mix, will change, possibly on a continent basis. So while you may not need water commerce access now, that could change dramatically in five years.").

⁷ A rail yard and vehicle-processing center is preferred on site, or at least in very close proximity." Ed McCallum, *What's Driving Automotive Assembly Plant Locations?*, Business Facilities (July 2004); see also Mark M. Sweeney, *Covering the Ground on Transportation Issues*, Ask the Expert, Business Facilities (March 2010) ("In assessing rail service at your site, do not assume that because there is a rail line alongside your property that it is rail served. You should receive direct confirmation of service, and any limitations to service, from the rail carrier. If the site can be served, do not assume that you can do your operational run ... restrictions on these activities are common ... This in turn may impact site size, layout, product and people flow, etc.").

⁸ "Transportation infrastructure is crucial to an automotive facility for both just-in-time component delivery as well as vehicle distribution. Logistics costs are the single largest variable cost of production. Inefficiency in any one aspect of the logistics supply chain ripples throughout the entire manufacturing process, which adds delays and increased cost. Transportation cost, reliability, access, and north/ south and east/west connectivity go hand in hand." Ed McCallum, *What's Driving Automotive Assembly Plant Locations?*, Business Facilities (July 2004); see also Mark M. Sweeney, *Covering the Ground on Transportation Issues*, Ask the Expert, Business Facilities (March 2010) ("There are a number of trends that should drive you to consider all modes of transportation, including quality of rail access, competition, and dynamic global supply chains, all of which will impact your transportation costs.").

3.4.2 Range of Alternatives

The goal of providing an exhaustive list of alternatives that meet the above purpose and needs of Palmetto Railways to serve Camp Hall Commerce Park is twofold: (1) to disclose and evaluate potential environmental impacts that may result from the Proposed Project and retained alternatives; and (2) to evaluate the proposed alternative's ability to fulfill the project purpose and need consistent with criteria provided. Palmetto Railways arrived at its proposed alternative after conducting the required stages of increasingly thorough analysis, while balancing the environmental impacts discussed in this analysis with economic, technological, and safety concerns.

The following list provides the range of reasonable alternatives identified by Palmetto Railways for consideration, along with a short, descriptive identification of the alternative (Appendix A, Figure 1):

A. No-Action

- a. The Proposed Project is not constructed.

B. Soter South Route

- a. The Soter South Route runs approximately 14.9 miles through Berkeley County. It connects to the CSX Transportation (CSXT) A-Line near the Century Aluminum plant, on US Highway 52, between Moncks Corner and Goose Creek. This route runs due west, across US Highway 17, until it nears Interstate Highway I-26. The route turns northwest and parallels I-26 until it reaches the eastern border of the Camp Hall Commerce Park. This route passes through a mix of industrial, commercial, residential, and silvicultural properties. Where possible, this route roughly follows existing utility line right of way.

C. Soter North Route

- a. The Soter North Route runs approximately 16.7 miles through Berkeley County. It connects to the CSXT A-Line near the Century Aluminum plant, on US Highway 52, between Moncks Corner and Goose Creek. The route runs due west to US Highway 176, and then parallels US Highway 176 northwest until it approaches Lebanon Road, turns southwest and enters the northeastern corner of the Camp Hall Commerce Park. This route passes through a mix of industrial, commercial, residential, and silvicultural properties.

D. Moncks Corner Route

- a. The Moncks Corner Route runs approximately 17.1 miles through Berkeley County. It connects to the CSXT A-Line near the Tailrace Canal, north of Moncks Corner. The route runs west from the CSXT A-Line towards Lake Moultrie, veers southwest below Pinopolis, and runs west into the Camp Hall Commerce Park. This route passes through a mix of residential and silvicultural properties.

E. Cross Route

- a. The Cross Route runs approximately 18.5 miles through Berkeley County. It connects to an existing CSXT A-Line rail spur, which services the Santee Cooper Cross Generating Station. The route runs south southwest from the Cross Generating Station, crossing the Diversion canal between Lakes Marion and Moultrie, runs through the unincorporated community of Cross and south into the Camp Hall Commerce Park. This route passes through a mix of commercial, residential, and silvicultural properties.

F. Eutawville/Holly Hill Route

- a. The Eutawville/Holly Hill Route runs approximately 17.5 miles through Orangeburg and Berkeley Counties. It connects to a CSXT secondary service track, immediately south of Eutawville. The route runs southeast from Eutawville to Mudville Road, before shifting south, directly into the Camp Hall Commerce Park. This route passes through a mix of commercial, residential, agricultural, and silvicultural properties.

G. Ridgeville Route

- a. The Ridgeville Route runs approximately 4.1 miles through Dorchester and Berkeley Counties. It connects to the Norfolk Southern freight line running through Dorchester County. The route runs northeast through the Ridgeville Commerce Park, across Interstate I-26 and US Highway 78, and enters the Camp Hall Commerce Park from the southwest. Key components of this route would include a grade separation rail bridge crossing of Interstate 26, a grade separated road bridge of Centerline Road on Camp Hall, bridging of Timothy Creek, and at-grade crossings of U.S., State roads and local roads. This route was originally developed by Norfolk Southern as a concept proposal following the development of the WestRock (Mead Westvaco) Ridgeville Industrial Site and Camp Hall. This route passes through a mix of commercial, residential, and silvicultural properties.

3.5 Level 1 Alternatives Practicability Analysis

Level 1 of the alternatives practicability analysis evaluates the range of reasonable alternatives identified above for their ability to best satisfy the purpose and need criteria of the Proposed Project. This step of the analysis is intended to identify on a macro level which of the alternatives might reasonably meet the purpose and need; those alternatives that clearly do not meet the requisite criteria were not considered further within this analysis.

Among the goals of the Level 1 analysis is to evaluate route options connecting to the Class 1 freight carriers at the macro level in order to determine whether route proposals are capable of satisfying the purpose and need criteria, and characteristics of the Proposed Project, and thus would be carried forward for more in depth screening at Level 2. To that end, Palmetto Railways undertook a conceptual analysis that compared the route alternatives in order to determine the viability of each for the Proposed Project. This analysis involved a generalized review of, among other things:

- The access points to Camp Hall and the Volvo Cars site;
- Design alternatives for the on-site freight railyard required to support and connect to Volvo Cars and other associated automotive industrial support facilities;
- Estimation of engineering and construction costs;
- Evaluation potential environmental impacts and the availability and cost of mitigation for same; and
- Evaluation of potential property impacts along the proposed routes between Camp Hall and the existing rail infrastructure.

Based on the Level 1 analysis, including the analysis of factors described above, three (3) of the identified route alternatives were eliminated as not reasonably being able to fulfill the purpose and need of the Proposed Project. These alternatives which failed to meet the basic minimum requirements of the proposed project include:

A. No Action (No Build)

- The No-Action (No Build) Alternative fails to meet any of the purpose and need criteria of the Proposed Project. Notwithstanding, this alternative is retained for further comparison in the alternatives practicability analysis in order to ensure a complete environmental impact evaluation, as well as provide a baseline comparison to other alternatives in the Level 2 analysis.

B. Ridgeville Route

- As discussed above, Palmetto Railways undertook an analysis that compared certain factors, characteristics and criteria of the two Class 1 freight carrier route. The Ridgeville Route does meet several of the elements put forward by Palmetto Railways for the Proposed Project, including: direct connectivity to Norfolk Southern's mainline (providing direct access to its inland/domestic network, as well as the Port of Charleston); capacity to serve both phases of the Volvo Cars site and expected future growth at the Camp Hall Commerce Park; the relative estimated cost of engineering, construction, and mitigation for potential environmental impacts; and the comparative impact of the proposed route on property owners, due to its relative proximity to the Camp Hall Commerce Park as compared to the CSXT route alternative. However, in the course of the evaluation of the Ridgeville Route alternative, certain key attributes of that route were identified that rendered it an impractical alternative for the Proposed Project.

First, the Ridgeville Route does not satisfy one of the most basic characteristics set forth in the purpose and need of the proposed project: ownership and operational control by Palmetto Railways. In the course of its analysis, Palmetto Railways interfaced with the two Class 1 freight carriers with respect to certain aspects of the proposed project, including the logistics of owning and operating the rail line connection once the project was completed. While Norfolk Southern expressed support for Palmetto Railways being the applicant, financier, and construction manager of the proposed project, it desired and expected that, once the project was completed, operational control of the rail line connection would be transferred to, or within the substantial control of Norfolk Southern. However, ownership and operational control of the rail line connection is fundamental to Palmetto Railways' proposal, without which Palmetto Railways, a division of an agency of the State of South Carolina, could neither justify the cost of the proposed project nor satisfy its statutory purpose of providing safe, efficient and cost-effective rail solutions to facilitate the movement of freight within South Carolina.

Second, the Ridgeville Route within the Camp Hall Commerce Park would require a crossing of Centerline Road due to the proposed entry point of the route on the southwestern side of the site (the opposite side of Centerline Road from both phases of the Volvo Cars site). An at-grade crossing of Centerline Road has the potential to cause frequent and substantial disruption to the operational capabilities of Volvo Cars and other future industrial sites within the Camp Hall Commerce Park, as Centerline Road serves as the primary vehicular access point to Camp Hall on the northern

and southern boundaries, as well as the main thoroughfare within the site. Consequently, a grade separated bridge over Centerline Road would be required to maintain consistent access and connectivity within the Camp Hall Commerce Park, thereby altering the logistics of the site layout requirements, requiring additional engineering and construction costs, for establishing the route and interface with Volvo Cars.

Third, because the Norfolk Southern mainline is located to the west of Interstate 26, the proposed route connection of Norfolk Southern's mainline to the Camp Hall Commerce Park requires a grade separation rail bridge crossing of Interstate 26, as well as an at-grade crossing of U.S. Highway 78 north of Ridgeville. The crossings of Interstate 26 and U.S. Highway 78 would add substantial additional engineering and construction costs to the budget of the Ridgeville Route, thereby increasing the overall cost of the project. In addition, adding additional capacity to Norfolk Southern's mainline increases logistic and feasibility risks to providing adequate freight rail service to, from and between the Camp Hall Commerce Park and the Port of Charleston.

Fourth, Palmetto Railways determined that the Ridgeville Route would impact areas of identified critical importance within the environment, including wetlands and stream impacts, which render the route a less attractive option than the CSXT route. In particular, Palmetto Railways undertook a wetland and stream impact analysis as a part of its analysis that looked at whether each of the Class 1 carrier routes could be permitted, what environmental impacts would be involved with each route, what the expected mitigation would involve and cost for each route, as well as how interested consulting parties might react to the impact and proposed mitigation. Palmetto Railways identified three (3) primary environmental issues related to the Ridgeville Route. First, the roadway crossings described above to achieve required grade separation would require bridging and associated construction, which would impact the environment. Second the proposed route requires a crossing of the headwaters of Timothy Creek, near the Camp Hall Commerce Park, which have been mentioned as an area of greater concern from both Santee Cooper and WestRock (which would be impacted by such a crossing). Finally, the Ridgeville Route would impact 375 feet of linear stream in the Four Hole Swamp watershed, requiring substantial stream mitigation credits.

For all of the above-described reasons, the Ridgeville Route fails to meet the basic minimum requirements of the Proposed Project as a preferred freight carrier provider and was eliminated as a non-viable alternative by Level 1 analysis.

C. Eutawville/Holly Hill Route

- The Eutawville/Holly Hill route was included in the initial analysis to determine if a CSXT route from the northwest is viable. The Eutawville/Holly Route would connect to the CSXT “AKE-Line” which runs roughly from Elloree through Eutawville and Holly Hill, and connects to the Norfolk Southern line between St. George and Dorchester. Palmetto Railways determined that this route alternative makes it logistically impractical and functionally infeasible to provide efficient direct access to the Port of Charleston by a single Class 1 freight carrier; therefore, it does not satisfy a primary characteristic and criterion identified as critical by Palmetto Railways. Because the Eutawville/Holly Hill route alternative fails to meet the basic minimum requirements of the Proposed Project, it was eliminated as a non-viable alternative by Level 1 analysis.

The Cross, Moncks Corner, Soter North, and Soter South routes have been identified as viable alternatives in Level 1 of this Alternatives Analysis. Each of these corridors allow for a new industrial rail line with direct connectivity to the CSXT A-Line, as well as and the Port of Charleston. An in-depth analysis of each of the remaining alternatives is presented in Level 2 of this Alternatives Analysis.

3.6 Level 2 Alternatives

Fine-level screening was conducted for the four remaining alignment alternatives from the initial site screening (Cross Route, Moncks Corner Route, Soter North Route, and Soter South Route). The fine-level screening essentially comprised a comparison of the four rail alignment alternatives to facilitate the anticipated review under the NEPA process. The No Build Alternative (No Action Alternative) is also presented herein as a basis for comparison as required by NEPA. During fine-level screening, the alignment alternatives were evaluated on their potential to impact environmental, economic, and socioeconomic resources, as well as cultural resources. A generalized route for each alternative has been developed, and a study area defined by a 1-mile buffer surrounding each generalized route (2-mile total width) has been evaluated (Appendix A, Figure 2). The screening criteria were selected from resources that were readily quantifiable. These resources would typically require permits or approvals under the proposed development action. Although not every resource that could be examined was considered for the fine-level screening of alternatives, the resources that were selected for this analysis were presumed to be potential key constraints to project development.

The selected resources included land use, environmental justice, potential relocations, recreational areas, historic and archaeological resources, air quality, hazardous materials, noise pollution, prime farmlands, wetlands, streams, floodplains, water quality and water resources, and threatened and endangered species.

3.6.1.1 Cross

The Cross Route runs approximately 18.5 miles through Berkeley County. It connects to an existing CSXT A-Line rail spur, which services the Santee Cooper Cross Generating Station. The route runs south southwest from the Cross Generating Station, crossing the Diversion canal between Lakes Marion and Moultrie, runs through the unincorporated community of Cross and south into the Camp Hall Commerce Park. This route passes through a mix of commercial, residential, and silvicultural properties. The route ties into the existing CSXT ALR-Line, an existing rail spur which ties into CSXT's A-Line in St. Stephen, South Carolina.

3.6.1.2 Moncks Corner

The Moncks Corner Route runs approximately 17.1 miles through Berkeley County. It connects to the CSXT A-Line near the Tailrace Canal, north of Moncks Corner. The route runs west from the CSXT A-Line towards Lake Moultrie, veers southwest below Pinopolis, and runs west into the Camp Hall Commerce Park. This route passes through a mix of residential and silvicultural properties. This route ties directly into CSXT's A-Line, which runs directly into the Port of Charleston.

3.6.1.3 Soter North

The Soter North Route runs approximately 16.7 miles through Berkeley County. It connects to the CSXT A-Line near the Century Aluminum plant, on US Highway 52, between Moncks Corner and Goose Creek. The route runs due west to US Highway 176, and then parallels US Highway 176 northwest until it approaches Lebanon Road, turns southwest and enters the northeastern corner of the Camp Hall Commerce Park. This route passes through a mix of industrial, commercial, residential, and silvicultural properties. This route ties directly into CSXT's A-Line, which runs directly into the Port of Charleston.

3.6.1.4 Soter South

The Soter South Route runs approximately 14.9 miles through Berkeley County. It connects to the CSX Transportation (CSXT) A-Line near the Century Aluminum plant, on US Highway 52, between Moncks Corner and Goose Creek. This route runs due west, across US Highway 17, until it nears Interstate Highway I-26. The route turns northwest and parallels I-26 until it reaches the eastern border of the Camp Hall Commerce Park. This route passes through a mix of industrial, commercial, residential, and silvicultural properties. Where possible, this route roughly follows existing utility line right of way. This route ties directly into CSXT's A-Line, which runs directly into the Port of Charleston.

3.6.1.5 No Build

Under the No Build Alternative (No Action Alternative), the proposed action is not implemented, i.e., no industrial rail line into the Camp Hall Commerce Park will be constructed.

3.7 Level 2 Potential Impacts

The following sections describe the various issues considered in this alternatives analysis. Where specific issues have varying degrees of impact on different alignment alternatives, quantified impacts for each route are provided.

3.7.1 Land Use

The study area for land use consists of each alternative alignment's ROW, occupying a total of 1,631 acres. According to the United States Geological Survey (USGS) Land Cover Institute (LCI) land uses within the study area include developed areas, croplands, shrublands, herbaceous areas, forests, wetlands, and open waters (USGS 2012). All of the alignment alternatives have similar land cover with the exception of Soter North, which has a much higher development percentage than the other three alignments (Appendix A, Figure 4). Table 3-1 lists the 2011 USGS land cover for a 200-ft assumed ROW for each alignment alternative.

Table 3-1. Level 2 Alternatives Land Use Analysis

Alignment Alternative	Crops, Shrubland, Herbaceous	Forested	Wetlands, Open Water	Developed
Cross	27.0%	35.8%	35.7%	1.5%
Moncks Corner	35.3%	26.1%	37.2%	1.4%
Soter North	18.2%	29.3%	24.7%	27.8%
Soter South	43.8%	18.3%	35.2%	2.7%

3.7.1.1 Cross

The Cross alignment alternative assumed 200-ft ROW is mostly covered by forests, forested wetlands, and open water. According to the LCI only 1.5% of the Cross alignment ROW is classified as developed land.

3.7.1.2 Moncks Corner

The Moncks Corner alignment alternative assumed 200-ft ROW is mostly croplands, shrublands, herbaceous understory, forests, forested wetlands, and open water. According to the LCI only 1.4% of the Moncks Corner alignment ROW is classified as developed land.

3.7.1.3 Soter North

The Soter North alignment alternative assumed 200-ft ROW is evenly distributed between crops, shrublands, herbaceous, forests, wetlands, open water, and developed lands. According to the LCI approximately 27.8% of the Soter North alignment ROW is classified as developed land.

3.7.1.4 Soter South

The Soter South alignment alternative assumed 200-ft ROW is mostly forests, forested wetlands, and open water. According to the LCI only 2.7% of the Soter South alignment ROW is classified as developed land.

3.7.1.5 No Build

The No Build alternative would have no effect on current land use.

3.7.2 Air Quality

The U.S. Environmental Protection Agency (USEPA) has established National Ambient Air Quality Standards (NAAQS) in 40 CFR 50 for the following criteria pollutants: sulfur dioxide (SO₂), particulate matter with an aerodynamic diameter of less than 10 microns (PM₁₀), particulate matter with an aerodynamic diameter of less than 2.5 microns (PM_{2.5}), carbon monoxide (CO), ozone (O₃), nitrogen dioxide (NO₂), and lead (Pb).

The study area will be located in attainment with the national standards for all six criteria pollutants (USEPA 2015). Construction and operation of the final selected rail alignment will have a minimal impact on the air quality of the immediately surrounding areas. Air quality is not expected to be a differentiating factor in comparing the rail alignment alternatives.

3.7.3 Noise

Noise is sound that is produced at levels that can be harmful and may be considered as unwanted by surrounding community, properties and residences. The Noise Control Act of 1972 (PL 92-574) and Executive Order (EO) 12088, require that federal agencies assess the impact of noise to the environment. Guidelines for noise have been established by the EPA based on a calculation of noise by the Daytime and Nighttime averages, referred to as the Day/Night Levels (L_{dn}) (FHWA 2011). The L_{dn} is reported as A-weighted decibels (dBA) that occur within a 24 hour period (Table 3-2).

Table 3-2. USEPA Standard Noise Levels for Various Community Types

Community	Day Night Average (L_{dn} – dBA)
Rural	35 to 50

Community	Day Night Average (Ldn – dBA)
Quiet Suburb	50
Normal Suburb	55
Urban Residential	60
Noisy Urban	65
Very Noisy Urban	70

Noise levels can vary depending on setting, built environment, and distance to the noise source. Noise levels by environment can be variable with levels at 40 dB for wilderness areas and 90 dB for urban areas. Rural communities typically have lower dBs than their urban counterparts with rural communities around 50 dB or less. The minimum volume level for train horns is 96 dB; maximum volume levels for newer equipment are 110 dB (FTA 2006).

The Federal Transit Administration (FTA) is one of multiple agencies within the USDOT that is concerned with rail transportation. The FTA has established Railroad Noise Emission Compliance Regulations at 49 CFR 210, which prescribes compliance requirements for enforcing railroad noise emission standards. Additionally, in order to aid in compliance with environmental regulations and guidelines related to noise and vibration, the FTA has developed guidance documents and assessment procedures for assessing train noise, horn noise, and vibration impacts from major rail projects. Berkeley County does not have any specific exemptions or prohibitions to its local noise control ordinance.

Locomotive horn soundings are a requirement of railroad operations and can contribute to existing surrounding noise levels. For example, locomotives must begin to sound train warning horns from 15 to 20 seconds in advance of all public roadway crossings (for train speeds less than 10 miles per hour). Segments of the proposed alignments within 300 feet of sensitive receptors should be further investigated using procedures from Transit Noise and Vibration Impact Assessment (FTA, 2006).

A baseline noise-level survey has not been conducted for any of the alignment alternative ROWs; however, it is expected that the project area would have noise levels typical of a rural environment surrounded by an active transportation corridor. Ambient noise within the project area consists mainly of transportation (highway and railroad), commercial/agricultural activities, rural, and natural sounds (e.g. moderate voice, wind, wildlife, and similar sounds). Several commercial/agricultural facilities are interspersed within the rural residential landscape, and these facilities could generate noise that would be heard at nearby receptors. Noise-sensitive receptors within and adjacent to the alternative alignment ROWs include areas associated with single family housing. In addition, nearby churches and schools along the Soter North alignment are known sensitive receptors.

3.7.4 Geology and Soils

The four alternative route study areas are in the Atlantic Coastal Plain Physiographic Province. Coastal Plain soils consist of ancient marine deposits including interbedded limestones, gravels, sands, silts and clays. The Coastal Plain is a wedge-shaped deposit of Cretaceous and younger sediments which range in thickness from near zero at the contact with the Piedmont Physiographic Province (the Fall Line) to the northwest, to thousands of feet at the coast.

According to the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS), the soils within the study area are mapped as nonhydryc, predominantly nonhydryc, predominantly hydryc, and hydryc soils. Approximately 47% of the study areas are within hydryc or predominantly hydryc soils. The dominating soil types within the study area are Meggett loam, Goldsboro loamy sand, Lynchburg fine sandy loam, and Rains fine sandy loam (Appendix A, Figure 3).

3.7.4.1 Prime Farmland

The National Agricultural Land Study of 1980-1981 discovered millions of acres of farmland were being converted in the United States each year. Farmland includes prime farmland, unique farmland, and land of statewide or local importance. Congress passed a law creating the Farmland Protection Policy Act (FPPA), which aims to protect against projects that convert farmland directly or indirectly (USDA 2015a). In addition, the FPPA is intended to minimize the impact Federal programs have on the irreversible conversion of farmland to nonagricultural areas. Farmland such as forest land, pastureland, and cropland can be subject to FPPA requirements. Consequently, soils specifically suited to agricultural uses may be protected under the FPPA. Conversion of these soils from pastureland to non-pastureland uses may be limited.

Activities that may be subject to FPPA include highway construction projects, electric cooperative construction projects, railroad construction projects, and Federal agency projects. Project sites that are federally funded or assisted require coordination with NRCS and state FPPA contacts. NRCS determines if the potential project impacts on farmland exceed the recommended allowable level.

According to the NRCS Web Soil Survey all four alternative rail alignments include soils designated as prime farmland and farmland of statewide importance (USDA 2015b). Some of the farmland soils on all four alternative alignments consist of existing development or are not used for agricultural and would be declassified as farmland. Farmland soils will be directly impacted on all four potential alternative rail alignments. The No Build alternative would not have any impacts on farmland soils. Table 3-3 lists the farmland soils coverage as a percentage for each alignment alternative 200-ft ROW (USDA 2015b).

Table 3-3. Level 2 Alternatives Farmland Analysis

Alignment Alternative	Prime Farmland	Farmland of statewide importance	Not Prime Farmland
Cross	29.5%	52.1%	18.4%
Moncks Corner	20.9%	54.4%	24.8%
Soter North	27.8%	54.1%	18.1%
Soter South	21.8%	47.5%	30.7%

3.7.5 Surface Waters

Surface water includes streams, rivers, lakes, and reservoirs. All four rail alternative alignments are located within the Cooper River Watershed (HUC 03050201) of the Ashley River Sub-basin, with a very small portion of the Cross alignment in the Four Hole Swamp Watershed (Hydrologic Unit Code [HUC] 03050205) of the Edisto River Sub-basin, both of which are contained within the Ashepoo, Combahee and Edisto (ACE) River Basin. Major water bodies occurring within the project study area include Gants Mill Branch, Felder Branch, Sandy Run, Wassamassaw Swamp, Cypress Swamp, Rudd Branch, Caton Creek, Black Creek, Big Run, and the Diversion Canal between Lake Marion and Lake Moultrie. According to the USGS National Hydrology Dataset all of the alternative routes would cross several of these named streams, as well as numerous agricultural ditches. The Cross Route would cross the Diversion Canal, a state navigable water (Appendix A, Figure 9).

Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403; 30 Stat. 1151) requires project approval by the USACE prior to the commencement of any work in or over navigable waters of the United States, or which affects the course, location, condition or capacity of such waters. Activities requiring Section 10 permits include the construction of cable or pipeline crossings. Navigable waters regulated by Section 10 are generally restricted to larger rivers and lakes; however, precise definitions of “navigable waters of the United States” or “navigability” are ultimately dependent on judicial interpretation and cannot be made conclusively by administrative agencies. A general definition of “Navigable waters of the United States” is those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.

3.7.5.1 Cross

The Cross alignment alternative is proposed to cross the Diversion Canal, a state navigable water, as well as 8 USGS named streams and 7 minor tributaries or major ditches. These named streams include Big Run, Black Creek, Caton Creek, and Mill Branch.

3.7.5.2 Moncks Corner

The Moncks Corner alignment alternative is proposed to cross 4 USGS named streams and 7 minor tributaries or major ditches. These named streams include Mill Branch, Caton Creek, and Wassamassaw Swamp

3.7.5.3 Soter North

The Soter North alignment alternative is proposed to cross four USGS named streams and 12 minor tributaries or major ditches. These named streams include Gants Mill Branch, Sandy Run, Cypress Swamp, and Mill Branch.

3.7.5.4 Soter South

The Soter South alignment alternative is proposed to cross 3 USGS named streams and 12 minor tributaries or major ditches. These named streams include Gants Mill Branch, Felder Branch, and Cypress Swamp.

3.7.5.5 No Build

The No Build alternative would have no effect on surface waters within the project corridor.

3.7.6 Floodplains

All of the proposed rail alignment alternatives would cross regulated 100-year floodplains and associated floodways at numerous creek and river crossings (Appendix A, Figure 9). Floodplain crossings must be reviewed to determine if the project increases existing flood heights. A No-Rise analysis must be conducted before any permitting can be issued. Well engineered floodplain crossing design can generate a no-rise certification.

It might be necessary to fill portions of the Federal Emergency Management Agency (FEMA) floodplain and floodway for development of the proposed rail alignment; furthermore, a Letter of Map Revision based on Fill (LOMR-F) would be required. Per FEMA, a LOMR-F is submitted for sites on which fill has been placed to raise a structure to or above the Base Flood Elevation (BFE). National Flood Insurance Programs (NFIP) regulations require that the lowest adjacent grade of the structure be at or above the BFE for a LOMR-F to be issued to remove the structure from the floodplain. As part of the proposed rail alignment development, coordination will be required between FEMA and the Berkeley County Floodplain Administrator, as well as meeting any pertinent requirements presented in the Berkeley County Floodplain Ordinance.

3.7.6.1 Cross

The Cross alignment alternative is proposed to cross no FEMA regulated floodways and five FEMA regulated 100-year floodplains.

3.7.6.2 Moncks Corner

The Moncks Corner alignment alternative is proposed to cross no FEMA regulated floodways and seven FEMA regulated 100-year floodplains.

3.7.6.3 Soter North

The Soter North alignment alternative is proposed to cross three FEMA regulated floodways (Wassamassaw Swamp, Sandy Run, and Laurel Swamp) and six FEMA regulated 100-year floodplains. Impacts to floodways will require additional coordination with the Berkeley County Floodplain Administrator and a LOMR-F.

3.7.6.4 Soter South

The Soter North alignment alternative is proposed to cross two FEMA regulated floodways (Cypress Swamp and Laurel Swamp) and three FEMA regulated 100-year floodplains. Impacts to floodways will require additional coordination with the Berkeley County Floodplain Administrator and a LOMR-F.

3.7.6.5 No Build

The No-Build alternative would not have an impact on floodway or floodplain areas.

3.7.7 Water Quality and Water Resources

The majority of the four study areas are within the USGS HUC-8 Cooper Watershed (03050201). Portions of the study area surrounding the Cross alignment are in Four Hole Swamp Watershed and Lake Marion Watershed; however, all of the proposed alignment ROWs are located within the Cooper Watershed. All states are required to develop a list of waterbodies that do not meet water quality standards (SCDHEC 2013); the 303(d) list is the list of impaired waterbodies. Three 303(d) water quality monitoring stations within the study area are impaired. Station CSTL-079, located on the Diversion Canal north of the proposed Cross alignment, is impaired for dissolved oxygen (DO) and mercury. Station SC-026, located on Waring Branch near Ranger Drive, is listed for E. coli. Station CSTL-063, located at the Wassamassaw Swamp crossing on US Highway 176, is listed for E. coli as well.

Most of the study area is located within a Total Maximum Daily Load (TMDL) watershed associated with the Charleston Harbor, Cooper River, Ashley River, and Wando River. The TMDL is listed for DO and is the only TMDL within the study area. The TMDL has many monitoring stations designated as not supporting aquatic life due to low DO levels. TMDL station CSTL-062 is associated with the aforementioned TMDL, located downstream of the study area on the Tail Race Canal, is also impaired for mercury (SCDHEC 2013). Low DO levels primarily results from excessive algae growth caused by nutrients. In addition to numerous National Pollutant Discharge Elimination System (NPDES) wastewater discharges

(continuous point sources) and NPDES stormwater discharges (non-continuous point sources) contribute to low DO levels (SCDHEC 2013). Low DO levels are also expected in the headwaters areas with numerous swamps and low-lying areas contributing to a natural high biological and chemical oxygen demand.

According to the aforementioned land use data, impervious area is minimal within the study area. Land use with high impervious area typically increases pollutant loads such as fecal coliforms, oils, and nutrients. Stormwater in the study area is typically transported by shallow surface flow due to low impervious area and associated stormwater infrastructure. The primary drainage direction in the study area is south towards Cypress Swamp.

Land clearing activities can cause lower dissolved oxygen concentrations by decreasing waterbody shading and increasing warmer water temperatures; warmer water temperatures lower DO concentrations. Often with new development, the addition of impervious areas can increase pollutant loading rates, if appropriate stormwater Best Management Practices (BMPs) are not used. Since the proposed rail line will not include a substantial amount of new impervious area, the primary water quality impacts are likely to result from the conversion of forested areas to a maintained railroad right of way and the channelization of stormwater runoff along certain areas. To mitigate potential water quality impacts from the proposed rail line, a variety of post-construction stormwater BMPs will be used to convey, filter, and dissipate runoff from the new rail line, including but not limited to: vegetated swales, vegetated filter strips, stream bank stabilization, and channelized flow dissipation.

3.7.7.1 Cross

The Cross alignment is within the aforementioned TMDL watershed that has a listing for DO. The northern half of the Cross alignment is outside of the existing TMDL watershed and would have less potential to affect DO levels. Water quality monitoring station CSTL-079 is located just north of the alignment on the Diversion Canal and is impaired for DO and mercury. The Cross alignment should not affect existing mercury levels. Station SC-026 is downgradient from the Cross alignment; however, rail activity should not contribute to existing E. coli levels.

3.7.7.2 Moncks Corner

The Moncks Corner alignment is located upstream of station CSTL-063, listed for E. coli. The Moncks Corner alternative rail activity should not contribute to E. coli levels within the impaired waterbody. The Moncks Corner alignment is also located upgradient of TMDL station CSTL-062, located on the Tail Race Canal; however should not contribute to existing mercury levels. The Moncks Corner alignment is within the aforementioned TMDL watershed and could affect existing low DO levels.

3.7.7.3 Soter North

Station CSTL-063 is located near the proposed Soter North alignment. The Soter North rail activity should not contribute to E. coli levels within the impaired waterbody. The Soter North alignment is within the aforementioned TMDL watershed and could affect existing low DO levels.

3.7.7.4 Soter South

No impaired 303(d) stations are located along the Soter South alignment; however, the alignment is within the aforementioned TMDL watershed and could affect existing low DO levels.

3.7.7.5 No Build

The No Build alternative would have no effect on water quality or water resources within the study area.

3.7.8 Wetlands

Jurisdictional waters of the U.S., including streams and wetlands, are defined by 33 CFR Part 328.3 *et al.* and are protected by Section 404 and other applicable sections of the CWA (33 USC 1344). Impacts to these regulated resources are administered and enforced by the Charleston District of the USACE, as well as other federal and state government agencies. Jurisdictional wetlands are defined in the USACE Wetland Delineation Manual and the Atlantic and Gulf Coastal Plain regional supplement. These techniques use a multi-parameter approach, which requires positive evidence of three criteria for a determination of existence of wetlands: hydrophytic vegetation, hydric soils, and wetland hydrology. Certain activities, such as construction, dredging, filling or other alterations, in jurisdictional wetlands, streams or other waters of the U.S. may require a Section 404 Clean Water Act permit which is regulated by the USACE.

Amec Foster Wheeler conducted a preliminary jurisdictional waters screening to assess the potential presence/absence of jurisdictional waters, including wetlands, and to approximate the potential jurisdictional boundaries within each of the four alternative project corridors. This desktop preliminary screening process used wetlands Inventory (NWI) mapping of the respective project corridors (Appendix A, Figure 8). A field delineation or USACE verification of jurisdictional waters was not conducted nor was information depicted on the sources list above field verified as a part of this alternatives analysis.

Unavoidable wetland impacts along the project corridor will generally include fill and clearing impacts to wetlands and culvert, piping, and shade impacts to streams and jurisdictional ditches.

Limits of jurisdictional wetlands and other waters of the U.S. within the preferred project corridor will be field delineated prior to final design and permitting.

3.7.8.1 Cross

The Cross alignment alternative is located mostly within the Cooper River watershed (8-digit HUC: 03050201), with a small portion located in the Four Hole Swamp watershed (8-digit HUC: 03050205). Based on the preliminary screening using NWI data, approximately 26.08% of the Cross alignment has been determined to be wetland. This alignment would potentially impact 1.44 acres of emergent wetlands, 97.46 acres of forested wetlands, 16.25 acres of shrub/scrub wetland, and 1.89 acres of open water (ponds & lakes), for a total potential impact of 117.04 acres.

3.7.8.2 Moncks Corner

The Moncks Corner alignment alternative is located wholly within the Cooper River watershed (8-digit HUC: 03050201). Based on the preliminary screening using NWI data, approximately 32.88% of the Moncks Corner alignment has been determined to be wetland. This alignment would potentially impact 5.05 acres of emergent wetlands, 119.11 acres of forested wetlands, 8.48 acres of shrub/scrub wetland, and 3.86 acres of open water (ponds & lakes), for a total potential impact of 136.50 acres.

3.7.8.3 Soter North

The Soter North alignment alternative is located wholly within the Cooper River watershed (8-digit HUC: 03050201). Based on the preliminary screening using NWI data, approximately 21.93% of the Soter North alignment has been determined to be wetland. This alignment would potentially impact 1.00 acres of emergent wetlands, 82.47 acres of forested wetlands, and 5.43 acres of shrub/scrub wetland, for a total potential impact of 88.89 acres.

3.7.8.4 Soter South

The Soter South alignment alternative is located wholly within the Cooper River watershed (8-digit HUC: 03050201). Based on the preliminary screening using NWI data, approximately 31.28% of the Soter South alignment has been determined to be wetland. This alignment would potentially impact 29.30 acres of emergent wetlands, 71.41 acres of forested wetlands, 0.18 acres of shrub/scrub wetland, and 12.40 acres of shrub/scrub wetland, for a total potential impact of 113.28 acres.

3.7.8.5 No Build

The No Build alternative would have no effect on the existing wetlands within the study corridors.

3.7.9 Endangered, Threatened, and other Listed Species

A current list of federally endangered and threatened plant and animal species for Berkeley County was compiled from the United States Fish and Wildlife Service (USFWS) Endangered Species List (USFWS Information, Planning, and Conservation System [IPaC], Version 1.4) was reviewed on November 23, 2016. According to the literature and records review, ten federally protected plant and animal species occur within Berkeley County (Table 3-4). The South Carolina Department of Natural Resources (SCDNR) Rare and Endangered Species Inventory website, a Geographic Information System natural resources data layer that includes the locations of all documented occurrences of federally endangered or threatened species, was reviewed for known occurrences of such species on or proximate to the subject project. There is one known red-cockaded woodpecker occurrence within one half mile of any of the corridors that is potentially still extant. There are several known bald eagle nests near Lake Moultrie.

Table 3-4. Current list of federally endangered, threatened, and candidate species in Berkeley County, South Carolina (USFWS 2016) and their habitat types.

Common Name	Scientific Name	Status	Survey Window	General Habitat Type
West Indian manatee	<i>Trichechus manatus</i>	E	May 15 - Oct 15	coastal waters
Frosted flatwoods salamander	<i>Ambystoma cingulatum</i>	T, CH	Jan 1 – Apr 30	pine areas maintained in an open state by fire with isolated ponds for breeding sites
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA	Oct 1 – May 15	coastlines, rivers, large lakes or streams
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Apr 1 – July 31	mature pine forests
Wood stork	<i>Mycteria americana</i>	E	Feb 15 – Sep 1	marshes, swamps, lagoons, ponds, flooded fields; depressions in marshes are important during drought; also occurs in brackish wetlands
Atlantic sturgeon	<i>Acipenser oxyrinchus</i>	E	Feb 1 – Apr 30	major river systems along the eastern seaboard
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	E	Feb 1 – Apr 30	major river systems along the eastern seaboard
Pondberry	<i>Lindera melissifolia</i>	E	Feb – mid Nov	swamp and pond margins, sandy sinks, swampy depressions, wet flats
Canby's dropwort	<i>Oxypolis canbyi</i>	E	July 15 - Sept	pond-cypress savannahs dominated by grasses, sedges or ditches next to bays; borders and shallows of cypress-pond pine ponds and sloughs
American chaffseed	<i>Schwalbea americana</i>	E	May – Aug	fire maintained open pine forest

E Federally endangered

T Federally threatened

CH Critical habitat

BGEPA Federally protected under the Bald and Golden Eagle Protection Act

A review of readily available remote sensing data was conducted to identify potential habitat for federally protected species within each of the alternative alignments.

3.7.9.1 Cross

There are seven known bald eagle occurrences within a half mile of the Cross route, near the Diversion Canal and Lake Moultrie, however, none of these nests are directly within the corridor. The closest known bald eagle nest is located 2,000 feet south of the alignment. Additional study may be required to ensure that this route will not disturb the bald eagle.

Shortnose sturgeon, Atlantic sturgeon, and West Indian manatee populations are known from Lake Marion and Lake Moultrie, however with the use of appropriate BMPs, this route would not likely adversely affect this species.

Marginal habitat for the red-cockaded woodpecker (RCW) and wood stork may be present within the project corridor, however, this habitat is of low quality and would not be a limiting factor for either of these species. There is no likely adverse effect to these species.

The Cross alignment is will have no effect on the frosted flatwoods salamander, Canby's dropwort, pondberry, and American chaffseed.

3.7.9.2 Moncks Corner

There are four known bald eagle occurrences within a half mile of the Moncks Corner route, along Lake Moultrie, however, none of these nests are directly within the corridor. Additional study may be required to ensure that this route will not disturb the bald eagle.

Marginal habitat for the RCW and wood stork may be present within the project corridor, however, this habitat is of low quality and would not be a limiting factor for either of these species. There is no likely adverse effect to these species.

The Moncks Corner alignment will have no effect on the West Indian manatee, frosted flatwoods salamander, shortnose sturgeon, Atlantic sturgeon, Canby's dropwort, pondberry, and American chaffseed.

3.7.9.3 Soter North

There no known bald eagle occurrences within a half mile of the Soter North route, therefore this route is not likely to affect the bald eagle.

There is one known occurrence of the RCW within one half mile of the Soter North route. This occurrence is located within an open pine stand, which may provide suitable habitat for both the RCW and American chaffseed. Additional study would be required to determine potential impacts to these species.

Marginal habitat for the wood stork may be present within the project corridor, however, this habitat is of low quality and would not be a limiting factor for this species. There is no likely adverse effect to this species.

The Soter North alignment is will have no effect on the West Indian manatee, frosted flatwoods salamander, shortnose sturgeon, Atlantic sturgeon, Canby's dropwort, and pondberry.

3.7.9.4 Soter South

There is one known bald eagle occurrences within a half mile of the Soter South route. Additional study may be required to ensure that this route will not disturb the bald eagle.

There is one known occurrence of the RCW within one half mile of the Soter South route. This occurrence is located within an open pine stand, which may provide suitable habitat for both the RCW and American chaffseed. Additional study would be required to determine potential impacts to these species.

Marginal habitat for the wood stork may be present within the project corridor, however, this habitat is of low quality and would not be a limiting factor for this species. There is no likely adverse effect to this species.

The Soter South alignment is will have no effect on the West Indian manatee, frosted flatwoods salamander, shortnose sturgeon, Atlantic sturgeon, Canby's dropwort, and pondberry.

3.7.9.5 No Build

The No Build alternative would have no effect on federally protected species within the study area.

3.7.10 Historic and Archaeological Resources

A general predictive model based on the location of cultural resources indicates a relationship exists between archaeological site location, relative topography, and available water sources. An Area of Potential Effect (APE), half-mile buffer around each ROW, to help identify potential areas of significance and account for indirect impacts to cultural resources. Prehistoric sites in the Coastal Plains are most often located on well drained low slope areas adjacent to water or on uplands overlooking water (Anderson 1996).

Amec Foster Wheeler conducted a desktop review for the proposed rail alignment alternatives in Berkeley County, South Carolina. The desktop study was based on available data resources reviewed at the South Carolina Institute of Archaeology and Anthropology (SCIAA) located in Columbia. The investigation was conducted to determine if previously-recorded archaeological sites or historic properties eligible for the National Register of Historic Places (NRHP) are present in the project area.

According to the records at SCIAA, 77 archaeological sites, 99 historic structures, and 6 historic areas are located within the four study areas. In addition, according to SCIAA, 77 of the historic structures within the study area are eligible for the NRHP. One of the historic areas is listed on the NRHP and one is eligible for listing. Table 3-6 lists the direct impacts (located within the ROW) of historic resources from each rail alignment alternative. In addition, Appendix A, Figure 7 shows the locations of the historic and archaeological resources.

3.7.10.1 Cross

Four archaeological sites (38BK0584, 38BK0585, 38BK0587 and 38BK0588) and no historic structures have been recorded within the ROW for the Cross alternative. Each of these archaeological sites were recommended as potentially eligible for the NRHP and would require further study to determine their eligibility. Eleven historic structures and eleven archaeological sites are located within the APE for the Cross alternative. Two of these sites are potentially eligible for the NRHP.

Impacts to known and potentially eligible archaeological sites are likely along the proposed Cross alignment; minor route adjustments to avoid these sites are possible and should be studied in order to limit or avoid effects to these resources. The portion of the alignment between the Camp Hall Site and the known archaeological sites shows limited potential for archaeological or historic impacts.

3.7.10.2 Moncks Corner

One archaeological site (38BK0102) is located within the proposed ROW of the Moncks Corner alignment. Two historic districts, the Pinopolis Dam - Jeffries Hydroelectric Plant / Navigation Lock and the Old Santee Canal are also located within proposed ROW. The Pinopolis Dam is an eligible historic district located north of the eastern portion of the proposed alignment. Old Santee Canal is listed on the NRHP and is located within close proximity of the eastern portion of the proposed alignment. Both of these sites would require further study and may limit the overall footprint for the proposed alignment. Eleven historic structures and eight archaeological sites are located within the APE for the Moncks Corner alignment. Six of these previously-recorded structures are considered eligible or potentially eligible for the NRHP.

While the potential for indirect impact to historic districts and related sites is possible along the eastern portion of the Moncks Corner alignment, the overall footprint for the rail build-in may have a limited direct effect on these sites. The portion of the alignment between the Camp Hall Site and the known historic district and other historic sites in Moncks Corner shows limited potential for archaeological or historic impacts.

3.7.10.3 Soter North

Four archaeological sites (38BK2570, 38BK2071, 38BK2078 and 38BK2130) and two known historic structures (Lewis Harvey Store and Lewis Harvey House) are located within the proposed ROW of the Soter North alignment. Both sites have been determined to be not eligible for the NRHP and would not require further study. Twenty-one historic structures and fifteen archaeological sites are located within the larger APE for the Soter North alignment. Three of these resources are considered eligible for the NRHP.

The impact to known and potentially eligible archaeological sites is negligible within the ROW for the Soter North alignment. The four known sites within the ROW should be avoided or studied further to make a determination of eligibility to the NRHP; however, slight reroutes would allow limited or no effects to these sites. The colocation of the portion of the alignment along U.S. Highway 176 has the lowest potential for impacting unknown sites.

3.7.10.4 Soter South

No historic structures, archaeological sites, or historic areas have been recorded within the proposed ROW for the Soter South alignment. On a broader scope, there have been twelve historic structures and fourteen archaeological sites recorded within the APE for the Soter South alignment. Three of these resources are eligible for the NRHP.

The lack of previously recorded cultural resources along the Soter South alignment suggests a low potential to impact cultural resources. The colocation of the portion of the alignment along existing utility corridors also lowers the potential for impacting any unknown sites.

3.7.10.5 No Build

The No Build alternative would have no effect on cultural resources.

3.7.11 Environmental Justice

Environmental Justice (EJ) was formally and legally introduced on February 11, 1994 when President Clinton signed Executive Order (EO) 12898. The EO's directive is to identify any disproportionate or adverse impacts on minority and low-income populations resulting from development or laws (USEPA 2010a). Adverse impacts may occur if a project has negative effects on the nearby economy, disrupts community cohesion, loss of community facilities, increase emergency response times, or reduce transportation mobility. Unfortunately, direct guidelines for defining EJ populations does not exist (USEPA 1999a), including the State of South Carolina. However, the EPA Region 4 defines potential EJ communities by comparing benchmark reference areas where thresholds can be applied.

The recommended threshold for use in EPA Region 4 is 1.2 times the state average for aggregate minorities and low-income populations; however, the Council on Environmental Quality (CEQ) states potential EJ communities include aggregate minority populations of the affected area that exceed 50% (CEQ 1997). Low-income populations can be defined using either 1.2 times the state poverty level or 1.2 times the percentage of households below \$15,000 annual income within the state (USEPA 1999a). Poverty data is not provided at the Census Block Group level; however, annual household income data is.

For this Level 2 analysis Amec Foster Wheeler compared minorities and percent of households below \$15,000 annual income at the Census Block Group and state level to define potential EJ communities. The thresholds used for defining potential EJ communities

are 1.2 times the South Carolina state average for aggregate minority populations and household incomes below \$15,000, as well as any aggregate minority populations exceeding 50% within each studied Census Block Group. Furthermore, the potential EJ communities found in this analysis are determined at the Census Block Group level. There are 25 Census Block Groups within the study area (USCB 2011; USCB 2010a), 23 groups within Berkeley County and 2 groups within Dorchester County (Appendix A, Figure 5).

It is important to note all data used in the analysis came from the United States Census Bureau. Census Block Groups within the study area are rather large due to sporadic populations and can create errors in defining potential EJ communities. Lastly, the rail alignments do not necessarily directly impact an EJ community since an EJ community can be smaller than the Census Block Group. Figure 3 indicates the Census Block Groups with potential EJ communities.

3.7.11.1 Cross

The Cross alignment alternative ROW intersects five U.S. Census Block Groups. Four of those Census Block Groups contain potential EJ communities. The majority of the Cross alignment is in active silviculture areas and would have minimal effects on the potential EJ communities.

3.7.11.2 Moncks Corner

The Moncks Corner alignment alternative ROW intersects seven U.S. Census Block Groups. Five of those Census Block Groups contain potential EJ communities. The Census Block Groups located within the Moncks Corner ROW area include smaller, concentrated areas. Therefore, the Moncks Corner alignment has an increased potential to adversely impact EJ communities within the proposed ROW.

3.7.11.3 Soter North

The Soter North alignment alternative ROW intersects seven U.S. Census Block Groups. None of those Census Block Groups contain potential EJ communities. The Soter North alignment would have no effect on potential EJ communities. The Soter North alignment would directly affect a State Designated Tribal Statistical Area (SDTSA). The Wassamassaw Tribe of Varnertown Indians is recognized as an Indian group by the State of South Carolina and is headquartered in Berkeley County (USCB 2010b). The Wassamassaw SDTSA is located within the proposed ROW of the Soter North alignment.

3.7.11.4 Soter South

The Soter South alignment alternative ROW intersects six U.S. Census Block Groups. None of those Census Block Groups contain potential EJ communities. The Soter South alignment

would have no effect on potential EJ communities. The Wassamassaw SDTSA is located within the proposed ROW of the Soter South alignment (USCB 2010b).

3.7.11.5 No Build

The No Build alternative would have no effect on potential EJ communities.

3.7.12 Potential Relocations

Relocations occur when a rail alignment alternative ROW directly impacts a residential home, church, or commercial business. Amec Foster Wheeler was limited to examining the potential relocations using only high-resolution aerial imagery; therefore, all potential relocations listed below are approximated and should be used for preliminary planning purposes only. The analysis estimated all four alignment alternatives would potentially directly impact residential houses or associated structures. The potential relocations consist mostly of single-family homes.

Berkeley County parcel information indicated 76 parcels could be directly impacted by the Cross alignment ROW, 55 parcels could be directly impacted by the Moncks Corner alignment ROW, 118 parcels could be directly impacted by the Soter North alignment ROW, and 58 parcels could be directly impacted by the Soter South alignment ROW. Table 3-6 lists the potential relocations from each alternative alignment.

3.7.12.1 Cross

The Cross alignment alternative has 6 residential buildings within 50-feet of the proposed ROW. No other buildings should be affected.

3.7.12.2 Moncks Corner

The Moncks Corner alignment alternative has 2 residential buildings within 50-feet of the proposed ROW. No other buildings should be affected.

3.7.12.3 Soter North

The Soter North alignment alternative has 42 residential buildings within 50-feet of the proposed ROW. In addition, 13 commercial buildings and 2 churches are located within 50-feet of the proposed ROW.

3.7.12.4 Soter South

The Soter South alignment alternative has 10 residential buildings within 50-feet of the proposed ROW. No other buildings should be affected.

3.7.12.5 No Build

The No Build alternative would have no effect on potential relocations.

3.7.13 Traffic and Transportation

According to the United States Census Bureau Topology Integrated Geographic Encoding and Referencing (TIGER) dataset the four study areas include over 1,300 roads, including one interstate, eight highways, and multiple arterial roads. The majority of the demarcated roads listed within the study area are minor agricultural and forestry roads. Table 3-6 lists the potential road crossings for each alignment alternative. The South Carolina Lowcountry is serviced by two freight rail operators, Norfolk Southern (NS) and CSX Transportation (CSXT), and Amtrak for passenger service. Existing nearby rail include the NS line connecting Charleston to Columbia, CSXT A-line, CSXT ALR-line, CSXT AKE-line, and CSXT SH-line.

Aside from Interstate 26, traffic volumes on surrounding roadways are relatively low. A general Level of Service (LOS) for each roadway is estimated based on the latest volumes and the ADT thresholds used in South Carolina Department of Transportation (SCDOT) Travel Demand Models. LOS is a measure of quality of operational conditions within a traffic stream based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and the ratio of facility volume to capacity (v/c). Based on the 2013 traffic volumes within the study area no roadway received a low LOS score. Table 3-5 indicates SCDOT traffic stations located on major arterial roads and highways near the intersections with the proposed rail alignments.

Table 3-5. South Carolina Department of Transportation 2015 Traffic Point Data

SCDOT Traffic Station	Mile Point	Corridor	Number of Lanes	Volume (Vehicles/Day)	Alignments Intersected
103	7.31	South Live Oak Drive	4	19,000	Soter North, Soter South
123	3.99	US Highway 52	4	22,500	Soter South
124	8.014	US Highway 52	4	21,200	Soter South
135	8.086	US Highway 176	2	3,900	Cross, Moncks Corner, Soter North, Soter South
137	19.841	US Highway 176	2	7,800	Cross, Moncks Corner, Soter North, Soter South
140	5.185	Old Highway 6	2	1,300	Cross
143	16.72	SC Highway 6	2	3,100	Moncks Corner
145	22.819	SC Highway 6 (West Main St)	3	10,100	Moncks Corner
163	5.63	SC Highway 311	2	1,400	Cross
177	2.343	Jedburg Road	2	7,100	Soter North, Soter South
223	1.062	Old Whitesville Road	2	2,400	Moncks Corner

3.7.13.1 Cross

The Cross alignment alternative would intersect 3 arterial roads or highways, 15 secondary roads, and 21 minor forestry roads. The major highways the Cross alignment would intersect include US Highway 176, SC Highway 311, and Old Highway 6, which are all two-lane highways.

3.7.13.2 Moncks Corner

The Moncks Corner alignment alternative would intersect 4 arterial roads or highways, 10 secondary roads, and 21 minor forestry roads. The arterial roads and highways the Moncks Corner alignment would intersect include US Highway 176, Cooper Store Road, Old Whitesville Road, and SC Highway 6 (West Main Street), which are all two-lane roadways.

3.7.13.3 Soter North

The Soter North alignment alternative would intersect 5 arterial roads or highways, 36 secondary roads, and 11 minor forestry roads. The arterial roads and highways the Soter North alignment would intersect include Lebanon Road, Cypress Campground Road, Jedburg Road, US Highway 176, and South Live Oak Drive. All of the intersections of major roads for the proposed Soter North alignment are two-lane roadways except South Live Oak Drive, which is a four-lane roadway.

3.7.13.4 Soter South

The Soter South alignment alternative would intersect 5 arterial roads or highways, 9 secondary roads, and 11 minor forestry roads. The arterial roads and highways the Soter South alignment would intersect include Cypress Campground Road, Jedburg Road, US Highway 176, South Live Oak Drive, and US Route 52. All of the intersections of major roads for the proposed Soter North alignment are two-lane roadways except South Live Oak Drive and US 52, which are both four-lane roadways. US 52 is a four-lane divided highway with a 60-ft grass median strip.

3.7.13.5 No Build

The No Build alternative would have no effect on the existing traffic or transportation infrastructure.

3.7.14 Recreation and Land Stewardship

Amec Foster Wheeler reviewed numerous stewardship and protected areas sources, including the USGS Protected Areas Database of the United States (PAD-US), the National Conservation Easement Database (NCED), USDA Natural Resources Conservation Service (NRCS) Conservation Stewardship Program (CSP), SCDNR, and multiple non-governmental organizations (NGOs), to develop a database of protected and conserved lands in the study areas. It should be noted that this database is not an exhaustive list, but gives an indication of the protected areas within the study area. The readily available stewardship and protected areas are shown in Appendix A, Figure 6.

3.7.14.1 Cross

There are multiple private, protected, and public lands within the vicinity of the study area. The Cross alignment alternative directly affects two Moultrie Hunt Unit Wildlife Management Areas (WMAs), owned by Santee Cooper. This alignment has the potential to impact the Caton Creek Mitigation Bank, owned by MeadWestvaco, however alignment modifications within the corridor could eliminate impacts.

3.7.14.2 Moncks Corner

The Moncks Corner alignment has the potential to impact the Caton Creek Mitigation Bank, owned by MeadWestvaco, however alignment modifications within the corridor could eliminate impacts. No other protected lands should be impacted by the Moncks Corner alignment.

3.7.14.3 Soter North

No protected lands should be impacted by the Soter North alignment.

3.7.14.4 Soter South

No protected lands should be impacted by the Soter South alignment.

3.7.14.5 No Build

The No Build alternative would have no effect on protected land disturbance.

3.7.15 Section 6(f) Resources

Section 6(f) properties are recreation resources funded under the Land and Water Conservation Fund (LWCF) Act. The Land and Water Conservation Fund Act of 1965 was established to assist in preserving, developing, and assuring accessibility of outdoor recreation resources to all citizens of the United States (NPS 2016). Conversion of these lands for uses other than for outdoor recreation must be approved by the U.S. Department of the Interior. Direct impacts to these resources are prohibited unless there are no feasible and prudent alternatives for the use of the properties and the project incorporates all possible measures to avoid or minimize harm to such properties (NPS 2012).

According to the LWCF South Carolina has received approximately \$279 million over the past 50 years. There are no Section 6(f) properties within the four study areas.

3.7.16 Hazardous Materials

A search for potential hazardous waste sites within 100 feet of the rail alignment alternatives ROWs was performed. The results of the search are as follows:

3.7.16.1 Cross

One hazardous waste site, Cross Generating Station, was identified within 100 feet of the Cross route options. This site is the Santee Cooper electric generating plant located in Cross, South Carolina. The site is listed on the State Hazardous Waste Sites (SHWS), Underground Storage Tank (UST), Leaking Underground Storage Tank (LUST), Solid Waste Facilities/Landfill (SWF/LF), and Permitted Airs Facility Listing (AIRS) environmental databases. The proposed ROW routes adjacent to an ash disposal / landfill area at the plant site.

No other hazardous waste sites were identified within 100 feet of the proposed ROWs of the Cross alternative options.

3.7.16.2 Moncks Corner

No hazardous waste sites were identified within 100 feet of the proposed ROW of the Moncks Corner alternative.

3.7.16.3 Soter North

Five hazardous waste sites were identified within 100 feet of the proposed ROW:

1. Robert R Besok located at 1377 State Road 176 is listed on the State underground petroleum storage tank databases (UST). Two petroleum USTs were removed from this site in 1994. A petroleum release reported at this site in 1993 received “no further action” required status (NFA) from the South Carolina Department of Health and Environmental Control (SCDHEC) on 7-28-1998.
2. LC Smith Grocery (currently All In One Barber & Beauty Salon) located at 2127 State Road 176 is listed on the State UST databases. Three petroleum USTs were removed from this site in 1991. A petroleum release reported at this site in 1990 has not received an NFA.
3. Janki Food Mart located at 2412 State Road 176 is listed on the State UST databases. This site is a retail petroleum outlet with two active USTs. Two former USTs were removed at this site in 1998. A petroleum release was reported at this site in 1999. This release received an NFA on 6-14-2001.
4. Harvey’s Lucky Dollar (last occupied by D’s General Store) located at 2417 State Road 176 is listed on the State UST databases. Three petroleum USTs were removed from this site in 1997. A petroleum release was reported at this site in 1993. The release has not received an NFA.
5. Cooper’s Store located at 2418 State Road 176 is listed on the State UST databases. Three petroleum USTs were removed from this site in 2015. A petroleum release was reported at this site in 1993. The release has not received an NFA.

3.7.16.4 Soter South

No hazardous waste sites were identified within 100 feet of the proposed ROW of the Soter South alternative.

3.7.16.5 No Build

The No Build alternative would have no effect on hazardous resources.

3.7.17 Level 2 Potential Impact Summary

The following chart summarizes the potential to impact environmental, economic, and socioeconomic resources, as well as cultural resources of the four alternative rail alignments examined in Level 2 of this Alternatives Analysis.

Table 3-6. Palmetto Railways Camp Hall Commerce Park Alternatives Analysis Level 2 Potential Impact Summary

Palmetto Railways Camp Hall Industrial Park Build-in Alternatives Analysis						
	Category	Unit of Measure	Cross	Moncks Corner	Soter North	Soter South
Engineering Criteria	Design Criteria					
	Total Length	miles	18.48	17.10	16.70	14.91
	ROW Area (100-ft Buffer)	acres	448.73	415.14	405.44	362.09
	Road Crossings					
	Arterial Roads / Highways	# of crossings	4	4	5	5
	Secondary Named Roads	# of crossings	15	10	36	9
	Minor Forestry/Agricultural Roads	# of crossings	21	21	11	11
	Transmission Line Crossings	# of crossings	5	2	2	10
Environmental Features	NWI Wetlands (within ROW)					
	Emergent	acres	1.44	5.05	1.00	29.30
	Forested	acres	97.46	119.11	82.47	71.41
	Shrub / Scrub	acres	16.25	8.48	5.43	0.18
	Pond / Lake	acres	1.89	3.86	0.00	12.40
	Wetland Total	acres	117.04	136.50	88.89	113.28
	Wetland Percentage of ROW	wetland acres/ROW acres	26.08%	32.88%	21.93%	31.28%
	Stream Crossings					
	Navigable Waters Crossings	# of crossings	1	0	0	0
	USGS Named Stream	# of crossings	8	4	4	3
	Minor Tributaries / Ditches	# of crossings	7	7	12	12
	Water Quality					
	303(d) Impaired Waterbodies	# of crossings	2	1	1	0
	TMDL Waterbodies	# of waterbodies	1	1	1	1
	Floodplain Crossings	# of crossings	5	7	6	3
	Farmland (within ROW)					
	Prime Farmland	acres	132.37	86.67	112.89	78.85
	Farmland of Statewide Importance	acres	233.78	225.63	219.34	172.10
	Habitat					
	Known Threatened & Endangered Species	Present/Not Present	Present	Present	Present	Present
	Cultural Resources (within ROW)					
	National Register Properties	# of properties affected	0	1	0	0
	Historic Buildings	# of buildings affected	0	0	2	0
	Historical Areas	# of areas affected	0	2	0	0
	Known Archaeological Sites	# of sites affected	4	1	4	0
	Known Cemeteries	# of cemeteries affected	0	0	0	0
	Hazardous Materials (within 100' of ROW)	# of hazardous sites affected				
Socioeconomic Issues	Private, Public, Protected Lands, Mitigation Areas	# of areas affected	3	1	0	0
	Environmental Justice	Potential # of Census Block Groups affected	4	5	0	0
	Subdivision Impact	# of subdivisions affected	0	0	1	1
	Estimated Parcels Affected (within ROW)	# of parcels affected	78	55	118	58
	Potential Relocations (within 50' of ROW)					
	Residential	# of residential houses affected	6	2	42	10
	Apartment Buildings	# of apartment buildings affected	0	0	0	0
	Commercial	# of commercial buildings affected	0	0	13	0
	Churches	# of churches affected	0	0	2	0
	Total Buildings Affected		6	2	57	10
Boundaries	Boundaries					
	County Boundaries	Boundaries affected	1	1	1	1
	Municipal Boundaries	Boundaries affected	0	0	1	1
	Urbanized Areas	Present/Not Present	Not Present	Present	Present	Present
	Census Designated Places	Boundaries affected	0	0	0	0
	Census Block Groups	Boundaries affected	5	7	7	6

3.8 Level 2 Conclusions

Level 2 of the alternatives practicability analysis evaluates the potential of the four remaining route alternatives to impact environmental, economic, and socioeconomic resources, as well as cultural resources. The Level 2 analysis allows an informed decision when selecting a preferred project corridor.

In general, as shown on Table 3-6, environmental, economic, socioeconomic, and cultural resource impacts for each of the four alternative alignments are comparable. However, critical issues arise from the following three alternatives, which prevent these alternatives from being viable alternatives:

- Of the four remaining route alternatives evaluated in the Level 2 analysis, the Moncks Corner alignment would require the largest amount of wetland impacts, with nearly 20 additional acres of wetland impacts versus the next highest alignment, has the highest percentage of wetlands, and the largest number of potential floodplain crossings. This alignment also has the largest potential to impact potential environmental justice communities. In addition, this alignment intersects the rapidly expanding North Charleston urbanized area. Due to these considerations, the Moncks Corner route has been eliminated as a viable alternative.
- The Soter North alignment is the most developed alternative alignment with an assessment by the USGS LCI showing the route composed of 27.8% developed land. This route would impact the greatest number of parcels, require most number of road crossings, and require the largest number of relocations, including 42 residential buildings, 13 commercial buildings, and 2 churches. These impacts and relocations substantially increase the cost of this alignment alternative, while logistics of successfully executing these relocations in a cost effective and expedient manner is substantially more difficult. *Cf.* 40 C.F.R. § 230.10(a)(2). The alignment also intersects the rapidly expanding North Charleston urbanized area. Due to these considerations the Soter North route has been eliminated as a viable alternative.
- The Soter South route alternative impacts the largest amount of emergent wetlands of the route alternatives carried forward into the Level 2 analysis, at nearly six times more impacts to emergent wetlands than the second highest route alternative. This alignment also impacts the second highest overall percentage of wetlands with the ROW. The data presented above for the Soter South route was developed utilizing current, readily available remote sensing sources. These sources do not take into account future proposed development within the alternative corridor. According to the U.S. Census Bureau, the

alignment intersects the North Charleston urbanized area. Furthermore, the Nexton development, a proposed and permitted 4,500-acre mixed use development, is located within the Soter South corridor. Due to the impacts to existing and proposed development, potential socioeconomic impacts, including the cost and logistical difficulties associated with the displacement/relocations along this route (*cf.* 40 C.F.R. § 230.10(a)(2)), traffic, and noise/ vibration concerns, the Soter South route was eliminated as a viable alternative.

The Cross route alternative alignment has been identified as Palmetto Railway's preferred project corridor. The Cross route alternative provides the most practical route with the least amount of overall impacts, while still meeting the characteristics and criteria identified by Palmetto Railways for the proposed project and in light of potential impact to environmental, economic, and socioeconomic resources.

3.9 Level 3 Analysis

Following selection of the generalized Cross route as the preferred corridor alternative, Palmetto Railways developed four alternative Cross alignments for further evaluation. The four Cross alternatives are generally longer and more sinuous than the generalized Cross alternative presented in Level 2, because the generalized route was not optimized to reduce environmental, economic, and socioeconomic impacts. Level 3 of this Alternatives Analysis presents a comparison of the four Cross rail alignment alternatives to facilitate review under the NEPA process. The No Build Alternative (No Action Alternative) is also presented herein as a basis for comparison. Four Cross alignments were developed and analyzed to determine the best route connecting Camp Hall to the CSX A-line (Cross Option 1, Cross Option 2, Cross Option 3, Cross Option 4). Each alignment alternative was evaluated on its potential to impact environmental, economic, and socioeconomic resources, as well as cultural resources. A refined Cross study area was defined to include the four Cross alignment alternatives (Appendix A, Figure 10).

3.9.1 Cross Rail Alignment Option 1

The Cross Route Option 1 runs approximately 20.51 miles through Berkeley County. It connects to the existing CSXT A-Line rail spur, which services the Santee Cooper Cross Generating Station. The major difference between the Cross Option 1 and the Cross route is that Cross Option 1 spans further west at Short Cut Road to avoid smaller parcels, potential relocations, and numerous Carolina Bays. The Cross Option 1 route runs southwest from the Cross Generating Station, crossing the Diversion Canal between Lakes Marion and Moultrie, runs west of the unincorporated community of Cross and south into the Camp Hall Commerce Park. This route passes through a mix of commercial, residential, and silvicultural properties. The route ties into the existing CSXT ALR-Line, an existing rail spur which ties into CSXT's A-Line in St. Stephen, South Carolina.

3.9.2 Cross Rail Alignment Option 2

The Cross Route Option 2 runs approximately 21.13 miles through Berkeley County. It connects to the existing CSXT A-Line rail spur, which services the Santee Cooper Cross Generating Station. The major difference between the Cross Option 2 and the original Cross route is that Cross Option 2 is located further west at Short Cut Road and further east at Old Highway 6 and Ranger Road to avoid smaller parcels, potential relocations, and numerous Carolina Bays. The Cross Option 3 route runs southwest from the Cross Generating Station to Camp Hall Commerce Park with a similar overall route as the Cross Option 1 route.

3.9.3 Cross Rail Alignment Option 3 (Preferred Project Corridor)

The Cross Route Option 3 runs approximately 22.50 miles through Berkeley County. It connects to the existing CSXT A-Line rail spur, which services the Santee Cooper Cross Generating Station. The major differences between Cross Option 3 and the Cross route is Cross Option 3 arcs northwest from Camp Hall to avoid the Caton Creek Mitigation Bank, extends further west at Short Cut Road, and turns further east at Old Highway 6 and Ranger Road to avoid smaller parcels, potential relocations, and numerous Carolina Bays. The Cross Option 3 route runs southwest from the Cross Generating Station to Camp Hall Commerce Park with a similar overall route as the Cross Option 1 route.

3.9.4 Cross Rail Alignment Option 4

The Cross Route Option 4 runs approximately 21.99 miles through Berkeley County. It connects to the existing CSXT A-Line rail spur, which services the Santee Cooper Cross Generating Station. The major differences between Cross Option 4 and the Cross route is Cross Option 4 curves northwest from Camp Hall to avoid the Caton Creek Mitigation Bank and turns further west at Short Cut Road to avoid smaller parcels, potential relocations, and numerous Carolina Bays. The Cross Option 4 route runs southwest from the Cross Generating Station to Camp Hall Commerce Park with a similar overall route as the Cross Option 1 route.

3.10 Level 3 Conclusions

Level 3 of the Cross alternatives practicability analysis evaluates the potential of the four remaining Cross alternatives to impact environmental, economic, and socioeconomic resources, as well as cultural resources. The Level 3 analysis allows an informed decision when selecting a preferred project corridor. Environmental, economic, socioeconomic, and cultural resource impacts for each of the remaining Cross alternative alignments are comparable. Issues that equally affected each alignment are stream crossings, wetland impacts, farmland, potential EJ communities, water quality, transmission crossings, and road crossings. Table 3-7 shows the outstanding issues comparing the Cross alignments.

Table 3-7. Level 3 Critical Issues Alternatives Analysis

Critical Issue	Cross Option 1	Cross Option 2	Cross Option 3	Cross Option 4
NWI Wetland Percentage	22.17%	25.91%	23.82%	20.37%
Estimated Parcels Affected (within ROW)	50	39	38	49
Potential Relocations	4	1	0	4
Known Archaeological Sites	1	1	0	0
Caton Creek Mitigation Bank	Direct Impact	Direct Impact	Unaffected	Unaffected

These remaining issues eliminated three alternatives, which prevent these alternatives from being viable alternatives.

- Cross Option 1 alignment would directly impact 50 parcels, the largest number of parcels and underlying property owners. This alignment also has four residential buildings located within 50-ft of the ROW, which may require relocation. In addition, this alignment intersects the Caton Creek Mitigation Bank, an important conservation property. Lastly, Option 1 directly impacts a known archaeological site (38BK2570). Due to these considerations, the Cross Option 1 route has been eliminated as a viable alternative.
- Cross Option 2 alignment would directly impact 39 separate parcel boundaries and has the highest percentage of wetlands within the ROW. This alignment also has a residential building located within 50-ft of the ROW, which may require relocation. In addition, this alignment intersects the Caton Creek Mitigation Bank, an important conservation property. Lastly, Option 2 directly impacts a known archaeological site (38BK2570). Due to these considerations, the Cross Option 2 route has been eliminated as a viable alternative.
- Cross Option 4 alignment would directly impact 49 separate parcel boundaries. This alignment also has 4 residential buildings located within 50-ft of the ROW, which may require relocation. Due to these considerations, the Cross Option 4 route has been eliminated as a viable alternative.
- The Cross Option 3 route alternative alignment has been identified as Palmetto Railway's preferred project corridor. Level 3 of this alternatives analysis has identified this route as Palmetto Railways' preferred project corridor because it is within the range of reasonable impacts, it affects the least amount of parcels within the project ROW, it does not require any relocations, it has no known archaeological sites, and does not affect the Caton Creek Mitigation Bank. Accordingly, Palmetto Railways respectfully submits that the Cross Option 3 is

the most practical route with the least amount of overall impacts, as judged by the potential impacts to environmental, economic, and socioeconomic resources.

3.11 Cross Option 3 Impact Minimization

Following selection of Cross Option 3 as the Preferred Project corridor, minor modifications were made the final alignment to further reduce impacts to environmental, economic, and socioeconomic resources. The alignment was modified to prevent impacts to cultural resources, including the Bulltown Ditch at the northern end of the rail line and the Garrett Cemetery located near the center of the proposed rail corridor.

3.12 Identification of the LEDPA

As support for the Corps' identification of the LEDPA, Palmetto Railways provides the following synopsis of its efforts at identifying potential alternatives for the Proposed Project:

As a starting point for identification and evaluation of alternatives, the proposed rail corridor into the Camp Hall Commerce Park is to be built, owned and operated by Palmetto Railways and must tie directly into an existing Class 1 mainline, while providing direct access to the Port of Charleston, sufficient rail capacity to serve both phases of the Volvo Cars site, as well as service the future growth and needs of additional industrial sites within the remaining portion of the Camp Hall Commerce Park, and without limiting access to the site while in use or requiring localized grade separation. These requirements narrowed the range of possible alternatives to the four alternative routes analyzed in Level 2 of this Alternatives Analysis. These alternative route were analyzed for potential impacts to environmental, economic, and socioeconomic factors. Through this process, the Cross route was determined to be the preferred project corridor.

A Level 3 analysis was conducted to further investigate the preferred Cross route. Four alternative alignments, originating near Santee Cooper's Cross Generating Station and terminating in the Camp Hall Commerce Park, were analyzed in Level 3 of this Alternatives Analysis. After applying the appropriate criteria and screening levels, Palmetto Railways proposes Cross Route 3 of the Level 3 Analysis as the preferred project corridor.

A detailed evaluation of the preferred project corridor on the human and natural environment will be conducted Cross Route 3 as presented below.

4 WATERS TO BE IMPACTED

A jurisdictional waters delineation for the preferred project corridor, Cross Route 3, was performed between April, 2016 and May, 2017. The field delineation extended 100-feet on either side of the Preferred Route centerline (200-ft corridor) and identified approximately 59% wetland coverage within the Preferred Route's corridor. A jurisdictional determination was submitted to and concurred with by the USACE (USACE SAC# 2016-01395). Wetlands and relatively permanent waters (RPWs) within the Proposed Project corridor are presented below and in Appendix B.

4.1 Wetlands

Wetlands within the project corridor have been classified by type and further by their existing condition as defined in Appendix C of the USACE "Guidelines for Preparing a Compensatory Mitigation Plan." Various wetland types share habitat types with differences lying in hydrologic periods, genesis of the wetland, and landscape position.

Plantation Pine Forests

The majority, ~36% (289.7 acres), of wetlands identified within the project corridor are within bedded plantation pine forests. Plantation pine forests span both upland and wetland areas. These areas have been routinely logged with heavy equipment for decades. Bedding is the practice of using a plow to build up a raised "bed" on which the trees are planted to keep them elevated from surface water. As the trees grow, they use a substantial amount of water, lowering the water table in the area. These areas are ditched on the stand boundaries to remove excess surface water. Ditches are routed to larger canals that move water off site or into adjacent wetland features. Some Carolina bay wetland features have been converted to pine monoculture. These wetland areas are considered *Impaired* and have experienced heavy soil disturbance and compaction. In some areas, beds are constructed against the native topography, trapping water between beds.

Carolina Bays

The project corridor spans four Carolina bays identified as Skeleton Bay, Beech Island Bay, Todd Bay, and an un-named bay. These areas comprise approximately 1% of the corridor (10.5 acres). Skeleton Bay, Beech Island, and Todd Bays are all *Impaired* wetlands. They have been harvested and re-planted in loblolly pine. Within Beech Island Bay a utility easement is maintained, creating an emergent wetland habitat. Skeleton Bay and Todd Bay have been completely converted to plantation pine, thus these areas were counted as such.

The un-named Carolina bay is *Partially Impaired* due to timber harvesting up to the edges of the bay. This Carolina bay makes up just over 1% of the corridor (8.4 acres). The outer ring of cypress has been removed, and loblolly has been planted in beds adjacent to the Carolina

bay. On one border of the bay, the planted pine has been recently clear-cut, and a ditch outfalls under the road to a culvert to maintain water below flood level within the Carolina bay.

Depressional Wetlands

The project area contains multiple depressional wetlands. These comprised 2% (15 acres) of the corridor. The depressional wetlands along the corridor within industrial forestlands are considered *Impaired* due to the conversion of the landscape to pine monoculture. Minor ditching has altered the hydrology within these areas as well. The depression wetlands within the South Carolina Department of Natural Resources' (SCDNR) Hall Wildlife Management Area (WMA) are considered *Fully Functional* as they retain their natural hydrology. Although minor logging has taken place within these wetlands, they remain pristine wetlands.

Bottomland Hardwood Forests

Bottomland Hardwood forests compose 21% (~175 acres) of the corridor. These areas exhibit evidence of past logging and are often bisected by roads with adequately sized culverts to allow unimpeded flow of water through the wetland. There are no old growth stands along the corridor; all stands are considered second or third growth based on species composition and tree size. Early successional wetland species such as river birch (*Betula nigra*), sweet gum (*Liquidambar styraciflua*), black willow (*Salix nigra*), water oak (*Quercus nigra*), and red maple (*Acer rubrum*) dominate recently harvested bottomland hardwood areas. In older regeneration, bald cypress (*Taxodium distichum*), swamp white oak (*Quercus bicolor*), and swamp tupelo (*Nyssa biflora*) dominate. These areas mostly lack a defined tributary, but rather are seasonally saturated and flooded, to semi-permanently flooded wetlands. For those few bottomland hardwood forests with a defined watercourse, it often has been channelized and crossed by forestry roads. Hydrology is altered in the industrial forest lands through the extensive ditching to remove surface water. These ditches are routed into wetland areas for eventual downstream discharge into a larger named watercourse. The bottomland hardwood forests within the SCDNR Hall Wildlife Management Area (WMA) are *Partially Impaired*. The hydrology of this area is partially altered with the construction of the Bulltown Ditch, as well as ruts and soil compaction due to past logging activity. The remainder of the corridor's bottomland hardwood wetlands are considered *Impaired* due to the extensive ditches altering the hydrology within these forest areas and fragmentation of the bottomlands with interspersed planting of loblolly pine.

4.2 Relatively Permanent Waters

Open Water

The Proposed Project crosses the diversion canal between Lakes Moultrie and Marion. This navigable Open Water wetland comprises <1% (2.4 acres) within the corridor and is used for commercial and recreational purposes. The diversion canal was constructed in the 1980s by the US Army Corps of Engineers. It provides aquatic habitat for a variety of species; however, there is no vegetation associated with the open water wetland. This area is considered *Very Impaired* due to the excavated nature of the canal and the periodic dredging to remove accumulated sediment. Also, spoil has been placed adjacent to the canal on either side, filling wetlands and altering the natural hydrology of these adjacent areas.

Linear Conveyances

Linear Conveyances occur throughout the project corridor. These features are used to drain and direct water from one area to another. Some of these features hold water long enough to allow for wetland vegetation growth in the base and along the banks, while others do not. The larger linear conveyances on industrial timberland properties contain some water flow or evidence of recent flow in the form of drift deposits and scouring. Smaller linear conveyances are often dry or contain standing water. Some of these features have been dug in uplands, while others have been excavated in wetlands. All linear conveyances within the industrial timber properties are routinely maintained with a tracked excavator to promote unimpeded water flow during large storms. Often, spoil is placed adjacent to the linear conveyance or incorporated into an adjacent road. All linear conveyances within the project corridor are considered *Very Impaired* due to their excavated nature and purpose of altering or removing hydrology in the adjacent areas.

There are two areas within the corridor that exhibit characteristics of a perennial, relatively permanent water (PRPW) tributary. Of the two (see Habitat Descriptions maps, pages 1 & 8) identified PRPW Tributaries, one is considered a naturally occurring feature with a sinuous channel and well-defined bed and bank. The channel is approximately 6-8 feet wide and the water level typically occurs approximately 5 feet below top of bank. This wetland feature crosses under various forestry roads via large concrete and metal culverts that are large enough not to impede the natural flow. There is no channelization of the water course. This wetland is considered a *Partially Impaired* wetland. Due to streamside management best management practices, the adjacent forest is buffered to protect water quality. Outside of the approximately 50' buffer, loblolly pine is planted in rows for future harvest. This buffer consists of a bottomland hardwood forest, interspersed with loblolly pine with sandy soils.

The second PRPW Tributary feature consists of a channelized run named "Bulltown Ditch" and is shown on Habitat Description maps page 1 & 2. The Bulltown Ditch extends over 18,000 feet from the Santee Canal off of Lake Moultrie to the Diversion Canal, bisecting

Bulltown Bay. This feature is approximately 6 feet wide and 4 feet deep. The canal is crossed by various public and forestry roads as well as the CSX rail line serving the Cross Generating Station through large concrete and metal culverts. The Bulltown Ditch dates from sometime after the Santee Canal (circa 1793) and is a maintained watercourse. This wetland system is highly impacted and is considered a *Very Impaired* wetland feature. It removes hydrology from some areas and is an excavated feature with an adjacent spoil berm that alters hydrology in the immediate area of the ditch. In some areas, the Bulltown Ditch flows through uplands before draining back into wetlands.

4.3 Impacts to Waters of the US

Rail construction limits from the 30% design plans have been utilized to determine potential impacts to waters of the US. Disturbance widths generally vary between 42 feet to 55 feet, but extend up to 175 feet for the filled approaches to the bridge over Diversion Canal. The disturbance limits surrounding the Diversion Canal expand outwards to approximately 180 feet in order to reach required clearing heights.

Approximately 83.18 acres of jurisdictional wetlands will be impacted. Approximately 77.49 acres of impacts are located with the Cooper Watershed and the remaining 5.76 acres of impacts are located with the Four Hole Swamp Watershed. In addition, approximately 0.06 acres and 169-feet of non-wetland waters (jurisdictional streams) will be impacted. These streams include Bulltown Ditch and Williams Branch, both located within the Cooper River Watershed.

Detailed jurisdictional waters impacts will be discussed in the Individual Permit application package submitted for the joint Section 404/401 permit.

5 PROPOSED MITIGATION

Palmetto Railways is currently soliciting comprehensive mitigation packages from mitigation providers. The selected mitigation package will comprehensively address impacts described in Section 4.3, utilizing the USACE's "Guidelines for Preparing a Compensatory Mitigation Plan". A Draft Mitigation Plan will be included in Appendix G.

6 AFFECTED ENVIRONMENT AND IMPACTS

An interdisciplinary team of environmental scientists, biologists, planners, economists, engineers, archaeologists, historians, and others with knowledge or experience related to the Proposed Project, has analyzed the proposed action in light of existing conditions and has identified relevant beneficial and adverse effects associated with the proposed action. Section 6 describes baseline conditions, the expected effects of the proposed action, and baseline study recommendations. A detailed evaluation of the Proposed Project corridor (Cross Route 3) on the human and natural environment is presented below. The Proposed Project corridor consists of a 200-ft wide corridor in which detailed environmental studies were conducted and impacts were evaluated.

6.1 Land Use

6.1.1 Description of Affected Environment

Land use is defined as the way people use and develop land, including uses such as agricultural, residential, and industrial. Many municipalities develop zoning ordinances and planning documents to control the direction of development and to keep similar land uses together. Land use in the incorporated areas of Berkeley County is governed by the Berkeley County Planning and Zoning Department.

The Proposed Project corridor (Cross Route 3) passes through an area mainly designated as FLEX1. As per the Code of Ordinances, Berkeley County, South Carolina (Berkeley County Code) [16], FLEX1 is an Agricultural District, which is intended to implement the land use goals of the agriculture and resource conservation areas within rural areas in the unincorporated portions of Berkeley County. Near the intersection of the project corridor and Highway 6, the alignment will cross a zoning classified as RNC. As per Berkeley County Code this zone is for rural and neighborhood commercial district, which provides for the development of commercial uses in the county's rural areas and urban areas for the development of small-scale commercial uses designated to serve adjacent residential neighborhoods. On the portion of the project corridor north of the Diversion Canal, the alignment will cross a zone classified as HI. As per Berkeley County Code this zone is for Heavy Industrial. Within a HI zone permitted uses include agricultural, commercial, industrial, recreational and institutional uses.

The project corridor begins at the existing CSXT rail line that services Santee Cooper's Cross Generating Station. Land use in the area is undeveloped woodland adjacent to the existing Santee Cooper Industrial site. Immediately south of the Cross Generating Station is the Diversion Canal between Lake Marion and Moultrie. South of the Diversion Canal is the unincorporated community of Cross. The land use in Cross is low density rural residential, with a few retail and commercial uses. Between Cross and the Camp Hall Commerce park, the land is intensely managed for timber, resulting in heavy bedding, interconnecting drainage

ditches, and established timber stands in various stages of rotation, though there is no evidence of fire management within the stands. The primary species in rotation is loblolly pine (*Pinus taeda*) (Figure 2). Land use within the Proposed Project corridor is presented in Table 6-1.

Table 6-1. Proposed Project Surrounding Land Use.

	Crops, Shrubland, Herbaceous	Forested	Wetlands, Open Water	Developed
Preferred Route	35.7%	37.2%	25.9%	1.2%

6.1.1.1 Recreation and Land Stewardship

Numerous stewardship and protected areas sources have been reviewed, including the USGS Protected Areas Database of the United States (PAD-US), the National Conservation Easement Database (NCED), USDA Natural Resources Conservation Service (NRCS) Conservation Stewardship Program (CSP), SCDNR, and multiple non-governmental organizations (NGOs), to develop a database of protected and conserved lands in the project corridor. It should be noted that this database is not an exhaustive list, but gives an indication of the protected areas in the vicinity of the proposed rail corridor.

The corridor passes through two units of the Moultrie Hunt WMA, owned by Santee Cooper and located on both the north and south sides of the Diversion Canal. The alignment was sited to completely avoid the Caton Creek Mitigation Bank, owned by MeadWestvaco.

6.1.1.2 Section 6(f) Resources

Section 6(f) properties are recreation resources funded under the Land and Water Conservation Fund (LWCF) Act. The Land and Water Conservation Fund Act of 1965 was established to assist in preserving, developing, and assuring accessibility of outdoor recreation resources to all citizens of the United States (NPS 2016). Conversion of these lands for uses other than for outdoor recreation must be approved by the U.S. Department of the Interior. Direct impacts to these resources are prohibited unless there are no feasible and prudent alternatives for the use of the properties and the project incorporates all possible measures to avoid or minimize harm to such properties (NPS 2012).

According to the LWCF South Carolina has received approximately \$279 million over the past 50 years.

There are no Section 6(f) properties within or near the proposed rail corridor.

6.1.2 Potential Environmental Impacts

Construction and operation of the Proposed Project corridor would result in impacts to land use. Land use within the project corridor would change from undeveloped (or lightly developed) to an industrial rail line. The surrounding area, however, is largely agricultural, undeveloped, and rural residential, which would not change. The proposed disturbance associated with the rail corridor is relatively narrow (usually 42 feet to 55 feet, but up to 175 feet on the filled approaches to the Diversion Canal), so a relatively small portion of a very large land use category would be lost (FLEX1). This adverse impact would be considered minor overall.

6.2 Aesthetics and Visual Resources

6.2.1 Description of Affected Environment

The physical, biological, and cultural features of an area combine to make the visual landscape character both identifiable and unique. Scenic integrity indicates the degree of unity or wholeness of the visual character. Scenic attractiveness is the evaluation of outstanding or unique natural features, scenic variety, seasonal change, and strategic location. Where and how the landscape is viewed affect the more subjective perceptions of its aesthetic quality and sense of place.

Views of a landscape are described in terms of what is seen in foreground, middleground, and background distances. In the foreground, an area within 0.5 mile of the observer, details of objects are easily distinguished in the landscape. In the middleground, normally between 1 and 4 miles from the observer, objects may be distinguishable but their details are weak and they tend to merge into larger patterns. Details and colors of objects in the background, the distant part of the landscape, are not normally discernible unless they are especially large and standing alone. The impressions of an area's visual character can have a substantial influence on how it is appreciated, protected, and used. The general landscape character of the project corridor is described in this section.

The proposed rail corridor passes through number types of visual settings. These include forested areas, silvicultural areas, open water crossings (bridge crossing of the Diversion Canal), as well as industrial and rural residential areas. Industrial facilities include Santee Cooper's Cross Generating Station at the northern end of the route and the Camp Hall Commerce Park at the southern terminus. The proposed rail corridor passes through the unincorporated community of Cross. Views of the project area would likely be up to distances in the foreground (0 feet to 0.5 mile) or middleground (1 to 4 miles) from local roads and other nearby residential areas. Scenic attractiveness of the area within the line of rail improvement corridor is common, and scenic integrity is low because of active, intensive forestry operations and other adjacent commercial/industrial development.

Based on criteria developed by the U.S. Forest Service (1995) to rate scenic quality, overall scenic values of the project area are low because of the low relief, lack of significant visual features, and the similarity to surrounding areas.

6.2.2 Potential Environmental Impacts

Construction and operation of the proposed rail corridor would result in effects to existing scenic resources. Removal of existing trees, site grading, and rail construction would affect the scenic integrity of portions of the proposed rail corridor which have a rural or naturally appearing landscape character. Noise and/or waste light could also be generated, depending on the size and kind required for rail construction and operation.

The proposed rail corridor would cause a visual change in the landscape as a result of the construction and operation of the rail line. As described above, overall existing scenic values within the project corridor are low. Visual impacts will occur due to conversion of existing forested lands into a rail corridor. However, these impacts will be limited to adjacent property owners, at grade crossings, and the bridging of the Diversion Canal.

Light can cause pollution when it becomes a nuisance to adjacent properties. Light pollution/light trespass is best described as artificial light that is allowed to illuminate, or intrude upon, areas not intended to be lit. There are options available for future development to reduce the impacts of glare, light trespass and light pollution. Some of these options include designing outdoor lighting fixtures to be shielded, aimed, located and maintained to prevent light trespass onto adjacent properties and roadways; have shields or cut-off fixtures; or light fixture poles in parking lots that do not exceed a certain height.

The areas directly adjacent to the proposed rail corridor would be slightly impacted by the construction of the Proposed Project. These impacts would be negligible to minor, based on the existing disturbance to the landscape by intensive silvicultural activities. Visual impacts to the Diversion Canal will be minimal, as the proposed rail over the canal will be proximate to an existing highway crossing of the canal.

6.3 Air Quality

6.3.1 Description of Affected Environment

A few common air pollutants are found across the United States. The USEPA calls these pollutants “criteria air pollutants” because the agency has regulated them by first developing health-based criteria (science-based guidelines) as the basis for setting permissible levels. One set of limits (primary standard) protects health; another set of limits (secondary standard) is intended to prevent environmental and property damage. A geographic area that meets the primary National Ambient Air Quality Standards (NAAQS) is called an attainment area; areas that do not meet the primary NAAQS are called nonattainment areas.

SCDHEC operates air quality monitoring stations throughout the state. Data from these monitoring sites show that South Carolina enjoys some of the best air quality in the United States and is one of a few states that currently meet all NAAQS. Sampling data continues to show that the entire state is in attainment of the NAAQS. Table 6-2 summarizes the NAAQS and observed air quality data for Berkeley, Charleston, and Dorchester Counties.

Table 6-2 Air Quality Data Summary for Tri-County Area

Pollutant	Averaging Time	NAAQS	Maximum Observed ^(a)
Lead	Rolling 3-month	0.15 ug/m ³	0.006 ug/m ³
Carbon Monoxide	1-hr Maximum 8-hr Maximum	35 ppm 9 ppm	Not available for the 3-county area
Nitrogen Dioxide	Annual Mean	100 ug/m ³	12.4 ug/m ³
Sulfur Dioxide	1-hr Maximum 3-hr Maximum	75 ppb 1300 ug/m ³	41.9 ug/m ³ (16 ppb) 35.8 ug/m ³
Ozone	8-hr Daily Maximum	0.075 ppm	0.061 ppm
Particulate Matter (PM10)	24-hr Maximum	150 ug/m ³	49 ug/m ³
Particulate Matter (PM2.5)	Annual Mean 24-hr Maximum	15 ug/m ³ 35 ug/m ³	8.9 ug/m ³ 21 ug/m ³

(a) Maximum observed valued during the 2011-2013 time period at any SCDHEC monitor in Berkeley, Charleston, and Dorchester Counties.

(b) Data Source: <http://www.scdhec.net/baq/>

Emissions Summary

Air pollution is emitted by a variety of sources, ranging from large power plants to automobiles to household paints. The USEPA has compiled the National Emission Inventory (NEI) that contains data on all stationary and mobile sources emitting criteria air pollutants. Table 6-3 summarizes the NEI emission estimates for Berkeley, Charleston, and Dorchester Counties for the latest compiled year, 2011. There are several large industrial sources located within a 25-mile radius of the proposed corridor. These sources include electric generation stations, a pulp and paper mill, chemical plants, metal processing plants, and two cement plants. Highway vehicles and off-road equipment are also important sources of air pollution in the area.

Table 6-3 Emission Summary for Tri-County Area

Source Category	Emissions (tons per year)				
	CO	NOx	SO2	VOC	PM10
BERKELEY COUNTY					

	Emissions (tons per year)				
Source Category	CO	NOx	SO2	VOC	PM10
Fuel Combustion - Electric Utility	10,846	8,175	16,280	139	2,493
Fuel Combustion – Industrial	621	719	768	34	236
Fuel Combustion – Other	343	60	5	60	49
Chemical and Allied Products	333	0	0	302	5
Metals Processing	46,643	324	3,897	220	329
Other Industrial Processes	61	29	0	288	293
Solvent Utilization	0	0	0	1,307	0
Petroleum Storage/Transport	0	0	0	765	38
Waste Disposal	4,574	149	4	464	535
Highway Vehicles	15,627	3,461	16	1,789	223
Off-highway Vehicles	9,536	1,255	7	2,561	99
Miscellaneous	19,933	464	204	4,694	8,053
Berkeley County Totals	108,518	14,636	21,181	12,656	12,353
CHARLESTON COUNTY					
Fuel Combustion - Electric Utility	43	41	1	4	2
Fuel Combustion – Industrial	856	1,699	971	59	498
Fuel Combustion – Other	861	272	16	143	121
Chemical and Allied Products	6	0	3	129	10
Metals Processing	0	0	0	0	0
Other Industrial Processes	5,149	948	1,062	1,016	576
Solvent Utilization	0	0	0	2,747	1
Petroleum Storage/Transport	0	0	0	2,811	0
Waste Disposal	2	0	0	7	0
Highway Vehicles	34,422	7,744	38	3,845	587
Off-highway Vehicles	25,767	5,251	12,535	3,838	473
Miscellaneous	14,435	296	136	3,391	6,587
Charleston County Totals	81,541	16,250	3,760	17,989	8,856
DORCHESTER COUNTY					
Fuel Combustion - Electric Utility	0	0	0	0	0
Fuel Combustion – Industrial	296	213	69	10	163
Fuel Combustion – Other	258	46	3	46	36
Chemical and Allied Products	0	0	0	0	0
Metals Processing	5,149	228	971	78	133
Other Industrial Processes	2,982	1,413	389	377	487
Solvent Utilization	0	0	0	1,019	0
Petroleum Storage/Transport	0	0	0	564	108
Waste Disposal	68	12	2	14	0
Highway Vehicles	11,907	2,641	12	1,311	146
Off-highway Vehicles	3,774	495	3	313	46
Miscellaneous	5,202	124	54	1,217	3,830
Dorchester County Totals	29,636	5,172	1,501	4,948	4,951
Tri-County Totals	219,694	36,058	26,443	35,592	26,160

6.3.2 Potential Environmental Impacts

During construction and development of the proposed rail corridor emissions from internal combustion engines and generation of dust could temporarily increase levels of some pollutants. To reduce the emission of pollutants, appropriate construction BMPs will be observed and engines would be properly maintained. A dust mitigation program to ensure emissions and fugitive dust are kept at a minimum may be implemented during development of the site. SCDHEC Bureau of Air Quality requires an air quality permit to “build, install, alter, replace, or operate equipment that emits or controls the emission of air contaminants...prior to construction, installation, or operation.

During the operation of the proposed rail, diesel-electric engines will be utilized, which are a source of the criteria pollutants mentioned above.

The Association of American Railroads (AAR) has noted that in 2011, one gallon of diesel fuel moved a ton of freight by rail 468 miles – four times the efficiency of trucks. The US Environmental Protection Agency estimates that for every ton-mile, a typical truck emits three times more nitrogen oxides and particulates than a train (AAR 2017). Related studies suggest that trucks emit 6 to 12 times more pollutants per ton-mile than railroads, depending on the pollutant measured. The American Society of Mechanical Engineers found that 2.5 million fewer tons of carbon dioxide would be emitted into the air annually if 10% of intercity freight now moving by highway were shifted to rail (AASHTO 2003).

The American Association of State Highway Officials (AASHTO) noted that for each 1% of long-haul freight currently moving by truck, fuel savings would be approximately 111 million gallons per year if moved by rail instead; and annual greenhouse gas emissions would fall by 12 million tons. If 10% of truck traffic went by rail – via intermodal movements involving both railroads and trucks – the cumulative estimated greenhouse gas reductions from 2007 to 2020 would be 210 million tons (AASHTO 2003).

USEPA initiated a multi-step program in 2008 to reduce diesel locomotive emissions. The USEPA’s stringent Tier 4 standards for newly built and remanufactured locomotives took effect Jan. 1, 2015. The agency estimates 90% particulate matter (PM) reductions and 80% nitrogen oxide (NOX) reductions from Tier 4 engines meeting these standards compared to engines meeting the current Tier 2 standards. Further, by 2030, it is estimated the program will result in the reduction of annual emissions of NOX by about 800,000 tons and PM emissions by 27,000 tons. In addition, emission reductions will continue to grow beyond 2030 as fleet turnover is completed. Twenty-one Locomotive builders and diesel power plant suppliers are already supplying power meeting Tier 4 standards.

It is expected that Palmetto Railways and their contractors will maintain their vehicles/equipment so that carbon monoxide, ozone-producing chemicals and other emissions are kept to a minimum. Thus, impacts to air quality are expected to be minor.

On a macro-scale basis, the anticipated emissions from the proposed rail line will most likely have an immaterial impact on air quality in the North Charleston-Summerville-Charleston Metropolitan Statistical Area (MSA).

Although the Proposed Project will add emissions to the project area, it is anticipated to be within concentrations of allowable emissions for the State of South Carolina.

In summary, the Proposed Project would have negligible to minor impacts on air quality levels for criteria pollutants and would not result in adverse impacts associated with toxic air pollutants that may be emitted.

6.4 Noise and Vibration

Noise is generally defined as unwanted sound. Unwelcome sound interferes with normal activities such as sleeping, conversation, and recreation, and can have an adverse impact on human health. There are two types of noise problems: occupational and community. Occupational noise generally stems from loud machinery, while community noise is attributed to the cumulative effect of several sources of noise. The main sources of community noises are highways, railroads, and airports (U.S. Department of Housing and Urban Development [HUD], 1998).

The degree of acceptability of the noise atmosphere at a site is determined by the outdoor day-night average sound level in decibels (dB) (HUD, 1998). A decibel is defined as a unit of measurement of the loudness or intensity of sound.

6.4.1 Description of Affected Environment

Berkeley County Ordinance No. 05-08-56 and 09-04-21 implements noise regulations for the unincorporated areas of Berkeley County. The ordinance addresses maximum permissible noise levels as well as provides exemptions for certain noise sources.

Section 38.1(c)(2) of the noise ordinance exempts noise from construction or demolition activities occurring between 6:00 a.m. and 10:00 p.m. Construction activity means any site preparation, assembly, erection, repair, or similar activity and any associated equipment testing.

Section 38.1(b)(1) of the noise ordinance prohibits continuous sound levels from a facility or property in excess of the following maximum limits, as measured from the nearest property line in a non-residential area of the unincorporated areas of the County.

Hours of the Day	Maximum Sound Level in A-Weighted Decibels (dBA)
6:00 a.m. to 10:00 p.m.	75 dBA
10:00 p.m. to 6:00 a.m.	69 dBA

Existing noise and vibration levels were estimated based on the Federal Transit Authority Manual. In proximity of major roadways, the estimate existing noise level was determined based on noise level estimation with distance to the roadway. Where there are no major roadway and the noise characteristics that surround the receptors are far enough from major roadways and are dominated by local streets and local community activity, the existing noise levels were estimated based on population density. The existing condition for each potential receptor is summarized in Appendix C.

6.4.2 Potential Environmental Impacts

A limited noise and vibration screening study was conducted to comply with NEPA requirements for the proposed rail corridor, which assumes PR would operate five (5) roundtrip freight trains per week from Camp Hall Commerce Park to existing CSXT railroad ROW, near the Santee Cooper Cross Generating Station in Berkeley County (Appendix C). Maximum operating speeds are projected to be 25 miles per hour (mph).

Guidance has been developed by the Federal Transit Administration (FTA) published in “Transit Noise and Vibration Impact Assessment” (Hanson, et. al 2006) for conventional rail noise and vibration impact assessments, and FRA has developed complementary guidance for high-speed rail (Hanson, et al. 2012). Furthermore, a Screening Noise Assessment was performed using aspects of the General Noise Assessment and General Vibration Assessment in accordance with FTA guidelines as well the CREATE Program guidelines. Future anticipated rail traffic volumes were evaluated in order to assess the Project-related effects of airborne noise.

The evaluation of potential noise and vibration impacts includes two parts: screening procedure and general assessment. The screening procedure is somewhat qualitative and uses basic information about a project and the area of proposed operation to develop an inventory of sensitive sites and/or receivers. Following the screening procedure, a general assessment was completed to develop more quantitative estimates of Project-related noise levels. By calculating Project-related train noise and existing noise at each receiver, the two types of noise can be compared with specific impact criteria, based on the type of land use that best describes the receiver. The impact criteria are used to designate each receiver as being severely impacted, moderately impacted, or not impacted.

Noise

Screening distances, based on the FTA Manual, were developed to identify the potential limits of noise impact from freight and passenger activity. FTA screening distances were 750 feet

for the proposed rail corridor and 1,600-feet for grade crossings where train-mounted horns will be used. The locomotive horn shall begin to be sounded at least 15 seconds, but no more than 20 seconds, before the locomotive enters the crossing. With a project speed of 25 mph, this results in a distance of 733 feet from all public crossings.

The screening distance criteria identified 85 receptors; however, only six residential structures would be classified as having moderate impacts. Locomotive horn use at public at-grade crossings is the primary cause of the predicted noise impacts at these locations. Since use of horns at crossing is a necessary feature to protect the public at these crossings, no change or modification of the standard warning procedure is mandated by these moderate impacts to six residences.

During project track construction noise levels, will be produced by the operation of heavy-duty equipment and various other construction activities. Noise levels generated by construction activities depend on a series of variables. Such variables include the number and type of pieces of equipment, their general condition of operation, the amount of time each piece operates per day, the presence of any noise attenuating features (e.g. walls, berms) and the location of the construction activities relative to the receptors. A professional judgment of the likely means and methods that would be used by the contractor has been used to determine likely noise impacts from construction. The assessment of construction noise determined that the greatest potential for noise impacts would result from at-grade track construction and bridge construction. The assessment has determined that noise impacts to the most sensitive receptors (i.e. residential properties) during construction would be within allowable limits and therefore no noise impacts from construction would be expected. Detailed results from the Noise Assessment are presented in Appendix C.

Vibration

Taking into consideration the traffic surrounding the proposed rail corridor the project falls under the Infrequent Event Category – fewer than 30 vibration events of the same kind per day.

Based on the distance to the Preferred Route centerline, none of the 85 receptors identified during the screening are within the impact distances. The projected vibration from the project is below the impact threshold. Material vibration impacts are therefore not anticipated with this project.

In addition, during the construction phase, no vibration impacts are expected to any of the identified receptors due to vibrations from construction activities. Therefore, based on this assessment no additional study or consideration of mitigation is considered necessary. Detailed results from the Vibration Assessment are presented in Appendix C.

6.5 Geology and Soils

6.5.1 Description of Affected Environment

The proposed rail corridor is located entirely within the Atlantic Coastal Plain Physiographic Province. Coastal Plain soils consist of ancient marine deposits including interbedded limestones, gravels, sands, silts and clays. The Coastal Plain is a wedge-shaped deposit of Cretaceous and younger sediments which range in thickness from near zero at the contact with the Piedmont Physiographic Province (the Fall Line) to the northwest, to thousands of feet at the coast. The Cross project corridor contains unconsolidated sediments of the Wicomico Terrace, which underlies the Penholoway terrace, a coastal feature that formed when the shoreline of the Atlantic Ocean stood about 70 feet higher than at present. The Penholoway terrace in this area is shown to have been formed during a pause in marine regression from the Wicomico stand, when the sea stood near 100 feet. This timeframe was during the Pleistocene geologic era and the project area also contains sediments from the Holocene geologic era. The Cross project corridor sediments deposited beneath the Holocene terraces includes sink holes (shallow depressions in-filled with debris, surrounding sediments or water formed by collapse of sediments from dissolution of limestone and marl by groundwater), freshwater marsh and swamp deposits (silty clay and peat), Carolina bay deposits (quartzose clay, clayey quartz, quartzose sands) and Carolina bay sand rims (medium quartz sands). Sediments beneath the Penholoway Terrace include quartz pebble stone, quartz sands and fine micas of the Penholoway Formation. Sediments beneath the Wicomico Terrace include the Dean Swamp member (silty clay and fine to medium quartz sand), the Toney Bay member (sandy quartz gravel), Wicomico terrace or Waccamaw formation barrier island deposits (phosphatic quartz sand, coarse quartz sand, heavy minerals, shell hash and trace coarse mica) and Wicomico terrace sediments or Waccamaw formation (sandy quartz gravel, fine to coarse quartz sand and opaque minerals).

Limestone, fill soil, sand, and gravel is currently being mined at several locations near the corridor. The proposed rail is not expected to impacts these existing or planned mining sites or mineral resources.

According to the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) (USDA 2015b), the soils within the project corridor are mapped as nonhydric, predominantly nonhydric, predominantly hydric, and hydric soils. Approximately 47% of the project corridor is within hydric or predominantly hydric soils as shown in Table 6-4 (Figure 3).

Table 6-4. USDA NRCS Soils Map Units within the Proposed Rail Corridor

Map Series	Hydric Rating	Description
Bethera loam	Predominantly hydric	Nearly level, deep, and poorly drained soils. Located on broad, low flats and in depressional areas east of the Summerville Scarp.
Bonneau loamy sand	Nonhydric	Nearly level to gently sloping, deep, and moderately well drained. Formed in loamy Coastal Plain sediment.
Borrow Pits	Hydric	Miscellaneous areas consisting of open excavations in areas where the surface layer and subsoil have been removed.
Byars loam	Predominantly hydric	Nearly level, deep, and very poorly drained. Formed in clayey Coastal Plain sediment.
Coxville fine sandy loam	Predominantly hydric	Nearly level, deep, and poorly drained. Formed in clayey Coastal Plain sediment.
Duplin fine sandy loam	Predominantly Nonhydric	Nearly level to gently sloping, deep and moderately well drained. Formed in clayey Coastal Plain sediment.
Goldsboro loamy sand	Predominantly Nonhydric	Nearly level, deep, and moderately well drained. Formed in loamy Coastal Plain sediment.
Lenoir fine sandy loam	Predominantly Nonhydric	Nearly level, deep, and somewhat poorly drained. Formed in clayey Coastal Plain sediment.
Leon fine sand	Hydric	Nearly level, poorly drained. Formed in sandy Coastal Plain sediment.
Lynchburg fine sandy loam	Predominantly Nonhydric	Nearly level, deep, and somewhat poorly drained. Formed in loamy Coastal Plain sediment.
Meggett loam	Hydric	Nearly level, deep, and poorly drained. Formed in clayey Coastal Plain sediment.
Norfolk loamy sand	Nonhydric	Nearly level to gently sloping, deep, and well drained. Formed in loamy Coastal Plain sediment.
Ocilla loamy fine sand	Nonhydric	Nearly level, deep, and somewhat poorly drained. Formed in loamy Coastal Plain sediment.
Pantego fine sandy loam	Predominantly hydric	Nearly level, deep, and very poorly drained. Formed in loamy Coastal Plain sediment.
Rains fine sandy loam	Predominantly hydric	Nearly level, deep, and poorly drained. Formed in loamy Coastal Plain sediment.
Santee loam	Hydric	Nearly level, deep, and very poorly drained. Formed in clayey Coastal Plain sediment.
Seagate loamy sand	Predominantly Nonhydric	Nearly level, deep, and somewhat poorly drained. Formed in loamy Coastal Plain sediment.
Udorthents	Nonhydric	Consist of soil materials that were excavated and piled along the Diversional Canal during construction.
Wahee loam	Nonhydric	Nearly level, deep, and somewhat poorly drained. Formed in clayey Coastal Plain sediment.

6.5.2 Prime Farmland

The National Agricultural Land Study of 1980-1981 discovered millions of acres of farmland were being converted in the United States each year. Farmland includes prime farmland,

unique farmland, and land of statewide or local importance. Congress passed a law creating the Farmland Protection Policy Act (FPPA), which aims to protect against projects that convert farmland directly or indirectly (USDA 2015a). In addition, the FPPA is intended to minimize the impact Federal programs have on the irreversible conversion of farmland to nonagricultural areas. Farmland such as forest land, pastureland, and cropland can be subject to FPPA requirements. Consequently, soils specifically suited to agricultural uses may be protected under the FPPA. Conversion of these soils from pastureland to non-pastureland uses may be limited.

Activities that may be subject to FPPA include highway construction projects, electric cooperative construction projects, railroad construction projects, and Federal agency projects. Project sites that are federally funded or assisted require coordination with NRCS and state FPPA contacts. NRCS determines if the potential project impacts on farmland exceed the recommended allowable level.

According to the NRCS Web Soil Survey, the proposed rail corridor includes soils designated as prime farmland, 23% of ROW, and farmland of statewide importance, 54% of ROW (USDA 2015b) (Figure 4), and shown on Table 6-5. Some of the farmland soils within the corridor consist of existing development or are not used for agricultural.

Table 6-5. USDA NRCS Farmland Classification.

Map Series	Farmland Classification	Percentage within right-of-way
Bethera loam	Farmland of statewide importance	0.24%
Bonneau loamy sand	Farmland of statewide importance	3.14%
Borrow pits	Not prime farmland	0.57%
Byars loam	Farmland of statewide importance	3.87%
Coxville fine sandy loam	Farmland of statewide importance	10.65%
Duplin fine sandy loam	All areas are prime farmland	2.71%
Goldsboro loamy sand	All areas are prime farmland	18.82%
Lenoir fine sandy loam	Farmland of statewide importance	1.27%
Leon fine sand	Not prime farmland	0.32%
Lynchburg fine sandy loam	Not prime farmland	17.38%
Meggett loam	Farmland of statewide importance	20.20%
Norfolk loamy sand	All areas are prime farmland	1.38%
Ocilla loamy fine sand	Farmland of statewide importance	5.34%
Pantego fine sandy loam	Not prime farmland	1.13%
Rains fine sandy loam	Farmland of statewide importance	8.79%
Santee loam	Farmland of statewide importance	0.57%
Seagate loamy sand	Not prime farmland	2.44%
Udorthents	Not prime farmland	0.47%
Water	Not prime farmland	0.32%
Wahee loam	Farmland of statewide importance	0.39%

6.5.3 Potential Environmental Impacts

The proposed rail corridor would have minor direct impacts to soil resources on-site as a result of construction and operation of the rail line, but no material adverse impact on the geology of the region. It is anticipated that minor impacts on soils would occur. These impacts would mostly occur during the construction phase, when excavation or fill activities are underway. This would cause minor impacts to geology and soils including minor, localized increases in erosion and sedimentation. Should borrow material be required, sand and gravel aggregate may be obtained either from on-site activities, or from local, off-site sources. The creation of new impervious surface would result in an increase in stormwater runoff and potential increase in soil erosion. Use of BMPs, such as soil erosion and sediment

control measures, would minimize the potential for increased soil erosion and runoff. A National Pollutant Discharge Elimination System (NPDES) Permit for discharges of stormwater associated with construction activities would likely be required. Application for the permit would require submission of a Stormwater Pollution Prevention Plan (SWPPP) describing the management practices that would be utilized during construction to site. Following construction, implementation of soil stabilization and vegetation management measures and proper maintenance of BMPs would reduce the potential for erosion impacts during site operations.

The proposed rail corridor would result in conversion of potential Prime Farmland soils and natural soils being converted to developed areas and/or impervious surfaces than under current conditions. A Prime Farmland analysis specified at 7 C.F.R. § 658.5 has not been completed for this project.

6.6 Water Resources/Floodplains

6.6.1 Description of Affected Environment

Surface Waters and Streams

Surface water includes streams, rivers, lakes, and reservoirs. The large majority of the proposed rail corridor is located within the Cooper River Watershed (Hydrologic Unit Code [HUC] 03050201). A minimal portion is located within the Four Hole Swamp Watershed (HUC 03050205).

In order to better categorize the existing streams within the proposed rail corridor, Berkeley County's Ordinance No. 89-04-09, titled "An Ordinance to Establish Regulations and Standards for Storm Drainage Facilities" was reviewed. It provides definitions for major, primary and secondary drainage channels.

The USACE Hydrologic Engineering Center Geospatial Hydrologic Modeling Extension (HEC Geo-HMS) model and readily available elevation data determined 43 watersheds drain towards the proposed rail alignment. The watersheds were organized into three Berkeley County categories; eight major channels, twelve primary channels, and twenty-three secondary channels. In addition to the 43 modelled drainage watersheds, the preferred route crosses the Diversion Canal between Lake Marion and Lake Moultrie. The majority of the modelled drainages are agricultural ditches draining large Carolina Bays and existing silvicultural land. Black Creek and Williams Branch (both major channels) are the only natural stream channels within the proposed rail ROW.

Wetlands

Jurisdictional waters of the U.S. located within the project corridor have been described above in Section 4.

Floodplains

Federal Emergency Management Agency (FEMA) Floodplain Insurance Rate Maps (FIRM) were used to determine if areas within the project site are located within the designated 100-year floodplain. FIRM Community-Panel Numbers 45015C 0075D, 0100D, 0200D, 0225D, 0350D, 0365D, and 0375D (10/16/2003) for Berkeley County indicate the Preferred Route intersect the existing Zone A floodplain at two separate occurrences. First, a tributary of Black Creek on FIRM panel 45015C0375D has an existing Zone A floodplain of approximately 455 feet wide. Second, the Diversion Canal on FIRM panel 45015C0200D has an existing Zone A floodplain approximately 430 feet wide. Zone A floodplains are those areas that have been determined to be within the 100-year flood, but no base flood elevations have been determined. The remainder of the Preferred Route is located in Zone X, or areas determined to be outside of the 500-year floodplain. There are no regulatory floodways within the project corridor.

The construction of the Proposed Project will require fill within portions of FEMA Zone A floodplains; therefore, a Letter of Map Revision based on Fill (LOMR-F) will be necessary. Per FEMA, a LOMR-F is submitted for properties on which fill has been placed to raise a structure or lot to or above the Base Flood Elevation (BFE). For Zone A floodplains, a 100-year base flood elevation will need to be determined as part of development and prior to any fill placement within this area. As part of the Preferred Route development, coordination will be required between FEMA and the Berkeley County Floodplain Administrator, as well as meeting any pertinent requirements presented in the Berkeley County Floodplain Ordinance.

Water Quality Regulations

Although all waters of the State are protected for swimming, SCDHEC requires closer monitoring on certain waters and watersheds. Regulation 61-69 Classified Waters, classifies the Cooper River Watershed as “FW” (freshwaters) and “SB” (tidal saltwaters). However, the Preferred Route is only within the freshwater portion of the Cooper Watershed. Freshwaters are waters that are suitable for primary and secondary contact recreation and as a source for drinking water supply after conventional treatment (SCDHEC 2005).

South Carolina Regulation 61-69(B), Tributaries to Classified Waters, states that where surface waters are not classified by name (unlisted) in the regulation, the use classification and numeric standards of the class of the stream to which they are a tributary apply, disregarding any site-specific numeric standards for the named waterbody. Therefore, the

streams and creeks to which the Preferred Route contributes are classified as Freshwater (FW).

Regulation 61-69(A), Criteria for Classes, states that all adopted classifications must conform to the standards and rules contained in Regulation 61-68 Water Classifications and Standards. Regulation 61-69(G) 10, Freshwaters (FW), state that freshwaters are suitable for primary and secondary contact recreation and as a source for drinking water supply after conventional treatment. It further states that Freshwaters are suitable for fishing and the survival and propagation of a balanced indigenous aquatic community of fauna and flora and is also suitable for industrial and agricultural uses. Regulation 61-69(G) 10 list the Quality Standards for Freshwaters per Table 6-6 below.

Table 6-6 South Carolina Quality Standards for Freshwaters [R. 61-69 (G)(10)]

Items	Standards
a. Garbage, cinders, ashes, oils, sludge, or other refuse	None allowed.
b. Treated wastes, toxic wastes, deleterious substances, colored or other wastes except those given in a. above.	None alone or in combination with other substances or wastes in sufficient amounts to make the waters unsafe or unsuitable for primary contact recreation or to impair the waters for any other best usage as determined for the specific waters which are assigned to this class.
c. Toxic pollutants listed in the appendix.	Any discharge into waters of the State must be permitted by the Department and receive a degree of treatment and/or control which shall produce an effluent which is consistent with the Clean Water Act.
d. Stormwater, and other nonpoint source runoff, including that from agricultural uses, or permitted discharge from aquatic farms, concentrated aquatic animal production facilities, and uncontaminated groundwater from mining.	Allowed if water quality necessary for existing and classified uses shall be maintained and protected consistent with antidegradation rules.
e. Dissolved oxygen.	Daily average not less than 5.0 mg/l with a low of 4.0 mg/l.
f. E. coli	Not to exceed a geometric mean of 126/100 ml based on at least four samples collected from a given sampling site over a 30 day period, nor shall a single sample maximum exceed 349/100 ml.
g. pH.	Between 6.0 and 8.5.
h. Temperature.	As prescribed in E.12. of this regulation.
i. Turbidity. Except for Lakes. Lakes only.	Not to exceed 50 Nephelometric turbidity units (NTUs) provided existing uses are maintained. Not to exceed 25 NTUs provided existing uses are maintained.

Water Quality Monitoring

SCDHEC has three impaired water quality monitoring stations near the Preferred Route. Monitoring Station CSTL-079 is located on the Diversion Canal approximately 6,800 feet upstream of the Preferred Route's proposed Diversion Canal crossing. Monitoring Station CSTL-079 is listed on the current (2014) 303(d) list as not meeting water quality standards

for aquatic life and fishing, and is listed as impaired for dissolved oxygen and mercury. Note that the SCDHEC recently transitioned from monitoring fecal coliform to E. coli for freshwaters. A total maximum daily load (TMDL) has been established for fecal coliform (or E. Coli) for the Charleston Harbor, Cooper, Ashley, and Wando Rivers; approximately the southern half of the Preferred Route drains into this TMDL.

Monitoring Station SC-026 is located on Waring Branch, approximately 3,000 feet upstream of the Preferred Route's crossing of Waring Branch. Monitoring Station SC-026 is listed on the current (2014) 303(d) list as not meeting water quality standards for fecal coliform. In addition, monitoring station CSTL-063 is listed for not meeting water quality standards for fecal coliform. Monitoring station CSTL-063 is located on Wassamassaw Swamp at US Highway 176.

The Cooper River Watershed is included in the TMDL for the Charleston Harbor, Cooper, Ashley and Wando Rivers for dissolved oxygen (DO). However, this TMDL is mainly associated with major point source dischargers (i.e. municipal and industrial wastewater treatment plants) at a critical low flow condition (when oxygen demanding substances assimilative capacity is lowest). The TMDL document concluded "non-point sources are a very minor contributor of oxygen consuming load under critical low flow conditions because of the absence of stormwater runoff" (SCDHEC 2013). The TMDL document also reported that wet-weather sampling and modeling determined that "developed areas currently contribute no more oxygen demanding pollutants to the TMDL segments than forested areas." Therefore, the TMDL does not include a load allocation for or a target reduction of, non-point source pollution or loads from regulated NPDES municipal separate storm sewer systems (MS4s) and other stormwater related discharges.

Palmetto Railways is committed to establishing various construction site stormwater BMPs during construction to address erosion prevention and sediment control and other water quality parameters.

6.6.2 Potential Environmental Impacts

Surface Waters and Wetlands

Approximately 83.18 acres of jurisdictional wetlands will be impacted. Approximately 77.49 acres of impacts are located with the Cooper Watershed and the remaining 5.76 acres of impacts are located with the Four Hole Swamp Watershed. In addition, approximately 0.06 acres and 169-feet of non-wetland waters (jurisdictional streams) will be impacted. These streams include Bulltown Ditch and Williams Branch, both located within the Cooper River Watershed. Wetland fragmentation will likely occur as a result of the proposed rail corridor. The impact of this fragmentation will be minor, as the wetlands that the corridor runs through have historically been fragmented by past and current land uses.

Compensatory mitigation will be required to offset the permanent impacts. The permanent impacts for this project fall into three categories: fill, dredge, and flood/impound. "Fill" refers to depositing material used for the primary purpose of replacing an aquatic area with dry land. "Dredge" means to dig or excavate. "Flood/Impound," means to collect or confine the flow of a riverine system by means of a dike, embankment, or other man made barrier. For a more detailed discussion of wetland impacts and compensatory mitigation, please refer to Sections 4 & 5 above.

Floodplains

Since a portion of the proposed rail corridor would be located within the regulated FEMA 100-year floodplain of the Diversion Canal (2.3 acres) and Black Creek (2.1 acres), appropriate rail design measures will be implemented to ensure minimal impact to this regulated resource. This will likely include placement of appropriately sized bridges or culverts under the road crossings to allow water and aquatic organisms to pass relatively unhindered. The appropriate permits will be obtained to address this work. The current design has been modeled and an opinion of probable no-rise has been made. See the Preliminary Hydraulic report for more information on potential impacts to regulatory floodplains.

State of South Carolina. Land disturbing activities (including the construction of roads, residential neighborhoods, commercial areas, etc.) are required to apply for and receive coverage under the NPDES Phase II Construction General Permit (CGP). The permit addresses water quality and quantity using thresholds based on the project's land disturbance footprint, distance to receiving water, and proximity to sensitive areas. Generally, a permit is required if a land disturbing project is:

- ≥ 1 acre and not within $\frac{1}{2}$ mile of a receiving water or
- if a project is $> \frac{1}{2}$ acre and within $\frac{1}{2}$ mile of a receiving water.

However, a permit could be required even if the project is $\leq \frac{1}{2}$ acres and within $\frac{1}{2}$ mile of a receiving water if it meets defined criteria that are outlined in the regulations. Also, projects within or part of a larger common plan (LCP) that will disturb more than one acre are subject to the NPDES requirement. All construction associated with the proposed rail corridor would be subject to these regulations as they will be part of the LCP and disturb areas greater than the thresholds listed above.

In addition to the above water quality regulations for the permanent stormwater management system for proposed rail corridor, the NPDES Phase II CGP also requires the implementation of various construction site stormwater BMPs be implemented during construction to address erosion prevention and sediment control (and other water quality parameters). The current NPDES Phase II CGP requires that a SWPPP be developed for the project site. The overall design consideration for the SWPPP is that it must provide for 80% total suspended solids (TSS) removal efficiency from the construction site under disturbed soil conditions.

In addition to erosion prevention and sediment control, the SWPPP must address various other components, including:

- project narrative;
- stormwater management and sediment control;
- sequence of conduction;
- identification of site features and sensitive areas (*i.e.* wetlands);
- buffer zone management compliance and plan;
- identification of potential sources of pollution;
- identification of BMPs to be implemented;
- site maps;
- engineering reports;
- construction plans (with phased control plan);
- velocity and volume control measures to be implemented to meet non-numeric effluent limits;
- management of non-stormwater discharges; and
- special considerations for TMDL watersheds.

Berkeley County, SC. Berkeley County's stormwater regulations reinforce the state's regulations and provide for some additional regulations mainly associated with the specific implementation of various stormwater management facilities. (*i.e.* ditches, culverts, secondary collection systems, etc.). The County's design regulations are summarized in its Stormwater Design Standards Manual (December 1, 2009).

The County has adopted the state's requirements related to water quality; see the discussion above.

The County's requirements for the design of stormwater collection and conveyance systems vary based on the type of system and the areas being drained. In general, minor (or secondary) collections systems (closed pipe systems and drainage ditches) shall be designed for the 10-year storm event. Road culverts (pipes crossing under roads) should be design to the 25-year storm event. Major drainage systems (large ditches and canals draining more than 200 acres) shall be design to carry the 50-year storm event within its banks.

Water Quality

Land clearing activities along the proposed ROW could cause lower dissolved oxygen concentrations by decreasing waterbody shading and increasing warmer water temperatures; warmer water temperatures lower DO concentrations. Often with new development, the addition of impervious areas can increase pollutant loading rates, if appropriate stormwater BMPs are not used. Since the proposed rail line will not include substantial amounts of new impervious area, the primary water quality impacts are likely to result from the conversion of forested areas to a maintained railroad right of way and the channelization of stormwater runoff along certain areas. To mitigate potential water quality impacts from the proposed rail line, a variety of post-construction stormwater BMPs will be used to convey, filter, and dissipate runoff from the new rail line, including but not limited to: vegetated swales, vegetated filter strips, stream bank stabilization, and channelized flow dissipation.

Water Quality Mitigation Strategies

During construction, the project site will be subject to the implementation of a detailed, phased SWPPP. As discussed above, the SWPPP will provide for the layout, implementation, details, sequencing, operation and maintenance of various temporary construction BMPs to mitigate the potential off-site release of pollutants (particularly sediment). The SWPPP will include the implementation of three types of temporary construction BMPs including erosion prevention BMPs, runoff control and conveyance BMPs, and sediment control BMPs.

Erosion prevention BMPs that may be implemented include:

- Dust control;
- Mulching;
- Blown Straw;
- Hydro-mulching/seeding;
- Erosion control blankets;
- Turf reinforcement mats; and
- Outlet protection (*i.e.* rip-rap).

Runoff control and conveyance BMPs that may be implemented include:

- Diversion ditches/dikes;
- Pipe slope drains;

- Drainage swales; and
- Level spreader.

Sediment control BMPs that may be implemented include:

- Sediment basins;
- Sediment traps;
- Silt fences;
- Ditch checks;
- Stabilized construction entrances;
- Storm drain inlet protection; and
- Sediment tubes.

All construction BMPs will be designed, implemented and maintained per the guidance in the SCDHEC Storm Water Management BMP Handbook (August 2005).

6.7 Biotic Communities

6.7.1 Description of Affected Environment

The proposed Palmetto Railway Corridor occurs completely within the Atlantic coastal plain physiographic province (USEPA 2013).

Wildlife

The proposed corridor provides suitable habitat for common wildlife species. During the field investigations, a variety of wildlife species or their scat was observed, including white-tailed deer (*Odocoileus virginianus*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), gray squirrel (*Sciurus carolinensis*), great blue heron (*Ardea herodias*), wild turkey (*Meleagris gallopavo*), red-shouldered hawk (*Buteo lineatus*), bald eagle (*Haliaeetus leucocephalus*), turkey vulture (*Cathartes aura*), black vulture (*Coragyps atratus*), pileated woodpecker (*Dryocopus pileatus*), downy woodpecker (*Picoides pubescens*), Eastern phoebe (*Sayornis phoebe*), American crow (*Corvus brachyrhynchos*), blue jay (*Cyanocitta cristata*), golden-crowned kinglet (*Regulus satrapa*), yellow-rumped warbler (*Dendroica coronata*), and Northern cardinal (*Cardinalis cardinalis*).

Other mammal species that are potentially present along the corridor include: bats, fox, bobcat (*Lynx rufus*), mice, rats, armadillo (*Dasypus novemcinctus*), and Eastern cottontail (*Sylvilagus floridanus*).

Additional bird species that are likely to occur in these habitats are: Mississippi kite (*Ictinia mississippiensis*), red-tailed hawk (*Buteo jamaicensis*), sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*A. cooperii*), osprey (*Pandion haliaetus*), barred owl (*Strix varia*), mourning dove (*Zenaida macroura*), red bellied woodpecker (*Melanerpes carolinus*), Eastern kingbird (*Tyrannus tyrannus*), Carolina chickadee (*Parus carolinensis*), tufted titmouse (*P. bicolor*), Carolina wren (*Thryothorus ludovicianus*), Northern mockingbird (*Mimus polyglottos*), Eastern bluebird (*Sialia sialis*), American robin (*Turdus migratorius*), white eyed vireo (*Vireo griseus*), solitary vireo (*Vireo solitaries*), and Northern parula (*Setophaga americana*).

Wading bird colonies are known to occur within a half mile of the corridors (SCDNR 2016). Species included in these colonies include but are not limited to: black-crowned night-heron (*Nycticorax nycticorax*), yellow-crowned night-heron (*Nycticorax violaceus*), great blue heron (*Ardea herodias*), snowy egret (*Egretta thula*), and great egret (*Casmerodius albus*).

Habitats

Ten basic habitat types were identified within the proposed rail corridor. A description of each habitat type is provided below and is representative of conditions at the time of evaluation.

The upland mixed hardwood and pine forest (U43) comprised 25.8 acres of the corridor and is characterized by an overstory composed primarily of loblolly pine (*Pinus taeda*) with some interspersed longleaf pine (*Pinus palustris*), southern red oak (*Quercus falcata*), pignut hickory (*Carya glabra*), and some interspersed live oaks (*Quercus virginiana*). Cover ranged from 40-70% in the overstory. The midstory is composed of loblolly pine, southern red oak, pignut hickory, longleaf pine, and sweetgum with a cover ranging from 10-30%. The shrub layer is sparse, with 10-20% cover consisting of wax myrtle (*Morella cerifera*), farkleberry (*Vaccinium arboreum*), redbay (*Persea borbonia*), and deerberry (*Vaccinium stamineum*). The herbaceous layer is healthy, at approximately 30-50% cover, and was composed primarily of bracken fern (*Pteridium aquilinum*), broomstraw (*Andropogon virginicus*), longleaf woodoats (*Chasmanthium sessiliflorum*), dogfennel (*Eupatorium capillifolium*), panic grass (*Panicum sp.*), and slender lespedeza (*Lespedeza virginica*). Vine species include muscadine (*Vitis rotundifolia*), greenbriar (*Smilax sp.*), and sawtooth blackberry (*Rubus argutus*) making up approximately 10% of the cover.

The upland hardwood forest (U43) is similar to the mixed hardwood and pine forest and comprised 8.5 acres of the corridor; however, it is generally present only within ecotones between upland and wetland areas. While there is an occasional loblolly or longleaf pine in these areas, the overstory composition is primarily composed of hardwoods including: white oak (*Quercus alba*), post oak (*Quercus stellata*), live oak, southern red oak, and pignut

hickory, with water oak found on the lower slopes leading to the wetlands. Overstory closure ranges from 40-60%. The midstory (10-25% cover) consists of pignut hickory, sweetgum, red oak, red maple, American hornbeam (*Carpinus caroliniana*), and American holly (*Ilex opaca*). Shrub layers are sparse (0-10% cover), and consist of redbay and wax myrtle. The herbaceous layer is sparse, approximately 0-10% cover, and is composed primarily of bracken fern, cinnamon fern (*Osmunda cinnamomea*), broomstraw, and longleaf woodoats.

The upland and wetland plantation pine forests (U42P, PFO4B) comprised approximately 494 acres of the corridor and is characterized by an overstory composed primarily of loblolly pine. Plantation pine forests span both upland and wetland areas, as well as some former Carolina bay features that were converted to pine monoculture. These areas are intensively managed for silviculture with a first thinning typically at ages 12-15 years old, followed by a clear cut at 25-30 years old. These areas are bedded and extensively ditched. The planted pine forest habitat covers 61% of the corridor. The corridor spans multiple stands of pines, ranging from open thinned (70-80 Basal Area) stands to dense, pre-merchantable stands (140 Basal Area). As a result of recent clear cuts there are areas with no overstory or midstory. In thinned pine areas (70-80 BA), there is a midstory of sweet gum and red maple with approximately 10-20% cover. In denser pine areas (140 BA) there is no midstory or shrub layer due to 90-100% overstory cover. In open thinned pine stands the shrub layer consists of wax myrtle, redbay, fetterbush (*Lyonia lucida*), and deerberry, with 10-30% cover. The herbaceous layer is also somewhat sparse, approximately 0-10% cover, and is composed primarily of dwarf palmetto (*Sabal minor*), longleaf woodoats, plumegrass (*Saccharum giganteum*), giant cane (*Arundinaria gigantea*), Virginia chain fern (*Woodwardia virginiana*), cinnamon fern, and netted chain fern (*Woodwardia areolata*). Sphagnum moss (*Sphagnum sp.*) is also present within some of the wetland areas.

Four Carolina bay (PFO2C, PFO1H) depressional wetlands are located within the project corridor comprising approximately 10.5 acres. These wetlands are seasonally to perennially inundated based upon their size. The genesis of this depressional habitat has been debated, although Piovan and Hodgeson (Piovan & Hodgeson 2016) found nine distinct qualities are common to all Carolina bays: 1) oval shaped; 2) oriented northwest to southeast; 3) parallelism of the long axis; 4) sand rims above general elevation; 5) interior surface below the general elevation; 6) different soils within sand rim and outside of sand rim; 7) shallow; 8) flat sandy bottom; 9) naturally isolated features. Within the corridor there are four Carolina bays, three of which are named, including Skeleton Bay, Beech Island Bay and Todd Bay shown on Habitat Descriptions map pages 1, 5, 6, & 7, respectively. A large portion of these bays are ditched and either partially or entirely planted in loblolly pine. Within the remnant habitat, red maple, swamp tupelo, and pond cypress (*Taxodium ascendens*) dominate the overstory at 30-40% cover. The midstory is sparse, consisting of the same species found in the overstory. Within more seasonally wet Carolina bays, a shrub and herbaceous layer is present consisting of redbay, dwarf palmetto (*Sabal minor*), and fetterbush in the shrub layer, with various grasses and sedges making up the herbaceous layer. Perennial flooded bays have no shrub or herbaceous vegetation present.

Plantation Pine Converted Carolina Bays were once Carolina bays but have been completely harvested, ditched, and planted in plantation pine for future harvest. This comprised 32.3 acres within the project corridor. This habitat type mirrors the wetland plantation pine habitat type.

Several depressional pond (PFO1C) wetlands are interspersed along the corridor, covering approximately 15 acres. These wetlands are characterized as isolated depressional features that are seasonally inundated. The overstory is composed of black gum (*Nyssa sylvatica*), sweet gum, red maple, and in larger gum ponds that are semi-permanently flooded, pond cypress are found. The overstory cover ranges from 20-40% in the overstory. The midstory is sparse, approximately 10% cover, consists of black gum, sweet gum, and red maple. The shrub stratum is composed of fetterbush and redbay. The understory cover is variable, ranging from open water to 100% cover. Species in this stratum include smartweed (*Polygonum* spp.), arrowhead (*Sagittaria lancifolia*), soft rush (*Juncus effusus*), giant cane, netted chain fern, and various other grasses and sedges.

The bottomland hardwood forested wetland (PFO1C, PFO2C, PFO1B) habitat comprised 175.4 acres and is characterized by an overstory composed of bald cypress (*Taxodium distichum*), water oak, black gum, swamp tupelo and swamp chestnut oak (*Quercus michauxii*). Overstory closure ranges from 30-50%. The midstory is composed of bald cypress, black gum, sweetgum, and swamp tupelo characterized by a cover ranging from 10-20%. The shrub and herbaceous layer ranges from sparse to heavy, approximately 10-60% cover, and is composed primarily of dwarf palmetto, giant cane, sphagnum moss, Virginia chain fern and cinnamon fern based on the hydrologic regimen of the wetland. Areas that are seasonally flooded are characterized by a sparse understory due to flooding. Areas that are characterized as temporarily flooded or saturated contain a well-developed understory. Defined stream channels occur within a few of the bottomland hardwood forests within the project area.

The project corridor crosses open water (L1UBHh) at the diversion canal between the Santee-Cooper lakes. This area comprised 2.4 acres of the corridor. The canal was excavated in 1941. It is 7.5 miles long, approximately 500 feet wide and approximately 12 feet deep. The bottom consists of sand and clay, with some sediments washed downstream from the Santee River. There is very little organic material or vegetation in this part of the canal and it was last dredged in 2014 to remove accumulated silt and sediments on the Lake Moultrie side of the canal. The diversion canal was once an important access for inland maritime trade, but today is used primarily for recreational access between the lakes.

Several small agricultural fields (U21) exist within the project corridor (1.3 acres), primarily as wildlife food plots. Commonly planted vegetation included chufa, wheat, peas and soybeans. In areas that are not planted, a variety of native grasses dominate, including: broomstraw, chalky bluestem (*Andropogon capillipes*), dog fennel, switchgrass (*Panicum virgatum*), and

tapered rosette grass (*Dichanthelium acuminatum*). These areas are routinely disked and cultivated.

Various Roads and Utilities cross the corridor, comprising approximately 6% of the project area (48.1 acres). The roads are filled, either paved or gravel, and are culverted over wetland crossings. Utility right of ways are maintained throughout the project area, from large transmission lines to smaller distribution lines.

Habitat descriptions and maps are provided in Appendix B.

6.7.2 Potential Environmental Impacts

Implementation of the Proposed Project would result in direct impacts to habitats. An approximately 23-mile long corridor of forested area would be cleared. This would result in the long-term conversion of the majority of the corridor to a mix of raised track and ballast bordered by maintained grass and herbaceous vegetation. This also would contribute to the fragmentation of some forest habitat types. Based on preliminary disturbance limits Table 6-7 presents the impacts to each habitat type.

Table 6-7. Preliminary Impacts to Habitats along the Proposed Rail Corridor

Habitat Type	Acreage Impacted
Agricultural Fields	0.19 acres
Bottomland Hardwood Forested Wetlands	15.37 acres
Carolina Bays	1.11 acres
Depressional Ponds	1.02 acres
Open Water	0.07 acres
Plantation Pine Converted Carolina Bays	5.63 acres
Roads & Utilities	5.77 acres
Upland Mixed Hardwood and Pine Forests	3.23 acres
Upland Plantation Pine	35.82 acres
Wetland Plantation Pine	35.50 acres

Direct impacts to forested areas would occur under the Proposed Project; however, the acreage of wooded area that would be permanently cleared for this project is minimal compared to the amount of similar habitat present in the project vicinity. USGS LCI was utilized to quantify wooded habitats within the Cooper and Four Hole watersheds and compare the total wooded area to impacts from the proposed rail corridor. The USGS LCI indicated that approximately 183,416 acres of wooded land are located within the Cooper Watershed, the proposed rail corridor will impact 134.6 acres of forested land, or approximately 0.07% of the total forested land within the Cooper Watershed. USGS LCI indicated that approximately 86,636 acres of forested land are located within the Four Hole Watershed, the proposed rail corridor will impact 21.9 acres of forested land, or approximately 0.03% of the total forested land within the Four Hole Watershed.

Taking into consideration the large amount of similar habitats in the area regionally and locally, the loss of the existing vegetation would be considered a minor impact. The surrounding area consists of very similar vegetative habitats and approximately 0.06% of the total forested area within the Cooper and Four Hole Watersheds would be impacted. The percentage loss or transformation of vegetation within the corridor in this context would be relatively small. Indirect impacts are possible if the existing vegetation is part of a larger system which relies on these particular plant communities for regional propagation and genetic diversity. Due to the large amount of similar habitat and plant communities surrounding the corridor; however, this impact is minor.

Direct impacts to wildlife are also anticipated following construction of the proposed rail corridor. Some wildlife living within the proposed rail corridor would be displaced by construction activities. Most species, especially those requiring more extensive, relatively unfragmented areas, would find the converted areas unsuitable. Species occupying the forested areas that would be cleared would be permanently displaced. Other species that depend on unfragmented habitats, would also be displaced. Forested habitats within the proposed rail corridor have been fragmented due to historical land uses, including agriculture (historically row crops, currently silviculture), rural development, and infrastructure to support these uses (roads, utilities, etc.). This historical fragmentation has previously limited the diversity of wildlife that the forested habitats will support. In addition, direct impacts from the proposed rail corridor will make up a small portion of the forested habitat in the surrounding areas.

Overall, direct impacts to wildlife would be permanent but minor. The existing forest habitats within the proposed rail corridor have historically been fragmented due to existing land uses. These impacts will consist of the displacement of habitat for the rail infrastructure. The impact will be minimized by the ability of mobile species to colonize adjacent similar habitat. Indirect impacts would be temporary and very minor as species colonize adjacent habitats.

6.8 Protected Species

6.8.1 Description of Affected Environment

Plants and animals listed as federally threatened and endangered are protected under the Endangered Species Act (P.L. 92-205) (ESA) which is administered and enforced by the USFWS. The bald eagle is federally protected under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA).

A current list of federally protected species for Berkeley County was compiled from the USFWS Charleston Field Office website accessed in November 2016 (dated August 8, 2016) and the USFWS Information Planning and Conservation System (IPAC) (November 2016). The SCDNR Rare and Endangered Species Inventory website, a Geographic Information System natural resources data layer that includes the locations of all documented

occurrences of federally endangered or threatened species, was reviewed for known occurrences of such species on or proximate to the subject project. There are three known endangered species occurrences within one half mile of the proposed corridor (2 occurrences of Canby's dropwort (within adjacent Carolina bays, not impacted by the rail) and one occurrence of shortnose sturgeon near Lake Moultrie) and one bald eagle occurrences near Lake Moultrie (SCDNR 2016). Federally protected species and their general habitat types are presented in Table 6-8.

Table 6-8. Current List of Federally Endangered, Threatened, and Candidate Species in Berkeley County, South Carolina (USFWS 2016) and their Habitat Types.

Common Name	Scientific Name	Status	Survey Window	General Habitat Type
West Indian manatee	<i>Trichechus manatus</i>	E	May 15 - Oct 15	coastal waters
Frosted flatwoods salamander	<i>Ambystoma cingulatum</i>	T, CH	Jan 1 – Apr 30	pine areas maintained in an open state by fire with isolated ponds for breeding sites
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA	Oct 1 – May 15	coastlines, rivers, large lakes or streams
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Apr 1 – July 31	mature pine forests
Wood stork	<i>Mycteria americana</i>	E	Feb 15 – Sep 1	marshes, swamps, lagoons, ponds, flooded fields; depressions in marshes are important during drought; also occurs in brackish wetlands
Atlantic sturgeon	<i>Acipenser oxyrinchus</i>	E	Feb 1 – Apr 30	major river systems along the eastern seaboard
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	E	Feb 1 – Apr 30	major river systems along the eastern seaboard
Pondberry	<i>Lindera melissifolia</i>	E	Feb – mid Nov	swamp and pond margins, sandy sinks, swampy depressions, wet flats
Canby's dropwort	<i>Oxypolis canbyi</i>	E	July 15 - Sept	pond-cypress savannahs dominated by grasses, sedges or ditches next to bays; borders and shallows of cypress-pond pine ponds and sloughs
American chaffseed	<i>Schwalbea americana</i>	E	May - Aug	fire maintained open pine forest

E Federally endangered

T Federally threatened

CH Critical habitat

BGEPA Federally protected under the Bald and Golden Eagle Protection Act

A pedestrian survey was conducted on April 20 to June 3, 2016, September 16-29, 2016, and April 28-May 3, 2017 to identify potential habitat for the above referenced species. The habitats identified are presented in Section 6.7 and Appendix B.

6.8.2 Potential Environmental Impacts

Based on review of the literature, SCDNR database, and on-site assessments, we have determined that the Proposed Project will (1) have no effect on the West Indian manatee, frosted flatwoods salamander, RCW, Atlantic sturgeon, and pondberry; 2) may affect, but not likely to adversely affect the wood stork, short-nose sturgeon, Canby's dropwort, and American chaffseed, and (3) is not likely to disturb the bald eagle. These results are summarized below in Table 6-9, and in Appendix B.

Table 6-9. Federally Protected Species Determination of Effect.

Common Name	Scientific Name	Determination of Effect	Comments
West Indian manatee	<i>Trichechus manatus</i>	No Effect	West Indian manatees navigate the locks entering the Santee-Cooper lakes. If manatees are identified, they are removed from the lakes, as they cannot survive winters in the lakes.
Frosted flatwoods salamander	<i>Ambystoma cingulatum</i>	No Effect	Lack of suitable quality habitat. Closest known population approx. 25 miles east of the project corridor.
Bald eagle	<i>Haliaeetus leucocephalus</i>	Not likely to disturb.	Corridor crosses the Diversion Canal, which is known foraging habitat for bald eagles. The bridge could potentially provide roost or nesting habitat to bald eagles or other birds of prey.
Red-cockaded woodpecker	<i>Picoides borealis</i>	No Effect	Lack of suitable habitat. Pine forests within the corridor are of the wrong age class and density for suitable habitat. Heavy midstory and lack of fire throughout.
Wood stork	<i>Mycteria americana</i>	May affect, not likely to adversely affect.	Ample alternative foraging and nesting habitat outside of the proposed corridor.
Atlantic sturgeon	<i>Acipenser oxyrinchus</i>	No Effect	Atlantic sturgeon primarily use deep channel habitats. There are no documented occurrences of Atlantic sturgeon within the project area. If they do enter the area, noise caused by pile-driving during construction is expected to discourage sturgeon from approaching the construction site.
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	May affect, not likely to adversely affect.	Shortnose sturgeon primarily use deep channel habitats. There are known populations of shortnose sturgeon in the Santee Cooper Lakes. If they do enter the area, noise caused by pile-driving during construction is expected to discourage sturgeon from approaching the construction site.
Pondberry	<i>Lindera melissifolia</i>	No Effect	Extensive ditching and water management on industrial forestlands have likely removed the wetland parameters pondberry requires. Lack of suitable quality habitat.
Canby's dropwort	<i>Oxypolis canbyi</i>	May affect, not likely to adversely affect.	History of industrial forestry, infrequent burning on the Cross WMA, lack of suitable quality habitat.
American chaffseed	<i>Schwalbea americana</i>	May affect, not likely to adversely affect.	History of industrial forestry, infrequent burning on the Cross WMA, lack of suitable quality habitat.

6.9 Cultural Resources

6.9.1 Description of Affected Environment

A Phase I cultural resource survey of the proposed rail corridor was completed between November 8 and December 21, 2016. Additional survey of the proposed Camp Hall Railroad Build-in was conducted in April 2017 due to a slight shift in the proposed alignment. The proposed rail corridor is located in northern Berkeley County and extends from its northern terminus, where it ties in to the existing CSX A-line approximately 5 kilometers (km) southwest of the community of Pineville, to its tie in with the Camp Hall tract at Fish Road, approximately 9 km northeast of the town of Ridgeville. The proposed study corridor is approximately 23 miles (37.01 km) long and 200 feet (60.96 meters) wide.

The investigation was conducted in order to comply with the permitting requirements of the USACE with respect to Section 106 of the National Historic Preservation Act (NHPA [Public Law 89-665; 80 Stat. 915; 16 U.S.C. 470]). The goals of this investigation were to identify cultural resources within the project corridor, make recommendations about the National Register of Historic Places (NRHP) eligibility status of each resource, and determine if the proposed undertaking will have adverse effects on properties eligible for the NRHP. Criteria used for assessing NRHP eligibility and project effects are set forth in 36 CFR, Part 60.4 (NRHP eligibility criteria) and 36 CFR Part 800 (project effects). Regarding the Area of Potential Effects (APE), the archaeological fieldwork was confined to the APE for direct impacts, or the 23-mile by 200-ft wide proposed rail corridor. Given the project description, the historic architecture survey included the APE for direct impacts as well as areas of potential indirect impacts within a zone of around one half mile from the centerline of the proposed corridor.

Prior to fieldwork, a search of the official records maintained by the South Carolina Institute of Archaeology and Anthropology (SCIAA) and the South Carolina Department of Archives and History (SCDAH) was conducted in order to identify previously recorded cultural resources within the APE of the proposed undertaking or its vicinity. Based on this search, it was determined that no archaeological sites have been recorded within the APE for the archaeological survey; however, 13 archaeological sites (38BK586, 38BK587, 38BK588, 38BK589, 38BK584, 38BK585, 38BK2346, 38BK583, 38BK590, 38BK346, 38BK387, 38BK610, and 38BK611) have been recorded within a 1-km radius. All but one of these resources (38BK2346) were listed as potentially eligible for NRHP listing, meaning that further information is needed to determine their eligibility status. None of these previously recorded sites have official SHPO NRHP determinations. The search also determined that there have been eight architectural, or aboveground, resources within the APE for the historic architectural survey. These included five structures (115-0004, 115-0006, 0806, 0807, 0808), one historic canal (0786), and two historic cemeteries (497-0002 and 115-0011). Seven of these resources were recommended as ineligible for NRHP listing; however, the diversion canal that connects Lakes Marion and Moultrie (0786) was recommended as eligible for

NRHP listing and as a contributing element to the NRHP eligible Santee-Cooper Hydroelectric Project Historic District. This resource is discussed in greater detail in Appendix E.

Fieldwork methodology was discussed with the South Carolina State Historic Preservation Office (SHPO) and determined to reflect an adequate survey approach. Archaeological methodology included pedestrian inspection and regular interval shovel testing throughout the survey corridor. Shovel testing was conducted along two survey transects that span the entire 23 mile by 200-ft wide corridor. Tests were placed at 30 meter intervals within locations mapped as uplands with relatively good soil drainage. Areas that were mapped as hydric or poorly drained were confirmed through subsurface investigation and subjected to visual inspection.

As a result of the archaeological survey, it was determined that much of the project area was characterized by hydric or frequently flooded soils, despite the fact that they were mapped as well drained. Perusal of historic topographic maps indicated that many of the areas mapped as upland were historically wetlands. Ditches and channelized streams have been used to drain many of these areas for silviculture. No archaeological sites or isolated finds were encountered within the proposed rail corridor and no further archaeological investigation is recommended for the proposed survey corridor.

As a result of the historic architecture survey, eight previously recorded aboveground resources were revisited and 54 previously unrecorded structures were documented. Details of these resources are presented in Table 6-10. Of the eight previously recorded resources, seven were originally recommended as ineligible for the NRHP. These recommendations were confirmed as a result of the present study. The diversion canal that connects Lakes Marion and Moultrie (0786) was recommended as eligible for the NRHP under Criterion A and C and was determined to contribute to the Santee-Cooper Hydroelectric Project Historic District (Mead and Hunt 2002). This recommendation was confirmed as part of the present study and the proposed rail line has the potential to cause an adverse effect to the diversion canal, as it will cross the canal near its central point. Consultation with SHPO and other consulting parties will be necessary to identify ways to minimize and/or mitigate any possible adverse effects.

Fifty-four previously unrecorded architectural resources were also documented during the study. All but two of these resources are recommended as not eligible for NRHP listing. One previously unrecorded cemetery, the Garrett Cemetery (1263), was identified adjacent to the proposed railroad corridor. This resource represents a small, African-American family cemetery with grave markers that are unique in their composition. Because it is a rare example of a rural, African American Cemetery with extant markers and because those markers are of unique construction and materials, this resource is recommended as eligible for NRHP listing under Criteria A, C, and D. Cemeteries are protected from disturbance and

desecration under South Carolina state law. It is recommended that a 50-ft buffer be established around the resource. Avoidance of the cemetery and this buffer is recommended.

The Bulltown Ditch (1270) was also identified within the northern portion of the study corridor. This resource was identified on the 1921 Chicora topographic map; however, it was noted in an 1881 report as part of the Santee Canal system, which was constructed in the late eighteenth century. Prior to the construction of Lake Moultrie, the Bulltown Ditch served as a feeder canal for the Santee Canal, draining water from Bulltown Swamp towards the canal. Due to its association with the Santee Canal, this resource is recommended eligible for NRHP listing under Criterion A and C.

Table 6-10. Historic Architectural Resources within the APE

Resource Number	Address	Year Built	Description	NRHP Eligibility Status
497-0002		ca 1831	Blackmon-Shuler Cemetery	Not Eligible
115-0004	1133 Highway 311	ca 1900	J. L. Williams House	Not Eligible
115-0006	Old Mudville Road	ca 1905	Peagler House	Gone
115-0011	Short Cut Road	ca 1915	Winningham Cemetery	Not Located, Erroneously Mapped
0786		1942	Lakes Marion and Moultrie Diversion Canal	Contributes to NRHP district
0806	2988 Mudville Road	ca 1925	House	Not Eligible
0807	Highway 311 and Mudville Road	ca 1930	R.L. Singletary Grocery	Not Eligible
0808	south of Highway 6	ca 1930	House	Gone
1212	1569 Thirty-Five Mile Road	ca 1965	House	Not Eligible
1213	1573 Thirty-five Mile Road	ca 1960	House	Not Eligible
1214	2290 Mudville Road	ca 1965	House	Not Eligible
1215	2341 Mudville Road	ca 1967	House	Not Eligible
1216	2817 Mudville Road	ca 1965	House	Not Eligible
1217	2818 Mudville Road	ca 1940	House	Not Eligible
1218	2924 Mudville Road	ca 1964	House	Not Eligible
1219	2982 Mudville Road	ca 1965	House	Not Eligible
1220	2991 Mudville Road	ca 1940	House	Not Eligible
1221	1226 Highway 311	ca 1960	House	Not Eligible
1222	1119 Highway 311	ca 1960	House	Not Eligible
1223	1030 Highway 311	ca 1965	House	Not Eligible
1224	2667 Highway 6	ca 1945	House	Not Eligible
1225	1015 Ranger Drive	ca 1965	House	Not Eligible
1226	276 George Wigfall Drive	ca 1948	House	Not Eligible

Resource Number	Address	Year Built	Description	NRHP Eligibility Status
1227	264 George Wigfall Road	ca 1950	House	Not Eligible
1228	246 George Wigfall Road	ca 1950	House	Not Eligible
1229	222 George Wigfall Road	ca 1945	House	Not Eligible
1230	210 George Wigfall Road	ca 1945	House	Not Eligible
1231	104 Hoppy Lane	ca 1967	House	Not Eligible
1232	157 George Wigfall Road	ca 1965	House	Not Eligible
1233	129 Wigfall Road	ca 1965	House	Not Eligible
1234	1063 Ranger Drive	ca 1965	House	Not Eligible
1235	1098 Short Cut Road	ca 1945	House	Not Eligible
1236	1120 Short Cut Road	ca 1960	House	Not Eligible
1237	1124 Short Cut Road	ca 1965	The Galilee Pentecostal Holiness Church	Not Eligible
1238	1209 Short Cut Road	ca 1950	House	Not Eligible
1239	1212 Short Cut Road	ca 1950	House	Not Eligible
1240	1389 Short Cut Road	ca 1965	House	Not Eligible
1241	1259 Old Highway 6	ca 1920	House	Not Eligible
1242	1138 Old Highway 6	ca 1935	House	Not Eligible
1243	245 Harley Circle	ca 1960	House	Not Eligible
1244	184 Harley Circle	ca 1960	House	Not Eligible
1245	1060 Old Highway 6	ca 1940	House	Not Eligible
1246	148 Lovers Lane	ca 1945	House	Not Eligible
1247	2179 Ranger Drive	ca 1965	House	Not Eligible
1248	2193 Ranger Drive	ca 1960	House	Not Eligible
1249	2243 Ranger Drive	ca 1940	House	Not Eligible
1250	2249 Ranger Drive	ca 1950	House	Not Eligible
1251	388 St. Julian Drive	ca 1950	House	Not Eligible
1252	271 St. Julian Drive	ca 1950	House	Not Eligible
1253	265 St. Julian Drive	ca 1965	House	Not Eligible
1254	254 St. Julian Drive	ca 1945	House	Not Eligible
1255	252 St. Julian Drive	ca 1945	House	Not Eligible
1256	393 Holy Avenue	ca 1955	House	Not Eligible
1257	367 Holy Avenue	ca 1960	House	Not Eligible
1258	331 Holy Avenue	ca 1960	House	Not Eligible
1259	325 Holy Avenue	ca 1960	House	Not Eligible
1260	1356 Springwood Road	ca 1960	House	Not Eligible

Resource Number	Address	Year Built	Description	NRHP Eligibility Status
1261	1350 Springwood Road	ca 1960	House	Not Eligible
1262	1332 Springwood Road	ca 1960	House	Not Eligible
1263	East of Mudville Road	ca 1876	Garrett Cemetery	Recommended Eligible
1270	North of Santee Cooper		Bulltown Ditch	Recommended Eligible

6.9.2 Potential Environmental Impacts

As designed, the proposed Camp Hall Railroad Build-in will not have an adverse effect on any NRHP-eligible archaeological resources. No further archaeological investigation is recommended for the current proposed corridor. Significant architectural resources were identified during this investigation. These include the diversion canal between Lakes Marion and Moultrie (0786), the Garrett Cemetery (1263), and the Bulltown Ditch (1270) (Figure 7). The proposed alignment will cross the Diversion Canal (0786) approximately 2.75 miles from its northern terminus. While the Highway 45 Bridge also crosses the canal, this newly proposed crossing is located more than one mile from the existing crossing. Based on this, the portion of the Diversion Canal that will be crossed by the Camp Hall Build-in retains its integrity of location, design, setting, materials, workmanship, feeling, and association. The proposed rail project has the potential to cause an adverse effect to the Diversion Canal. Consultation with SHPO and other parties should be undertaken to identify ways to minimize and mitigate these possible adverse effects. The Garrett Cemetery (1263) was also identified during this investigation. The western edge of the survey corridor is approximately 75 feet outside of the cemetery boundaries; however, proposed impacts associated with the rail line itself will only occur within a zone approximately 175 feet from the cemetery boundary. Cemeteries are protected from disturbance and desecration under South Carolina state law. It is recommended that a 50-ft buffer be established around the resource. Avoidance of the cemetery and this buffer is recommended. The proposed undertaking, as planned, will not impact the cemetery or its buffer. If the cemetery cannot be avoided, consultation with the SHPO to determine how to minimize potential impacts will need to be conducted.

The Bulltown Ditch (1270) was identified north and east of the Santee Cooper power plant and was determined to be eligible for NRHP listing under A and C. The current alignment of this rail project will cross this resource at its northern end adjacent to the existing CSX A-line rail line. The section of the Bulltown Ditch has already been impacted by the construction of the existing CSX A-line and a transmission easement, both of which allow the ditch to pass beneath them through a culvert system. It is recommended that steps be taken to minimize this potential damage during construction and that measures be put in place to stabilize the bank of Bulltown Ditch near where the rail line would cross the ditch. In addition to the proposed crossing, a portion of the rail line near the existing Santee-Cooper Power Plant, runs parallel to the ditch approximately 150 feet away; this distance is sufficient to avoid

impacts during construction. Measures should be put in place to ensure impacts do not occur outside of the proposed APE in the vicinity of Bulltown Ditch, Garrett Cemetery and the Diversion Canal. These are general recommendations for ways to minimize the potential to adversely affect the three significant historic resources; specific measures to minimize adverse effects should be developed in consultation with the SC SHPO.

The complete Phase 1 Cultural Resources Survey is presented in Appendix E.

6.10 Socioeconomic and Environmental Justice Impacts

6.10.1 Methods and Description of Affected Environment

Socioeconomic and Environmental Justice (EJ) impacts were evaluated based on a comparison of large and small scale readily available Census data, labor statistics, aerial photography, and site reconnaissance. Nearby residences and businesses adjacent to the proposed rail corridor were identified to determine potential direct and indirect impacts. Negative and positive affects to the local population surrounding the proposed project were evaluated using the aforementioned datasets.

Community and neighborhood cohesion is relatively unaffected by the proposed rail alignment. Minimal grade crossings allow for little increases in commute and emergency response times, and insignificant impacts to community safety. As mentioned in Section 6.4.2 there are also no assumed major impacts regarding noise and vibration. In addition, it is not anticipated that the proposed rail corridor would require any relocations.

6.10.1.1 Population and Race

South Carolina has had higher population increases than the national average, with even higher increases in the South Carolina Lowcountry. The population of Berkeley County, as reported in the 2010 U.S. Census of Population, is 177,842. There are five Census Block Groups (CBG) within the proposed rail corridor: 450150201012, 450150201021, 450150201022, 450150202023, and 450150205032 (Figure 8). Each CBG is fairly large, with dispersed populations, ranging from 64 square miles to 1 square mile. The majority of the CBGs are greater than 10 square miles.

Racial demographics within the Cross project corridor are dominated by minorities in the northern portion of the project corridor near the Cross Census County Division (CCD) and Cross Generating Station. The southern portion of the Cross project corridor is majority Caucasian. Table 6-11 indicates the racial statistics within the area.

6.10.1.2 Employment, Education, and Income

According to the United States Bureau of Labor Statistics South Carolina unemployment rate in October 2016 was 4.7%. However, the unemployment rate for Berkeley County was

reported at 9.9% and 17.2% for Cross CCD (USCB 2016). Furthermore, unemployment rates in each affected CBG are significantly higher than the reported state unemployment rate.

Approximately 15% of South Carolina residents between the age of 18 and 24 did not graduate from high school (USCB 2016); approximately 22% between the age of 18 and 24 did not graduate high school in Cross CCD. However, over 40% of Cross CCD residents completed some form of higher education.

The CBGs located near Cross CCD typically have lower median household incomes than the CBGs located near Camp Hall Commerce Park. Local median household incomes are relatively similar to the state and Berkeley County averages. As mentioned previously in the level two analysis, poverty rates are not available at the CBG level so percent households below \$15,000 was used for income statistics. Local percent households below \$15,000 are higher than the state and Berkeley County average near Cross CCD and lower near Camp Hall Commerce Park. Table 6-11 indicates the income statistics for South Carolina, Berkeley County, Cross CCD, and the affected CBGs.

6.10.2 Potential Environmental Justice Impacts

Environmental Justice attempts to reduce adverse impacts on human health and the environment on low-income and minority populations. EO 12898 is intended to identify any disproportionate or adverse impacts on minority or low-income populations resulting from development or laws. Adverse impacts may occur if a project has negative effects on the nearby economy, disrupts community cohesion, loss of community facilities, increase emergency response times, or reduce transportation mobility. Unfortunately, direct guidelines for defining EJ populations does not exist, including the State of South Carolina. However, the EPA Region 4 defines potential EJ communities by comparing benchmark reference areas where thresholds can be applied.

Minorities and percent of households below \$15,000 annual income at the CBG level were compared to state levels to define potential EJ communities. The thresholds used for defining potential EJ communities are 1.2 times the South Carolina state average for aggregate minority populations and household incomes below \$15,000, as well as any aggregate minority populations exceeding 50% within each studied CBG. It is important to note all data used in the analysis came from the United States Census Bureau, and potential EJ communities were determined at the CBG level. CBGs within the proposed rail corridor are rather large due to sporadic populations, which can cause error in defining potential EJ communities. Lastly, the proposed rail corridor does not necessarily directly impact an EJ community since an EJ community can be smaller than the CBG.

Four of the five CBGs directly affected by the proposed rail corridor route are listed for having potential EJ communities. These EJ communities could be exposed to noise and aesthetic impacts. These minor to moderate impacts are discussed in detail in Section 6.2 (Aesthetics

and Visual Resources) and Section 6.4 (Noise). The adverse impacts associated with the proposed rail corridor would be predominantly endured by minority and low-income populations; however, the affected CBGs data is extremely granular and disperse due to low populations and larger tracts of land within the project corridor. In addition, the proposed alignment has increased sinuosity to best avoid sensitive communities. Lastly, it is not anticipated that any relocations will occur.

It is also expected the proposed rail corridor will provide economic connectivity to the expanding urbanized area associated with North Charleston and Summerville. The benefits of the Proposed Project would extend to populations throughout the South Carolina Lowcountry and primarily the Cross CCD, whereas the impacts would largely be endured by the communities adjacent to the proposed alignment. The construction of the proposed alignment would result in major short-term benefits to the local and regional economy. Long-term economic benefits could occur as well from employment opportunities directly or indirectly created by the construction of the rail and connection to Camp Hall Commerce Park. Employment opportunities could directly increase the need for higher education and stimulate the local economy.

Table 6-11 Socioeconomic Impacts and Environmental Justice

U.S. Census Bureau Study Level	South Carolina	Berkeley County	Cross CCD	Census Tract 201.01 Block Group 2	Census Tract 201.02 Block Group 1	Census Tract 201.02 Block Group 2	Census Tract 202.02 Block Group 3	Census Tract 205.03 Block Group 2
Race (2015)	4,777,576	193,613	7,253	2,258	1,608	1,760	1,432	2,500
White	3,210,708	130,379	3,641	939	912	1,183	211	1,405
Black	1,315,058	47,440	3,396	1,252	634	517	1,210	1,009
American Indian	14,966	1,001	29	29	18	20	2	15
Asian	66,982	4,815	0	1	1	1	1	2
Hawaiian	2,588	169	0	0	0	0	0	3
Other Race	73,324	4,402	45	19	4	7	4	16
Some other Race	93,950	5,407	142	35	22	31	12	36
% Minority	32.8%	32.7%	49.8%	58.4%	43.3%	32.8%	85.3%	43.8%
1.2 times South Carolina % Minority	39.4%	39.4%	39.4%	39.4%	39.4%	39.4%	39.4%	39.4%
Median Household Income	\$45,483	\$52,506	\$36,382	\$45,373	\$39,510	\$48,092	\$18,661	\$25,489
Total Households:	1,815,094	69,030	2,457	890	568	661	591	981
Household Income less than \$10,000	160,030	4,613	291	132	8	72	84	53

U.S. Census Bureau Study Level	South Carolina	Berkeley County	Cross CCD	Census Tract 201.01 Block Group 2	Census Tract 201.02 Block Group 1	Census Tract 201.02 Block Group 2	Census Tract 202.02 Block Group 3	Census Tract 205.03 Block Group 2
Household income between \$10,000 to \$14,999	116,567	2,926	184	74	48	38	81	117
Percent households below \$15,000	15.2%	10.9%	19.3%	23.1%	9.9%	16.6%	27.9%	17.3%
1.2 times South Carolina % households below \$15,000	18.3%	18.3%	18.3%	18.3%	18.3%	18.3%	18.3%	18.3%

6.10.2.1 Potential Relocations

The Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally-Assisted Programs rule (49 CFR Part 24) established minimum standards for federally funded programs and project that require the acquisition of real property or displace persons from their homes, businesses, or farms. A relocation would be required if a residence or business would be located within the ROW of the proposed rail corridor. Based on high-resolution aerial review, it is not anticipated that the proposed rail corridor would require any relocations. Smaller buildings such as barns and sheds were not addressed in the analysis.

6.11 Traffic and Transportation

6.11.1 Description of Affected Environment

The South Carolina Lowcountry is serviced by two freight rail operators, Norfolk Southern (NS) and CSXT, and Amtrak for passenger service. Existing nearby rail include the NS line connecting Charleston to Columbia, CSXT A-line, CSXT ALR-line, CSXT AKE-line, and CSXT SH-line. The proposed rail corridor will connect with the CSXT ALR-line and connect further to the CSXT A-line.

According to the United States Census Bureau Topology Integrated Geographic Encoding and Referencing (TIGER) dataset the proposed rail corridor intersects 18 minor forestry roads, 8 secondary roads, 1 arterial road, and 3 highways.

SCDOT maintains traffic stations to record annual traffic volume. A general Level of Service (LOS) for each roadway is estimated based on the latest volumes and the Annual Average Daily Traffic (AADT) thresholds used in SCDOT Travel Demand Models. According to a

recent study (Project Soter 2015) in the surrounding area, no roadways received low LOS scores for the roads near the proposed rail corridor. The lowest score for the surrounding roads was on US Highway 176 (US-176). Traffic at US-176 is expected to have stable flow with the ability for drivers to maneuver fairly easily, and maintain a minimum vehicle spacing of about 220 feet. Traffic at the minor roads intersecting the Preferred Route are expected to have reasonably free flow to free flow with the ability to easily avoid incidents. Minimum vehicle spacing for the minor roads is expected to be between 300 feet and 550 feet (TRB 2010).

The aforementioned AADT count data is the best readily available data for analyzing daily traffic volume. Table 6-12 indicates available SCDOT traffic stations at roads and highways that intersect with the proposed rail corridor. Further study will need to be conducted to determine the comprehensive long term roadway needs, which may include widening projects, intersection improvements and signal additions.

Table 6-12. South Carolina Department of Transportation 2015 Traffic Point Data

SCDOT Traffic Station	Mile Point	Corridor	Number of Lanes	2010 Volume (Vehicles/Day)	2015 Volume (Vehicles/Day)	Percent Change
135	8.086	US Highway 176	2	3,100	3,900	25.81%
139	3.31	Trojan Road	2	4,000	3,900	-2.50%
140	5.185	Old SC Highway 6	2	1,050	1,300	23.81%
141	10.738	Ranger Drive	2	4,000	3,700	-7.50%
143	16.72	SC Highway 6	2	3,800	3,100	-18.42%
163	5.63	SC Highway 311	2	1,350	1,400	3.70%
173	1.27	Ranger Drive	2	1,450	1,550	6.90%
277	2.016	Old SC Highway 6	2	1,150	800	-30.43%
293	4.851	Mudville Road	2	1,250	1,350	8.00%

According to SCDOT, AADT data from 2010 and 2015 traffic counts have remained fairly consistent surrounding the Preferred Route. However, traffic volumes have increased along US-176 and Old SC-6 towards Moncks Corner, Pinopolis, and North Charleston. Conversely, traffic volumes have slightly decreased near Cross and the Diversion Canal.

6.11.2 Potential Environmental Impacts

The current build out anticipates an expected five trains per week will access the Camp Hall Commerce Park. Each train will consist of approximately 30 railcars traveling at 25 mph or less. It is expected that daily commute times could increase depending on train arrival and

departure times; however, due to the limited number of railcars, and decreasing traffic trends surrounding Cross, commute time increases are expected to be minimal.

Additional traffic impacts could occur during construction of at-grade crossings. Traffic control will be administered in accordance with SCDOT's "2017 Work Zone Traffic Control Manual" (SCDOT 2017) to mitigation traffic impacts to the greatest practicable extent.

6.12 Utilities

6.12.1 Description of Affected Environment

A preliminary utilities assessment was completed to identify existing utilities that may encroach upon the proposed rail corridor. The utility records collected in this report serve as a planning tool that compared features of the proposed rail project to existing utilities. Six (6) utility owners were identified in the area of the project (See Table 6-13 below for a summary of the owners identified). The preliminary Utilities Report is presented in Appendix F.

Table 6-13. Preliminary Listing of Utility Owners

Notes:	Preliminary Listing of Utility Owners ¹
	1) Santee Cooper Electrical Transmission
	2) Berkeley Electric Cooperative Electrical Distribution
	3) Santee Cooper Electrical Distribution
	4) Home Telephone Company
	5) Berkeley County Water and Sanitation
	6) TDS Telecom
1) Utility owners were identified during site reconnaissance and by contacting utility owners. The utilities, and any mention in the utilities report, is approximate and not deemed as complete (including exhibits and locations of utilities). The list of the utilities presented herein is for preliminary planning purposes only.	

Utility records were obtained from the identified utility owners and compared to the proposed rail corridor. Area of potential conflict were identified, and are presented in Table 6-14.

Table 6-14. Preliminary Listing of Utility Owners and Approximate Locations of Utilities

Preliminary Listing of Utility Owners ¹	Approximate Locations of Utilities
Santee Cooper Electrical Transmission ²	Santee Cooper has several Electrical Overhead Transmission lines that intersect the proposed rail alignment: 1. 0.83 mile NE of US 176 along the railroad alignment at coordinates 33°12'30.0" N 80°14'05.3" W; 2. 2.32 miles NE of US 176 along the railroad alignment at coordinates 33°13'28.0" N 80°13'00.2" W; 3. 0.96 mile south from SC 6 along the meandering railroad alignment at coordinates 33°16'04.2" N 80°10'28.3" W;

	4. 440 feet NW of SC 311 along the railroad alignment at coordinates 33°17'00.0" N 80° 10' 24.1" W; 5. 0.64 mile east of Ranger Drive along the power line at coordinates 33°21'39.9" N 80° 07' 30.9" W 0.45 mile south from Springwood Road along the power line at coordinates 33°23'59.6" N 80° 06' 07.5" W . 6. 0.45 mile south from Springwood Road along the power line at coordinates 33°23'59.6" N 80° 06' 07.5" W
Berkeley Electric Cooperative (BEC) Electrical Distribution	1. Fish Road (S-8-309); 2. State Road (US 176); 3. Mudville Road (S-8-135); 4. SC 311; 5. Mikey Road; 6. Short Cut Road (S-8-60); 7. Old Highway 6; 8. Ranger Drive/Hwy 6 (S-8-132); and 9. Viper Road (S-8-708).
Santee Cooper Electrical Distribution	1. South of Springwood Road, parallel to the existing railroad
Home Telephone Company (Hometelco) ³	1. Fish Road (S-8-309); 2. State Road (US 176) 3. Mudville Road (S-8-135); 4. SC 311; 5. Mikey Road; 6. Short Cut Road (S-8-60); 7. Old Highway 6; 8. Ranger Drive/Hwy 6 (S-8-132); and 9. Viper Road (S-8-708).
Berkeley County Water and Sanitation (BCW&S)	1. Mudville Road (S-8-135); 2. SC 311; 3. Short Cut Road (S-8-60); 4. Old Highway 6; and 5. Ranger Drive/Hwy 6 (S-8-132).
TDS Telecom (TDS)	1. Viper Road (S-8-708).

Notes:

- 1) Utility owners were identified during site reconnaissance and by contacting utility owners. The utilities, and any mention in the utilities report, is approximate and not deemed as complete (including exhibits and locations of utilities). The list of the utilities presented herein is for preliminary planning purposes only.
- 2) The proposed rail system relative to the existing Santee Cooper Electrical Overhead Transmission lines are difficult to list in a tabular format. This overlap is shown in the Utilities Report in Appendix F. Please note that all of the exhibits in this report are preliminary in nature.
- 3) Hometelco's facilities are buried unless otherwise noted along the nine roadways in the vicinity of the proposed rail corridor.
- 4) No gas mains were identified during field visits.

6.12.2 Potential Environmental Impacts

Known and readily available utility records, along with field investigations, were used to identify utilities located within the proposed rail corridor. Following completion of 30% design plans, potential conflicts with existing utilities will need to be discussed between utility owners and PR. In addition, planned utility improvements along with proposed rail corridor will need to be identified. However, it is anticipated that utility improvements will occur within the proposed ROW, and additional wetland impacts and land disturbance will not be required.

6.13 Hazardous Materials/Toxic Substances

6.13.1 Description of Affected Environment

A Phase I Environmental Site Assessment (ESA) was performed for the proposed rail alignment ROW (the “subject property”). The purpose of the ESA was to identify, pursuant to ASTM E 1527-13, recognized environmental conditions (REC) in connection with the subject property. A REC is defined as the presence or likely presence of hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. The term includes hazardous substances or petroleum products even under conditions in compliance with laws.

The majority of the subject property was observed to route through land used for timber cultivation. Unpaved roads are present on some of the parcels through which the subject property routes, primarily on the forested parcels. The route of the subject property was observed to cross several major and secondary paved two-lane roadways including Fish Road, Highway 176, Mudville Road, Highway 311, Short Cut Road, Ranger Drive (Hwy 6), Old Highway 6, and Viper Road. The proposed route of the subject property will also cross the Diversion Canal water body between Lake Marion and Lake Moultrie. The north end of the subject property will route through a portion of the Santee Cooper Cross Generating Station property, connecting with an existing rail line that delivers coal to the power plant. No structures were observed on the subject property; however, according to information provided by the client, six residential buildings are located within a close proximity to the proposed ROW.

A search for environmental database listed sites of potential concern along the proposed ROW and within a specified radius of the subject property was conducted. In addition, a site reconnaissance was performed along the proposed ROW to identify potential hazardous waste sites within 100 feet of the rail alignment ROW. The results of the database search and site reconnaissance identified one site, Santee Cooper electric generating plant (Cross Generating Station) located in Cross, South Carolina as a REC. The site is listed on the State Hazardous Waste Sites (SHWS), Underground Storage Tank (UST), Leaking Underground

Storage Tank (LUST), Solid Waste Facilities/Landfill (SWF/LF), and Permitted Airs Facility Listing (AIRS) environmental databases. The proposed rail alignment ROW routes adjacent to an ash disposal / landfill area at the power plant site. The Santee Cooper Cross Generating Station is considered a REC because the operations performed at the facility represent a potential source for soil and groundwater contamination on and under an area of the subject property.

No other hazardous waste sites were identified within a proximity of concern to the proposed rail corridor. The Phase 1 ESA is available upon written request.

6.13.2 Potential Environmental Impacts

Construction and operation of the Proposed Project has a low potential to generate hazardous waste. Heavy construction equipment will be used to construct the rail corridor and diesel locomotives will be utilized to haul freight. A Spill Prevention, Control and Countermeasures Plan (SPCCP); SWPPP; and Oil and Hazardous Substance Contingency Plan (OHSCP) would be developed to show locations and quantities of waste material generated and provide disposal requirements.

6.14 Cumulative Impacts

This section includes a brief discussion of cumulative impacts that may occur as a result of the Proposed Project. Cumulative impacts are those impacts that result from the incremental impact of an action added to other past, present, and reasonably foreseeable actions in the future. NEPA requires that federal projects undergoing NEPA analysis consider cumulative impacts. The Council on Environmental Quality (CEQ) has provided a framework for addressing cumulative effects as part of an environmental assessment, "Considering Cumulative Effects Under the National Environmental Policy Act" (CEQ, 1997). This guidance places a priority on "counting what counts" within a defined geographic (spatial) and time (temporal) boundary when considering cumulative impacts.

6.14.1 Description of Affected Environment

As described in the sections above, development within and directly adjacent to the Proposed Project corridor has historically been utilized for low-density residential development (Unincorporated Community of Cross) and intensive commercial silviculture.

Resources Affected

The 2010 Berkeley County Comprehensive Plan (BCCP 2010) was reviewed to determine if any known future projects could have the potential to, when combined with the Proposed Project, result in an additional cumulative impact. The Comprehensive Plan indicates that the Proposed Project is located outside of a growth allocation area, and in an area designated

as “constrained residential growth”. These uses do not allow for additional large population or commercial centers without amendment of the Land Use Plan. Therefore, it is unlikely that uses within the 2010 Berkeley County Comprehensive Plan would combine with the Proposed Project to result in material cumulative impacts.

Additional industrial development along the rail corridor is not reasonably foreseeable, as the cross-country route does not have easy access to existing infrastructure, and the extensive wetlands are not conducive to additional industrial development. Therefore, this cumulative impacts assessment will focus broadly on air quality, noise & vibration, water resources, biotic communities, socioeconomic impacts, and traffic & transportation. The existing condition for each of these resources has been described in Sections 6.3, 6.4, 6.6, 6.7, 6.10, and 6.11.

Spatial Scope

Due to the nature of the Proposed Project, as a rail line connecting an industrial site with an existing freight rail network, cumulative impacts across a large geographical area would be limited or non-existent. Industrial development at the Camp Hall Commerce Park has already begun and freight is being shipped on the CSXT A-Line. Because of the existing commercial and transportation For the purpose of this cumulative impacts assessment, the Proposed Project could potentially have effects across the unincorporated areas of northwestern Berkeley County, between the Orangeburg County line and the main run of the Wassamasaw Swamp.

Temporal Scope

The Proposed Project will run cross country, through areas that have historically been used for rural residential uses and commercial agriculture (i.e. silviculture). The historic silviculture along the Proposed Project has previously resulted in habitat conversion and fragmentation ditching of wildlife habitats and water resources.

Initial development of the Camp Hall Commerce Park, at the southern end of the Proposed Project, was approved by the SCDHEC and the USACE in July of 2015 for construction of the Volvo Cars facility, and permitting for development of the remainder of the Camp Hall Commerce Park has recently been approved by the USACE. Build-out of the Camp Hall Commerce Park can reasonably be expected to be completed within 20 years. For these reasons, the timeframe for this cumulative impacts assessment will begin will include past impacts due to commercial silviculture in the region and extend 20 years into the future.

6.14.2 Potential Environmental Impacts

Cumulative Impacts associated with the Proposed Project could result from increased development within the Camp Hall Commerce Park due to access to an industrial rail line and increased habitat and water resources fragmentation. These impacts, in both temporal and

spatial scope, can broadly be interpreted as cumulative impacts to the human and natural environment. Cumulative impacts to the human environment can include air quality, noise & vibration, socioeconomic impacts, and traffic and transportation impacts due to potential future increases in rail traffic. Cumulative impacts to the natural environment can include water resources and biotic community impacts due to rail corridor introducing additional fragmentation of habitat impacts to an area that has already been impacted.

Human Environment

Cumulative Impacts to the human environment could occur due to development within the Camp Hall Commerce Park requiring more rail service over time than can be expected at this time. Additional development outside of the Camp Hall Commerce Park cannot be reasonably foreseen, as the landforms adjacent to the Propose Project are not conducive to industrial development and the 2010 Berkeley County Comprehensive Plan does not allow for high density development outside of the Camp Hall Commerce Park.

Should rail demand within the Camp Hall Commerce Park be greater than expected, additional cumulative impacts to the human environment may occur due to increased rail traffic on the proposed rail line. These potential impacts would likely not be substantial, as rail traffic above what is anticipated in this report would be minimal.

Additional air quality impacts would not be anticipated, as emissions from construction and exhaust from diesel locomotives would be considered minor. Socioeconomic impacts are anticipated to be minor as well. Additional development at the Camp Hall Commerce Park could bring higher paying jobs into an economically depressed area such as the unincorporated community of Cross. These job opportunities and increased tax base could help off-set additional cumulative impacts to residents of the area.

Natural Environment

The Proposed Project corridor runs through an area that has historically been utilized for intensive silvicultural production. To make the area suitable for pine production, the landscape has been extensively modified to allow for successful growth of pine trees and to allow for ease of harvesting of the trees. The landscape has been extensively altered by ditching, forestry roads, and bedding of the pine areas. This historical landscape alteration has resulted in fragmentation of forest habitat and extensive modification of natural drainage systems.

The Proposed Project has been studied to determine if the rail corridor could act cumulatively with this historic landscape fragmentation to increase habitat and surface water degradation further. The proposed rail corridor will introduce additional forest and wetland fragmentation, beyond what has occurred from previous land uses. However, the rail corridor will generally follow or parallel other uses that have previously introduced fragmentation, including roads (both paved and forestry) and utility line easements. By paralleling these existing impacts, the cumulative fragmentation impact from the proposed rail corridor will be minor.

Surface waters within the proposed rail corridor have been extensively altered both upstream and downstream of the rail corridor. The rail line will be designed to prevent additional surface water impairment, through the use of appropriately sized bridges and culverts.

6.15 Summary and Conclusions

Environmental Report Summary

Project Location:	Berkeley County, South Carolina
Project Title:	Palmetto Railways Camp Hall Commerce Park Rail Spur
Assessed By:	Amec Foster Wheeler Environment & Infrastructure, Inc.

Summary of Environmental Impact of the Proposed Project:

This environmental report was prepared for the construction and operation of a proposed rail corridor by Palmetto Railway. The Proposed Project is an approximately 22.7-mile by 200-ft corridor (0.85 square mile) that will connect to the CSXT rail network near the Santee Cooper Cross Generating Station and travel south and west to the Camp Hall Commerce Park. The proposed rail corridor will impact a total of 83.18 acres of jurisdictional wetlands, 55.7 acres of jurisdictional wetlands and 169-feet (0.06 acres) of non-wetlands waters (jurisdictional streams).

Recommendation:

- Finding of No Significant Impact (FONSI). (This project will not result in a significant adverse impact on the environment and will not result in highly controversial adverse public reaction; therefore an environmental impact statement is not required.)
- ☒ Mitigated FONSI. (Use of mitigation may allow the federal agencies to comply with NEPA's procedural requirements by issuing an EA and FONSI, or 'mitigated FONSI', based on the agency's commitment to ensure the mitigation that supports the FONSI is performed, thereby avoiding the need to prepare an environmental impact statement.)
- An Environmental Impact Statement is required.

Table 6-15. Effects Summary

Attributes (ER Section)	Alternatives	
	No Action	Proposed Project (Cross Route 3)
Land Use (6.1)	0	-
Aesthetics and Visual Resources (6.2)	0	-
Air Quality (6.3)	0	0
Noise & Vibration (6.4)	0	-
Geology & Soils (6.5)	0	-
Water Resources/Floodplains (6.6)	0	-- (0 with mitigation plan)
Biotic Communities (6.7)	0	-
Protected Species (6.8)	0	0
Cultural Resources (6.9)	0	0
Socioeconomic Impacts (6.10)	0	0
Traffic & Transportation (6.11)	0	-
Utilities (6.12)	0	0
Hazardous Waste (6.13)	0	0
Cumulative Impacts (6.14)	0	-

Note: + = Beneficial Effect -- = Moderate Effect
 - - - = Severe Effect - = Minimal Effect
 0 = No Significant Effect

Definitions of Impacts

1. Beneficial - No adverse effect anticipated. Effect would provide a favorable, advantageous and/or improved condition.
2. Severe - Complete destruction, disruption, violation of standards, incompatibility, disturbance, or surpassing capability of the attribute under consideration.
3. Moderate - Considerable destruction, disruption, violation of standards incompatibility, disturbance or surpassing of capability of the attribute. However, the effect can be minimized through further study and mitigation.
4. Minimal - Temporary or minor destruction, disruption, violation of standards, incompatibility, disturbance or surpassing of capability of the attribute. This effect can be mitigated through standard design, construction or operational procedures.
5. No Significant Effect No effect anticipated.

Project Description:

Refer to Section 2 of the Environmental Report.

Alternatives Considered:

Refer to Section 3 of the Environmental Report.

Environmental Impacts:

Refer to Sections 4 and 6 of the Environmental Report.

Mitigative Actions:

Mitigation packages for wetland and waters of the US impacts are currently being evaluated by Palmetto Railways. The selected mitigation package will completely cover the project impacts, utilizing the USACE's "Guidelines for Preparing a Compensatory Mitigation Plan".

7 LIST OF PREPARERS AND CONTRIBUTORS

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) served as lead consultant for preparation of the Environmental Report and supporting documents. Amec Foster Wheeler served as primary author for the sections related to *Alternatives Analysis, Land Use, Aesthetics and Visual Resources, Air Quality, Noise & Vibration, Geology and Soils, Water Resources/Floodplains, Cultural Resources, Socioeconomic and Environmental Justice, Traffic & Transportation, Utilities, and Cumulative Impacts*.

TranSystems served as the primary civil engineers for this project. They have completed all necessary rail design work, including 30% design drawings, wetlands impacts and fill calculations.

GEL Engineering, LLC and Sabine & Waters completed the wetland delineation of the project route and served as the primary author for sections related to *Waters to be Impacted (including wetland type and existing condition), vegetative Biotic Communities, and Protected Species Biological Assessment*.

S&ME, Inc. served as the primary author for the section related to *Hazardous Material and Toxic Substances*.

Randolph Lowell with Willoughby & Hoefer, PA served as secondary author for the *Alternatives Analysis* and *Purpose and Need* sections of this Environmental Report.

CDM Smith Inc. provided project management, oversight, and review.

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Appendix A: Alternatives Analysis Maps

CAMP HALL RAIL PROJECT



**540 East Bay Street
Charleston, South Carolina**

25 July 2017

Figure 2. Environmental Features Map

Camp Hall Railroad Build-in
Alternatives Analysis
Berkeley County, South Carolina

Legend

- County Boundary
- Camp Hall Commerce Park
- Tier 2 Study Area
- Impaired 303D Station
- TMDL Station
- TMDL Watershed
- Stream Crossings
- Named Stream
- Minor Tributary
- National Wetland Inventory
- Known Threatened/Endangered Species Habitat

Existing Nearby Rail

- CSXT
- Norfolk Southern

Tier 2 Rail Alternative Alignments

- Cross
- Moncks Corner
- Soter North
- Soter South



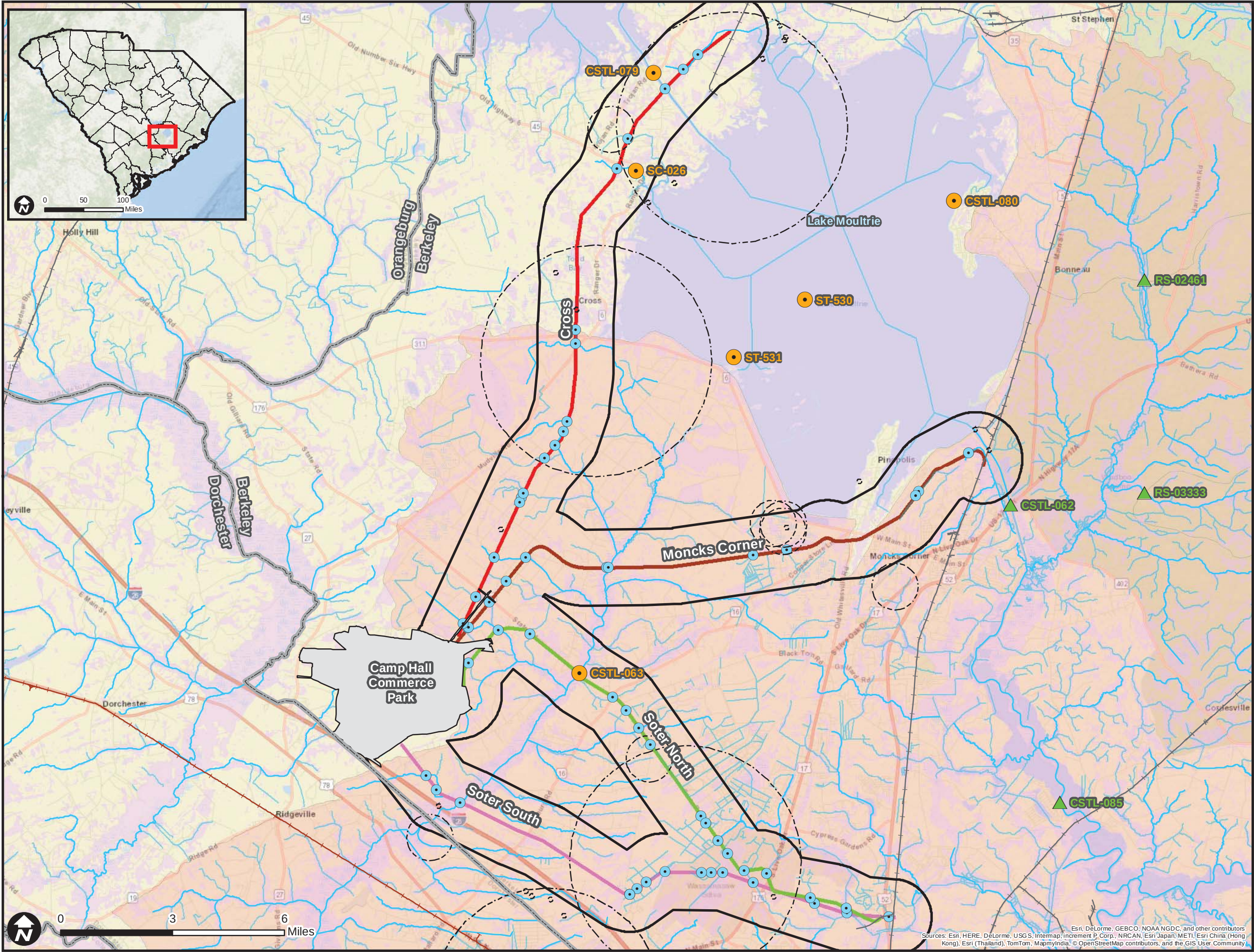
Job No. 6250-16-0108

Drawn By: BWS

Reviewed By: AWC

Date: 09/23/2016

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Figure 3. Physical Features Map

Camp Hall Railroad Build-in
Alternatives Analysis
Berkeley County, South Carolina

Legend

- County Boundary
- Camp Hall Commerce Park
- Tier 2 Study Area
- SCDOT Traffic Station
- Parcel
- Potential Relocation
- Census Block Group with Possible EJ Community
- State Designated Tribal Statistical Area (SDTSA)
- Municipality
- Urbanized Area
- Existing Nearby Rail
 - CSXT
 - Norfolk Southern
- Tier 2 Rail Alternative Alignments
 - Cross
 - Moncks Corner
 - Soter North
 - Soter South



Job No. 6250-16-0108

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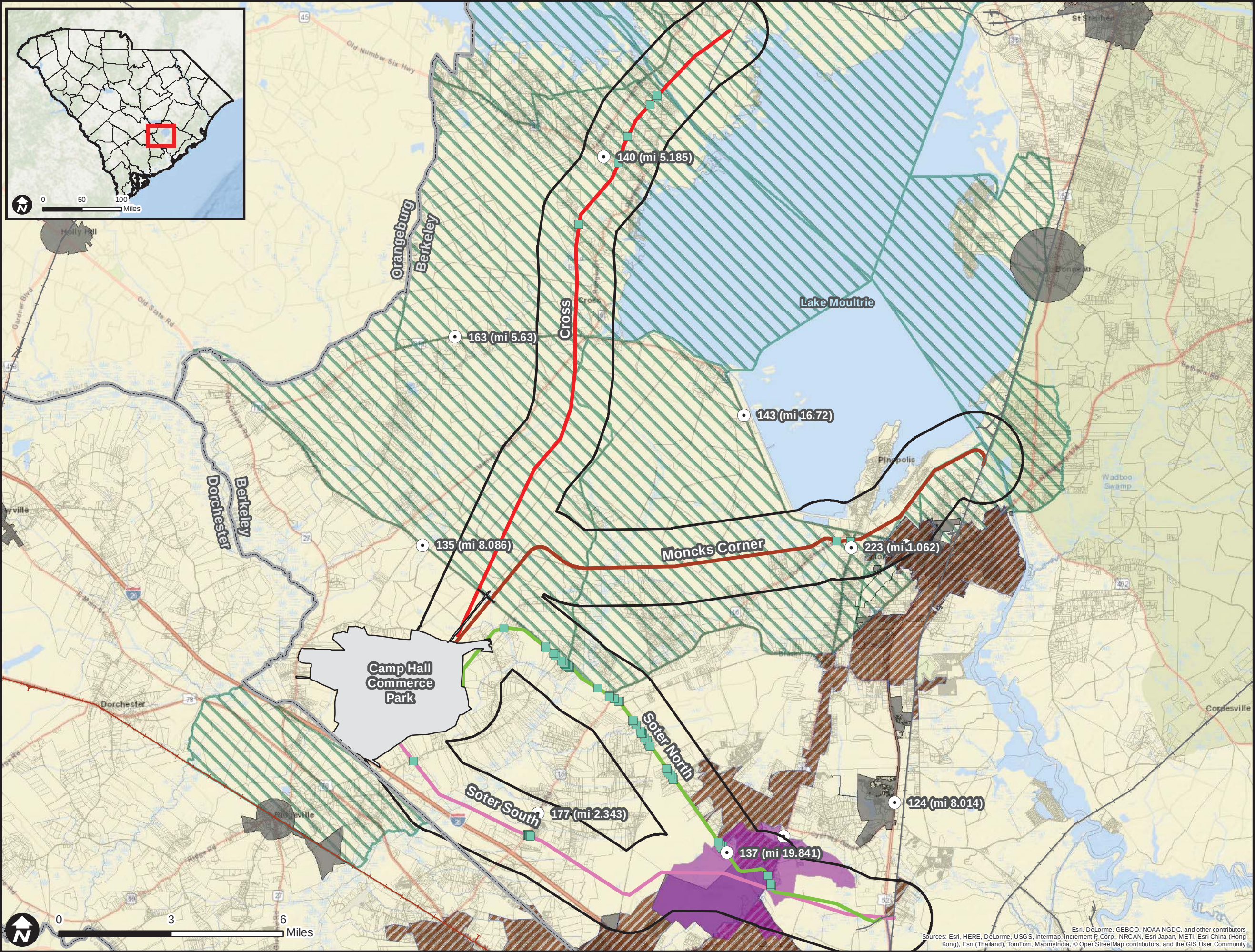


Figure 4. Historic and Archaeological Resources Map

Camp Hall Railroad Build-in
Alternatives Analysis
Berkeley County, South Carolina

Legend

- County Boundary
- Camp Hall Commerce Park
- Tier 2 Study
- Historic Structure
- Known Archaeological
- Historic Area
- NRHP Site
- Existing Nearby Rail
 - CSXT
 - Norfolk Southern
- Tier 2 Rail Alternative Alignments
 - Cross
 - Moncks Corner
 - Soter North
 - Soter South



Job No. 6250-16-0108

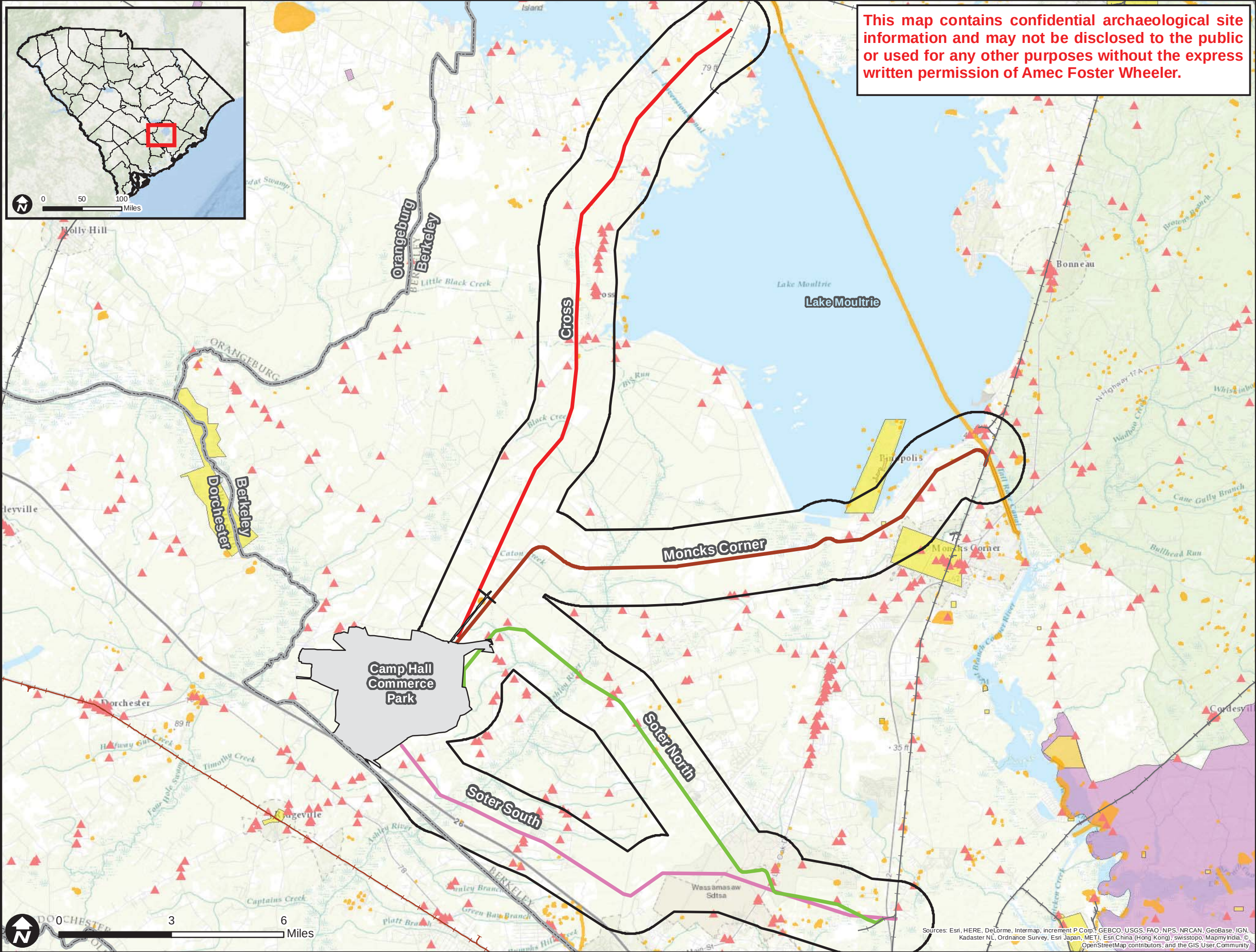
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Date: 09/23/2016

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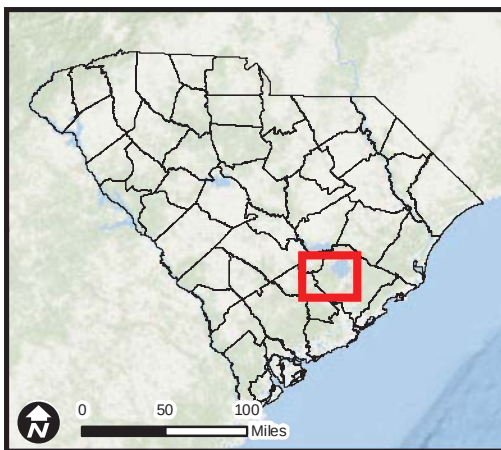


Figure 5. Stewardship and Protected Lands Map

Legend

-  County Boundary
-  Camp Hall Commerce Park
-  Tier 2 Study Area
-  Existing Private, Protected, and Public Lands
-  Caton Creek Mitigation Bank
-  Volvo Mitigation Parcels
-  Existing CSXT Rail
-  Existing Norfolk Southern Rail

Tier 2 Rail Alternative Alignments

- Cross
- Moncks Corner
- Soter North
- Soter South



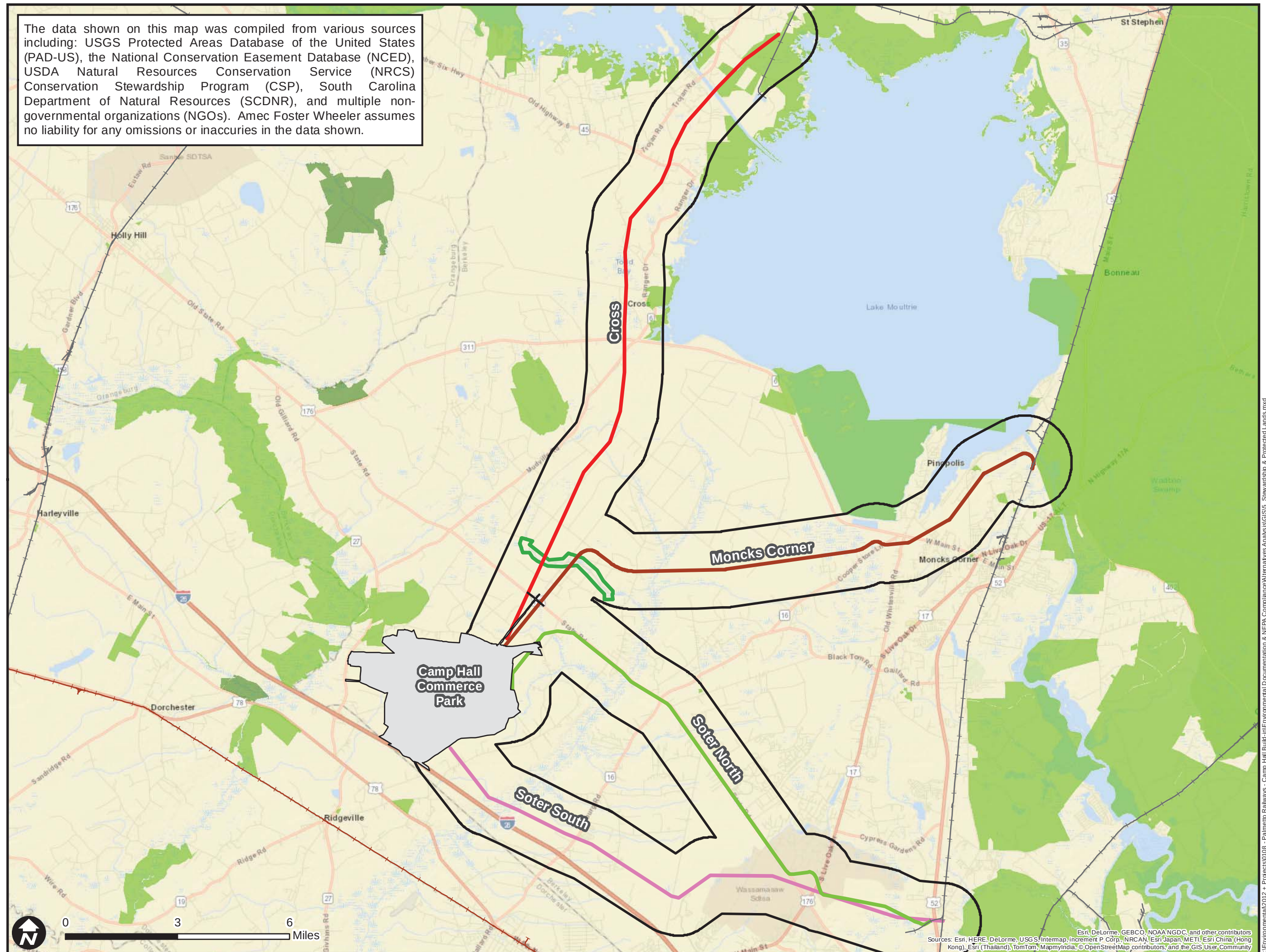
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Drawn By: BWS

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Date: 09/23/2016

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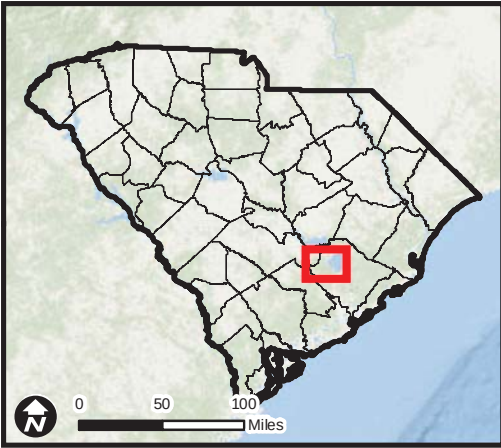


Figure 6a. Tier 3 Cross Option 1 Alternative Alignment

Camp Hall Railroad Build-in
Alternatives Analysis
Berkeley County, South Carolina

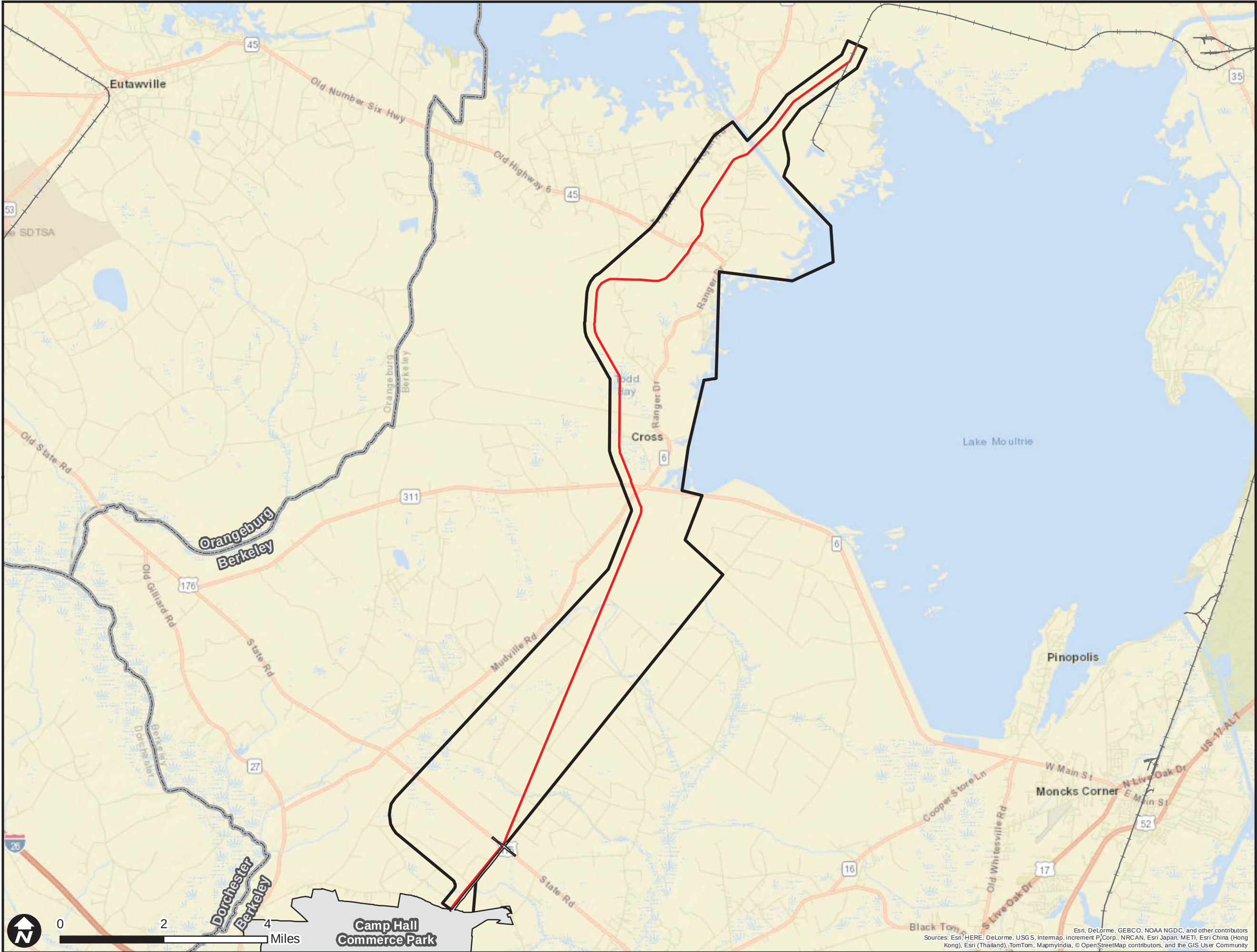
Legend

- County Boundary
- Camp Hall Commerce Park
- Tier 3 Study Area
- Existing Nearby Rail**
 - CSXT
 - Norfolk Southern
- Tier 3 Rail Alternative Alignment**
 - Cross Option 1



Job No. 6250-16-0108
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Reviewed By: AWC
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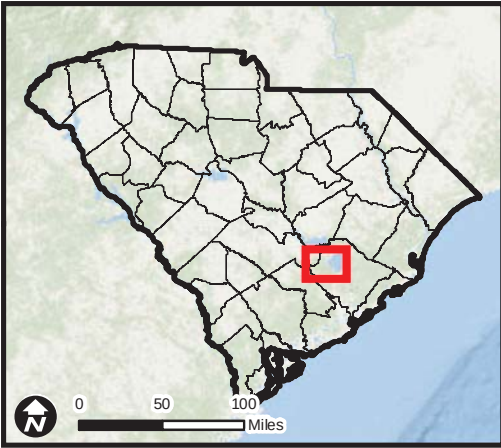


Figure 6b. Tier 3 Cross Option 2 Alternative Alignment

Camp Hall Railroad Build-in
Alternatives Analysis
Berkeley County, South Carolina

Legend

- County Boundary
- Camp Hall Commerce Park
- Tier 3 Study Area

Existing Nearby Rail

- CSXT
- Norfolk Southern

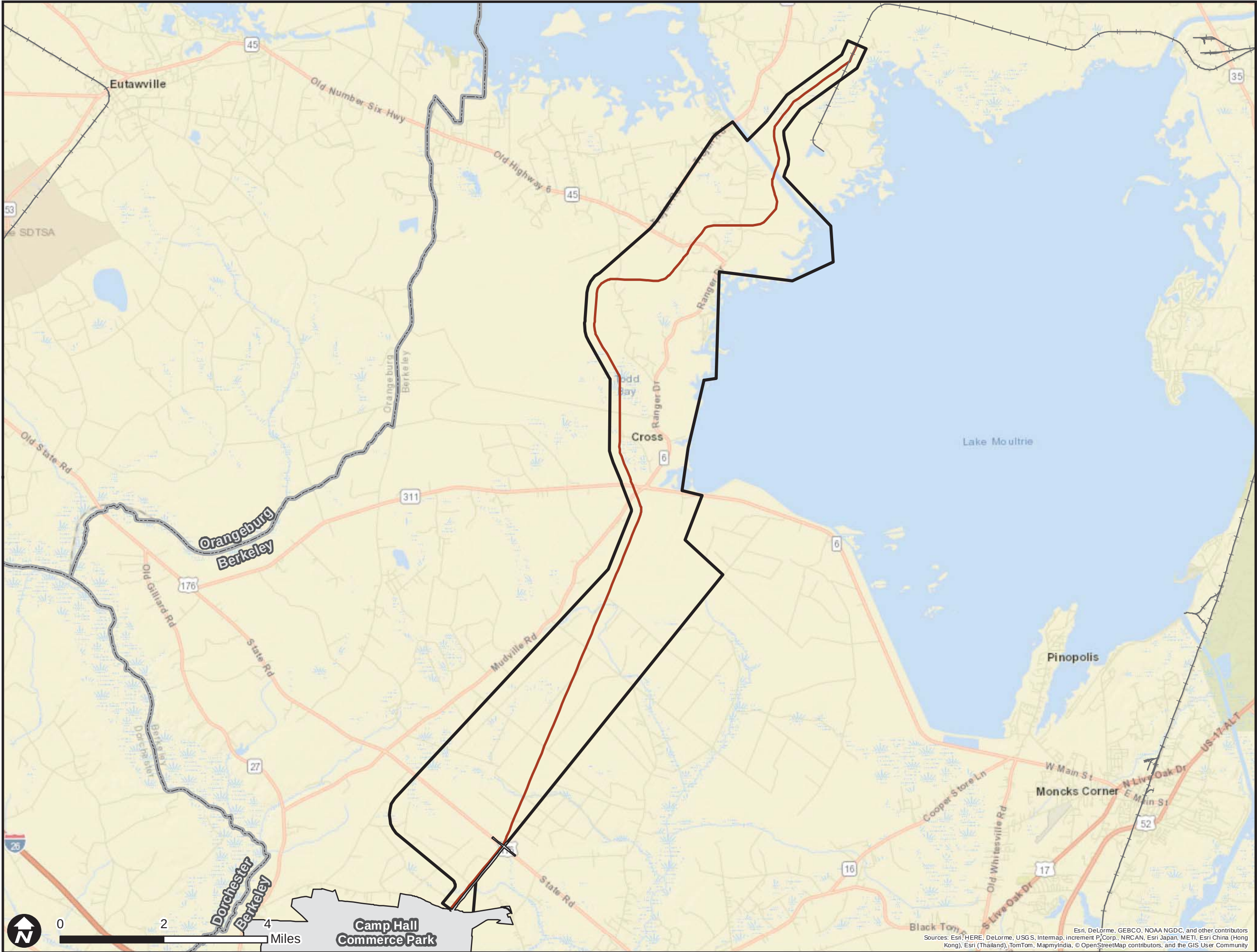
Tier 3 Rail Alternative Alignment

- Cross Option 2



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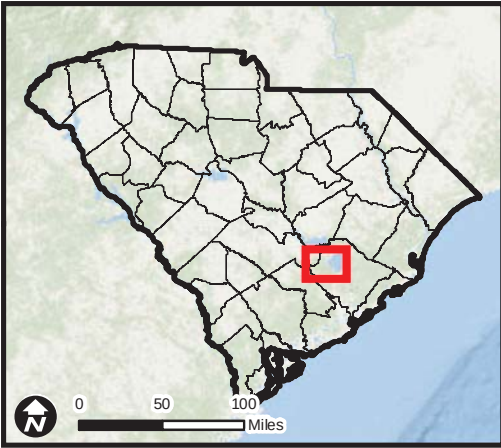


Figure 6c. Tier 3 Cross Option 3 Alternative Alignment

Camp Hall Railroad Build-in
Alternatives Analysis
Berkeley County, South Carolina

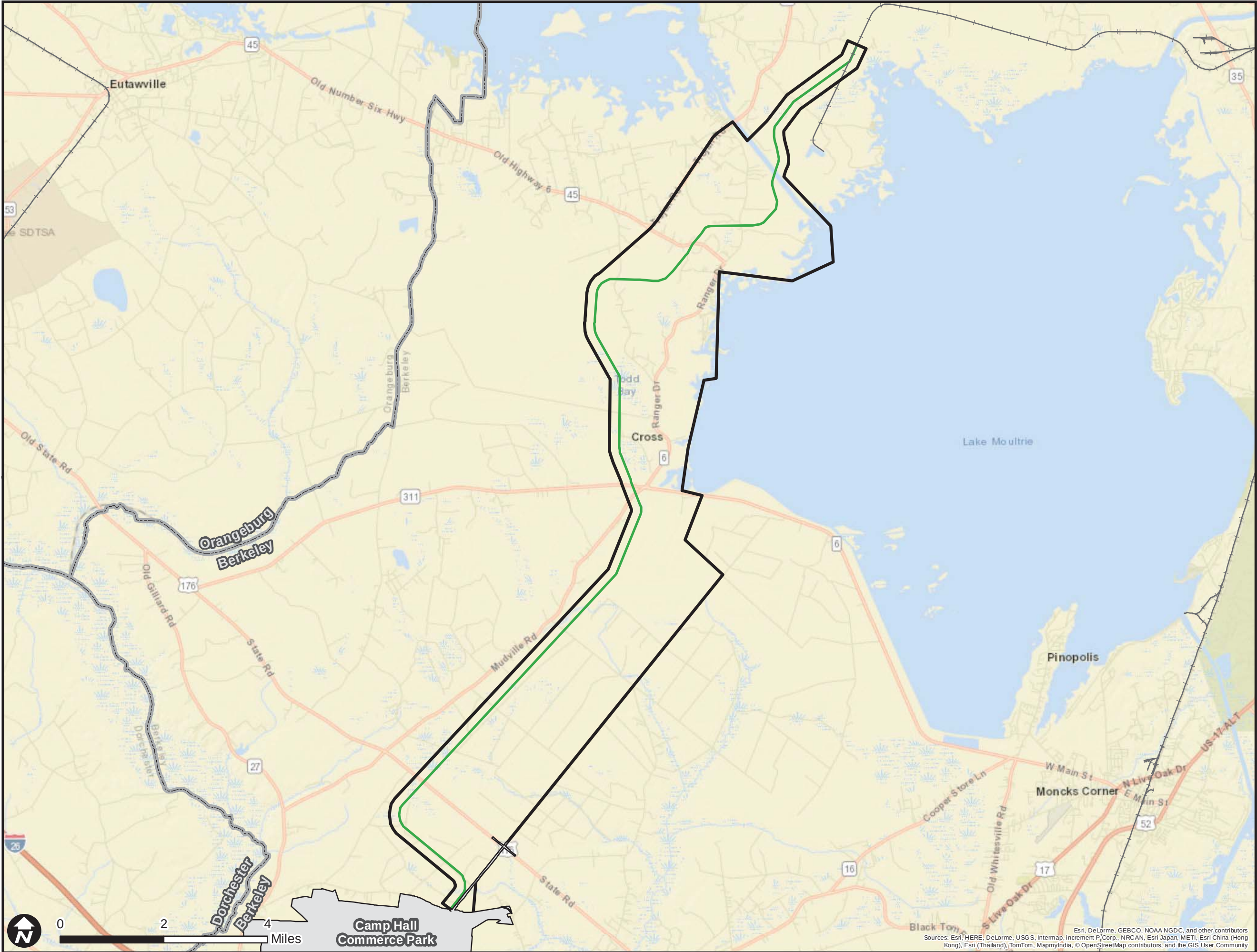
Legend

- County Boundary
- Camp Hall Commerce Park
- Tier 3 Study Area
- Existing Nearby Rail**
 - CSXT
 - Norfolk Southern
- Tier 3 Rail Alternative Alignment**
 - Cross Option 3



Job No. 6250-16-0108
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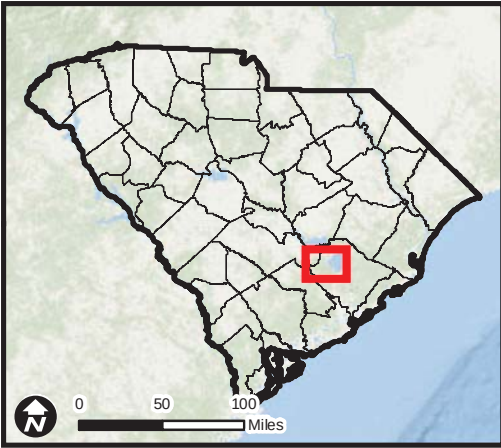


Figure 6d. Tier 3 Cross Option 4 Alternative Alignment

Camp Hall Railroad Build-in
Alternatives Analysis
Berkeley County, South Carolina

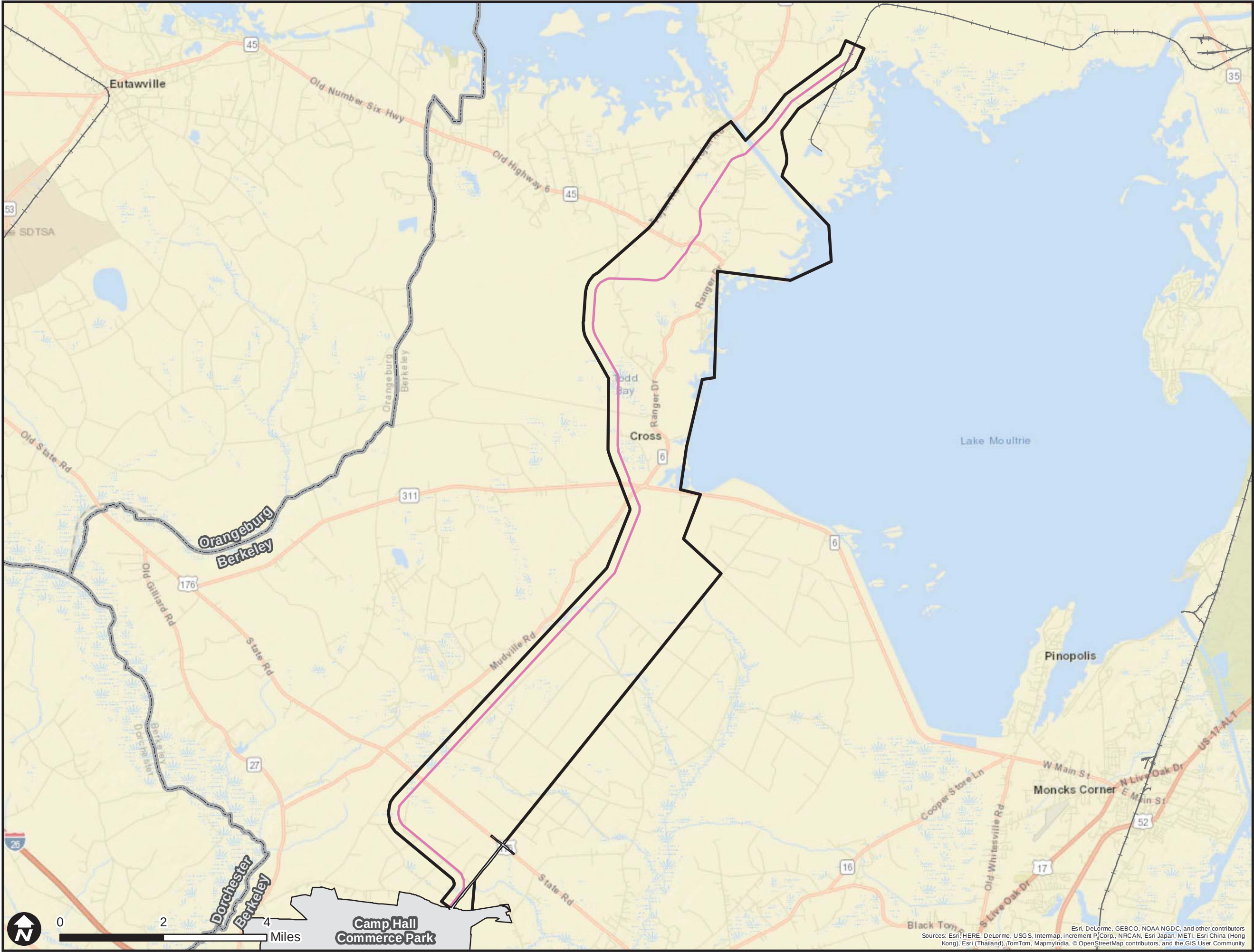
Legend

- County Boundary
- Camp Hall Commerce Park
- Tier 3 Study Area
- Existing Nearby Rail**
 - CSXT
 - Norfolk Southern
- Tier 3 Rail Alternative Alignment**
 - Cross Option 4



Job No. 6250-16-0108
Drawn By: BWS
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Appendix B: Habitat and Wetland Descriptions

CAMP HALL RAIL PROJECT



**540 East Bay Street
Charleston, South Carolina**

25 July 2017

HABITAT AND WETLAND DESCRIPTIONS

The proposed 22.7-mile railroad corridor connecting the Camp Hall Commerce Park to the existing rail line at the Cross generating station has been evaluated with respect to habitat and wetland types. The proposed rail line corridor review area is approximately 200 feet wide, plus some expanded areas where minor alternatives to the original alignment may be considered. The entire proposed rail line corridor, including all expanded areas, totals approximately 866 acres. Of the original proposed rail line corridor (623 acres), 368.6 acres have been confirmed as wetlands based on a Preliminary Jurisdictional Determination issued by the U.S. Army Corps of Engineers (USACE) identified by SAC # 2016-01395. The most recent areas added to the potential route have not been verified by the USACE and include approximately 242 acres of which an estimated 157 acres are wetlands. Assuming the USACE confirms the 157 additional acres as wetlands, 526 acres of wetlands occur in the entire proposed project corridor being considered for the proposed rail line.

The evaluation occurred between April 20, 2016 and June 1, 2017. The inspection has identified 11 types of habitat and 14 types of wetlands. These habitat types include: **upland mixed hardwood and pine forests, upland hardwood forests, upland plantation pine forests, wetland plantation pine forests, Carolina bays, plantation pine converted Carolina bays, depressional ponds, bottomland hardwood forested wetlands, open water, agricultural fields, roads and utilities.** The wetland types follow the Cowardin code (National Wetland Index) referenced in Table 1. The habitat types are based on observations in the field. The habitat and wetland types are shown on attached Maps, pages 1-17, and discussed below.

Habitat Types

A description of each habitat type is provided below and is representative of conditions at the time of evaluation. Table 2 provides the approximate acreage of each habitat type in the corridor.

The **upland mixed hardwood and pine forest (U43)** comprised 25.8 acres of the corridor and is characterized by an overstory composed primarily of loblolly pine (*Pinus taeda*) with some interspersed longleaf pine (*Pinus palustris*), southern red oak (*Quercus falcata*), pignut hickory (*Carya glabra*), and some interspersed live oaks (*Quercus virginiana*). Cover ranged from 40-70% in the overstory. The upland pine forest habitat found within and immediately adjacent to the corridor appeared to be approximately 30-50 years old; however, nothing within this habitat type was considered to be old growth. The midstory is composed of loblolly pine, southern red oak, pignut hickory, longleaf pine, and sweetgum (*Liquidambar styraciflua*) with a cover ranging from 10-30%. The shrub layer is sparse, with 10-20% cover consisting of wax myrtle (*Morella cerifera*), farkleberry (*Vaccinium arboreum*), redbay (*Persea borbonia*), and deerberry

(*Vaccinium stamineum*). The herbaceous layer is healthy, at approximately 30-50% cover, and was composed primarily of bracken fern (*Pteridium aquilinum*), broomstraw (*Andropogon virginicus*), longleaf woodoats (*Chasmanthium sessiliflorum*), dogfennel (*Eupatorium capillifolium*), panic grass (*Panicum sp.*), and slender lespedeza (*Lespedeza virginica*). Vine species include muscadine (*Vitis rotundifolia*), greenbriar (*Smilax sp.*), and sawtooth blackberry (*Rubus argutus*) making up approximately 10% of the cover.

The **upland hardwood forest (U43)** is similar to the mixed hardwood and pine forest and comprised 8.5 acres of the corridor; however, it is generally present only within ecotones between upland and wetland areas. The age classes found within this habitat type ranged from new growth to approximately 50 years old. No old growth was found within or adjacent to the corridor. While there is an occasional loblolly or longleaf pine in these areas, the overstory composition is primarily composed of hardwoods including: white oak (*Quercus alba*), post oak (*Quercus stellata*), live oak, southern red oak, and pignut hickory, with water oak (*Quercus nigra*) found on the lower slopes leading to the wetlands. Overstory closure ranges from 40-60%. The midstory (10-25% cover) consists of pignut hickory, sweetgum, red oak, red maple (*Acer rubrum*), American hornbeam (*Carpinus caroliniana*), and American holly (*Ilex opaca*). Shrub layers are sparse (0-10% cover), and consist of redbay and wax myrtle. The herbaceous layer is sparse, approximately 0-10% cover, and is composed primarily of bracken fern, cinnamon fern (*Osmunda cinnamomea*), broomstraw, and longleaf woodoats.

The **upland and wetland plantation pine forests (U42P, PFO4B)** comprised approximately 544.4 acres of the corridor and is characterized by an overstory composed primarily of loblolly pine. Plantation pine forests span both upland and wetland areas, as well as some former Carolina bay features that were converted to pine monoculture. These areas are intensively managed for silviculture with a first thinning typically at ages 12-15 years old, followed by a clear cut at 25-30 years old. Age classes along the corridor spanned from new growth to approximately 30 years old. These areas are bedded and extensively ditched. The planted pine forest habitat covers 61% of the corridor. The corridor spans multiple stands of pines, ranging from open thinned (70-80 Basal Area) stands to dense, pre-merchantable stands (140 Basal Area). As a result of recent clear cuts there are areas with no overstory or midstory. In thinned pine areas (70-80 BA), there is a midstory of sweet gum and red maple with approximately 10-20% cover. In denser pine areas (140 BA) there is no midstory or shrub layer due to 90-100% overstory cover. In open thinned pine stands the shrub layer consists of wax myrtle, redbay, fetterbush (*Lyonia lucida*), and deerberry, with 10-30% cover. The herbaceous layer is also somewhat sparse, approximately 0-10% cover, and is composed primarily of dwarf palmetto (*Sabal minor*), longleaf woodoats, plumegrass (*Saccharum giganteum*), giant cane (*Arundinaria gigantea*), Virginia chain fern (*Woodwardia virginiana*), cinnamon

fern, and netted chain fern (*Woodwardia areolata*). Sphagnum moss (*Sphagnum sp.*) is also present within some of the wetland areas.

Five **Carolina bay (PFO2C, PFO1H)** depressional wetlands are located within the project corridor comprising approximately 10.5 acres. These wetlands are seasonally to perennially inundated based upon their size. The genesis of this depressional habitat has been debated, although Piovan and Hodgeson¹ found nine distinct qualities are common to all Carolina bays: 1) oval shaped; 2) oriented northwest to southeast; 3) parallelism of the long axis; 4) sand rims above general elevation; 5) interior surface below the general elevation; 6) different soils within sand rim and outside of sand rim; 7) shallow; 8) flat sandy bottom; 9) naturally isolated features. Within the corridor there are five Carolina bays, four of which are named, including Bulltown Bay, Skeleton Bay, Todd Bay, and Beech Island Bay shown on Habitat Descriptions map pages 1, 5, 6, 7, 8, & 9, respectively. A large portion of these bays are ditched and either partially or entirely planted in loblolly pine. Within the remnant habitat, red maple, swamp tupelo (*Nyssa biflora*), and pond cypress (*Taxodium ascendens*) dominate the overstory at 30-40% cover with the oldest reaching approximately 50 years old; no areas within the habitat type are considered old growth. The midstory is sparse, consisting of the same species found in the overstory. Within more seasonally wet Carolina bays, a shrub and herbaceous layer is present consisting of redbay, dwarf palmetto (*Sabal minor*), and fetterbush in the shrub layer, with various grasses and sedges making up the herbaceous layer. Perennial flooded bays have no shrub or herbaceous vegetation present.

Plantation Pine Converted Carolina Bays were once Carolina bays but have been completely harvested, ditched, and planted in plantation pine for future harvest. This comprised 32.3 acres within the project corridor, and the timber within this habitat type was approximately 10 to 30 years of age. This habitat type mirrors the wetland plantation pine habitat type.

Several **depressional pond (PFO1C)** wetlands are interspersed along the corridor, covering approximately 17 acres. These wetlands are seasonally inundated and characterized by age classes ranging from new growth to approximately 30 years old. No old growth was found within this habitat type. The overstory is composed of black gum, sweet gum, red maple, and in larger gum ponds that are semi-permanently flooded, pond cypress is present. The overstory cover ranges from 20-40% in the overstory. The

¹ Piovan, S. & Hodgeson, M. 2016. How many Carolina bays? An analysis of Carolina bays from USGS topographic maps at different scales. Journal of Cartography and Geographic Information Science. Pgs 1-17.

midstory is sparse, approximately 10% cover, consists of black gum, sweet gum, and red maple. The shrub stratum is composed of fetterbush and redbay. The understory cover is variable, ranging from open water to 100% cover. Species in this stratum include smartweed (*Polygonum* spp.), arrowhead (*Sagittaria lancifolia*), soft rush (*Juncus effusus*), giant cane, netted chain fern, and various other grasses and sedges.

The **bottomland hardwood forested wetland (PFO1C, PFO2C, PFO1B)** habitat comprised 174.8 acres and is characterized by an overstory composed of bald cypress (*Taxodium distichum*), water oak, black gum, swamp tupelo and swamp chestnut oak (*Quercus michauxii*). Overstory closure ranged from 30-50% characterized by an age class from 10 to 50 years old. No old growth was found within or immediately adjacent to the proposed project corridor. The midstory is composed of bald cypress, black gum, sweetgum, and swamp tupelo characterized by a cover ranging from 10-20%. The shrub and herbaceous layer ranges from sparse to heavy, approximately 10-60% cover, and is composed primarily of dwarf palmetto, giant cane, sphagnum moss, Virginia chain fern and cinnamon fern based on the hydrologic regimen of the wetland. Areas that are seasonally flooded are characterized by a sparse understory due to flooding. Areas that are characterized as temporarily flooded or saturated contain a well-developed understory. Defined stream channels occur within a few of the bottomland hardwood forests within the proposed project corridor.

The project corridor crosses **open water (L1UBHh)** at the Diversion Canal between the Santee-Cooper lakes. This area comprised 2.4 acres of the corridor. The canal was excavated in 1941. It is 7.5 miles long, approximately 500 feet wide and approximately 12 feet deep. The bottom consists of sand and clay, with some sediments washed downstream from the Santee River. There is very little organic material or vegetation in this part of the canal and it was last dredged in 2014 to remove accumulated silt and sediments on the Lake Moultrie side of the canal. The Diversion Canal was once an important access for inland maritime trade, but today is used primarily for recreational access between the lakes.

Several small **agricultural fields (U21)** exist within the project corridor (1.3 acres), primarily as wildlife food plots. Commonly planted vegetation included chufa, wheat, peas and soybeans. In areas that are not planted, a variety of native grasses dominate, including: broomstraw, chalky bluestem (*Andropogon capillipes*), dog fennel, switchgrass (*Panicum virgatum*), and tapered rosette grass (*Dichanthelium acuminatum*). These areas are routinely disked and cultivated.

Various **Roads and Utilities** cross the corridor, comprising approximately 6% of the proposed project corridor (48.9 acres). The roads are filled, either paved or gravel, and

are culverted over wetland crossings. Utility right of ways are maintained throughout the proposed project corridor, from large transmission lines to smaller distribution lines.

Wetland Types and Condition

There are multiple wetland types within the project corridor. These wetlands have been classified by type and further by their existing condition as defined in Appendix C of the US Army Corps of Engineers' "Guidelines for Preparing a Compensatory Mitigation Plan"² (see Appendix A attached). Various wetland types share habitat types with differences lying in hydrologic periods, genesis of the wetland, and landscape position. Table 3 provides the approximate amount of each wetland type and its condition(s) in the corridor.

The majority ~62% (323.9 acres) of wetlands identified within the project corridor are within bedded **plantation pine forests**. Plantation pine forests span both upland and wetland areas and comprised approximately 66% of the corridor (576.7 Acres). These areas have been routinely logged with heavy equipment for decades. Bedding is the practice of using a plow to build up a raised "bed" on which the trees are planted to keep them elevated from surface water. As the trees grow, they use a substantial amount of water, lowering the water table in the area. These areas are ditched on the stand boundaries to remove excess surface water. Ditches are routed to larger canals that move water off site or into adjacent wetland features. Some Carolina bay wetland features have been converted to pine monoculture, and the plantation pine forest spans both upland and wetlands. These wetland areas are considered *Impaired* and have experienced heavy soil disturbance and compaction. In some areas, beds are constructed against the native topography, trapping water between beds.

The project corridor spans five **Carolina bays** identified as Bulltown Bay, Skeleton Bay, Todd Bay, Beech Island Bay, and an un-named bay. These areas comprise approximately 2% of the wetland acreage of the corridor (10.5 acres), and this habitat type covers approximately 1% of the total corridor. A part of Bulltown Bay that is impacted by the existing rail line is considered *Very Impaired* due to the fill material and lack of hydrologic connections through the railroad grade. Skeleton Bay, Todd Bay, and Beech Island Bay are all *Impaired* wetlands. They have been harvested and re-planted in loblolly pine. Within Beech Island Bay a utility easement is maintained, creating an emergent wetland habitat. Skeleton Bay and Todd Bay have been completely converted to plantation pine, thus these areas were counted as such.

The un-named Carolina bay is *Partially Impaired* due to timber harvesting up to the edges of the bay. This Carolina bay makes up over 1% of the wetlands identified within the corridor (8.4 acres). The outer ring of cypress has been removed, and loblolly has been planted in beds adjacent to the Carolina bay. On one border of the bay, the planted

²USACE, Guidelines for Preparing a Compensatory Mitigation Plan, 2010, Page 1-114

pine has been recently clear-cut, and a ditch outfalls under the road to a culvert to maintain water below flood level within the Carolina bay.

The proposed project corridor contains multiple **depressional wetlands**. These comprised 3% (16.9 acres) of the total wetland acreage of the corridor and approximately 2% of the total corridor. The depressional wetlands along the corridor within industrial forestlands are considered *Impaired* due to the conversion of the landscape to pine monoculture. Minor ditching has altered the hydrology within these areas as well. The depression wetlands within the South Carolina Department of Natural Resources' (SCDNR) Hall Wildlife Management Area (WMA) are considered *Fully Functional* as they retain their natural hydrology. Although minor logging has taken place within these wetlands, they remain pristine wetlands.

Bottomland Hardwood forests compose 33% (174.8 acres) of the total wetland acreage of the corridor, and approximately 20% of the entire corridor. These areas exhibit evidence of past logging and are often bisected by roads with adequately sized culverts to allow unimpeded flow of water through the wetland. There are no old growth stands along the corridor; all stands are considered second or third growth based on species composition and tree size. Early successional wetland species such as river birch (*Betula nigra*), sweet gum, black willow (*Salix nigra*), water oak, and red maple dominate recently harvested bottomland hardwood areas. In older regeneration, bald cypress, swamp white oak, and swamp tupelo dominate. These areas mostly lack a defined tributary, but rather are seasonally saturated and flooded, to semi-permanently flooded wetlands. For those few bottomland hardwood forests with a defined watercourse, it often has been channelized and crossed by forestry roads. Hydrology is altered in the industrial forest lands through the extensive ditching to remove surface water. These ditches are routed into wetland areas for eventual downstream discharge into a larger named watercourse. The bottomland hardwood forests within the South Carolina Department of Natural Resources' (SCDNR) Hall Wildlife Management Area (WMA) are *Partially Impaired*. The hydrology of this area is partially altered with the construction of the Bulltown Ditch. There is also slight fragmentation with the construction of the CSX rail line crossing through wetlands shown on habitat type map, page 1, as well as ruts and soil compaction due to past logging activity within the wetland areas. The remainder of the corridor's bottomland hardwood wetlands are considered *Impaired* due to the extensive ditches altering the hydrology within these forest areas and fragmentation of the bottomlands with interspersed planting of loblolly pine.

The corridor crosses the Diversion Canal between Lakes Moultrie and Marion. This navigable **Open Water** wetland comprises <1% (2.4 acres) of the total wetlands within the corridor and < 1% of the total corridor. The open water is used for commercial and recreational purposes. The Diversion Canal was constructed in the 1980s by the US Army

Corps of Engineers. It provides aquatic habitat for a variety of species; however, there is no vegetation associated with the open water wetland. This area is considered *Very Impaired* due to the excavated nature of the canal and the periodic dredging to remove accumulated sediment. Also, spoil has been placed adjacent to the canal on either side, filling wetlands and altering the natural hydrology of these adjacent areas.

Linear Conveyances occur throughout the project corridor. These features are used to drain and direct water from one area to another. Some of these features hold water long enough to allow for wetland vegetation growth in the base and along the banks, while others do not. The larger linear conveyances on industrial timberland properties contain some water flow or evidence of recent flow in the form of drift deposits and scouring. Smaller linear conveyances are often dry or contain standing water. Some of these features have been dug in uplands, while others have been excavated in wetlands. All linear conveyances within the industrial timber properties are routinely maintained with a tracked excavator to promote unimpeded water flow during large storms. Often, spoil is placed adjacent to the linear conveyance or incorporated into an adjacent road. All linear conveyances within the project corridor are considered *Very Impaired* due to their excavated nature and purpose of altering or removing hydrology in the adjacent areas.

There are two areas within the corridor that exhibit characteristics of a perennial, relatively permanent water (PRPW) tributary, identified by the USACE as “Non-Wetland Waters.” Of the two (see Habitat Descriptions maps, pages 1 & 8) identified PRPW Tributaries, one is considered a naturally occurring feature with a sinuous channel and well-defined bed and bank. The channel is approximately 6-8 feet wide and the water level typically occurs approximately 5 feet below top of bank. This wetland feature crosses under various forestry roads via large concrete and metal culverts that are large enough not to impede the natural flow. There is no channelization of the water course. This wetland is considered a *Partially Impaired* wetland. Due to streamside management best management practices, the adjacent forest is buffered to protect water quality. Outside of the approximately 50’ buffer, loblolly pine is planted in rows for future harvest. This buffer consists of a mixed hardwood and pine forest with a sandy soil.

The second PRPW Tributary feature consists of a channelized run named “Bulltown Ditch” and is shown on Habitat Description maps page 1 & 2. The Bulltown Ditch extends over 18,000 feet from the Santee Canal off of Lake Moultrie to the Diversion Canal, bisecting Bulltown Bay. This feature is approximately 6 feet wide and 4 feet deep. The canal is crossed by various public and forestry roads as well as the CSX rail line serving the Cross Generating Station through large concrete and metal culverts. The Bulltown Ditch dates from sometime after the Santee Canal (circa 1793) and is a maintained watercourse. This wetland system is highly impacted and is considered a *Very Impaired* wetland feature. It removes hydrology from some areas and is an excavated

feature with an adjacent spoil berm that alters hydrology in the immediate area of the ditch. In some areas, the Bulltown Ditch flows through uplands before draining back into wetlands.

PALMETTO RAILWAYS – CROSS ROUTE WETLAND CLASSIFICATIONS	
Cowardin Code (NWI)	Description
PFO1B	Palustrine forested with broad-leaved deciduous vegetation, saturated soils
PFO1C	Palustrine forested with broad-leaved deciduous vegetation, seasonally flooded
PFO1H	Palustrine forested with broad-leaved deciduous vegetation, permanently flooded
PFO2C	Palustrine forested with needle-leaved deciduous vegetation, seasonally flooded
PFO4B	Palustrine forested with needle-leaved evergreen vegetation, saturated soils
PFO4C	Palustrine forested with needle-leaved evergreen vegetation, seasonally flooded
PSS1B	Palustrine scrub shrub with broad-leaved deciduous vegetation, saturated soils
PSS1E	Palustrine scrub shrub with broad-leaved deciduous vegetation, seasonally flooded/saturated
PSS1H	Palustrine scrub shrub with broad-leaved deciduous vegetation, permanently flooded
U14	Upland transportation and utilities
U21	Upland agriculture
U42P	Upland evergreen forest (pine)
U43	Upland mixed forest
L1UBHh	Lacustrine limnetic with unconsolidated bottom, permanently flooded due to diking

Table 1- Description of Cowardin Code (National Wetland Index) used to classify wetland types.

PALMETTO RAILWAYS - CROSS ROUTE HABITAT DESCRIPTIONS	
HABITAT DESCRIPTION	ACREAGE
AGRICULTURAL FIELDS	1.3
BOTTOMLAND HARDWOOD FORESTED WETLANDS	174.8
CAROLINA BAYS	10.5
DEPRESSIONAL PONDS	16.9
OPEN WATER	2.4
PLANTATION PINE CONVERTED CAROLINA BAYS	32.3
ROADS AND UTILITIES	48.9
UPLAND HARDWOOD FORESTS	8.5
UPLAND MIXED HARDWOOD AND PINE FORESTS	25.8
UPLAND PLANTATION PINE	252.8
WETLAND PLANTATION PINE	291.6
Total	865.8 Acres

Table 2- Acreage of different habitat types along the 22.7-mile Project Corridor

PALMETTO RAILWAYS - CROSS ROUTE WETLAND HABITAT INFORMATION		
HABITAT DESCRIPTION	CONDITION	ACREAGE
BOTTOMLAND HARDWOOD FORESTED WETLANDS	PARTIALLY IMPAIRED	94.2
BOTTOMLAND HARDWOOD FORESTED WETLANDS	IMPAIRED	71.2
BOTTOMLAND HARDWOOD FORESTED WETLANDS	VERY IMPAIRED	9.5
CAROLINA BAYS	PARTIALLY IMPAIRED	5.3
CAROLINA BAYS	IMPAIRED	5.2
DEPRESSIONAL PONDS	FULLY FUNCTIONAL	4.9
DEPRESSIONAL PONDS	PARTIALLY IMPAIRED	1.2
DEPRESSIONAL PONDS	IMPAIRED	9.8
DEPRESSIONAL PONDS	VERY IMPAIRED	1.0
PLANTATION PINE CONVERTED CAROLINA BAYS	IMPAIRED	32.3
WETLAND PLANTATION PINE	IMPAIRED	291.6
Total		526.2 Acres

Table 3 – Acreage and Condition of Wetland Habitat Types within Project Corridor

Appendix A

From the USACE's "Guidelines for Preparing a Compensatory Mitigation Plan"²

Existing Condition- the degree of disturbance relative to the ability of a site to perform its physical, chemical, and biological functions. This factor evaluates site disturbances relative to the existing functional state of the system.

Fully Functional- The typical suite of functions attributed to the aquatic resource type are functioning naturally. Existing disturbances do not substantially alter important functions. Examples include: Pristine (undisturbed) wetlands, aquatic resources with non-functional ditches or old logging ruts with no effective drainage, or minor selective cutting.

Partially Impaired- Site disturbances have resulted in partial or full loss of one or more functions typically attributed to the aquatic resource type but functional recovery is expected to occur through natural processes. Examples include: clear-cut wetlands, aquatic areas with ditches that impair but do not eliminate wetland hydrology, or temporarily cleared utility corridors.

Impaired- Site disturbances have resulting in the loss of one or more functions typically attributed to the aquatic resource type and functional recovery is unlikely to occur through natural processes. Restoration activities are required to facilitate recovery. Examples include: areas that have been impacted by surface drainage and converted to pine monoculture or agriculture, areas that are severely fragmented, or wetlands within maintained utility corridors.

Very Impaired- Site disturbances have resulted in the loss of most functions typically attributed to the aquatic resource type and functional recovery would require a significant restoration effort. Examples include: filled areas, excavated areas, or effectively drained wetlands (hydrology removed or significantly altered)

² USACE, Guidelines for Preparing a Compensatory Mitigation Plan. 2010. Pgs 1-114.

Appendix C: Noise and Vibration Assessment

CAMP HALL RAIL PROJECT

Submitted to:



**Palmetto Railways
540 East Bay Street
Charleston, South Carolina**

25 July 2017

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1.0 INTRODUCTION

1.1 Project Overview

Palmetto Railways (PR) is planning for the development of an industrial rail line to serve the Camp Hall Commerce Park in Berkeley County, South Carolina. The new rail line will connect Camp Hall Commerce Park to existing railroad right-of-way, near the Santee Cooper Cross Generating Station in Berkeley County.

The proposed rail corridor extends approximately 23 miles west to east between a point northeast out of Camp Hall Commerce Park to the existing railroad right-of-way near the Santee Cooper Cross Generating Station.

1.2 Noise and Vibration Overview

The purpose of this Report is to comply with NEPA requirements for the Proposed Action, on account of which PR proposes to operate 5 roundtrip freight trains per week from Camp Hall Commerce Park to existing railroad right-of-way, near the Santee Cooper Cross Generating Station in Berkeley County. Maximum operating speeds are projected to be 25 miles per hour (mph).

Figure 1-1 shows the project area for this Proposed Action. Along the project area, there is one **Build Alternative** that will be evaluated. For this Proposed Action, construction impacts will be assessed.

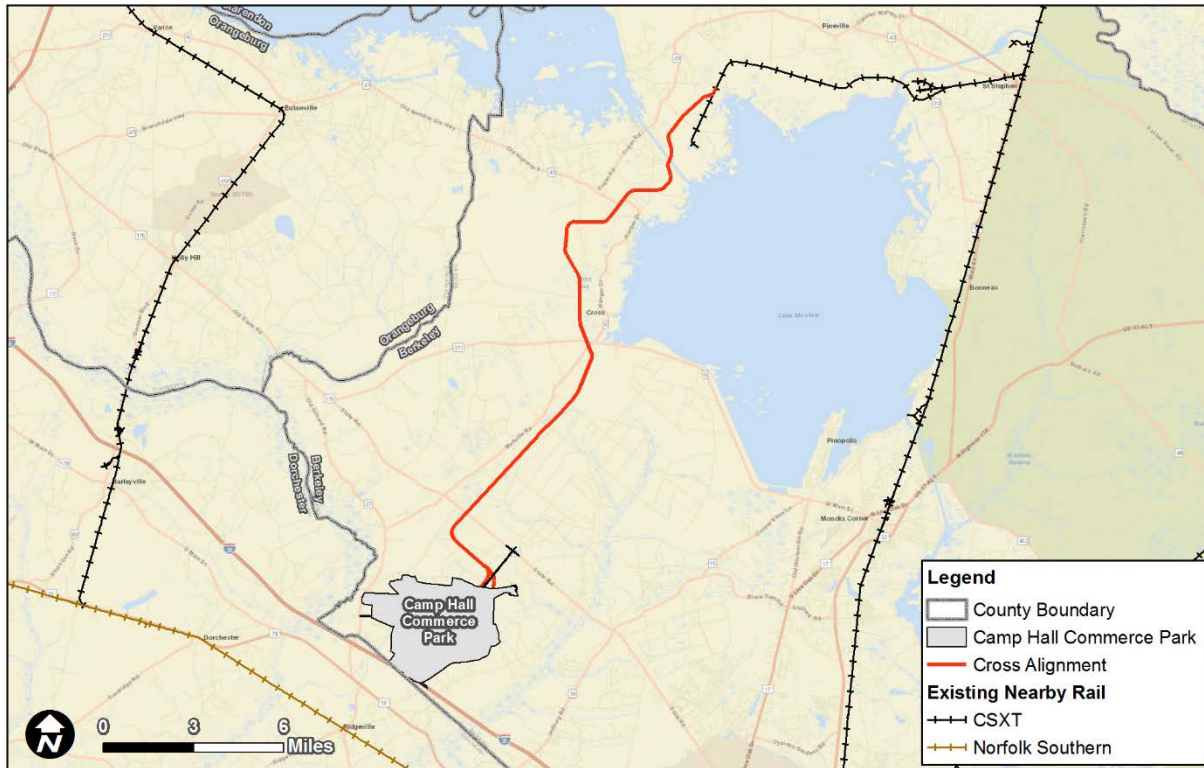


Figure 1-1: Project Alignment

Guidance has been developed by the Federal Transit Administration (FTA) published in “Transit Noise and Vibration Impact Assessment” [1] for conventional rail noise and vibration impact assessments, and FRA has developed complementary guidance for high-speed rail [2].

FTA transit noise and vibration impact assessment procedures are relied on by FRA in evaluating improvements to conventional passenger rail lines and stationary rail facilities and for assessments of horn noise. Since there are no existing federal guidance documents or methods specifically applicable for the evaluation of freight train traffic noise a supplemental freight rail analysis guideline was developed for the Chicago Rail Efficiency And Transportation Efficiency (CREATE) program [3] using the FTA procedures with certain modifications to allow for the evaluation of freight traffic.

The Project team performed a Screening Noise Assessment using aspects of the General Noise Assessment and General Vibration Assessment in accordance with FTA guidelines as well the CREATE Program guidelines. Future anticipated rail traffic volumes were evaluated in order to assess the Project-related effects of airborne noise.

1.3 Regulatory Setting

The jurisdictional authorities and corresponding regulations, statutes, and guidelines for determining potential impacts related to noise and vibration are summarized in Table 1-1.

Table 1-1: Regulations, Statutes and Guidelines for Noise and Vibration

Regulation, Statute, Guideline	Description
Federal	
National Environmental Policy Act (42 USC 4321 et seq.) [4]	Requires the consideration of potential environmental effects. NEPA implementation procedures are set forth in the President's Council on Environmental Quality's Regulations for Implementing NEPA (49 CFR 1105).
U.S. Army Corps of Engineers NEPA Environmental Regulations (33 CFR 230) [5]	Provides guidance for implementing the procedural provisions of NEPA for the Corps. It supplements CEQ regulations 40 CFR 1500–1508.
Noise Control Act of 1972 (42 USC Chapter 65) [6]	Protects the health and welfare of U.S. citizens from the growing risk of noise pollution, primarily from transportation vehicles, machinery, and other commerce products. Increased coordination between federal researchers and noise control activities; established noise emission standards; and presented noise emission and reduction information to the public.
U.S. Environmental Protection Agency Railroad Noise Emission Standards (40 CFR 201) [7]	Established final noise emission standards for surface carriers engaged in interstate commerce by railroad. This rulemaking is pursuant to Section 17 of the Noise Control Act of 1972.
FRA Railroad Noise Emission Compliance Regulations (49 CFR 210) [8]	These regulations indicate the minimum compliance regulations necessary to enforce EPA's Railroad Noise Emission Standards.
FRA Final Rule on the Use of Locomotive Horns at Highway-Rail Grade Crossings (49 CFR 222) [9] and (49 CFR 229) [10]	Requires the sounding of locomotive horns at public highway rail grade crossings. Considers the allowance of quiet zones when the increase risk is mitigated with supplementary grade crossing safety measures.
Federal Transit Administration Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06, May 2006) [1]	Provides procedures and guidance for analyzing the level of noise and vibration, assessing the resulting impacts, and determining possible mitigation for most federally funded transit projects.
FRA High-Speed Ground Transportation Noise and Vibration Impact Assessment (DOT/FRA/ORD-12/15) [2]	Provides guidance and methods for “the assessment of potential noise and vibration impacts resulting from proposed high-speed ground transportation projects.”
CREATE Program, "CREATE Noise and Vibration Assessment Methodology (CREATE) [3]	Provides guidance and methods for “the assessment of potential noise impacts resulting from proposed freight rail transportation projects.”
Local	
Berkeley County Noise Control Ordinances (Ordinance No. 05-08-56 [11] amended by Ordinance No. 09-04-21 [12])	Regulates excessive noise that interfere with the use, value and enjoyment of property and which pose a hazard to the public health, safety and welfare.

Notes:

USC = United States Code;

NEPA = National Environmental Policy Act;

Regulation, Statute, Guideline	Description
--------------------------------	-------------

CFR = Code of Federal Regulations;
FTA = Federal Transit Administration;
FRA = Federal Railroad Administration;

1.4 Methodology

The evaluation of potential noise and vibration impacts includes two parts: screening procedure and general assessment. The screening procedure is somewhat qualitative and uses basic information about a project and the area of proposed operation to develop an inventory of sensitive sites and/or receivers. Following the screening procedure, a general assessment was completed to develop more quantitative estimates of Project-related noise levels. By calculating Project-related train noise and existing noise at each receiver, the two types of noise can be compared with specific impact criteria, based on the type of land use that best describes the receiver. The impact criteria are used to designate each receiver as being severely impacted, moderately impacted, or not impacted (see discussion on Section **Error! Reference source not found.**). An inventory of impacts was then tabulated and used to make decisions regarding the potential need for noise mitigation.

The general noise assessment steps are described below. These steps are described in further detail in Section 3.0. The main items to consider are:

- **Source Levels** – Determine the Source Reference Level based on the type of project being assessed. For moving sources, the noise descriptor Sound Exposure Level (SEL) is used to describe a vehicle pass-by under reference operating conditions. For stationary sources, the SEL pertains to a typical operation for one hour.
- **Project Operating Conditions** – Convert the noise source reference level to noise exposure in terms of “hourly equivalent sound level” or $L_{eq}(h)$ or “day-night sound level” or L_{dn} under approximate operating characteristics. Noise exposure is first calculated at a reference distance of 50 feet from the track or corridor centerline.
- **Propagation Characteristics** – Generate noise exposure versus distance curves for each source that will allow for calculation of noise exposure at any distance from the corridor. Apply estimates of shielding attenuation from rows of buildings so that estimates of noise impact are not unrealistically high.
- **Study Area Characteristics** – Estimate the existing noise exposure at surrounding areas prior to any project construction or implementation.
- **Noise Impact Estimation** – Using impact criteria provided in the FRA guidelines, locate the distance from source at which project noise exposure related to existing noise exposure results in impact. Calculate distance to moderate impact and severe impact along the corridor, and generate impact contours, signifying the outer limits of impact.
- **Noise Impact Inventory** – Tabulate impacted receivers within moderate and severe impact contours, making sure to account for shielding attenuation from buildings.
- **Noise Mitigation** – In areas where impacts have been identified, estimate the noise reduction that would result from mitigation measures and repeat the tabulation of noise impacts after mitigation.

The FTA model has been adopted by the FRA, however the FTA model – which can be found on the FTA Noise Impact Assessment Spreadsheet (FTA Spreadsheet [13] ¹), is directly applicable to conventional rail noise. A supplemental freight rail analysis spreadsheet (CREATE Spreadsheet [14] [15]²) tool was developed for the Chicago Rail Efficiency And Transportation Efficiency (CREATE) program using the FTA Manual model procedures [3]. This tool was used for the purposes of the general assessment undertaken for this project.

1.5 Project Traffic Description

The Proposed Project will be used solely for freight traffic. The current traffic scenario is identified in Table 1-2 which reflects the basic assumptions for the impact assessment.

Table 1-2: General Assumptions for Project Traffic

<i>Line</i>	Assumption	Value	Notes
1	Total Traffic Per Day	$\frac{5}{7}$ (0.71)	Corresponds to a total of 5 trains per week
1.a	Average Hourly Daytime Traffic (7AM – 10PM)	$\frac{2.5}{7} \times \frac{1}{15}$ (0.024)	From Line 1, considered that half of the traffic will occur during day-time
1.b	Average Hourly Nighttime Traffic (10PM – 7AM)	$\frac{2.5}{7} \times \frac{1}{9}$ (0.040)	From Line 1, considered that half of the traffic will occur during night-time
2	Typical Train make-up		
2.a	Number of Locomotives	2	Per Train
2.b	Number of Cars	30	Per Train
2.c	Length of Car	76 ft	-
2.d	Speed	25 mph	-

2.0 INVENTORY OF SENSITIVE SITES

2.1 Study Area

The study area for direct impacts is within 1 mile of the project centerline. Figure 2-1 illustrates the study area.

¹ Federal Transit Administration Noise Impact Assessment Spreadsheet. <https://www.transit.dot.gov/regulations-and-guidance/environmental-programs/noise-impact-assessment-spreadsheet>

² CREATE Freight Noise and Vibration Model Spreadsheet. <https://www.fra.dot.gov/eLib/Details/L03727>

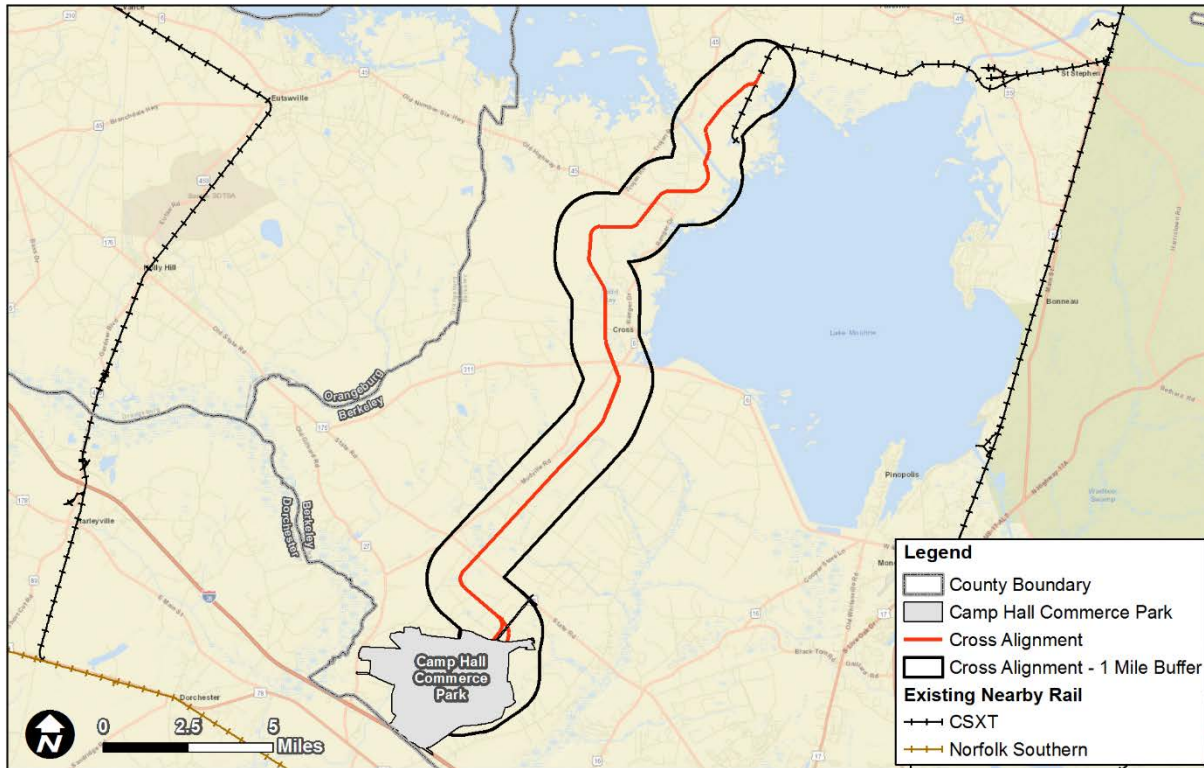


Figure 2-1: Study Area

2.2 Screening Areas

Screening distances were developed to identify the potential limits of noise impact from freight and passenger activity. The screening distances were based on the FTA Manual³. It must be noted that the FTA Manual does not provide a direct recommendation for the screening distance for a project with similar traffic as the Project under assessment.

As per FTA manual the screening distances are:

- For the project alignment: 750 ft
- In proximity of a crossing where train mounted horns will be used: 1,600 ft

The definition of proximity to a crossing is found in the FRA regulations⁴. The locomotive horn shall begin to be sounded at least 15 seconds, but no more than 20 seconds, before the locomotive enters the crossing. With a project speed of 25 mph, this results in a distance of 733 ft from all public crossings. The screening distances is presented in Figure 2-2.

³ FTA Manual Table 4-1 and 4-2.

⁴ 49 CFR 222, § 222.21 (2)

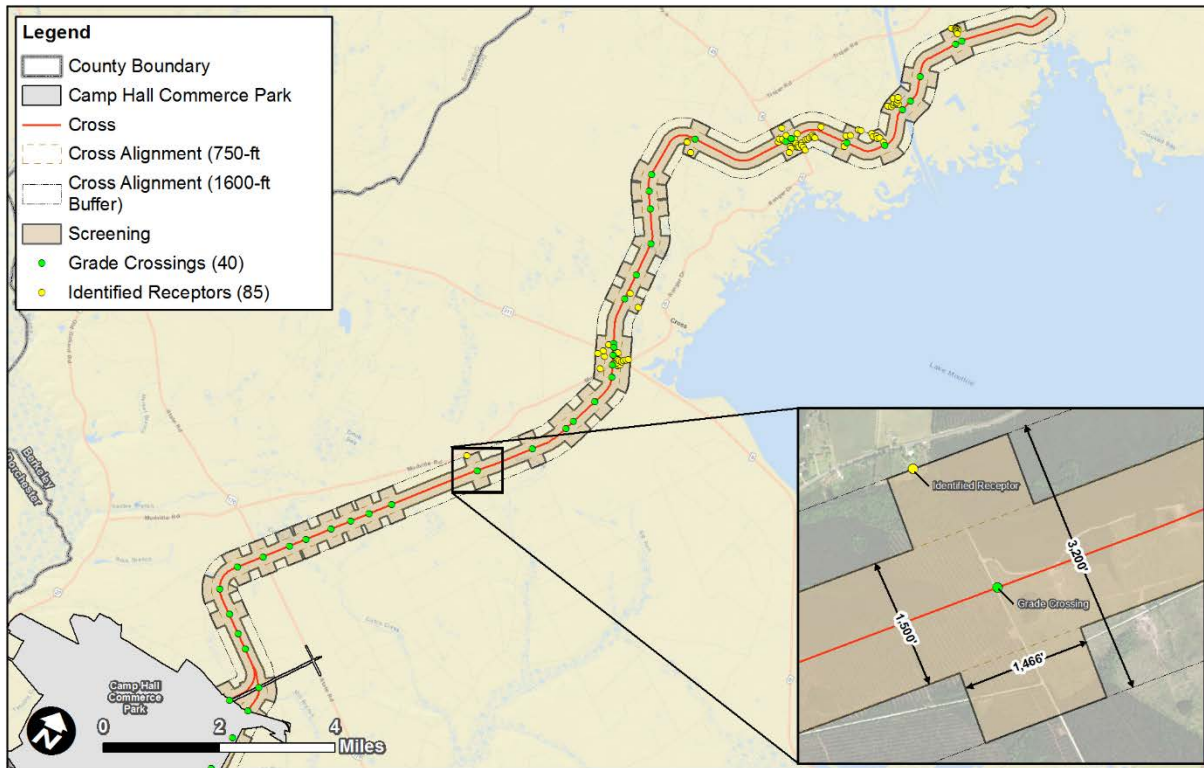


Figure 2-2: Screening Distances

2.3 Zoning Review

A review of the Berkeley County and Municipal Zoning Classifications was completed. Figure 2-3 shows the Berkeley County Zoning Map⁵.

⁵ Berkeley County Zoning Map, updated on February 14, 2014, as retrieved from http://gis.berkeleycountysc.gov/PDF/ZONING_OVERALL.pdf

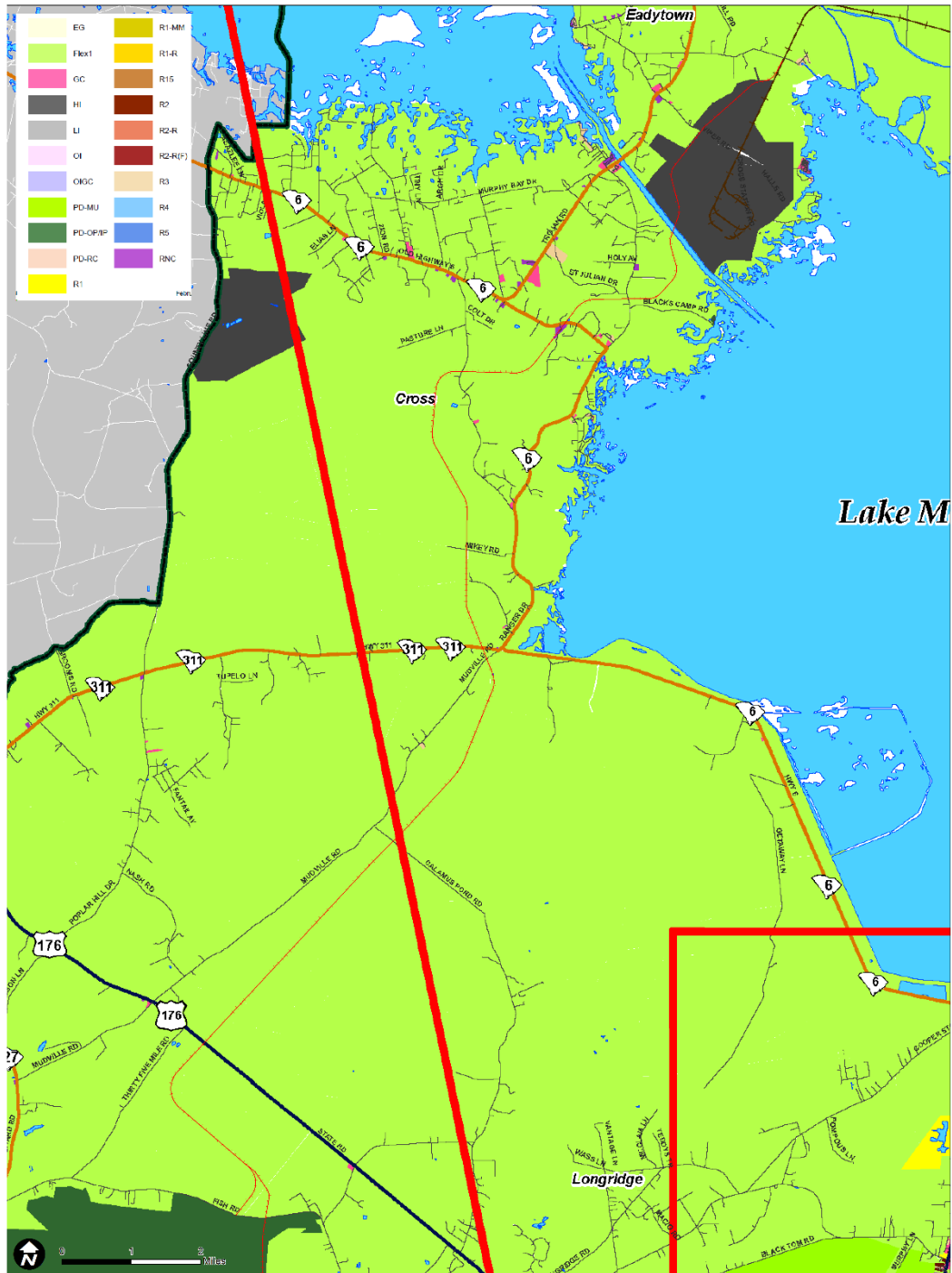


Figure 2-3: Berkeley County (SC) Zoning Map

The Project alignment passes through an area mainly designated as FLEX1. As per the Code of Ordinances, Berkeley County, South Carolina (Berkeley County Code) [16], FLEX1 is an Agricultural District. One of the permitted uses of this zone is for Residential Uses and therefore individual or clusters of residential buildings may be found. Near the intersection of the Project alignment and Highway 6, the alignment will cross a zoning classified as RNC. As per Berkeley

County Code, this zone is for Rural and neighborhood commercial district. Within a RNC zone permitted uses include residential, commercial, recreational and institutional uses. On the portion of the Project alignment north of the Diversion Canal, the alignment will cross a zone classified as HI. As per Berkeley County Code, this zone is for Heavy Industrial. Within a HI zone permitted uses include agricultural, commercial, industrial, recreational and institutional uses.

2.4 Noise Evaluation Areas

The screening distance is variable within the study area, so the study area was subdivided into noise evaluation areas (NEA's) assumed to have similar background noise conditions. Each NEA was evaluated in terms of unique noise receptors for analysis. A list of all the NEA's for the project and receptors is presented in Table 2-1.

Table 2-1: Receptors Identified During Screening

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
NEA	Receptor	Address	Coordinates		Existing Land Use	Type of Structure	Distance to Alignment [ft]
			Longitude	Latitude			
NEA_01	PR_01	2341 Mudville Road	-80.20154756	33.24418234	FLEX1	Residential	1600
NEA_02	PR_02	2924 Mudville Road	-80.17602582	33.27767545	FLEX1	Residential	1200
NEA_03	PR_03a	2991 Mudville Road	-80.17219556	33.28018193	FLEX1	Residential	450
	PR_03b	n/a	-80.17193846	33.28002533	FLEX1	Residential	660
NEA_04	PR_04a	n/a	-80.17286622	33.28034991	FLEX1	Residential	100
	PR_04b	2982 Mudville Road	-80.17286622	33.28034991	FLEX1	Residential	180
	PR_04c	n/a	-80.17286622	33.28034991	FLEX1	Residential	310
NEA_05	PR_05a	n/a	-80.17203945	33.28165162	FLEX1	Residential	523
	PR_05b	n/a	-80.17203945	33.28165162	FLEX1	Residential	690
	PR_05c	n/a	-80.17203945	33.28165162	FLEX1	Residential	915
NEA_06	PR_06a	1030 Highway 311	-80.17038301	33.28232898	FLEX1	Residential	1000
	PR_06b	n/a	-80.17038301	33.28232898	FLEX1	Residential	1215
	PR_06c	1015 Ranger Drive	-80.17038301	33.28232898	FLEX1	Residential	1415
NEA_07	PR_07	n/a	-80.17240948	33.28309182	FLEX1	Residential	415
NEA_08	PR_08a	Red Ash Lane	-80.17657933	33.28122901	FLEX1	Residential	790
	PR_08b	1119 Highway 311	-80.17657933	33.28122901	FLEX1	Residential	915
	PR_08c	J.L. Williams House	-80.1777997	33.28113809	FLEX1	Historical	1390
NEA_09	PR_09	1126 Highway 311	-80.1769639	33.28415208	FLEX1	Residential	460
NEA_10	PR_10	276 George Wigfall Road	-80.17321196	33.29620146	FLEX1	Residential	1450
NEA_11	PR_11	Dora Way	-80.17697782	33.29772158	FLEX1	Residential	250
NEA_12	PR_12a	n/a	-80.1797322	33.33891432	FLEX1	Residential	430

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
NEA	Receptor	Address	Coordinates		Existing Land Use	Type of Structure	Distance to Alignment [ft]
			Longitude	Latitude			
	PR_12b	n/a	-80.1797322	33.33891432	FLEX1	Residential	590
NEA_13	PR_13	n/a	-80.17750646	33.33684509	FLEX1	Residential	1285
NEA_14	PR_14a	n/a	-80.15531755	33.34896562	FLEX1	Residential	260
	PR_14b	n/a	-80.15531755	33.34896562	FLEX1	Residential	450
	PR_14c	n/a	-80.15531755	33.34896562	RNC	Residential	295
	PR_14d	n/a	-80.15491699	33.34986539	FLEX1	Residential	485
NEA_15	PR_15	Abraham Lane	-80.15585582	33.35062424	FLEX1	Residential	1220
NEA_16	PR_16a	Cherokee Path Lane	-80.15166305	33.34746302	FLEX1	Residential	630
	PR_16b	Cherokee Path Lane	-80.15166305	33.34746302	FLEX1	Residential	800
	PR_16c	Cherokee Path Lane	-80.15166305	33.34746302	FLEX1	Residential	1060
NEA_17	PR_17a	n/a	-80.15135013	33.34973389	FLEX1	Residential	310
	PR_17b	1138 Old Highway 6	-80.15135013	33.34973389	RNC	Residential	245
	PR_17c	n/a	-80.15135013	33.34973389	FLEX1	Residential	605
NEA_18	PR_18a	n/a	-80.14971915	33.34898574	FLEX1	Residential	930
	PR_18b	n/a	-80.14971915	33.34898574	FLEX1	Residential	867
	PR_18c	n/a	-80.14971915	33.34898574	FLEX1	Residential	1045
NEA_19	PR_19a	n/a	-80.14853795	33.34930919	FLEX1	Residential	885
	PR_19b	245 Harley Circle	-80.14853795	33.34930919	FLEX1	Residential	845
	PR_19c	n/a	-80.14853795	33.34930919	FLEX1	Residential	1015
	PR_19d	Jerusalem Church	-80.14853795	33.34930919	FLEX1	Institutional	1240
	PR_19e	n/a	-80.14853795	33.34930919	FLEX1	Residential	1550
NEA_20	PR_20	n/a	-80.1517578	33.35206979	FLEX1	Residential	135
NEA_21	PR_21a	n/a	-80.1476464	33.35198334	FLEX1	Residential	745

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
NEA	Receptor	Address	Coordinates		Existing Land Use	Type of Structure	Distance to Alignment [ft]
			Longitude	Latitude			
NEA	PR_21b	n/a	-80.1476464	33.35198334	FLEX1	Residential	755
	PR_21c	n/a	-80.1476464	33.35198334	FLEX1	Residential	735
	PR_21d	n/a	-80.147611	33.35210629	FLEX1	Residential	625
	PR_21e	n/a	-80.14750468	33.35210527	FLEX1	Residential	475
	PR_21f	n/a	-80.14750468	33.35210527	FLEX1	Residential	640
	PR_21g	n/a	-80.14683957	33.35251171	FLEX1	Residential	735
NEA_22	PR_22	n/a	-80.14564716	33.35576468	FLEX1	Residential	388
NEA_23	PR_23a	n/a	-80.1384932	33.35667831	FLEX1	Residential	530
	PR_23b	n/a	-80.13716901	33.3569272	FLEX1	Residential	725
NEA_24	PR_24a	2249 Ranger Drive	-80.13711175	33.35401177	FLEX1	Residential	195
	PR_24b	2243 Ranger Drive	-80.13711175	33.35401177	FLEX1	Residential	360
NEA_25	PR_25a	n/a	-80.13554441	33.35889405	FLEX1	Residential	1507
	PR_25b	n/a	-80.13554441	33.35889405	FLEX1	Residential	1570
NEA_26	PR_26a	n/a	-80.13058773	33.35935441	FLEX1	Residential	1404
	PR_26b	n/a	-80.13058773	33.35935441	FLEX1	Residential	1130
	PR_26c	n/a	-80.13058773	33.35935441	FLEX1	Residential	1055
	PR_26d	n/a	-80.12868491	33.35913038	FLEX1	Residential	802
	PR_26e	n/a	-80.12868491	33.35913038	FLEX1	Residential	790
	PR_26f	n/a	-80.12669654	33.35881665	FLEX1	Residential	266
NEA_27	PR_27a	n/a	-80.12884593	33.36820866	FLEX1	Residential	1260
	PR_27b	n/a	-80.12918121	33.36803004	FLEX1	Residential	905
	PR_27c	n/a	-80.12922861	33.36863191	FLEX1	Residential	876
	PR_27d	n/a	-80.12922861	33.36863191	FLEX1	Residential	915

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
NEA	Receptor	Address	Coordinates		Existing Land Use	Type of Structure	Distance to Alignment [ft]
			Longitude	Latitude			
	PR_27e	n/a	-80.12859147	33.36933671	FLEX1	Residential	679
	PR_27f	n/a	-80.12859147	33.36933671	FLEX1	Residential	561
	PR_27g	n/a	-80.12859147	33.36933671	FLEX1	Residential	815
	PR_27h	n/a	-80.12859147	33.36933671	FLEX1	Residential	1288
	PR_27i	n/a	-80.12828963	33.37024506	FLEX1	Residential	950
	PR_27j	n/a	-80.12828963	33.37024506	FLEX1	Residential	1028
NEA_28	PR_28a	n/a	-80.12118024	33.39158984	FLEX1	Residential	1454
	PR_28b	n/a	-80.12146512	33.39216728	FLEX1	Residential	1234
	PR_28c	n/a	-80.12146512	33.39216728	FLEX1	Residential	1260
	PR_28d	n/a	-80.12146512	33.39216728	FLEX1	Residential	1260
	PR_28e	n/a	-80.12146512	33.39216728	FLEX1	Residential	1170
	PR_28f	n/a	-80.12133495	33.39206548	FLEX1	Residential	1130
	PR_28g	n/a	-80.121268	33.39189461	FLEX1	Residential	1005
	PR_28h	n/a	-80.121268	33.39189461	FLEX1	Residential	995
	PR_28i	n/a	-80.121268	33.39189461	FLEX1	Residential	965
	PR_28j	n/a	-80.121268	33.39189461	FLEX1	Residential	1050
	PR_28k	n/a	-80.121268	33.39189461	FLEX1	Residential	900
	PR_28l	n/a	-80.12082629	33.3914237	FLEX1	Residential	751

Table Notes:

- (A) **NEA** – Noise Evaluation Area
- (B) **Receptor** – Receptor labeling used in Figure 3a to 3e
- (C) **Address** – Receptor address (if available)
- (D) **Longitude** – Receptor longitude
- (E) **Latitude** – Receptor latitude
- (F) **Existing Land Use** – Land use as identified in Local Planning

- (G) **Type of Structure** – Type of structure identified as part of the sceening
- (H) **Distance to Track Alignment [ft]** – Measured distance from receptor location to track alignment.

2.5 Noise Evaluation Criteria

The FTA and FRA established similar procedures and guidelines for assessing train noise. Train noise is generally expressed in terms of A-weighted sound pressure level as a function of time. The time descriptor used in this train noise assessment is the day-night noise level (L_{dn}). The L_{dn} can be thought of as a 24-hour average noise level that penalizes noise events that happen at night (10pm to 07am) because most people are more annoyed by noise at nighttime than during the daytime.

This noise assessment assessed Project-related noise at land uses where overnight sleep occurs (primarily residences); this is consistent with FRA guidance. Residences were identified by visual inspection of digital aerial photographs; no site surveys were performed. The impact assessment, discussed later in this document, uses the term receptors to refer to land uses where overnight sleep occurs; each noise impact identified later in this report represents a single receptor, or land use where overnight sleep occurs.

The FTA noise impact criteria⁶ are defined by two curves, representing severe and moderate noise impacts, which are defined as:

- **Severe Impact**. A significant percentage of people are highly annoyed by noise in this range. Noise mitigation would normally be specified for severe impact areas unless it is not feasible or reasonable (unless there is no practical method of mitigating the impact).
- **Moderate Impact**. In this range, other project-specific factors are considered to determine the magnitude of the impact and the need for mitigation. Other factors include the predicted increase over existing noise levels, the types and number of noise-sensitive land uses affected, existing outdoor-indoor sound insulation, and the cost-effectiveness of mitigating noise to more acceptable levels.

Each of these curves are expressed for the three following land use categories defined in the FTA Manual⁷:

- **Category 1:** Tracts of land where quiet is an essential element for their intended purpose. This category includes tracts of land set aside for serenity and quiet and such land uses as outdoor concert pavilions, as well as National Historical Landmarks with significant outdoor use.
- **Category 2: Residential** – This category covers all residential land uses and any buildings where people sleep, such as hotels and hospitals.
- **Category 3: Institutional** – This category includes schools, parks, libraries, cemeteries, and churches where it is important to avoid interference with such activities as speech, meditation and concentration on reading.

Figure 2-4 illustrates the FTA noise impact criteria, these are based on existing noise exposure and project-related noise exposure. FTA noise impact thresholds vary with existing noise levels and with the land time use.

⁶ Noise impact criteria is identified in **Figure 3-1** from the FTA Manual

⁷ Land use categories are identified in **Table 3-2** from the FTA Manual

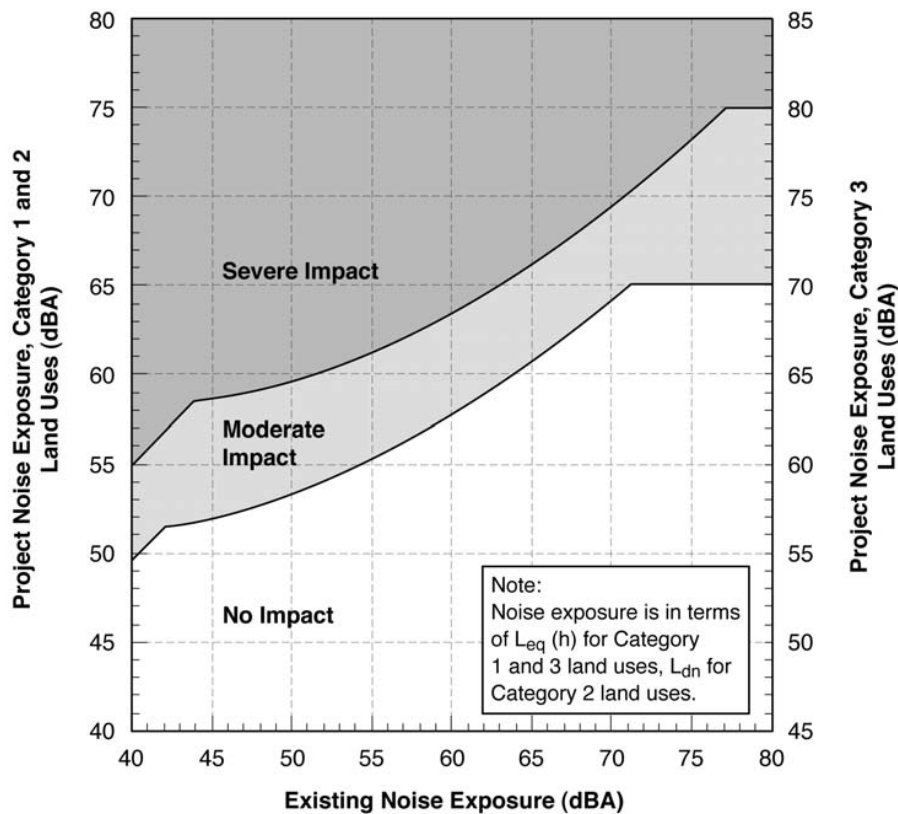


Figure 2-4: FTA Noise Impact Criteria

2.6 Existing Noise Levels

The existing noise levels were estimated based on **Section 5.4** of the FTA Manual. In proximity of major roadways, the estimate existing noise level was determined based on noise level estimation with distance to the roadway (**Table 5-7** of the FTA Manual). When there are no major roadways and the noise characteristics that surround a receptor are far enough from major roadways and is dominated by local streets and local community activity the existing noise levels were estimated based on population density (**Table 5-7** of the FTA Manual).

Existing noise exposure levels are presented on Table 2-2: Existing Noise Exposure Levels are based on the methodology described above.

Table 2-2: Existing Noise Exposure Levels

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
Receptor	Near Major Roadway	Roadway	Distance [ft]	Census		Existing Noise Exposure (FTA Tbl 5-7)				
				County	Population Density [ppl/sq-mi]	Based on...	L _{eq,D}	L _{eq,E}	L _{eq,N}	L _{dn}
PR_01	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_02	No	n/a	n/a	Berkeley	122	Other Roadway	55	50	45	55
PR_03a	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_03b	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_04a	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_04b	Yes	Old Hwy 6	535	Berkeley	122	Population Density	40	35	30	40
PR_04c	Yes	Old Hwy 6	215	Berkeley	122	Population Density	40	35	30	40
PR_05a	Yes	Old Hwy 6	190	Berkeley	122	Other Roadway	60	55	50	60
PR_05b	Yes	Old Hwy 6	215	Berkeley	122	Other Roadway	60	55	50	60
PR_05c	Yes	Old Hwy 6	750	Berkeley	122	Other Roadway	60	55	50	60
PR_06a	Yes	State Hwy 6	680	Berkeley	122	Other Roadway	60	55	50	60
PR_06b	Yes	State Hwy 6	770	Berkeley	122	Population Density	40	35	30	40
PR_06c	No	n/a	n/a	Berkeley	122	Other Roadway	55	50	45	55
PR_07	Yes	State Hwy 6	95	Berkeley	122	Other Roadway	55	50	45	55
PR_08a	Yes	State Hwy 6	105	Berkeley	122	Other Roadway	50	45	40	50
PR_08b	Yes	State Hwy 6	160	Berkeley	122	Other Roadway	60	55	50	60
PR_08c	Yes	State Hwy 6	318	Berkeley	122	Other Roadway	50	45	40	50
PR_09	Yes	State Hwy 6	140	Berkeley	122	Other Roadway	50	45	40	50
PR_10	Yes	State Hwy 6	195	Berkeley	122	Population Density	40	35	30	40
PR_11	Yes	State Hwy 6	145	Berkeley	122	Population Density	40	35	30	40

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
Receptor	Near Major Roadway	Roadway	Distance [ft]	Census		Existing Noise Exposure (FTA Tbl 5-7)				
				County	Population Density [ppl/sq-mi]	Based on...	L _{eq,D}	L _{eq,E}	L _{eq,N}	L _{dn}
PR_12a	Yes	State Hwy 6	270	Berkeley	122	Population Density	40	35	30	40
PR_12b	Yes	State Hwy 6	100	Berkeley	122	Population Density	40	35	30	40
PR_13	Yes	State Hwy 6	110	Berkeley	122	Population Density	40	35	30	40
PR_14a	Yes	State Hwy 6	215	Berkeley	122	Other Roadway	50	45	40	50
PR_14b	Yes	State Hwy 6	645	Berkeley	122	Other Roadway	55	50	45	55
PR_14c	No	n/a	n/a	Berkeley	122	Other Roadway	60	55	50	60
PR_14d	No	n/a	n/a	Berkeley	122	Other Roadway	55	50	45	55
PR_15	No	n/a	n/a	Berkeley	122	Other Roadway	50	45	40	50
PR_16a	No	n/a	n/a	Berkeley	122	Other Roadway	50	45	40	50
PR_16b	No	n/a	n/a	Berkeley	122	Other Roadway	50	45	40	50
PR_16c	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_17a	No	n/a	n/a	Berkeley	122	Other Roadway	65	60	55	65
PR_17b	No	n/a	n/a	Berkeley	122	Other Roadway	60	55	50	60
PR_17c	Yes	n/a	n/a	Berkeley	122	Other Roadway	60	55	50	60
PR_18a	Yes	n/a	n/a	Berkeley	122	Other Roadway	55	50	45	55
PR_18b	Yes	n/a	n/a	Berkeley	122	Other Roadway	60	55	50	60
PR_18c	Yes	n/a	n/a	Berkeley	122	Other Roadway	60	55	50	60
PR_19a	Yes	n/a	n/a	Berkeley	122	Other Roadway	60	55	50	60
PR_19b	Yes	n/a	n/a	Berkeley	122	Other Roadway	55	50	45	55
PR_19c	No	n/a	n/a	Berkeley	122	Other Roadway	60	55	50	60
PR_19d	No	n/a	n/a	Berkeley	122	Other Roadway	60	55	50	60
PR_19e	No	n/a	n/a	Berkeley	122	Other Roadway	55	50	45	55

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
Receptor	Near Major Roadway	Roadway	Distance [ft]	Census		Existing Noise Exposure (FTA Tbl 5-7)				
				County	Population Density [ppl/sq-mi]	Based on...	Leq,D	Leq,E	Leq,N	L _{dn}
PR_20	No	n/a	n/a	Berkeley	122	Other Roadway	50	45	40	50
PR_21a	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_21b	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_21c	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_21d	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_21e	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_21f	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_21g	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_22	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_23a	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_23b	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_24a	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_24b	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_25a	Yes	State Rd S-8-708	155	Berkeley	122	Population Density	40	35	30	40
PR_25b	Yes	State Rd S-8-708	150	Berkeley	122	Population Density	40	35	30	40
PR_26a	Yes	State Rd S-8-708	250	Berkeley	122	Population Density	40	35	30	40
PR_26b	Yes	State Rd S-8-708	355	Berkeley	122	Population Density	40	35	30	40
PR_26c	Yes	State Rd S-8-708	405	Berkeley	122	Population Density	40	35	30	40
PR_26d	Yes	State Rd S-8-708	322	Berkeley	122	Population Density	40	35	30	40
PR_26e	Yes	State Rd S-8-708	373	Berkeley	122	Population Density	40	35	30	40
PR_26f	Yes	State Rd S-8-708	317	Berkeley	122	Population Density	40	35	30	40
PR_27a	Yes	State Rd S-8-708	320	Berkeley	122	Population Density	40	35	30	40

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
Receptor	Near Major Roadway	Roadway	Distance [ft]	Census		Existing Noise Exposure (FTA Tbl 5-7)				
				County	Population Density [ppl/sq-mi]	Based on...	L _{eq,D}	L _{eq,E}	L _{eq,N}	L _{dn}
PR_27b	Yes	State Rd S-8-708	195	Berkeley	122	Population Density	40	35	30	40
PR_27c	Yes	State Rd S-8-708	140	Berkeley	122	Population Density	40	35	30	40
PR_27d	Yes	State Rd S-8-708	155	Berkeley	122	Population Density	40	35	30	40
PR_27e	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_27f	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_27g	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_27h	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_27i	No	n/a	n/a	Berkeley	122	Population Density	40	35	30	40
PR_27j	Yes	Old Hwy 6	535	Berkeley	122	Population Density	40	35	30	40
PR_28a	Yes	Old Hwy 6	215	Berkeley	122	Other Roadway	60	55	50	60
PR_28b	Yes	Old Hwy 6	190	Berkeley	122	Other Roadway	60	55	50	60
PR_28c	Yes	Old Hwy 6	215	Berkeley	122	Other Roadway	55	50	45	55
PR_28d	Yes	Old Hwy 6	750	Berkeley	122	Other Roadway	55	50	45	55
PR_28e	Yes	State Hwy 6	680	Berkeley	122	Other Roadway	50	45	40	50
PR_28f	Yes	State Hwy 6	770	Berkeley	122	Other Roadway	55	50	45	55
PR_28g	No	n/a	n/a	Berkeley	122	Other Roadway	55	50	45	55
PR_28h	Yes	State Hwy 6	95	Berkeley	122	Other Roadway	55	50	45	55
PR_28i	Yes	State Hwy 6	105	Berkeley	122	Other Roadway	55	50	45	55
PR_28j	Yes	State Hwy 6	160	Berkeley	122	Other Roadway	60	55	50	60
PR_28k	Yes	State Hwy 6	318	Berkeley	122	Other Roadway	60	55	50	60
PR_28l	Yes	State Hwy 6	140	Berkeley	122	Other Roadway	60	55	50	60

Table Notes:

(I) **Receptor** – Receptor labeling used in Figure 3a to 3e.

- (J) **Near Major Roadway** – Identifies if the receptor is in proximity of a major roadway.
- (K) **Roadway** – Identifies the major roadway in proximity of the receptor
- (L) **Distance [ft]** – Measured distance from receptor location to major roadway.
- (M) **County** – County that the receptor is located within.
- (N) **Population Density** – County population density in number of people per square mile.
- (O) **Existing Noise Exposure – Base on...** – Defines the columns used for estimation of noise levels based on **Table 5-7** from the FTA Manual.
- (P) **$L_{eq,D}$** – Day-time L_{eq} .
- (Q) **$L_{eq,E}$** – Evening L_{eq} .
- (R) **$L_{eq,E}$** – Night-Time L_{eq} .
- (S) **L_{DN}** – Day-Night sound pressure level.

2.7 Vibration Evaluation Criteria

The FTA Manual provides a calculation method for predicting vibration levels for a generalized assessment. The criteria for ground borne vibration is established based on frequency of operation and specific land uses. The three identified land uses⁸ for vibration assessment are:

- **Vibration Category 1 – High Sensitivity:** Included in Category 1 are buildings where vibration would interfere with operations within the building, including levels that may be well below those associated with human annoyance.
- **Vibration Category 2 – Residential:** This category covers all residential land uses and any buildings where people sleep, such as hotels and hospitals. No differentiation is made between different types of residential areas.
- **Vibration Category 3 – Institutional:** Vibration Category 3 includes schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment, but still have the potential for activity interference.

There are also some buildings that can be very sensitive to vibration and noise but do not fit into any of the three categories previously listed. Examples include concert halls, TV and recording studios, and theaters. These buildings have their own impact criteria and are treated separately from the aforementioned categories.

The limits are presented in Table 2-3 which represent the FTA Manual⁹ limits for both ground borne vibration (GBV) and ground borne noise (GBN).

Table 2-3: Ground Borne Vibrations (GBV) Impact and Ground-Borne Noise (GBN) Impact Criteria for General Assessment

Land Use Category	GBV Impact Levels (VdB re 1 µin/sec)			GBN Impact Levels (dB re 20 micro Pascals)		
	Frequent Events ¹	Occasional Events ²	Infrequent Events ³	Frequent Events ¹	Occasional Events ²	Infrequent Events ³
Category 1: Buildings where vibration would interfere with interior operations	65 VdB ⁴	65 VdB ⁴	65 VdB ⁴	N/A ⁵	N/A ⁵	N/A ⁵
Category 2: Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

⁸ Land use categories are identified in **Section 8.1.1** from the FTA Manual

⁹ Impact limits for operational vibrations are identified in **Table 8-1** from the FTA Manual

Land Use Category	GBV Impact Levels (VdB re 1 µin/sec)			GBN Impact Levels (dB re 20 micro Pascals)		
	Frequent Events ¹	Occasional Events ²	Infrequent Events ³	Frequent Events ¹	Occasional Events ²	Infrequent Events ³

Notes:

1. *Frequent Events* is defined as more than 70 vibration events of the same kind per day.
2. *Occasional Events* is defined as between 30 and 70 vibration events of the same kind per day.
3. *Infrequent Events* is defined as fewer than 30 vibration events of the same kind per day.
4. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
5. Vibration-sensitive equipment is not sensitive to ground-borne noise.

3.0 OPERATIONAL NOISE

3.1 No Build Alternative

Under the No-Build Alternative no freight train will be introduced and the noise levels at the receptors will remain unchanged.

3.2 Project Alternative

3.2.1 Estimated Noise Levels and Impact Assessment

The estimated noise levels from the Proposed Project were calculated based on two distinct models:

- For receptors in proximity of a public crossing the model used was the FRA Horn Model [17]. It should be noted that this model is provided by the FRA¹⁰ in a closed (secured) excel format. This model does not provide as an output specific exterior noise level, rather only the impact assessment based on distance between the receptor and the alignment and distance to crossing.
- For receptors not in proximity of a public crossing the CREATE model was used [18]. It should be noted that this model is provided by the FRA¹¹ in a closed (secured) excel format. This model does provide an estimated exterior sound level based on the distance between the receptor and the alignment.

For each receptor identified in Section 2.4 an assessment of impact was conducted and the results presented in Table 3-1.

¹⁰ Horn Noise MS Excel spreadsheet model [15], in Excel spreadsheet format as provided by the FRA can be found at <https://www.fra.dot.gov/eLib/Details/L04091>

¹¹ CREATE Freight Noise and Vibration Model MS Excel Spreadsheet Model [13], in Excel spreadsheet format as provided by the FRA can be found at <https://www.fra.dot.gov/eLib/Details/L03727>

Table 3-1: General Noise Assessment

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
Receptor	FTA Land Use / Noise Metric	Distance to Track Alignment [ft]	Near Crossing / Longitudinal distance to Crossing [ft]	Existing Land Use	Existing Noise Level [dBA]	Predicted Exterior Noise Levels [dBA]	Scenario Impacts			
							Increase in Overall Noise Exposure – Build over Existing [dBA]	FTA Allowable Increase [dBA]		Impact Under FTA Criteria
								MI	SI	
PR_01	2 / Ldn	1600	Yes / 295	FLEX1	40	n/a	n/a	10	15	No Impact
PR_02	2 / Ldn	1200	Yes / 160	FLEX1	55	n/a	n/a	4	7	No Impact
PR_03a	2 / Ldn	450	Yes / 60	FLEX1	40	n/a	n/a	10	15	Moderate Impact
PR_03b	2 / Ldn	660	Yes / 60	FLEX1	40	n/a	n/a	10	15	No Impact
PR_04a	2 / Ldn	100	Yes / 113	FLEX1	40	n/a	n/a	10	15	No Impact
PR_04b	2 / Ldn	180	Yes / 155	FLEX1	40	n/a	n/a	10	15	No Impact
PR_04c	2 / Ldn	310	Yes / 135	FLEX1	40	n/a	n/a	10	15	Moderate Impact
PR_05a	2 / Ldn	523	Yes / 397	FLEX1	60	n/a	n/a	2	5	No Impact
PR_05b	2 / Ldn	690	Yes / 396	FLEX1	60	n/a	n/a	2	5	No Impact
PR_05c	2 / Ldn	915	Yes / 300	FLEX1	60	n/a	n/a	2	5	No Impact
PR_06a	2 / Ldn	1000	Yes / 419	FLEX1	60	n/a	n/a	2	5	No Impact
PR_06b	2 / Ldn	1215	Yes / 410	FLEX1	40	n/a	n/a	10	15	No Impact
PR_06c	2 / Ldn	1415	Yes / 330	FLEX1	55	n/a	n/a	4	7	No Impact
PR_07	2 / Ldn	415	Yes / 253	FLEX1	55	n/a	n/a	4	7	No Impact
PR_08a	2 / Ldn	790	Yes / 245	FLEX1	50	n/a	n/a	5	10	No Impact
PR_08b	2 / Ldn	915	Yes / 264	FLEX1	60	n/a	n/a	2	5	No Impact
PR_08c	1 / Leq(h)	1390	Yes / 0	FLEX1	50	n/a	n/a	5	10	No Impact
PR_09	2 / Ldn	460	Yes / 111	FLEX1	50	n/a	n/a	5	10	No Impact
PR_10	2 / Ldn	1450	Yes / 259	FLEX1	40	n/a	n/a	10	15	No Impact

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
Receptor	FTA Land Use / Noise Metric	Distance to Track Alignment [ft]	Near Crossing / Longitudinal distance to Crossing [ft]	Existing Land Use	Existing Noise Level [dBA]	Predicted Exterior Noise Levels [dBA]	Scenario Impacts			
							Increase in Overall Noise Exposure – Build over Existing [dBA]	FTA Allowable Increase [dBA]		Impact Under FTA Criteria
								MI	SI	
PR_11	2 / Ldn	250	Yes / 569	FLEX1	40	n/a	n/a	10	15	Moderate Impact
PR_12a	2 / Ldn	430	Yes / 558	FLEX1	40	n/a	n/a	10	15	No Impact
PR_12b	2 / Ldn	590	Yes / 560	FLEX1	40	n/a	n/a	10	15	No Impact
PR_13	2 / Ldn	1285	Yes / 140	FLEX1	40	n/a	n/a	10	15	No Impact
PR_14a	2 / Ldn	260	Yes / 645	FLEX1	50	n/a	n/a	5	10	Moderate Impact
PR_14b	2 / Ldn	450	Yes / 391	FLEX1	55	n/a	n/a	4	7	No Impact
PR_14c	2 / Ldn	295	Yes / 166	RNC	60	n/a	n/a	2	5	No Impact
PR_14d	2 / Ldn	485	Yes / 266	FLEX1	55	n/a	n/a	4	7	No Impact
PR_15	2 / Ldn	1220	Yes / 191	FLEX1	50	n/a	n/a	5	10	No Impact
PR_16a	2 / Ldn	630	Yes / 189	FLEX1	50	n/a	n/a	5	10	No Impact
PR_16b	2 / Ldn	800	Yes / 177	FLEX1	50	n/a	n/a	5	10	No Impact
PR_16c	2 / Ldn	1060	Yes / 104	FLEX1	40	n/a	n/a	10	15	No Impact
PR_17a	2 / Ldn	310	Yes / 102	FLEX1	65	n/a	n/a	1	4	No Impact
PR_17b	2 / Ldn	245	Yes / 288	RNC	60	n/a	n/a	2	5	No Impact
PR_17c	2 / Ldn	605	Yes / 179	FLEX1	60	n/a	n/a	2	5	No Impact
PR_18a	2 / Ldn	930	Yes / 145	FLEX1	55	n/a	n/a	4	7	No Impact
PR_18b	2 / Ldn	867	Yes / 309	FLEX1	60	n/a	n/a	2	5	No Impact
PR_18c	2 / Ldn	1045	Yes / 282	FLEX1	60	n/a	n/a	2	5	No Impact
PR_19a	2 / Ldn	885	Yes / 597	FLEX1	60	n/a	n/a	2	5	No Impact
PR_19b	2 / Ldn	845	Yes / 728	FLEX1	55	n/a	n/a	4	7	No Impact
PR_19c	2 / Ldn	1015	Yes / 573	FLEX1	60	n/a	n/a	2	5	No Impact

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
Receptor	FTA Land Use / Noise Metric	Distance to Track Alignment [ft]	Near Crossing / Longitudinal distance to Crossing [ft]	Existing Land Use	Existing Noise Level [dBA]	Predicted Exterior Noise Levels [dBA]	Scenario Impacts			
							Increase in Overall Noise Exposure – Build over Existing [dBA]	FTA Allowable Increase [dBA]		Impact Under FTA Criteria
								MI	SI	
PR_19d	3 / Leq(h)	1240	Yes / 635	FLEX1	60	n/a	n/a	2	5	No Impact
PR_19e	2 / Ldn	1550	Yes / 675	FLEX1	55	n/a	n/a	4	7	No Impact
PR_20	2 / Ldn	135	Yes / 684	FLEX1	50	n/a	n/a	5	10	Moderate Impact
PR_21a	2 / Ldn	745	No / n/a	FLEX1	40	46	7	10	15	No Impact
PR_21b	2 / Ldn	755	No / n/a	FLEX1	40	46	7	10	15	No Impact
PR_21c	2 / Ldn	735	No / n/a	FLEX1	40	46	7	10	15	No Impact
PR_21d	2 / Ldn	625	No / n/a	FLEX1	40	47	8	10	15	No Impact
PR_21e	2 / Ldn	475	No / n/a	FLEX1	40	49	10	10	15	No Impact
PR_21f	2 / Ldn	640	No / n/a	FLEX1	40	47	8	10	15	No Impact
PR_21g	2 / Ldn	735	No / n/a	FLEX1	40	46	7	10	15	No Impact
PR_22	2 / Ldn	388	No / n/a	FLEX1	40	50	10	10	15	No Impact
PR_23a	2 / Ldn	530	Yes / 314	FLEX1	40	n/a	n/a	10	15	No Impact
PR_23b	2 / Ldn	725	Yes / 33	FLEX1	40	n/a	n/a	10	15	No Impact
PR_24a	2 / Ldn	195	Yes / 146	FLEX1	40	n/a	n/a	10	15	No Impact
PR_24b	2 / Ldn	360	Yes / 69	FLEX1	40	n/a	n/a	10	15	Moderate Impact
PR_25a	2 / Ldn	1507	Yes / 529	FLEX1	40	n/a	n/a	10	15	No Impact
PR_25b	2 / Ldn	1570	Yes / 747	FLEX1	40	n/a	n/a	10	15	No Impact
PR_26a	2 / Ldn	1404	Yes / 597	FLEX1	40	n/a	n/a	10	15	No Impact
PR_26b	2 / Ldn	1130	Yes / 570	FLEX1	40	n/a	n/a	10	15	No Impact
PR_26c	2 / Ldn	1055	Yes / 276	FLEX1	40	n/a	n/a	10	15	No Impact
PR_26d	2 / Ldn	802	Yes / 317	FLEX1	40	n/a	n/a	10	15	No Impact

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
Receptor	FTA Land Use / Noise Metric	Distance to Track Alignment [ft]	Near Crossing / Longitudinal distance to Crossing [ft]	Existing Land Use	Existing Noise Level [dBA]	Predicted Exterior Noise Levels [dBA]	Scenario Impacts			
							Increase in Overall Noise Exposure – Build over Existing [dBA]	FTA Allowable Increase [dBA]		Impact Under FTA Criteria
								MI	SI	
PR_26e	2 / Ldn	790	Yes / 82	FLEX1	40	n/a	n/a	10	15	No Impact
PR_26f	2 / Ldn	266	Yes / 49	FLEX1	40	n/a	n/a	10	15	No Impact
PR_27a	2 / Ldn	1260	Yes / 833	FLEX1	40	n/a	n/a	10	15	No Impact
PR_27b	2 / Ldn	905	Yes / 595	FLEX1	40	n/a	n/a	10	15	No Impact
PR_27c	2 / Ldn	876	Yes / 388	FLEX1	40	n/a	n/a	10	15	No Impact
PR_27d	2 / Ldn	915	Yes / 157	FLEX1	40	n/a	n/a	10	15	No Impact
PR_27e	2 / Ldn	679	Yes / 104	FLEX1	40	n/a	n/a	10	15	No Impact
PR_27f	2 / Ldn	561	Yes / 49	FLEX1	40	n/a	n/a	10	15	No Impact
PR_27g	2 / Ldn	815	Yes / 52	FLEX1	40	n/a	n/a	10	15	No Impact
PR_27h	2 / Ldn	1288	Yes / 45	FLEX1	40	n/a	n/a	10	15	No Impact
PR_27i	2 / Ldn	950	Yes / 220	FLEX1	40	n/a	n/a	10	15	No Impact
PR_27j	2 / Ldn	1028	Yes / 370	FLEX1	40	n/a	n/a	10	15	No Impact
PR_28a	2 / Ldn	1454	Yes / 225	FLEX1	60	n/a	n/a	2	5	No Impact
PR_28b	2 / Ldn	1234	Yes / 37	FLEX1	60	n/a	n/a	2	5	No Impact
PR_28c	2 / Ldn	1260	Yes / 147	FLEX1	55	n/a	n/a	4	7	No Impact
PR_28d	2 / Ldn	1260	Yes / 228	FLEX1	55	n/a	n/a	4	7	No Impact
PR_28e	2 / Ldn	1170	Yes / 275	FLEX1	50	n/a	n/a	5	10	No Impact
PR_28f	2 / Ldn	1130	Yes / 188	FLEX1	55	n/a	n/a	4	7	No Impact
PR_28g	2 / Ldn	1005	Yes / 232	FLEX1	55	n/a	n/a	4	7	No Impact
PR_28h	2 / Ldn	995	Yes / 175	FLEX1	55	n/a	n/a	4	7	No Impact
PR_28i	2 / Ldn	965	Yes / 30	FLEX1	55	n/a	n/a	4	7	No Impact

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
Receptor	FTA Land Use / Noise Metric	Distance to Track Alignment [ft]	Near Crossing / Longitudinal distance to Crossing [ft]	Existing Land Use	Existing Noise Level [dBA]	Predicted Exterior Noise Levels [dBA]	Scenario Impacts			
							Increase in Overall Noise Exposure – Build over Existing [dBA]	FTA Allowable Increase [dBA]		Impact Under FTA Criteria
								MI	SI	
PR_28j	2 / Ldn	1050	Yes / 50	FLEX1	60	n/a	n/a	2	5	No Impact
PR_28k	2 / Ldn	900	Yes / 40	FLEX1	60	n/a	n/a	2	5	No Impact
PR_28l	2 / Ldn	751	Yes / 25	FLEX1	60	n/a	n/a	2	5	No Impact

Table Notes:

- (A) **Receptor** – Receptor labeling used in Figure 3a to 3e.
- (B) **FTA Land Use / Noise Metric** – Type of land use for a receptor based on land use categories identified in **Table 3-2** from the FTA Manual. Metric used for assessment as per **Table 3-2** from the FTA Manual.
- (C) **Distance to Track Alignment [ft]** – Measured distance from receptor location to track alignment.
- (D) **Near Crossing / Longitudinal Distance to Crossing [ft]** – Measured distance along track alignment to nearest public crossing.
- (E) **Existing Land Use** – Land use as identified in Local Planning.
- (F) **Existing Noise Level** – Existing noise level defined for the receptor.
- (G) **Predicted Exterior Noise Levels** – Predicted exterior noise levels. For receptors in proximity of a public crossing the model used was the FRA Horn Model (Column D indicates “Yes”) [17] – this method does not provide a specific exterior noise level, rather only the impact assessment. For receptors not in proximity of a public crossing the CREATE model was used [14].
- (H) **Increase in Overall Noise Exposure – Build over Existing** – Estimated Increase of noise levels from existing noise levels.
- (I) **MI** – Moderate Impact threshold based on existing noise levels and land use as per **Table 3-1** from the FTA Manual.
- (J) **SI** – Severe Impact threshold based on existing noise levels and land use as per **Table 3-1** from the FTA Manual.
- (K) **Impact under FTA Criteria** – This is based on the result from FRA Horn Model [17] for receptors in proximity of public crossings or based on the result in Column H for all other receptors.

3.2.2 Impacts and Mitigations

Based on the results presented in Table 3-1, only six (6) of the eighty-five (85) identified receptors would be classified as having Moderate Impacts – PR_03a, PR_04c, PR_11, PR_14a, PR_20, and PR_24b. Locomotive horn use at public-at grade crossings is the primary cause of the predicted noise impacts at these locations. Therefore, minimizing locomotive horn use in the Proposed Project area represents the greatest opportunity to mitigate potential Project-related noise impacts.

No Severe Impacts were identified for the Proposed Project.

4.0 OPERATIONAL VIBRATION

4.1 Project Specific Criteria

Taking into consideration the traffic for the Project as identified in Section 1.5, the Proposed Project falls under the Infrequent Event Category – fewer than 30 vibration events of the same kind per day. Based on that assumption, the project specific limits are identified in Table 4-1.

Table 4-1: Project Specific GBV Impact and GBN Impact Criteria

Metric for Assessment	Land Use Category		
	Category 1	Category 2	Category 3
GBV Impact Levels (VdB re 1 μ in/sec)	65 VdB	80 VdB	83 VdB
GBN Impact Levels (dB re 20 micro Pascals)	N/A	43 dBA	48 dBA

Notes:

Category 1: Buildings where vibration would interfere with interior operations

Category 2: Residences and buildings where people normally sleep

Category 3: Institutional land uses with primarily daytime use

4.2 Estimated Vibration Levels and Impact Assessment

Based on the FTA Manual (**Chapter 10**) a noise assessment of the possible impacts was generated to determine the distances from the alignment necessary to comply with the Project specific ground-borne vibrations and ground-borne noise identified in Table 4-1. Figure 4-1 shows the Project specific estimated¹² ground surface vibrations, adjusted to the Project speed of 25 mph (see Section 1.5).

¹² Based on the FTA Manual Generalized Ground Surface Vibration Curves (**Figure 10-1** of the FTA Manual)

Based on the Receptor location review presented in Section 2.4, all receptors can be classified as Vibration Category 2 – Residential or Vibration Category 3 – Institutional. No Vibration Category 1 – High Sensitivity receptors were identified as part of the Screening.

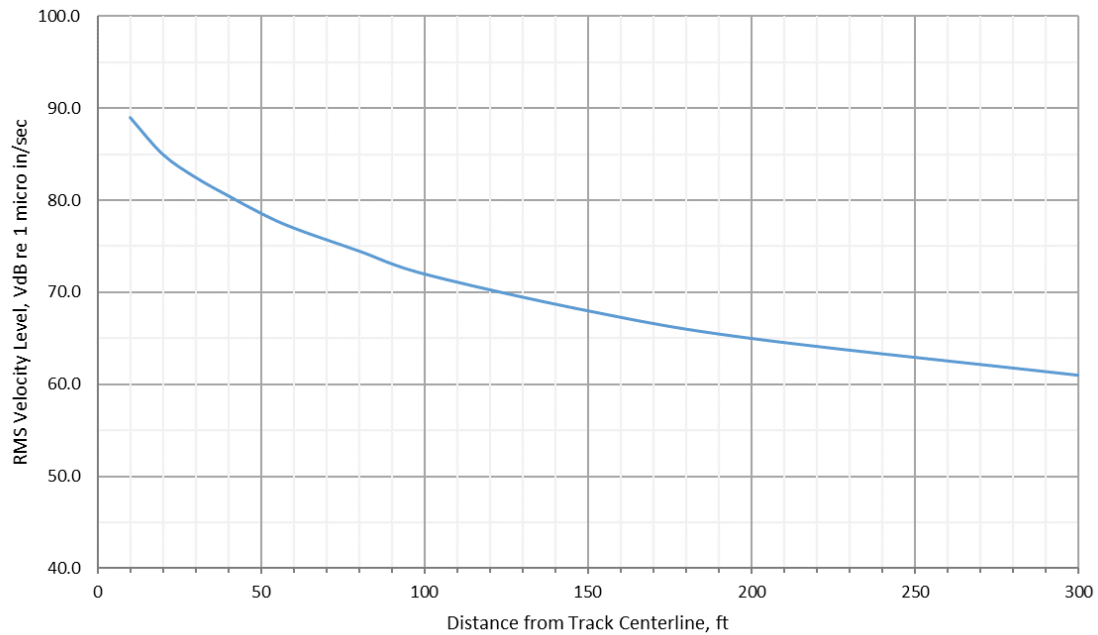


Figure 4-1: Project Specific Generalized Ground Surface Vibrations

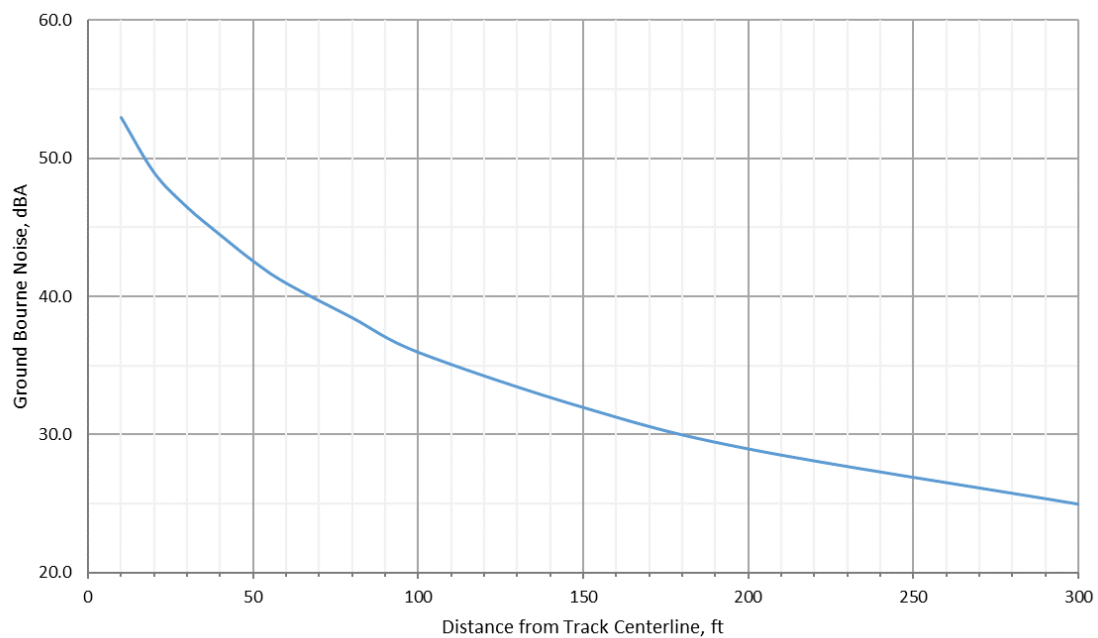


Figure 4-2: Project Specific Generalized Ground Bourne Noise

Based on Figure 4-1 and Figure 4-2 the following distances are identified for compliance with the limits:

Table 4-2: Project Specific GBV and GBN Impact Distances

Metric for Assessment	Land Use Category (Vibration) ^(A)			
	Category 2		Category 3	
	Limit	Distance [ft]	Limit	Distance [ft]
GBV Impact Levels (VdB re 1 μ in/sec)	80 VdB	40	83 VdB	30
GBN Impact Levels (dB re 20 micro Pascals)	43 dBA	60	48 dBA	30

Notes:

(A) – No Vibration Category 1 land uses were identified in the Project Screening.

Based on the distance to the track centerline identified in Table 3-1, none of the identified receptors identified during the screening is within the impact distances identified in Table 4-2. Therefore, the projected vibration from the project is below the impact threshold. Significant vibration impacts are therefore not anticipated with this project.

5.0 CONSTRUCTION ASSESSMENT

5.1 Introduction

During project track construction, noise levels will be produced by the operation of heavy-duty equipment and various other construction activities. Noise levels generated by construction activities depend on a series of variables. Such variables include the number and type of pieces of equipment, their general condition of operation, the amount of time each piece operates per day, the presence of any noise attenuating features (e.g. walls, berms) and the location of the construction activities relative to the receptors. The majority of these variables are traditionally left to the discretion of the contractor which makes it difficult to accurately estimate levels of construction noise. As such for purposes of this assessment, a professional judgment of the likely means and methods that would be used by the contractor is used. Some construction activities and use of some equipment may result in perceptible vibrations levels, depending on the distance from the construction activity to the receptor. Activities such as pile driving, pavement breaking and the use of tracked vehicles (e.g., bulldozers) can generate higher ground-borne vibration levels.

5.2 Noise Assessment

The Berkeley County has an ordinance for noise control in unincorporated areas (Ordinance No. 05-08-56 [11] amended by Ordinance No. 09-04-21 [12]). These ordinances specify sound level limits for continuous operation of equipment in proximity of residential and non-residential areas. The amendment of the noise control ordinance (by Ordinance No. 09-04-21 [12]) stipulates on Sec. 38-1. §§c. an exception for “Noises from construction or demolition activities occurring between 6:00 a.m. and 10:00 p.m.”.

The FTA Guidelines¹³ define a two-step approach to assessment of noise impact from construction activities. The first step is a screening process based on the combined noise levels, from the two noisiest pieces of equipment, under the assumption that they operate at the same time and locations. The criteria for this screening assessment are identified in Table 5-1 which represent noise levels which are not to be exceeded.

Table 5-1: Construction Noise General Assessment Criteria

Land Use	One-hour L _{eq} [dBA]	
	Day	Night
Residential	90	80
Commercial	100	100
Industrial	100	100

The equipment anticipated to be part of the construction stage for this project is identified in Table 5-2. Two areas of project are identified as likely to have the largest impacts due to proximity to the construction zones. One area is composed of at-grade track construction and another is the bridge construction over the Diversion Canal. The noise characteristics for the different types of equipment's anticipated to be used on site are identified in Table 5-2. The values presented are the same as the values presented in the FTA Manual or the FHWA Highway Construction Handbook [19].

Table 5-2: Expected Equipment to be used During Construction (Noise Assessment)

Equipment	Noise Emissions Characteristics		Project Areas	
	E.L. [dBA] ^(A)	U.F. ^(B)	At-grade Track Construction	Bridge Construction
Air Compressor	81	40%	77	77
Backhoe	80	40%	76	76
Crane, Mobile	83	16%	75	75
Dozer	85	40%	81	n.e.u. ^(C)
Generator	81	50%	78	78
Loader	85	40%	81	81
Dump Truck	84	40%	80	80
Pile-driver	95	20%	n.e.u. ^(C)	88
Concrete Mixer	85	40%	n.e.u. ^(C)	81
Concrete Pump	82	20%	n.e.u. ^(C)	75
Roller	74	20%	67	n.e.u. ^(C)

¹³ See Section 12.1.3 of the FTA Manual.

Equipment	Noise Emissions Characteristics		Project Areas	
	E.L. [dBA] ^(A)	U.F. ^(B)	At-grade Track Construction	Bridge Construction
Spike Driver	77	2%	60	60
Tie Cutter	84	2%	67	67
Tie Handler	80	2%	63	63
Tie Inserter	85	2%	68	68
Truck	88	2%	71	71

Notes:

(A) – E.L. is the noise emission level of the particular piece of equipment at the reference distance of 50 feet.

(B) – U.F. is the usage factor that accounts for the fraction of time that the equipment is in use over the specified time period.

(C) – n.e.u. indicates that the particular piece of equipment is not expected to be used for the identified Project Areas.

From the data presented in Table 3-1, the closest receptor to the at-grade construction area is PR_04a with a distance to the alignment of 100 ft. For the area of the bridge construction the closest receptor is PR_27f with a distance to the alignment of 561 ft. Both locations are residential, therefore will have the strictest noise criteria limits as identified in Table 5-1.

An assessment was done for the 2 noisiest sound sources, and the results are presented in Table 5-3.

Table 5-3: General Assessment of Construction Noise

Reception Location	One-hour L_{eq} [dBA]	
	At-grade Track Construction	Bridge Construction
At 50 ft distance	84	89
PR-04a (100 ft)	78	n/a
PR-27f (561 ft)	n/a	68

The values presented in Table 5-3 are below the limits identified in in Table 5-1 for residential locations located within the project screening area. Therefore based on this assessment no additional study or consideration of mitigation is considered necessary.

5.3 Vibration Assessment

During construction activities vibrations from construction equipment are expected. These vibrations may be perceptible at some receptor locations. However since perceptible vibrations from construction are typically short-term and reversible the focus of assessment is typically constrained to potential damage, resulting from vibration levels which are greater than the limits

of human perception, to structures which in most cases is of greater concern. The FTA Guidelines¹⁴ defines the limits for potential damages in structures due to construction vibrations. These limits are identified in Table 5-4.

Table 5-4: Vibration Limits for Damage due to Construction Activities

Building Category	PPV [in/sec] ^(A)
I. Reinforced concrete, steel or timber (no plaster)	0.50
II. Engineered concrete and masonry (no plaster)	0.30
III. Non-engineered timber and masonry buildings	0.20
IV. Buildings extremely susceptible to vibrations damages	0.12

Notes:

(A) – PPV = Peak Particle Velocity

The significant vibration generating equipment anticipated to be part of the construction stage for this project are identified in Table 5-5. Two areas of project are identified as likely to have the largest impacts due to proximity to the construction zones. One refers to at-grade track construction and another refers to the bridge construction over the diversion canal. The vibration characteristics identified in Table 5-5 are taken from the FTA Manual.

Table 5-5: Expected Equipment to be used During Construction (Vibration Assessment)

Equipment	PPV at 25 ft [in/sec]	Project Areas	
		At-grade Track Construction ^(A)	Bridge Construction ^(B)
Pile Driver (Impact)	0.644	n.e.u. ^(C)	0.006
Vibratory Roller	0.210	0.026	0.002
Large bulldozer	0.089	0.011	0.001
Loaded Trucks	0.076	0.010	0.001

Notes:

(A) – for at-grade track construction the receptor PR-04a at a distance of 100 ft distance – closest receptor to construction site.

(B) – for at-grade track construction the receptor PR-27f at a distance of 561 ft distance – closest receptor to construction site.

(C) – n.e.u. indicates that the particular piece of equipment is not expected to be used for the identified Project Areas.

Based on the values presented in Table 5-5, no vibration impacts are expected to any of the identified receptors due to vibrations from construction activities. Therefore based on this assessment no additional study or consideration of mitigation is considered necessary.

¹⁴ See Section 12.2.2 of the FTA Manual.

6.0 CLOSURE

Yours truly,

Amec Foster Wheeler Environment & Infrastructure
a Division of Amec Foster Wheeler Americas Limited

Written by: Alfredo Rodrigues, EngSci
Senior Building Acoustics Specialist

Signature: _____ Date: July 25, 2017

Reviewed by: Buddy Ledger, M.A.Sc., P.Eng., INCE
Acoustics Group Leader / Senior Acoustic Engineer

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Noise And Vibration Report\6250160108_Camphall_N&V_Report_V00_Blar.Docx

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- [12] Berkeley County, South Carolina, *An Ordinance to Amend and Clarify Certain Sections of Ordinance No. 05-08-56 - Codified through Ordinance No. 09-04-21*, Moncks Corner, SC: Berkeley County Council, 2009.
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APPENDIX A

FIGURES

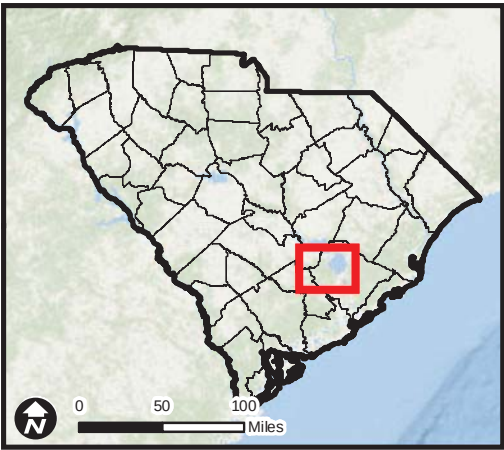


Figure 1. Site Location Map

Camp Hall Railroad Build-in
Noise and Vibration Analysis
Berkeley County, South Carolina

Legend

-  County Boundary
-  Camp Hall Commerce Park
-  Cross Alignment
-  Cross Alignment - 1 Mile Buffer
- Existing Nearby Rail**
-  CSXT
-  Norfolk Southern



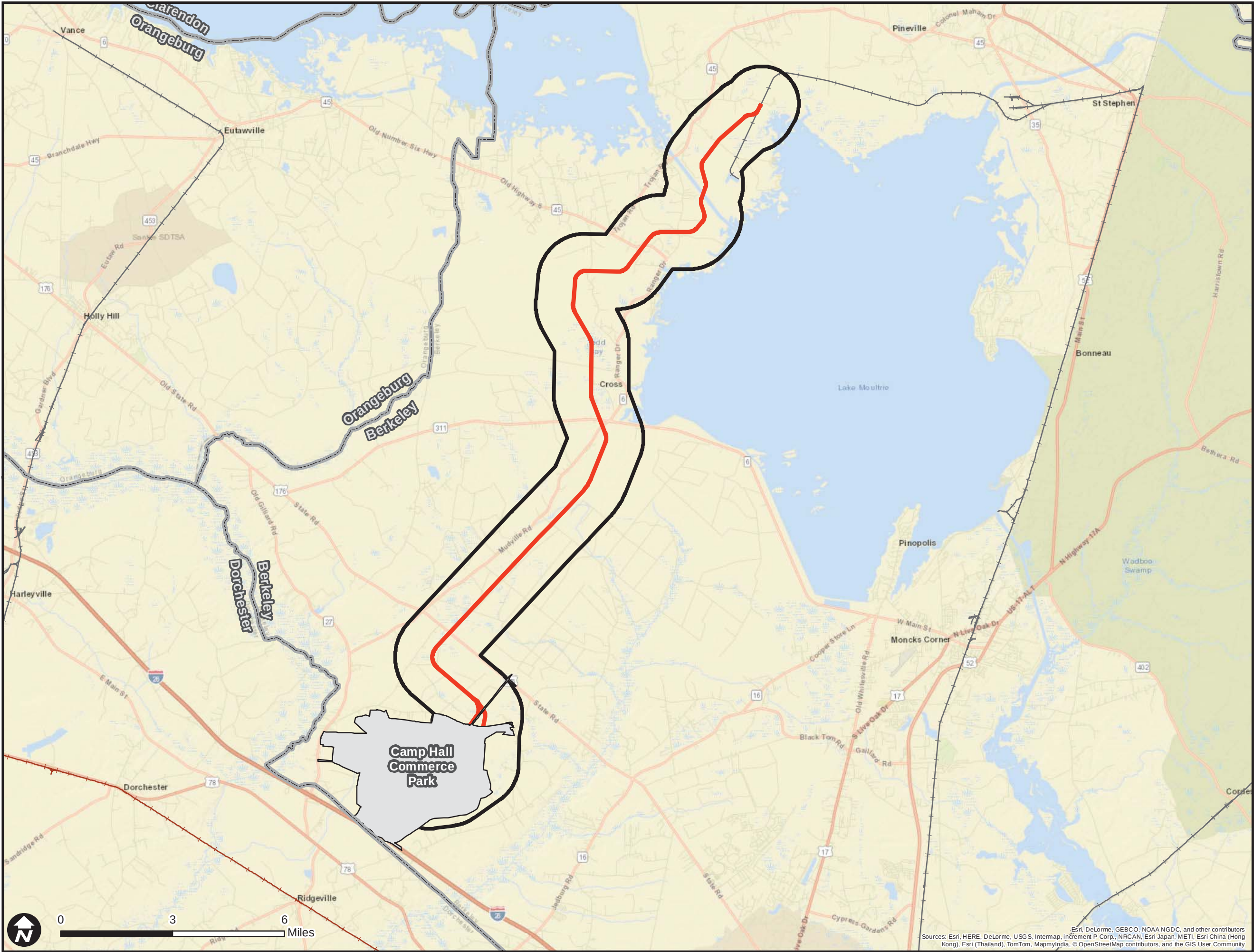
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Reviewed By: AR

Date: 05/11/2017

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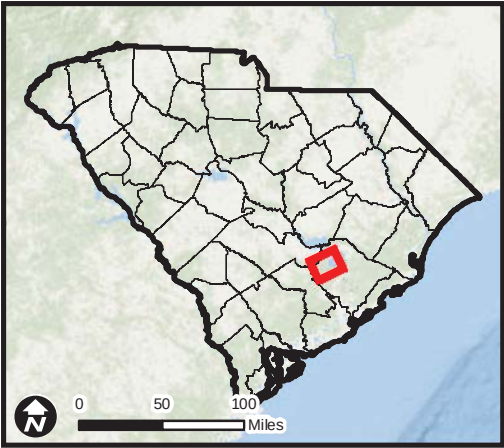


Figure 2. Screening Area Map

Camp Hall Railroad Build-in
Noise and Vibration Analysis
Berkeley County, South Carolina

Legend

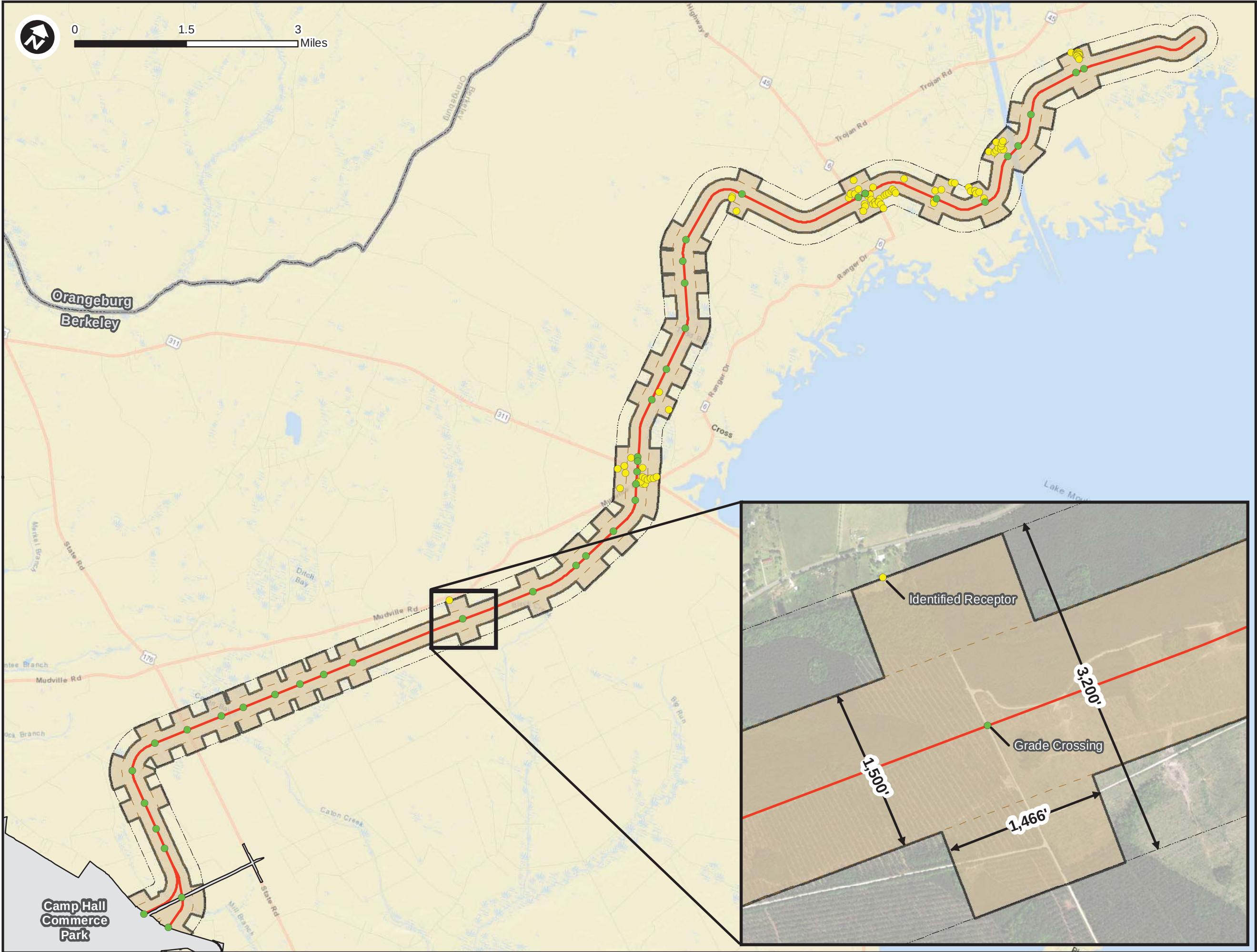
-  County Boundary
-  Camp Hall Commerce Park
-  Cross Alignment
-  Grade Crossings (40)
-  Identified Receptors (85)
-  Cross Alignment (750-ft Buffer)
-  Cross Alignment (1600-ft Buffer)
-  Screening Area

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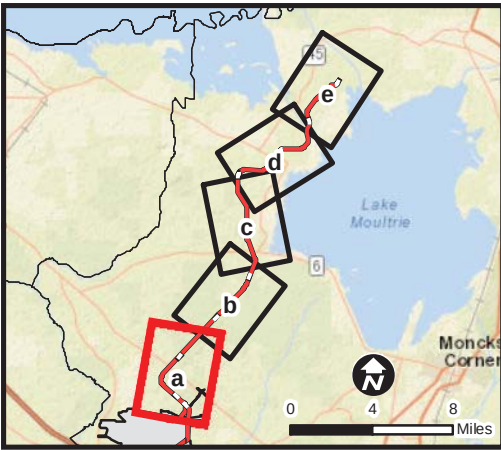


Figure 3a. Identified Receptors Map

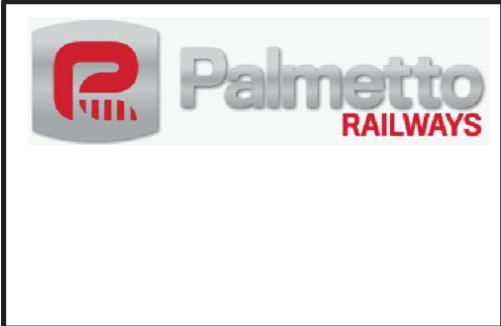
Camp Hall Railroad Build-in
Noise and Vibration Analysis
Berkeley County, South Carolina

Legend

- Camp Hall Commerce Park
- Proposed Rail Centerline
- Cross Alignment (750-ft Buffer)
- Cross Alignment (1600-ft Buffer)
- Screening Area
- Named Road
- Grade Crossings (40)

Receptor Impact Under FTA Criteria

- No Impact
- Moderate Impacts



Job No. 6250-16-0108

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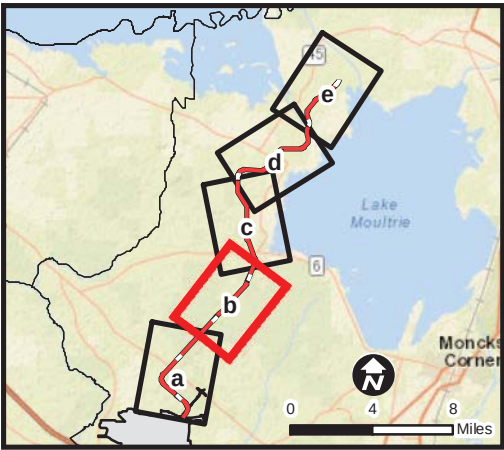


Figure 3b. Identified Receptors Map

Camp Hall Railroad Build-in
Noise and Vibration Analysis
Berkeley County, South Carolina

Legend

- Camp Hall Commerce Park
- Proposed Rail Centerline
- Cross Alignment (750-ft Buffer)
- Cross Alignment (1600-ft Buffer)
- Screening Area
- Named Road
- Grade Crossings (40)

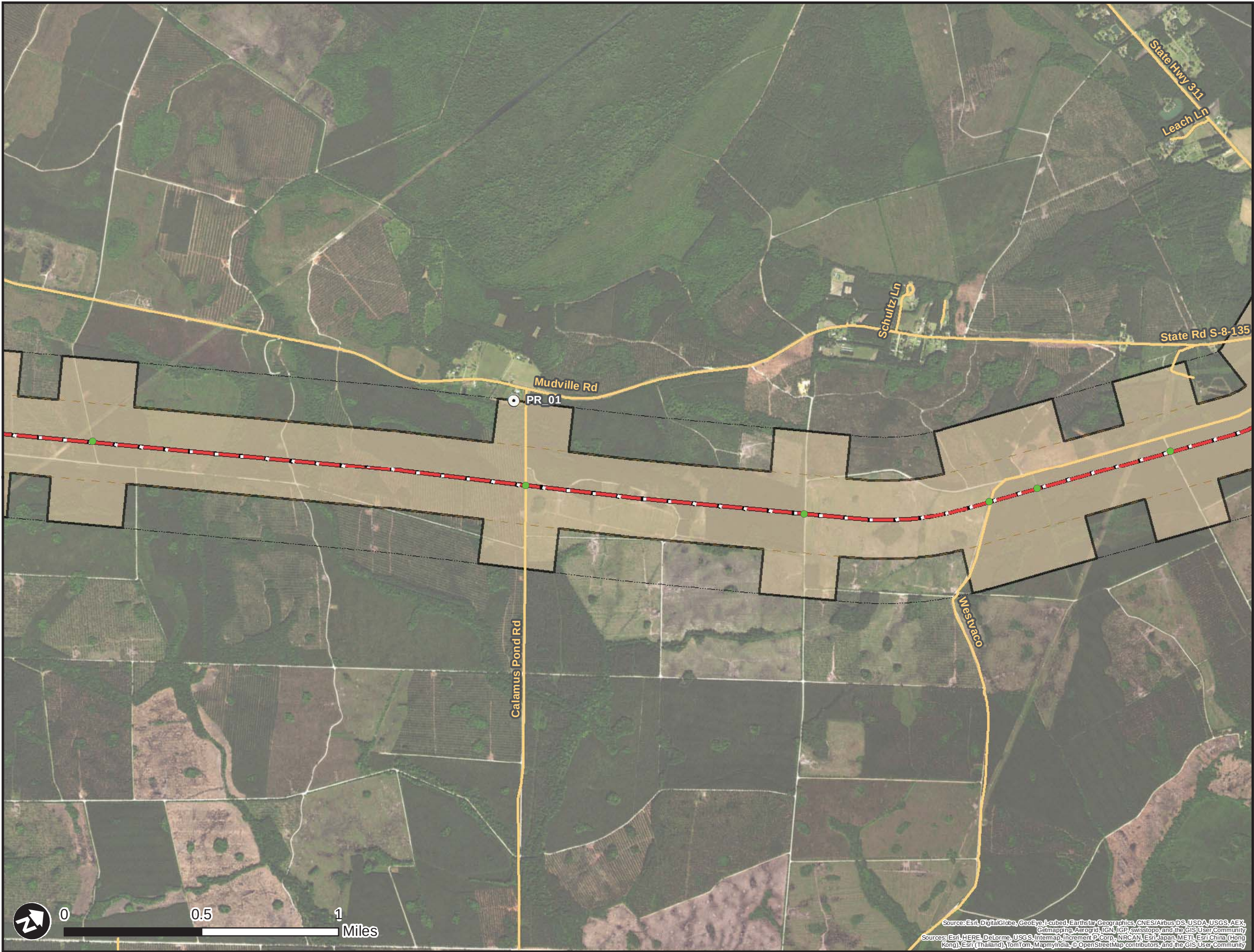
Receptor Impact Under FTA Criteria

- No Impact
- Moderate Impacts



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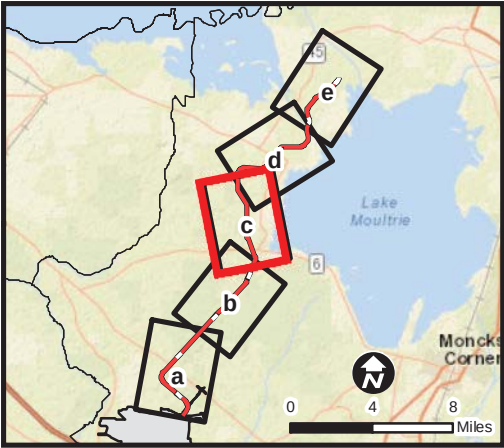


Figure 3c. Identified Receptors Map

Camp Hall Railroad Build-in
Noise and Vibration Analysis
Berkeley County, South Carolina

Legend

- Camp Hall Commerce Park
- Proposed Rail Centerline
- Cross Alignment (750-ft Buffer)
- Cross Alignment (1600-ft Buffer)
- Screening Area
- Named Road
- Grade Crossings (40)

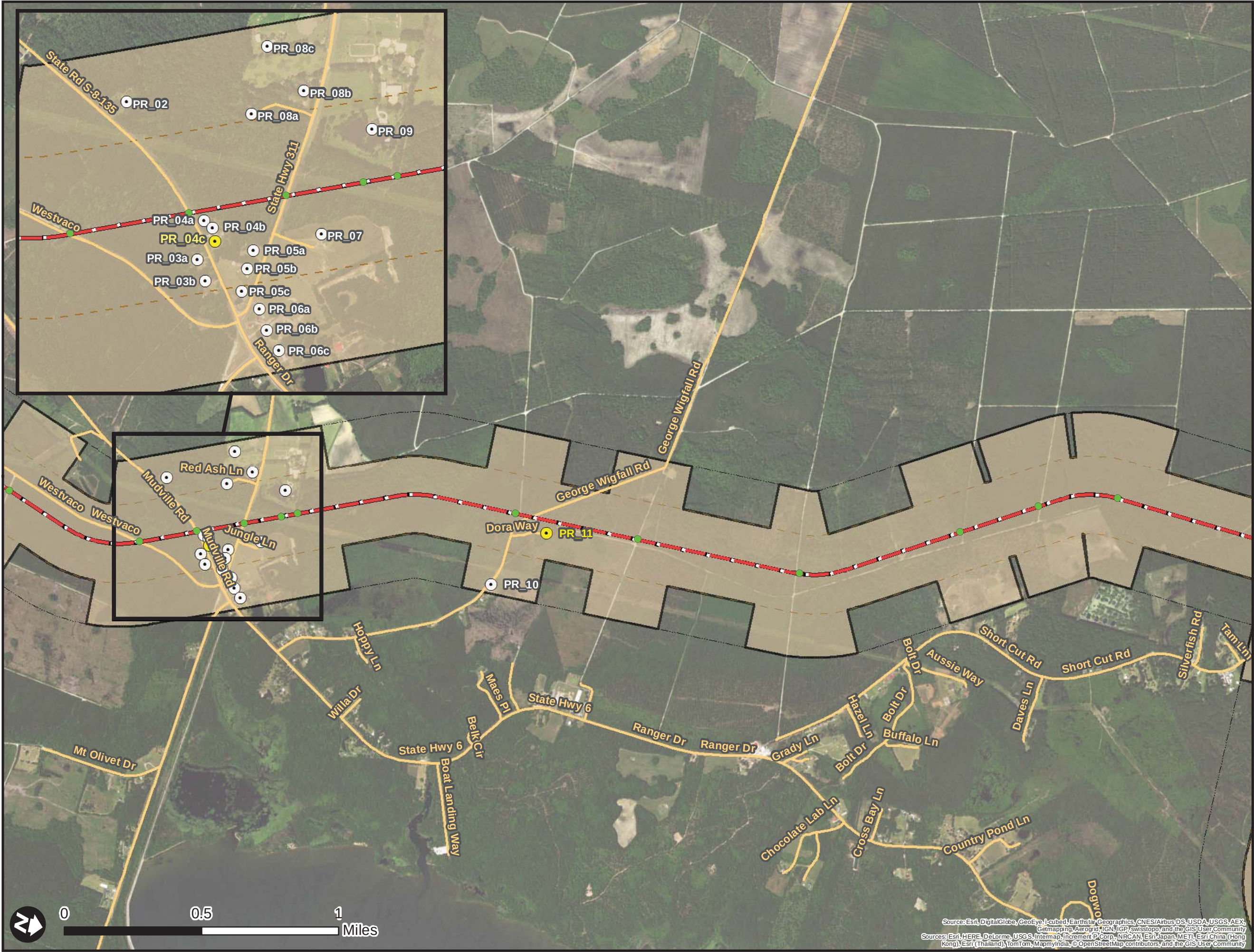
Receptor Impact Under FTA Criteria

- No Impact
- Moderate Impacts



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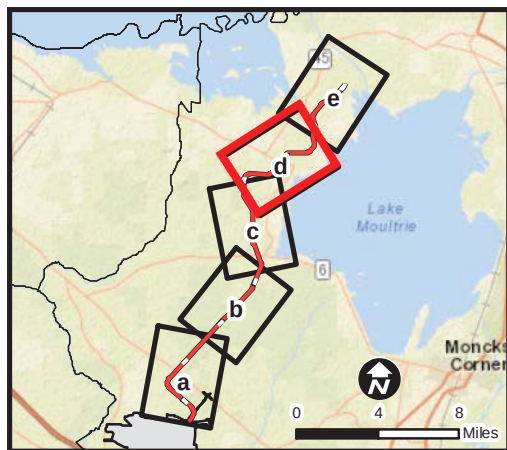


Figure 3d. Identified Receptors Map

Camp Hall Railroad Build-in
Noise and Vibration Analysis
Berkeley County, South Carolina

Legend

-
- Camp Hall Commerce Park
 - Proposed Rail Centerline
 - Cross Alignment (750-ft Buffer)
 - Cross Alignment (1600-ft Buffer)
 - Screening Area
 - Named Road
 - Grade Crossings (40)

Receptor Impact Under FTA Criteria

-  No Impact
-  Moderate Impacts



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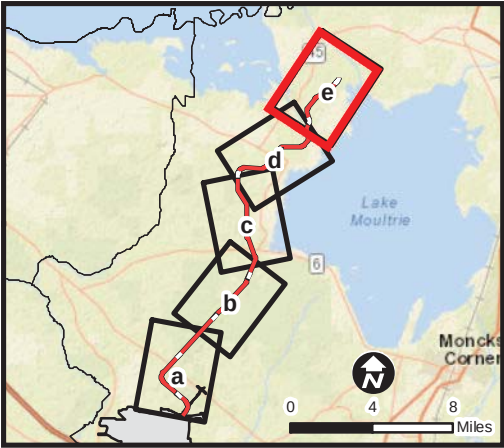


Figure 3e. Identified Receptors Map

Camp Hall Railroad Build-in
Noise and Vibration Analysis
Berkeley County, South Carolina

Legend

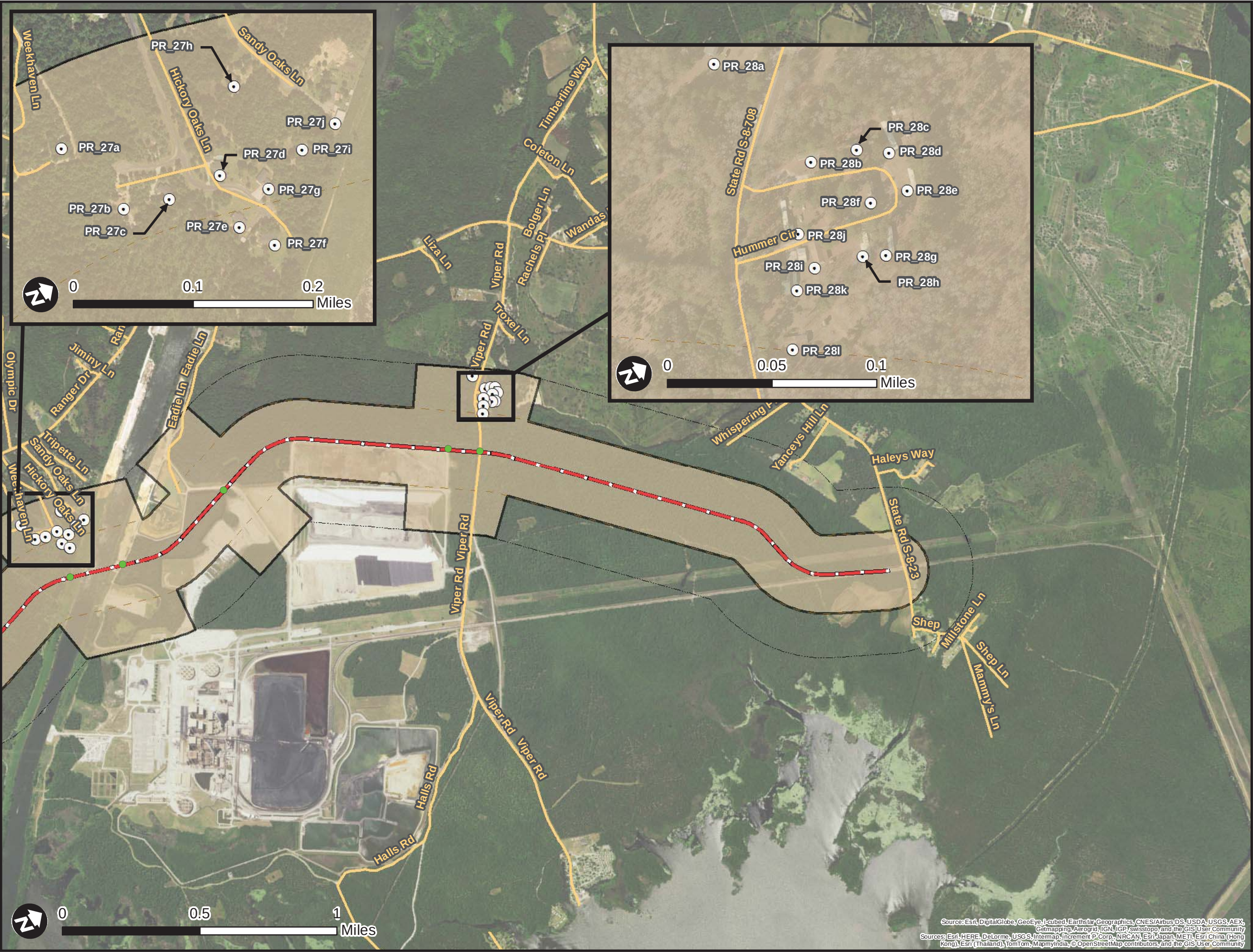
- Camp Hall Commerce Park
- Proposed Rail Centerline
- Cross Alignment (750-ft Buffer)
- Cross Alignment (1600-ft Buffer)
- Screening Area
- Named Road
- Grade Crossings (40)
- Receptor Impact Under FTA Criteria**
 - No Impact
 - Moderate Impacts

Note:
No Impact receptors are not labeled



Job No. 6250-16-0108
Drawn By: BWS
Reviewed By: AR
Date: 05/11/2017

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Appendix D: Protected Species Assessment

CAMP HALL RAIL PROJECT



**Palmetto Railways
540 East Bay Street
Charleston, South Carolina**

25 July 2017

July 27, 2017

Mr. Mark Caldwell
U. S. Fish & Wildlife Service
176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407

**SUBJECT: Protected Species Assessment
23-mile corridor, approximately 866 acres
Pringletown to Cross, Berkeley County, South Carolina**

Dear Mr. Caldwell:

This letter initiates Informal Consultation with the U.S. Fish and Wildlife Service (USFWS), Charleston Field Office, under Section 7 of the Endangered Species Act regarding the project area referenced above.

PROJECT LOCATION AND LIMITS / PROPOSED ACTION

An investigation was conducted on approximately 866 acres located in rural Berkeley County. The corridor is being considered by Palmetto Railways, a division of the SC Department of Commerce, as a route to provide rail service to the new Volvo manufacturing plant. Therefore, Palmetto Railways is conducting necessary due diligence activities. Present owners of the properties that include the route are primarily Weyerhaeuser (previously Plum Creek and MeadWestvaco), Santee Cooper, with smaller parcels owned by additional private entities. The corridor begins at the proposed Volvo Plant in Pringletown, Berkeley County, South Carolina, off of SC HWY 176 and ends near the Cross Generating Station in Cross, Berkeley County, South Carolina. An approximately 200-foot wide area was assessed for the majority of the corridor, plus some expanded areas where minor alternatives in the original alignment may be considered. The proposed action to occur on site is the construction of a new railroad line connecting the Volvo plant to an existing rail line in Cross. The proposed action will include a timber harvest and site preparation, the deposition of fill material, and construction of the rail line. The width of the final impacted area is anticipated to be 42 to 55 feet along most of the corridor except 175 feet on the approaches to the Diversion Canal. In those areas where a secondary track or pull off area is required, the corridor will be wider. The proposed impacts to wetlands will be mitigated in accordance with US Army Corps of Engineers and SC Department of Health and Environmental Control (DHEC) requirements.

HABITAT DESCRIPTION

The railroad corridor consists of **upland pine forest, planted pine forest, upland hardwood forest, gum pond, Carolina bay, bottomland hardwood forested wetlands, open water and agriculture fields**. Age classes for habitat types were based upon observation of tree size and height as well as site index for the area. Increment Borings were not taken.

The **upland pine forest** habitat was characterized by having an overstory composed primarily of loblolly pine (*Pinus taeda*) with some interspersed longleaf pine (*P. palustris*). Cover ranged from 40-70% in the overstory. The upland pine forest habitat found within and immediately adjacent to the corridor ranged from new growth to approximately 50 years old; however, nothing within this habitat type was considered to be old growth. The midstory was composed of loblolly pine, sweetgum (*Liquidambar styraciflua*), and farkleberry (*Vaccinium arboreum*) with a cover ranging from 10-30%. The shrub layer was sparse, with 10-20% cover consisting of wax myrtle (*Morella cerifera*), farkleberry, redbay (*Persea borbonia*) and deerberry (*Vaccinium stamineum*). The herbaceous layer was healthy, at approximately 30-50% cover, and was composed primarily of bracken fern (*Pteridium aquilinum*), broomstraw (*Andropogon virginicus*), longleaf woodoats (*Chasmanthium sessiliflorum*), dogfennel (*Eupatorium capillifolium*), panic grass (*Panicum sp.*), and slender lespedeza (*Lespedeza virginica*). Vines were present in both stages of management with muscadine (*Vitis rotundifolia*), greenbriar (*Smilax sp.*), and sawtooth blackberry (*Rubus argutus*) making up approximately 10% of the cover. This natural upland pine community was only found within areas of Santee-Cooper ownership and on the Cross Generating Station Wildlife Management Area (WMA). This area was characterized by infrequent low-intensity prescribed burns.

The **upland hardwood forest** occupied a small area of the corridor, and was generally found on the ecotone of the project area between uplands and wetland areas. Overstory composition was generally composed of white oak (*Quercus alba*), live oak (*Quercus virginiana*), southern red oak (*Quercus falcata*) and pignut hickory (*Carya glabra*), with water oak (*Quercus nigra*) found on the lower slopes leading to the wetlands. Overstory closure ranged from 40-60%. The age classes found within this habitat type ranged from new growth to approximately 50 years old. No old growth was found within or adjacent to the corridor within this habitat type. The midstory (10-25% cover) consisted of pignut hickory, sweetgum, red oak, red maple (*Acer rubrum*), American hornbeam (*Carpinus caroliniana*), and American holly (*Ilex opaca*). Shrub layers were sparse (0-10% cover), and consisted of redbay (*Persea borbonia*) and wax myrtle. The herbaceous layer was

sparse, approximately 0-10% cover, and was composed primarily of bracken fern, cinnamon fern (*Osmunda cinnamomea*), broomstraw, and longleaf woodoats.

The **planted pine forest** habitat was characterized by an overstory composed primarily of loblolly pine. These areas were intensively managed for silviculture with a first thinning occurring typically at ages 12-15 years old, followed by a clearcut at 25-30 years old. Age classes along the corridor spanned from new growth to approximately 30 years old. These areas were bedded and extensively ditched. The planted pine forest habitat covered 70-80% of the corridor. The corridor spans multiple stands of pines, ranging from open thinned (70-80 Basal Area [BA]) stands to dense, pre-merchantable stands (140 BA). As a result of recent clearcut harvests on site there were areas with no overstory or midstory present. In the thinned pine areas (70-80 BA), there was a midstory of sweet gum and red maple with approximately 10-20% cover. In the denser pine areas (140 BA) there was no midstory or shrub layer due to 90-100% overstory cover. In the open thinned pine stands the shrub layer consisted of wax myrtle, redbay, fetterbush (*Lyonia lucida*), and *Vaccinium*, with 10-30% cover. The herbaceous layer was also somewhat sparse, approximately 0-10% cover, and was composed primarily of dwarf palmetto (*Sabal minor*), longleaf woodoats, plumegrass (*Saccharum giganteum*), switchcane (*Arundinaria tecta*), Virginia chain fern (*Woodwardia virginiana*), cinnamon fern, and netted chain fern (*Woodwardia areolata*). Sphagnum moss (*Sphagnum sp.*) was also present within some of the wetland areas.

Several depressional **gum pond** wetlands were interspersed along the corridor. These wetlands are seasonally inundated and characterized by age classes ranging from new growth to approximately 30 years old. No old growth was found within this habitat type. The overstory was composed of black gum (*Nyssa sylvatica*), laurel oak (*Q. laurifolia*), willow oak (*Q. phellos*), sweet gum, red maple, and in larger gum ponds that were semi-permanently flooded, pond cypress (*Taxodium ascendens*), was found. The overstory cover ranged from 20-40% in the overstory. The midstory was sparse, approximately 10% cover, consisted of black gum, sweet gum, and red maple. The shrub stratum was composed of sweet gallberry (*I. coriacea*), fetterbush, and redbay. The understory cover was variable, ranging from open water to 100% cover. Species in this stratum included smartweed (*Polygonum spp.*), arrowhead (*Sagittaria lancifolia*), soft rush (*Juncus effusus*), switchcane, netted chain fern as well as various other grasses and sedges. Few vines occurred within the gum pond habitat due to periods of inundation, but around the margins some vine species were identified including poison ivy (*Toxicodendron radicans*) and laurel leaf smilax (*Smilax laurifolia*).

A few **Carolina bay** depression wetlands were located within the project corridor. These wetlands are seasonally to perennially inundated based upon their size. The genesis of this depressional habitat has been debated, although Piovan and Hodgeson (2016) found nine distinct qualities were common to all Carolina bays: 1) oval shaped; 2) oriented northwest to southeast; 3) parallelism of the long axis; 4) sand rims above general elevation; 5) interior surface below the general elevation; 6) different soils within sand rim and outside of sand rim; 7) shallow; 8) flat sandy bottom; 9) naturally isolated features. Within the corridor there were five Carolina bays, four of which are named, including Bulltown Bay, Skeleton Bay, Todd Bay, and Beech Island Bay. Much of these areas were ditched and either partially or entirely planted in loblolly pine, which are now approximately 10 to 30 years old. Within the remnant habitat, red maple, swamp tupelo, and pond cypress dominated the overstory at 30-40% cover with the oldest reaching approximately 50 years of age. No areas within this habitat type are considered old growth. The midstory was sparse, consisting of the same species found in the overstory. Within more seasonally wet Carolina bays, a shrub and herbaceous layer was present consisting of redbay, dwarf palmetto, and fetterbush in the shrub layer, with various grasses and sedges making up the herbaceous layer. Perennial flooded bays had no shrub or herbaceous vegetation present.

The **bottomland hardwood forested wetland** habitat was characterized by having an overstory composed of bald cypress (*Taxodium distichum*), water oak, swamp tupelo (*Nyssa biflora*) and swamp chestnut oak (*Quercus michauxii*). Overstory closure ranged from 30-50%, characterized by an age class from 10 to 50 years old. No old growth was found within or immediately adjacent to the project area. The midstory was composed of bald cypress, black gum, sweetgum, and swamp tupelo characterized by having a cover ranging from 10-20%. The shrub and herbaceous layer were also somewhat sparse, approximately 0-10% cover, and was composed primarily of dwarf palmetto, switchcane, sphagnum moss, Virginia chain fern, and cinnamon fern. Standing water was present within most of the bottomland hardwood forest habitats. Defined stream channels occurred in several areas within this habitat. Flow was characterized as relatively permanent, or perennial, flow.

The project corridor crosses **open water** across the diversion canal between the Santee-Cooper lakes. This body of water was excavated in 1941. The canal is 7.5 miles long, approximately 500 feet wide, and approximately 12 feet deep. The bottom consists of sand and clay, with some sediments washed downstream from the Santee River. There is very little organic material or vegetation in this part of the canal and it was last dredged in 2014 to remove accumulated silt and sediments on the Lake Moultrie side of the canal.

The diversion canal was once an important access for inland maritime trade, but today is used primarily for recreational access between the lakes.

Several small **agricultural fields** existed within the project corridor, primarily as wildlife food plots. Common planted vegetation included chufa, wheat, peas and soybeans. In areas that were not planted, a variety of native grasses dominated, including: broomstraw, chalky bluestem (*Andropogon capillipes*), dog fennel, switchgrass (*Panicum virgatum*), and tapered rosette grass (*Dichanthelium acuminatum*). These areas are routinely disked and cultivated.

LISTED SPECIES AND HABITAT REQUIREMENTS

Prior to field investigations, we consulted multiple sources including: March 30, 2017 update of the South Carolina List of Endangered, Threatened and Candidate Species for Berkeley County provided to us by the USFWS, the South Carolina Department of Natural Resources (SCDNR) Rare, Threatened & Endangered Species Inventory, the SCDNR Heritage Trust Program, Information Planning and Conservation tool ((IPaC) (Consultation Code: 04ES1000-2017-SLI-0523, Event Code: 04ES1000-2017-E-01064)) and the SCDNR Eagle Nest Survey. Julie Holling, Kathy Boyle, and Caroline Causey of SCDNR were also contacted to determine what protected species may occur on the project site and approximate locations of any red-cockaded woodpecker occurrences nearby. Based on the list for Berkeley County, and multiple site visits dating between April 20, 2016 and June 1, 2017, the list of potentially occurring species was narrowed as follows:

Common Name	Scientific Name	Listing Status
American chaffseed	<i>Schwalbea americana</i>	Federally Endangered
Atlantic sturgeon	<i>Acipenser oxyrinchus</i>	Federally Endangered
Bald eagle	<i>Haliaeetus leucocephalus</i>	B&GEPA
Canby's dropwort	<i>Oxypolis canbyi</i>	Federally Endangered
Frosted flatwoods salamander	<i>Ambystoma cingulatum</i>	Federally Threatened
Pondberry	<i>Lindera melissifolia</i>	Federally Endangered
Red-cockaded woodpecker	<i>Picoides borealis</i>	Federally Endangered
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	Federally Endangered
West Indian manatee	<i>Trichechus manatus</i>	Federally Threatened
Wood stork	<i>Mycteria americana</i>	Federally Threatened

American chaffseed – American chaffseed (*Schwalbea americana*) occurs in sandy, acidic, seasonally moist to dry soils. Habitats where it most commonly occurs include open, moist pine flatwoods, fire-maintained savannas, ecotones between peaty wetlands and xeric sandy soils, and other open grass-sedge systems. American chaffseed is dependent on factors such as fire, mowing, or fluctuating water tables that maintain the open, early successional conditions that it requires (USFWS 1995). Often associated with chaffseed habitat are quail and red-cockaded woodpeckers. The land management necessary to maintain these species benefits chaffseed as well. American chaffseed is not capable of long-term dormancy within the soil which reflects its need for early successional habitat and periodic disturbance that is mimicked by prescribed fire (USFWS 2008).

Atlantic sturgeon – The Atlantic sturgeon (*Acipenser oxyrinchus*) is an anadromous species of fish found on the Atlantic coast of North America. It inhabits marine, estuarine, and freshwater reaches of the major river basins along the Atlantic coast from North Florida to New Brunswick, Canada. Atlantic sturgeons are similar in appearance to shortnose sturgeons; however, differences lie in the larger body size, smaller mouth, and different snout shape of the Atlantic sturgeon. They are bluish-black to olive on the back and white or pale brown underneath. Atlantic sturgeon spawn in moderately flowing water, typically in deep rivers. Preferred spawning habitats include high-gradient rapids-complex river sections with cobble, bedrock, gravel and coarse sand substrates. When not spawning, adults frequent coastal waters and estuaries (NOAA 2012).

Bald eagle - The bald eagle (*Haliaeetus leucocephalus*) was once endangered throughout the 48 contiguous states except for the populations in Washington, Oregon, Minnesota, Wisconsin and Michigan, which were classified as threatened. In 2007, the U.S. Fish and Wildlife Service published a notice of delisting of the bald eagle from the endangered species list. Despite its delisting, the bald eagle remains protected under the Bald and Golden Eagle Protection Act (B&GEPA) and the Migratory Bird Treaty Act. The (B&GEPA) dates to 1940 and provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle or any golden eagle, alive or dead, or any part, nest, or egg thereof". Further, the Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." "Disturb" means: "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or

3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

(16 U.S.C. 668-668d, 54 Stat. 250).

The bald eagle is primarily associated with coasts, rivers and lakes, usually nesting near bodies of water where it feeds. An opportunistic predator, the bald eagle feeds primarily on fish but also takes a variety of birds, mammals and turtles (both live and as carrion) when fish are not readily available (USFWS 1989).

Canby's dropwort – Canby's dropwort (*Oxypolis canbyi*) is a perennial herb, which grows 0.8 to 1.2 meters tall. The "quill-like" leaves are slender, terete, hollow and septate. The compound umbels of small five parted flowers appear from mid-August to October with white petals and pale green sepals (USFWS 1990). The plant resembles a mature Queen Anne's lace and has a slight dill fragrance.

Typical habitat for Canby's dropwort includes wet meadows, wet pineland savannas, ditches, sloughs, and around the edges of cypress ponds (USFWS 2006). The largest and most vigorous populations have been found to occur in open bays or ponds that are wet throughout most of the year but which have little or no canopy cover. Canby's dropwort occupies sandy loams or acidic peat-mucks, followed by an underlying layer of clay, which results in water retentive habitat. Also, these soils usually contain high organic matter, are poorly drained, and contain a high water table. Water requirements for the plant are very narrow, with too much or too little being detrimental to the plant. Plants seem to be most successful in shallow inundation, with depths from 2 to 12 inches (USFWS 1990).

Frosted flatwoods salamander – The frosted flatwoods salamander (*Ambystoma cingulatum*) is a small (9-13.5 cm total length), elongate species in the mole salamander family (Ambystomatidae), which are characterized as having a biphasic life history. It has a small indistinct head, short legs, and a long, rounded tail. Typical coloration consists of a background of brownish black to purplish black overlaid with narrow gray or silvery white reticulations (net-like markings), bands, or diffuse spotting. The aquatic larvae are distinctly colored, having a series of bold brown and yellow longitudinal stripes (USFWS 2009).

The frosted flatwoods salamander is fossorial, where it spends the majority of its life in refuge underground. Optimum habitat for the frosted flatwoods salamander 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 and a diverse understory of native grasses and herbaceous vegetation (USFWS 2009).

Pondberry – Pondberry (*Lindera melissifolia*) is a deciduous, aromatic shrub growing 0.5 to 1.8 meters in height with thin, drooping glabrous or pubescent leaves that smell like sassafras when crushed. Pondberry is a dioecious species, having both male and female plants, and is capable of producing abundant fruits which remain viable for 1-2 years. Pale yellow flowers appear in the spring before the leaves. The bright red 12-millimeter long oval-shaped fruits mature in the fall. However, pondberry is a colonial plant, achieving reproduction primarily through vegetative, asexual production of new shoots. Most of the shrubs in any pondberry population are clones or genets of a much smaller number of genetically unique individuals rather than primarily seed production (USFWS 2010).

Pondberry is primarily found in association with wetland habitats (USFWS 1992). In South Carolina, pondberry is associated with the margins of seasonally flooded sinks, ponds, and depression in pinelands (USFWS 1993). Fire and flooding reduce pondberry's competition, allowing it to reproduce from rhizospheres in the soil.

Red-cockaded woodpecker – The red-cockaded woodpecker (RCW) (*Picoides borealis*) is a black and white woodpecker approximately 18 centimeters long. The bird displays black and white horizontal stripes on its back. The cheeks and underparts are white and the sides are streaked with black. The cap and stripe on the throat and neck are black. The male has a small red spot on each side of the black cap. The males also display a red crown patch after the first post-fledgling molt.

Typical nesting habitat for red-cockaded woodpeckers consists of open stand of pines with an age of 80 to 120 years (USFWS 1992), although nesting occasionally occurs in younger trees. Nests may be found in many species of pine. Stands that are primarily hardwood or that have a dense hardwood understory are usually avoided. Foraging habitat usually consists of pine or pine-hardwood stands at least 30 years old (USFWS 2003).

Shortnose sturgeon – The shortnose sturgeon (*Acipenser brevirostrum*) is an anadromous fish approximately 41 to 91 centimeters long, inhabiting marine, estuarine, and freshwater reaches of the major river basins along the Atlantic coast from North Florida to New Brunswick, Canada. The fish is brown to gray or black on the back, turning gold or yellow on the sides, and to white underneath. The blunt snout and 11 dorsal plates are distinctive characteristics of this sturgeon (NOAA 2010).

Shortnose sturgeon ascend rivers to spawn in late winter to early spring, historically migrating inland through the fall line zone to the Piedmont prior to construction of dams. Preferred spawning habitats include high-gradient rapids-complex river sections with cobble,

bedrock, gravel and coarse sand substrates. In most Atlantic Coast river basins, rapids-complex habitats are no longer accessible due to blockage, restricting sturgeon to coastal plain river reaches. Coastal plain spawning habitats include gravel bars and bedrock outcrops, and woody debris in accessible main-stem and tributary rivers. Shortnose sturgeon egg and larval stages are highly susceptible to turbidity and sedimentation effects. Adults and juveniles congregate during summer months in lower river areas but may move upstream during all months of the year. Upstream movements to cooler water refuge areas may occur during summer (NOAA 1998).

West Indian manatee – The West Indian manatee (*Trichechus manatus*) is a large marine mammal with no rear flippers and a flattened rounded tail. The manatee is normally associated with brackish water estuaries, shallow lagoons and coastal rivers. Manatees have been reported to occur along the southeastern coastline with the greatest number of individuals inhabiting the coastal water of Florida (USFWS 1980). A subpopulation of manatees frequents the South Carolina and Georgia coasts, with occurrences up to Rhode Island documented. The primary habitat for manatees includes shallow grass beds with ready access to deep water and fresh water sources near the mouths of coastal river systems, particularly estuarine systems (Deutsch et al. 2008).

American Wood stork – The American wood stork (*Mycteria americana*) is a large wading bird approximately 127 centimeters tall, with a wingspan of 1 to 1.5 meters. The wood stork was downlisted from Endangered to Threatened in 2014 (USFWS 2014). Wood storks are highly colonial, usually nesting in large rookeries and feeding in flocks. Their plumage is generally white, with black primary and secondary wing feathers and a short black tail. The head displays a prominent bill that is slightly decurved, thick at the base and black.

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. Foraging habitat may include freshwater marshes, flooded pastures and flooded ditches (USFWS 1992). Foraging sites are often in areas of fish concentrations due to either local reproduction or drying.

EVALUATION CRITERIA AND RESULTS

An examination of the SCDNR Rare, Threatened and Endangered Species Inventory, SCDNR Heritage Trust Program, and SCDNR Bald Eagle Nest Locator indicated that there are no documented occurrences of any federally listed or protected species within or immediately adjacent to the proposed project area. On April 20 - June 3, 2016, September 16 – 29, 2016, and April 28 - May 3, 2017, field investigations were conducted and consisted of pedestrian surveys

with the purpose of identifying potential habitat for the species referenced above. USFWS identifies optimal survey windows for each species, however, the due diligence window to conduct field work for the proposed action did not allow for surveying all species at their optimal times. The goal of the protected species assessment is to identify potential habitat that could support threatened or endangered species in order to determine the likelihood of the occurrence of the identified species within the project area. Due to access constraints, the only observations outside the corridor on adjacent properties were within line of sight and any vocalizations observed. Our investigations led to the following conclusions regarding habitat suitability for the species referenced above:

American chaffseed – Due to past use of prescribed fire on the landscape, habitat requirements for American chaffseed were marginal within the Cross Generating Station WMA; however, it had been some time since a prescribed burn was conducted as evidenced by the presence of the extensive shrub layer and woody cover. In addition, only faint evidence of burn scars was present on larger pine trees. Other areas of the corridor were comprised of industrial timberland that were extensively ditched and disturbed. Early successional habitat was not present except for within clear cut areas, ditch banks, and roadsides. The clearcut areas were treated with herbicide during site preparation to reduce competition and promote the survivability of the loblolly pine seedlings. Herbicide was applied to roadways to maintain the right of ways. Ditches appeared to be routinely cleaned out, placing new spoil material on the banks. Due to the history of industrial forestry within the corridor and infrequent burning on the Cross WMA, and lack of suitable quality habitat, it is our opinion that the project may effect, but is not likely to adversely affect American chaffseed. There are no documented occurrences of American chaffseed within the project area. Coordination with SCDNR and USFWS did not identify any populations near the project area.

Atlantic sturgeon – The habitat requirements for Atlantic sturgeon are met within the diversion canal connecting the Santee-Cooper lakes; however, due to the construction of dams built in conjunction with the re-diversion project, the sturgeon can no longer migrate to historic spawning grounds in the upper Santee River. The shortnose sturgeon has been known to migrate into the lakes through the fish lift and dam locks, but Atlantic sturgeon have not been documented to navigate the dams, nor have they been documented occupying the Santee-Cooper lakes. There are few documentations of tagged Atlantic sturgeon reaching the dam in a presumptive spawning run, and turning around or attempting to spawn at the dam itself. Atlantic sturgeons are known to spend much of their time in brackish and saline systems, and migrate to the inland freshwater reaches for spawning. The proposed rail line will bridge the diversion canal and will likely require supports to be built in the canal. Due to the fragmentation of historic spawning routes through the construction of dams and the re-diversion project, the proposed

action will have no effect on the Atlantic sturgeon. The Atlantic sturgeon are accustomed to navigation traffic and primarily use deep channel habitats. If Atlantic sturgeon are in the Santee-Cooper Lakes, it is unlikely they will enter and reside in and around the waters of the project construction site. If they do enter the area, the noise caused by pile-driving during construction is expected to discourage sturgeon from approaching the construction site. In addition, there are no documented occurrences of Atlantic sturgeon within the project area.

Bald eagle – Areas within the railroad corridor could provide potential foraging and nesting habitat for bald eagles. SCDNR's Bald Eagle nest location database was used to identify documented nests in proximity to the corridor, with the closest nest being over 1/3 mile away within a large wetland area (see attached map), outside of the 660-foot secondary zone outlined in the National Bald Eagle Management Plan (USFWS 2007). Intensive silviculture is practiced throughout the project corridor, preventing timber from growing to the size required for nest trees. The past mechanical disturbance associated with silvicultural practices could have acted as a deterrent to bald eagles nesting along the project corridor. Adjacent properties that were not as intensively managed for silviculture could provide nesting and foraging habitat. The corridor crosses the diversion canal between the Santee-Cooper Lakes, which are known foraging habitat for bald eagles. The bridge could potentially provide roost or nesting habitat to bald eagles or other birds of prey. 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 B&GEPA. There are no documented occurrences of bald eagles within the project area, or within 660 feet of the project area.

Canby's dropwort - Due to the extensive ditching and water management on industrial forestlands, the narrow wetland parameters Canby's dropwort requires are likely non-existent within the project corridor. Any open shallow wetland areas were previously ditched and loblolly pine was planted immediately adjacent to the wetland areas. Besides the Cross Generating Station WMA, which had evidence of a past prescribed fire, there were no other areas with a history of prescribed fire within the project area. There is a historic documented occurrence (last observed in 1987) outside the project limits (approximately 700 feet outside project limits) within a power line right of way (see attached map). However, there are no documented occurrences of Canby's dropwort within the project corridor. Due to the lack of suitable quality habitat, the proposed activity may affect, but is not likely to adversely affect Canby's dropwort.

Frosted flatwoods salamander – Habitat for the frosted flatwoods salamander was not observed within the project corridor. Frosted flatwoods salamanders require fire maintained ephemeral wetlands for breeding and fire maintained open pine forests during the remainder of their life cycle. The gum ponds and Carolina bays observed within the project corridor are

ditched, altering the hydrology of the system. The adjacent habitat to these areas are commercial timberlands, with high levels of soil disturbance from logging and bedding practices and no observed prescribed burning regimen. A historic population exists within the designated critical habitat south of Huger within the Francis Marion National Forest, approximately 25 miles away from the corridor, with the last documented occurrence of the species being documented in 2010. Due to the lack of suitable quality habitat, the proposed action will have no effect on frosted flatwoods salamanders. Also, there are no documented occurrences of frosted flatwoods salamanders within the project corridor.

Pondberry - Due to the extensive ditching and water management on industrial forestlands, the wetland parameters pondberry requires are likely absent within the project corridor. Any open shallow wetland areas were previously ditched and the loblolly pine was planted immediately adjacent to the wetland areas, leaving little transition zone or intact undisturbed wetlands. Prescribed fire has been removed from the landscape through a majority of the corridor, which historically would have maintained an open understory allowing for pondberry to grow. Pondberry is not likely to occur within the project corridor due to the degraded wetlands, extensive ditching and disturbance, as well as lack of fire on the landscape. Due to the lack of suitable quality habitat, the proposed action will have no effect on pondberry. There are no documented occurrences of pondberry within the project corridor, and only five populations exist within Berkeley County, all within the Francis Marion National Forest (USFWS 2010). Coordination with SCDNR and USFWS did not identify any populations near the project area.

Red-cockaded woodpecker - No nesting or foraging habitat for red-cockaded woodpeckers (RCW) occurred within the project corridor. Due to the industrial forest management practices along the corridor, final harvest of planted loblolly occurs at 25-30 years old. This does not allow for the trees to grow old enough (60+ years) in order to develop heart rot or other characteristics making trees suitable for RCW nesting. Not only are the trees not reaching the age class to be suitable habitat, but the BA of the planted pine forest are also much greater at 80-140 BA compared to suitable habitat at 40-70 BA. The planted pine forest habitat covered 70-80% of the corridor, with the other corridor areas being composed of wetlands and natural pine stands of unsuitable habitat due to heavy midstory and lack of prescribed fire. There are few documented populations of RCWs nearby, with the closest population to the corridor over two miles away on Oakland Plantation, and other populations in Orangeburg County approximately five miles away (see attached map). Adjacent property habitat management and site conditions were observed when visible from the corridor and staff listened for vocalizations during field work. Otherwise these areas were remotely assessed due to project and access issues. One adjacent area was observed to have suitable foraging habitat, but not nesting habitat. During

a site visit, a single potential RCW vocalization was heard from this adjacent property but was not confirmed. Multiple site visits back to this area did not identify (audible or visual) evidence of RCWs, indicating that either the field biologist did not hear a RCW on the single occasion or it was a foraging RCW. The proposed action will have no effect on RCWs because of the absence of suitable foraging or nesting habitat within the corridor, and the absence of documented occurrences of RCW within or immediately adjacent to the project area.

Shortnose sturgeon – The habitat requirements for shortnose sturgeon are met within the diversion canal connecting the Santee-Cooper lakes. The shortnose sturgeon has occasionally been reported in the reservoirs themselves, and in fact there is a known historical occurrence of shortnose sturgeon in Lake Moultrie (see attached map). An isolated population of shortnose sturgeon has been reported to occur within Lake Marion and its tributaries, yet there is little evidence of their migration downstream into the lower reservoir (Collins et al 2003). Shortnose sturgeon are known to spend more time in freshwater or brackish systems than Atlantic sturgeon. The area below the dam in the Tailrace Canal and near the head of the West Branch of the Cooper River is a known breeding area for shortnose sturgeon that cannot migrate through the fish lift and locks. The proposed rail line will bridge the diversion canal and will likely require supports to be built in the canal. Best management practices (BMP's) for avoidance and minimization of listed species for in-water construction are attached in Appendix A (see attached). Shortnose sturgeon are accustomed to navigation traffic and primarily use deep channel habitats; therefore, it is unlikely they will enter and reside in and around the waters of the project construction site. If they do enter the area, the noise caused by pile-driving during construction is expected to discourage sturgeon from approaching the construction site. With BMP's for avoidance and minimization as well as the fragmentation of historic spawning routes through the construction of dams and the re-diversion project, and other reasons listed above, the proposed action will have no effect on shortnose sturgeon. There are no documented occurrences of shortnose sturgeon within the project area.

West Indian manatee - West Indian manatees have rarely made their way through the locks into the Santee-Cooper Lakes. When they are identified, they are captured and removed as the manatees often become trapped and cannot survive winters in the lake as the water temperatures become too cold. West Indian manatees are a seasonal visitor to the lowcountry of South Carolina, where they can be found in many of the estuaries where freshwater rivers meet the Atlantic Ocean. Migration into interior reaches of freshwater rivers has been documented, but is not common. The proposed rail line will bridge the diversion canal and will likely require supports to be built in the canal following best management practices (Appendix A). Due to the rarity of West Indian manatees successfully navigating the locks and entering the Santee-Cooper

lakes, the proposed action will have no effect on West Indian manatees. There are no documented occurrences of West Indian manatees within the project area.

American Wood stork – Potential foraging or nesting habitat for American wood storks exists within some of the wetland areas within the project corridor, specifically the larger gum and cypress ponds as well as bottomland hardwood forests. The corridor will span the diversion canal between the Santee-Cooper Lakes, which are potential foraging and nesting habitat for American wood storks. Due to the availability of alternative foraging and nesting habitat outside of the corridor and on adjacent properties, the proposed action may affect, but is not likely to adversely affect wood storks. No wood storks or wood stork rookeries were observed within or immediately adjacent to the project corridor. Coordination with SCDNR and USFWS did not identify any rookeries near the project area.

DETERMINATION OF EFFECT

Based on our findings, we believe that the proposed action (1) “may affect, but is not likely to adversely affect” American chaffseed, Canby’s dropwort, and American wood stork, (2) will have no effect on Atlantic sturgeon, flatwoods salamanders, pondberry, red-cockaded woodpeckers, Shortnose sturgeon and West Indian manatees, and (3) will not likely disturb bald eagles. Direct and indirect impacts from past silviculture activity, ditching, dam construction and a lack of prescribed fire within the project area are the primary factors that likely negate the presence of any of the above listed species. The impacted area of the proposed action will be an approximately 50-foot wide right of way that will be located within the 200-foot wide study area, plus some expanded areas where minor alternatives in the original alignment may be considered.

We request your written concurrence with these findings. If you have questions or comments, please contact me at (843) 871-5383. Thank you for your assistance.

Sincerely,

Robert C. Strange
Sabine & Waters, Inc.

Enclosures

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APPENDIX A

BMPs for Avoiding and/or Minimization of Impacts on Listed Species for the in-water work associated with the proposed Palmetto Railways bridge at the Santee Cooper Diversion Canal

General Considerations

- Structures over water and/or other benthic resources have been aligned so as to minimize the over-water footprint as much as practicable

Construction Methodology

The following Best Management Practices (BMPs) will be implemented during construction by the contractor responsible for the execution of the work. These will be required in addition to conditions set forth in regulatory permit(s).

General

- Prior to construction, the Contractor shall be required to submit a Work Plan describing their proposed construction approach, methodology, and equipment to be used. This plan will be reviewed by the Owner and/or their representative(s) to ensure compliance with applicable regulatory conditions and BMPs. The contractor shall also be required to attend and document his/her attendance at the Pre-Construction Conference meeting.
- Once construction is initiated, the Contractor shall be required to complete the project in an expeditious manner in order to minimize the period of disturbance to environmental resources.
- Land disturbing activities shall not encroach into any wetland areas outside of the permitted impact area.
- The Contractor will be required to implement BMPs that will minimize erosion and migration of sediments on and off the upland project site, including reclaimed lands, during and after construction. The contractor will also be required to conduct inspections at a minimum of at least once every calendar week or within 24 hours of the end of a storm event of 0.5 inches or greater, until final stabilization is reached on all areas of the construction site.
- Contractor shall be required to ensure that oil, tar, trash, debris, and other pollutants do not enter the adjacent waters or wetlands during construction.
- All construction personnel shall be instructed on the potential presence of protected species in the construction area as described in the Protected Species Biological Assessment and the need to prevent entrapment, harm, or other impacts to these animals.
- All construction personnel will be advised that there are civil and criminal penalties for harming, harassing, or killing protected species.
- All in-water construction activities shall be completed during daylight hours.

- Upon completion of construction activities, permanent manatee signs shall be posted at locations prominently visible to persons engaged in water-related activities within and around the bridge. The signs should include contact information for reporting manatee collisions and/or injury, as well as any sightings, to the U.S. Fish and Wildlife Service at their Charleston Field Office at (843) 727-4707.

Pile Driving/Caissons/Drilled Shaft Foundations

- Contractor shall be required to implement measures to control and/or contain suspended sediments resulting from construction activities.
- Siltation barriers, if required, shall be made of material in which a Protected Species cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid entrapment of protected species.
- Contractor shall use a vibratory hammer to the maximum extent practicable.
- Contractor shall use cushion blocks or other noise attenuation devices when using an impact hammer.
- Pile driving activities shall be limited to no more than 12 hours per day (February – March, sturgeon; May – September, manatee).
- Contractor shall use a “soft start” for a pile driving activities (i.e. - driving does not occur at full power at first).

Vessel Operations

- Shallow draft vessels that maximize the navigational clearance between the vessel and the river bottom (e.g. – “jon boats”, flat-bottomed barges, etc.) should be used where possible.
- All vessels associated with the construction project shall operate at “no wake/idle” speeds whenever possible while in the construction area and while in water depths where the draft of the vessel provides less than a four-foot clearance from the bottom.
- If a Protected Species is seen within 300 feet of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection. These precautions shall include cessation of operation of any moving equipment closer than 50 feet of a Protected Species. Operation of any mechanical construction equipment shall cease immediately if a Protected Species is seen within a 50-ft radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition. Contact the USFWS immediately at (843) 727-4707.
- Any collision with and/or injury to a West Indian manatee shall be reported immediately to the USFWS, Charleston Field Office, (843) 727-4707

Appendix E: Phase I Cultural Resources Survey

CAMP HALL RAIL PROJECT



**540 East Bay Street
Charleston, South Carolina**

25 July 2017

Appendix F: Preliminary Assessment of Existing Utilities

CAMP HALL RAIL PROJECT



**540 East Bay Street
Charleston, South Carolina**

25 July 2017

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1. Executive Summary

A preliminary utility report for the planning of the Camp Hall Railway Build-In has been performed. The current and preferred alignment of the rail project consists of approximately 23 miles of proposed track in Berkeley County, South Carolina. The proposed track line is mostly in rural areas, but its proposed alignment will cross or run parallel to several utilities. These proposed track alignment has the potential to affect existing utilities along the project corridor.

In order to facilitate the planning for the Camp Hall Rail project, field visits were completed and utility owners within the proposed project corridor were identified. Consistent with the level of effort for a planning-level preliminary utilities assessment, identified and collected utility records from owners within the project corridor were identified, however, additional utilities may exist within the project area. Additionally, the accuracy and locations of the existing utilities depicted in this assessment cannot be guaranteed. Due to the preliminary nature of the collected records, the utilities identified in this assessment should be used for planning purposes only.

The preliminary utilities assessment identified a number of existing utilities that may encroach upon the proposed railroad right of way.

In this report, the utility records serve as a planning tool that compared features of the proposed rail project to the existing utilities. Six (6) possible utility owners were identified within the proposed project corridor (See Table 1-1 below for a summary of the owners identified. For a more detailed listing of the utility owners' info, please Table 3-1 in Section 3.).

Table 1-1: Preliminary listing of utility owners

Preliminary Listing of Utility Owners ^{1,2}	
1)	Santee Cooper Electrical Transmission
2)	Berkeley Electric Cooperative Electrical Distribution
3)	Santee Cooper Electrical Distribution
4)	Home Telephone Company (Telephone, cable and fiber optic)
5)	Berkeley County Water and Sanitation
6)	TDS Telecom (Telephone, cable and fiber optic)

Notes:

- 1) Utility owners listed above in Table 1-1 were identified by conducting field visits, by identifying the utilities in the field, and by contacting with the utility owners. Therefore, the utilities, their locations, and any mention thereof in this report, are approximate and not deemed as complete (including exhibits and locations of utilities). The list of the utilities in Table 1-1 is for basic planning purposes only.
- 2) Gas mains within the proposed project corridor were not identified during initial field investigations.

Available utility records from the utility owners identified in Table 1-1 were collected and compared against the proposed Camp Hall Rail project, and identified areas of potential conflicts between the rail project and the existing utilities (See Table 1-2 below for a brief synopsis of the utility locations. For a more detailed listing of the locations, please see Table 3-1 in Section 3. For a set of basic set of exhibits depicting the approximate location of the utilities, see the Exhibits at the end of this report.).

Table 1-2: Preliminary listing of utility owners and approximate locations of utilities

Preliminary Listing of Utility Owners¹	Approximate Locations of Utilities²
Santee Cooper Electrical Transmission³	Santee Cooper has several Electrical Overhead Transmission lines that intersect the proposed rail alignment: 1) 0.83 mile NE of US 176 along the railroad alignment at coordinates 33°12'30.0" N 80°14'05.3" W; 2) 2.32 miles NE of US 176 along the railroad alignment at coordinates 33°13'28.0" N 80°13'00.2" W; 3) 0.96 mile south from SC 6 along the meandering railroad alignment at coordinates 33°16'04.2" N 80°10'28.3" W; 4) 440 feet NW of SC 311 along the railroad alignment at coordinates 33°17'00.0" N 80° 10' 24.1" W; 5) 0.64 mile east of Ranger Drive along the power line at coordinates 33°21'39.9" N 80° 07' 30.9" W 0.45 mile south from Springwood Road along the power line at coordinates 33°23'59.6" N 80° 06' 07.5" W . 6) 0.45 mile south from Springwood Road along the power line at coordinates 33°23'59.6" N 80° 06' 07.5" W
Berkeley Electric Cooperative (BEC) Electrical Distribution	1) Fish Road (S-8-309); 2) State Road (US 176); 3) Mudville Road (S-8-135); 4) SC 311; 5) Mikey Road; 6) Short Cut Road (S-8-60); 7) Old Highway 6; 8) Ranger Drive/Hwy 6 (S-8-132); and 9) Viper Road (S-8-708).
Santee Cooper Electrical Distribution	1) South of Springwood Road parallel to the existing railroad.
Home Telephone Company (Hometelco)⁴	1) Fish Road (S-8-309); 2) State Road (US 176); 3) Mudville Road (S-8-135); 4) SC 311; 5) Mikey Road; 6) Short Cut Road (S-8-60); 7) Old Highway 6; 8) Ranger Drive/Hwy 6 (S-8-132); and 9) Viper Road (S-8-708).
Berkeley County Water and Sanitation (BCW&S)	1) Mudville Road (S-8-135); 2) SC 311; 3) Short Cut Road (S-8-60); 4) Old Highway 6; and 5) Ranger Drive/Hwy 6 (S-8-132).

Notes:

- 1) Utility owners listed above in Table 1-2 were identified by field visits, identifying the utilities in the field, and contacting the utility owners.
- 2) Subsequent to performing a preliminary discovery of the utility owners, utility records were obtained from the utility owners. The information summarized in Table 1-1 and Table 1-2 above are preliminary in nature. Therefore, the utility owners, the utilities, their locations, and any mention thereof in this report, are approximate and not deemed complete (including exhibits and other tables).
- 3) Due to the complex nature of overlap between the existing Santee Cooper Electrical Overhead Transmission lines and the proposed rail line, please see Santee Cooper Electrical Transmission Exhibits 1 through 3 for additional clarification.
- 4) Homtelco's facilities are buried unless otherwise noted along the nine roadways in Table 1-2.
- 5) Gas mains within the proposed project corridor were not identified during initial field investigations.

Following collection of utility records, field reviews were conducted within the proposed rail corridor to identify the pertinent features associated with the Camp Hall Rail project. In order to complete the comparisons of the existing utilities with the proposed Camp Hall Rail project, meetings with the utility owners and the project design professionals will be conducted. At these meetings, the attendees will discuss potential crossings with the existing utilities and any possible encroachments of the utilities into the right-of-way of the proposed track system. Attendees must discuss any planned utility improvements for the proposed project area and site (e.g., extensions to existing waterlines or other utilities to the site, upgrading pipe sizes or materials, etc.).

Palmetto Railways utility surveying subconsultant will conduct these meetings with the utility owners and project designers. Subsequent to these meetings, a preliminary report will be prepared to summarize the extent of conflicts, the extent of prior rights, and available alternatives for conflict resolution and recommendations for relocation design. This preliminary information will be utilized to provide a recommendation concerning the locations and quality levels of subsurface utility engineering (SUE) needed.

In order to conduct these meetings with the utility owners, prepare a preliminary report and recommend levels/limits of SUE, Palmetto Railways should provide the following information to the SUE and UC team:

- ▶ The required minimum depth by Palmetto Railways for utilities going underneath their rail systems;
- ▶ Casing requirements for all utility crossings (e.g.: water, sewer, communications, electrical, etc.);
- ▶ The minimum vertical clearance for aerial lines crossing the track;
- ▶ The minimum horizontal clearance for utility lines running parallel to the track right of way;
- ▶ The width of the track right of way;
- ▶ Variations of right of way width;
- ▶ The depth of track subgrade below the track;
- ▶ If the depth of subgrade varies, please provide these areas;
- ▶ Track elevation changes (e.g.: bridge tie-ins) and the proposed profiles in these areas;
- ▶ Proposed track cross sections;
- ▶ The estimated construction start date; and
- ▶ Electronic files for the line coordinates of the proposed track line.

2. Introduction to the Camp Hall Rail project

Currently, Palmetto Railways is in the planning stages for developing the Camp Hall Rail project. The Camp Hall Rail project will be an industrial rail line system to serve the Camp Hall Commerce Park in Berkeley County, South Carolina. The proposed Camp Hall Rail project will connect to an existing railroad right-of-way near Santee Cooper's Cross Generating Station in Berkeley County.

Figure 2-1 below provides a preliminary project map depicting Santee Cooper's Cross Generating Station, the Camp Hall Commerce Park and the initial study area.

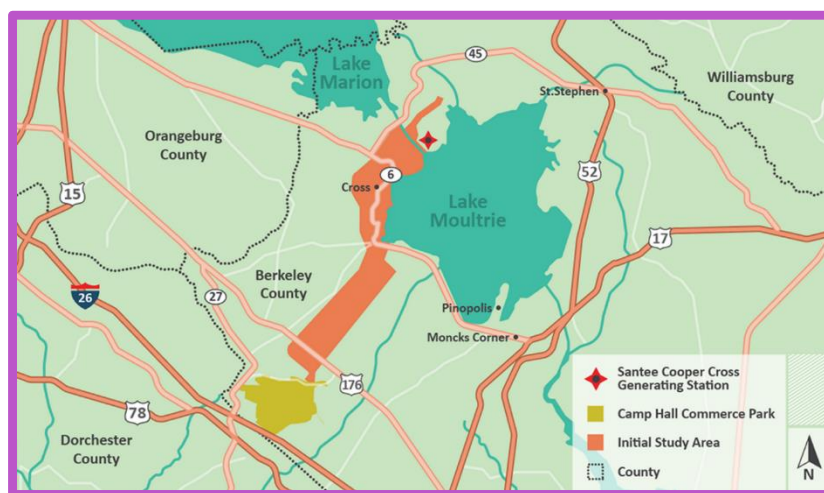


Figure 2-1: Planning process study map for the Camp Hall Rail project

2.1 Preliminary alignment of Camp Hall Rail project and preliminary utilities

Palmetto Railways will construct, own, operate and maintain the rail system for the Camp Hall Rail project. The preliminary preferred alignment of the industrial rail system will be approximately 23-miles long, and will mostly traverse rural areas, rural roads, wooded areas, wetlands and the Diversion Canal near SC Hwy. 45.

Using the proposed project corridor of the Camp Hall Rail project, a utility coordination team (UC team) gathered preliminary utility information from utility owners within the area of the project. After gathering the preliminary utility info, the UC team compiled a list of utilities along the route of the rail system. These utilities are the primary focus of this report. Some of the major utilities include Santee Cooper's Electrical Transmission lines and Berkeley Electric Cooperative's Distribution lines. In Section 3, findings are outlined concerning the gathering of preliminary utility information.

3. Preliminary identification of utilities

In order to identify the utilities within the Camp Hall Rail project limits, the UC Team conducted site visits. The UC Team also contacted six (6) utility owners to gather record drawings, as-built drawings and GIS information.

The UC Team obtained information from the following utility owners:

- ▶ Santee Cooper Electrical Transmission;

- ▶ Berkeley Electric Cooperative (BEC) Electrical Distribution;
- ▶ Santee Cooper Electrical Distribution;
- ▶ Home Telephone Company (Hometelco) - (Telephone, cable and fiber optic);
- ▶ Berkeley County Water and Sanitation (BCW&S); and
- ▶ TDS Telecom (TDS) - (Telephone, cable and fiber optic).

The UC Team assembled Table 3-1 below to identify approximate locations of the infrastructure belonging to the six (6) utility owners along the Camp Hall Rail project. Table 3-2 found below identifies the utility owners contacted as part of this investigation.

This is not an exhaustive identification of utilities and there may be other facilities within the project limits. Additionally, the locations of the identified utilities are approximate, not accurate and be used for planning purposes. Section 3.2 addresses the data collected to date concerning additional and future utilities.

Additionally, the records and maps collected from the utility owners were mostly rudimentary in nature. The utility owner's information is contained in preliminary exhibits in this report. The exhibits are for reference purposes only.

Table 3-1: Existing utility data identified¹

Utility Owners	Approximate Locations of Utility Impacts
Santee Cooper Electrical Transmission	The following is the info gathered relating to Santee Cooper's Overhead Transmission lines: 1) 0.83 mile NE of US 176 along the railroad alignment at coordinates 33°12'30.0" N 80°14'05.3" W (See Santee Cooper Electrical Transmission—Exhibit 1); 2) 2.32 miles NE of US 176 along the railroad alignment at coordinates 33°13'28.0" N 80°13'00.2" W (See Santee Cooper Electrical Transmission—Exhibit 1); 3) 0.96 mile south from SC 6 along the meandering railroad alignment at coordinates 33°16'04.2" N 80°10'28.3" W (See Santee Cooper Electrical Transmission—Exhibit 2); 4) 440 feet NW of SC 311 along the railroad alignment at coordinates 33°17'00.0" N 80° 10' 24.1" W (See Santee Cooper Electrical Transmission—Exhibit 2); 5) 0.64 mile east of Ranger Drive along the power line at coordinates 33°21'39.9" N 80° 07' 30.9" W (See Santee Cooper Electrical Transmission—Exhibit 3); and 6) 0.45 mile south from Springwood Road along the power line at coordinates 33°23'59.6" N 80° 06' 07.5" W (See Santee Cooper Electrical Transmission—Exhibit 3).
BEC Electrical Distribution BEC Electrical Distribution (Cont.)	The following is the info gathered relating to BEC's Distribution lines: 1) <u>Fish Road (S-8-309)</u>: There is a single-phase power line on south side of road with pole line terminating about 150 feet west of the proposed railroad. There are no communication attachments on this power line. There is a service drop to a construction office (See Berkeley Electric Cooperative Electrical Distribution – Exhibit 1); 2) <u>State Road (US 176)</u>: There is a three-phase power line along the south side of the roadway with the nearest pole about 150 feet east of the proposed railroad. There are no communication attachments on this power line; (See Berkeley Electric Cooperative Electrical Distribution – Exhibit 1);

	3) <u>Mudville Road (S-8-135)</u>: There is a three-phase power line along the north side of the roadway with the nearest pole about 110 feet east of the proposed railroad. There are no communication attachments on this power line; (See Berkeley Electric Cooperative Electrical Distribution – Exhibit 2); 4) <u>SC 311</u>: There is a three-phase power line along the north side of the roadway with the nearest pole about 50 feet west of the proposed railroad. There are no communication attachments on this power line; (See Berkeley Electric Cooperative Electrical Distribution – Exhibit 2); 5) <u>Mikey Road</u>: There is a single-phase power line located about 315 feet north of Mikey Road and approximately parallel to Mikey Road. The nearest power pole is 112 feet east of the proposed railroad. There are no communication attachments on this power line; (See Berkeley Electric Cooperative Electrical Distribution – Exhibit 2); 6) <u>Short Cut Road (S-8-60)</u>: There is a single-phase power line along the east side of the roadway with the nearest pole about 75 feet south of the proposed railroad. There are no communication attachments on this power line; (See Berkeley Electric Cooperative Electrical Distribution – Exhibit 2); 7) <u>Old Highway 6</u>: There is a three-phase power line along the north side of the roadway with the nearest pole about 50 feet west of the proposed railroad. There is a Home Telephone Company (Hometelco) attachment on the poles associated with the power line; (See Berkeley Electric Cooperative Electrical Distribution – Exhibit 3); 8) <u>Ranger Drive/Hwy 6 (S-8-132)</u>: There is a three-phase power line along the east side of the roadway with the nearest pole about 125 feet north of the proposed railroad. There is a Hometelco attachment on the poles associated with the power line. (See Berkeley Electric Cooperative Electrical Distribution – Exhibit 3); and 9) <u>Viper Road (S-8-708)</u>: There is a three-phase power line along the south side of the roadway with the nearest pole about 200 feet west of the proposed railroad. There is a Hometelco attachment on the poles associated with the power line. (See Berkeley Electric Cooperative Electrical Distribution – Exhibit 3).
Santee Cooper Electrical Distribution	The following is the info gathered relating to Santee Cooper's Distribution's lines: 1) Santee Cooper has a 34 kV three-phase power line located 30 feet west and parallel to existing railroad south of Springwood Road. There may be three to four poles impacted by the proposed railroad (See Santee Cooper Electrical Distribution – Exhibit 1).
Hometelco Hometelco (Cont.)	The following is the info gathered relating to Hometelco's Facilities²: 1) <u>Fish Road (S-8-309)</u>: There is a 200 pair copper and a 20-strand fiber on the north side of the road. There is a 100 pair copper, a 144-strand fiber and a spare 1¼" PVC duct on the south side of the road. There is a traffic resistant hand hole on the south side that may be impacted by the proposed railroad; (See Home Telephone Company– Exhibit 1); 2) <u>State Road (US 176)</u>: There is a 100 pair copper, a 48-strand fiber and a spare 1¼" PVC duct on the north side of the road. There are two 200 pair copper cables and a 10-strand fiber on the south side of the road; (See Home Telephone Company– Exhibit 1);

	3) <u>Mudville Road (S-8-135)</u>: There is a single 50 pair copper on the north side of the road. There is a 50 pair copper and a 10-strand fiber on the south side of the road; (See Home Telephone Company– Exhibit 2); 4) <u>SC 311</u>: There is a 100 pair copper and an 8-strand fiber on the north side of the road. There is a 600 pair copper, a 48-strand fiber and a spare 1¼” PVC duct on the south side of the road; (See Home Telephone Company– Exhibit 2); 5) <u>Mikey Road</u>: There is a single 2 pair copper on the north side of the road; (See Home Telephone Company– Exhibit 2); 6) <u>Short Cut Road (S-8-60)</u>: There is a single 50 pair copper on the east side of the road; (See Home Telephone Company– Exhibit 2); 7) <u>Old Highway 6</u>: There is a 22 pair copper, a 100 pair copper and a 12-strand fiber on the north side of the road. There is also coax aerial attachment on the power poles on the north side. There is a 75 pair copper, a 300 pair copper and a 200 pair copper on the south side of the road; (See Home Telephone Company– Exhibit 3); 8) <u>Ranger Drive/Hwy 6 (S-8-132)</u>: There is a single 100 pair copper on the east side of the road. There is also a coax aerial attachment on the power poles on the east side of the road. There is a 100 pair copper and a 24-strand fiber on the west side of the road; (See Home Telephone Company– Exhibit 3); and 9) <u>Viper Road (S-8-708)</u>: There is a 24-strand fiber and coax aerial attachments on the power poles on the south side of the road. (See Home Telephone Company– Exhibit 3).
Berkeley County Water and Sanitation (BCW&S)	The following is the info gathered relating to BCW&S’ Water Main: 1) <u>Mudville Road (S-8-135)</u>: There is a 6” PVC water main on the north side of the roadway. There is a hydrant approximately 280 feet east of the proposed railroad; (See Berkeley County Water & Sanitation – Exhibit 1); 2) <u>SC 311</u>: There is a 12” PVC water main on the south side of the roadway. There is a hydrant approximately 285 feet west of the proposed railroad; (See Berkeley County Water & Sanitation – Exhibit 1); 3) <u>Short Cut Road (S-8-60)</u>: There is a 12” PVC water main on the west side of the roadway. There is a hydrant approximately 500 feet north of the proposed railroad; (See Berkeley County Water & Sanitation – Exhibit 1); 4) <u>Old Highway 6</u>: There is a 12” PVC water main on the south side of the roadway. There is a hydrant approximately 210 feet east of the proposed railroad; (See Berkeley County Water & Sanitation – Exhibit 2); and 5) <u>Ranger Drive/Hwy 6 (S-8-132)</u>: There is an 8” PVC water main on the east side of the roadway. There is a hydrant approximately 425 feet south of the proposed railroad. (See Berkeley County Water & Sanitation – Exhibit 2).
TDS Telecom (TDS)	The following is the info gathered relating to TDS’ Buried Facilities: 1) <u>Viper Road (S-8-708)</u>: There is a single 50 pair cable on the north side of the road and, a 50 pair cable, a 200 pair cable and a 24-strand fiber on the south side of the road. (See TDS Telecom – Exhibit 1)

Notes:

- 1) All utility locations above are from records supplied by utility owners, are approximate, and cannot be deemed as complete. The locations are for basic planning purposes only.
- 2) Hometelco’s facilities are buried unless otherwise noted along the nine roadways in Table 3-1.

- 3) There were no natural gas facilities found within the project limits.

Table 3-2: Contact info of utility owners

Utility Owner	Contact Name & Address	Phone #	Email
Santee Cooper Electrical Transmission	Teresa Hensley One Riverwood Drive P.O. Box 2946101 Moncks Corner, SC 29461-2901	843-761-8000 Ext. 7207	teresa.hensley@santeecooper.com
BEC Electrical Distribution	John Hall 551 Rembert C. Dennis Blvd. P.O. Box 1234 Moncks Corner, SC 29461	843-559-2458	johnh@bec.coop
Santee Cooper Electrical Distribution	John Ackerman One Riverwood Drive P. O. Box 2946101 Moncks Corner, SC 29461-2901	843-351-4586 Ext. 6276	john.ackerman@santeecooper.com
Hometelco	Steve Cooper 579 Stoney Landing Rd Moncks Corner, SC 29461	843-761-9541	steve.cooper@hometelco.com
BCW&S	Joshua Hawkins 212 Oakley Plantation Drive Moncks Corner, SC 29461	843-719-2313	joshua.hawkins@berkeleycountysc.gov
TDS Telecom	Kevin Barnette Manager of NC & SC Field Services St. Stephens, SC	843-567-3122	kevin.barnette@tdstelecon.com

3.1 Preliminary identification of future utilities

Utility owners and other infrastructure providers were contacted to determine if there is any future infrastructure planned for the Camp Hall Commerce Park, or in and around the Camp Hall Rail project limits. This was a preliminary contact and analysis performed by the project team to gather the info.

The following projects are planned for the area:

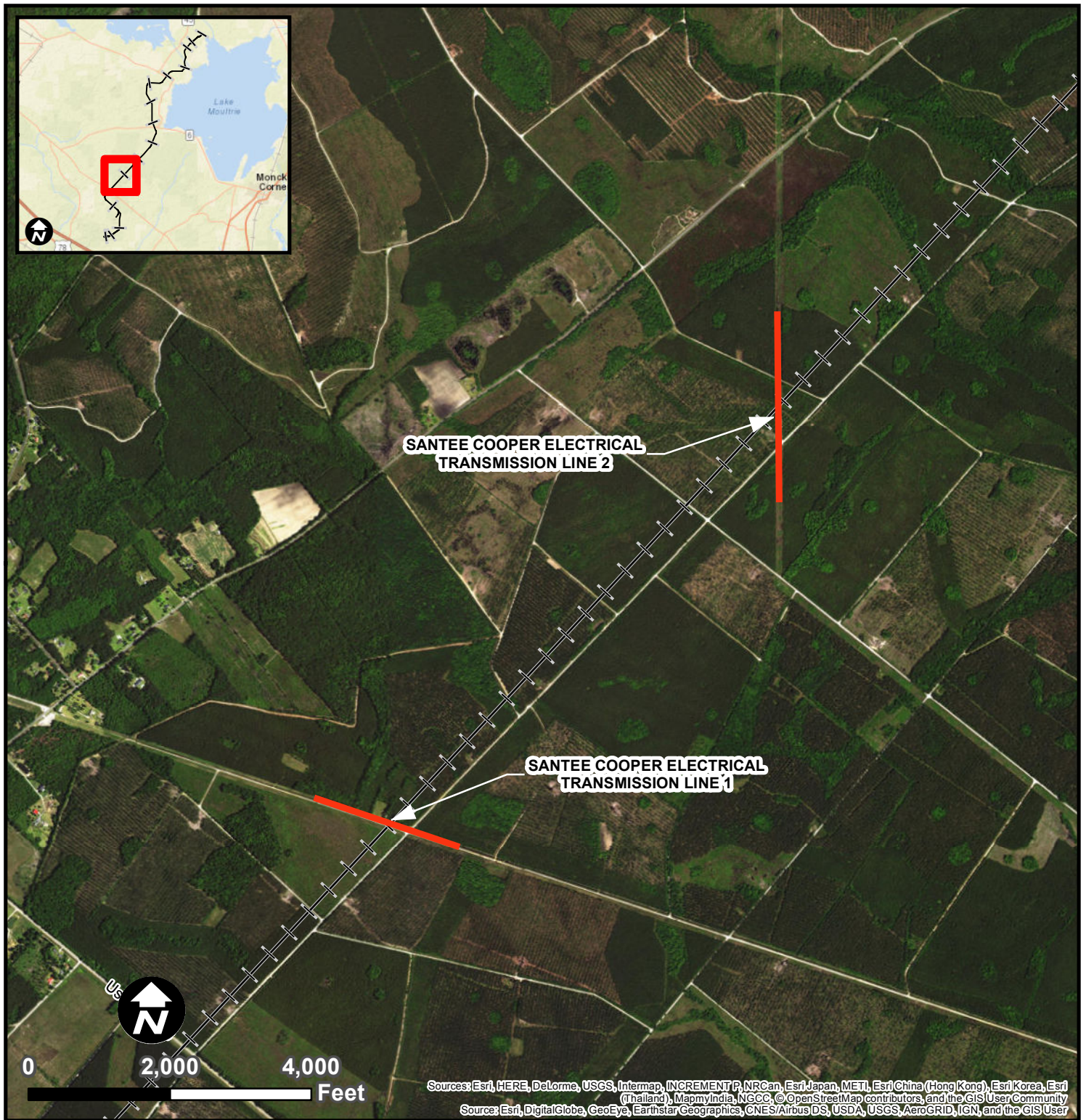
- Transportation – Roadways:
 - Volvo Car Drive (north): Under Construction between Fish Drive and US 176; and
 - Railway Crossover – Volvo Car Drive: Approximately 2,375' from Fish Road.

- Water and Sewer Service:
 - Water main is under construction on the north for Volvo Car Plant and will be installed on the west side of Volvo Car Drive. Berkeley County Water and Sanitation will furnish water in a 12" PVC main. There will be a potential conflict about 2,390' from Fish Road; and

- ▶ Sewerage will be out of the south side of the Volvo Car Plant via a pipeline by I-26 and treated either in Summerville or Goose Creek.
- ▶ Natural Gas:
 - ▶ SCE&G will furnish natural gas via a high-pressure main from at Ridgeville and installed near SC 27, then under I-26 to the south side of the Volvo Car Plant.
- ▶ Electrical Power Distribution:
 - ▶ Berkeley Electric Cooperative will furnish power via a 25 kV underground power line from US 176 to the Volvo Car Plant. This underground power line will be installed on the east side of Volvo Car Drive. There will be a potential conflict about 2,360' from Fish Road.
 - ▶ Electrical Power Transmission:
 - ▶ Santee Cooper will furnish power via their Pringletown - Wassamasaw transmission line to the north side of the Volvo Car Plant.

Santee Cooper Electrical
Transmission
Exhibits

**Santee Cooper Electrical
Transmission
Exhibit 1**



Document Path: F:\AMEC_Projects\2016\CampHallRailLine\GISMXDs\NewMapLayout\SANTEE_TRANSMISSION_EXHIBIT1.mxd



LEGEND

- Santee Cooper Transmission Line
- +— Proposed Railroad

CAMP HALL RAIL LINE EXISTING UTILITY SANTEE COOPER ELECTRICAL TRANSMISSION - EXHIBIT 1

Camp Hall Commerce Park Rail Spur
Berkeley County, South Carolina

Job No. 6250160108

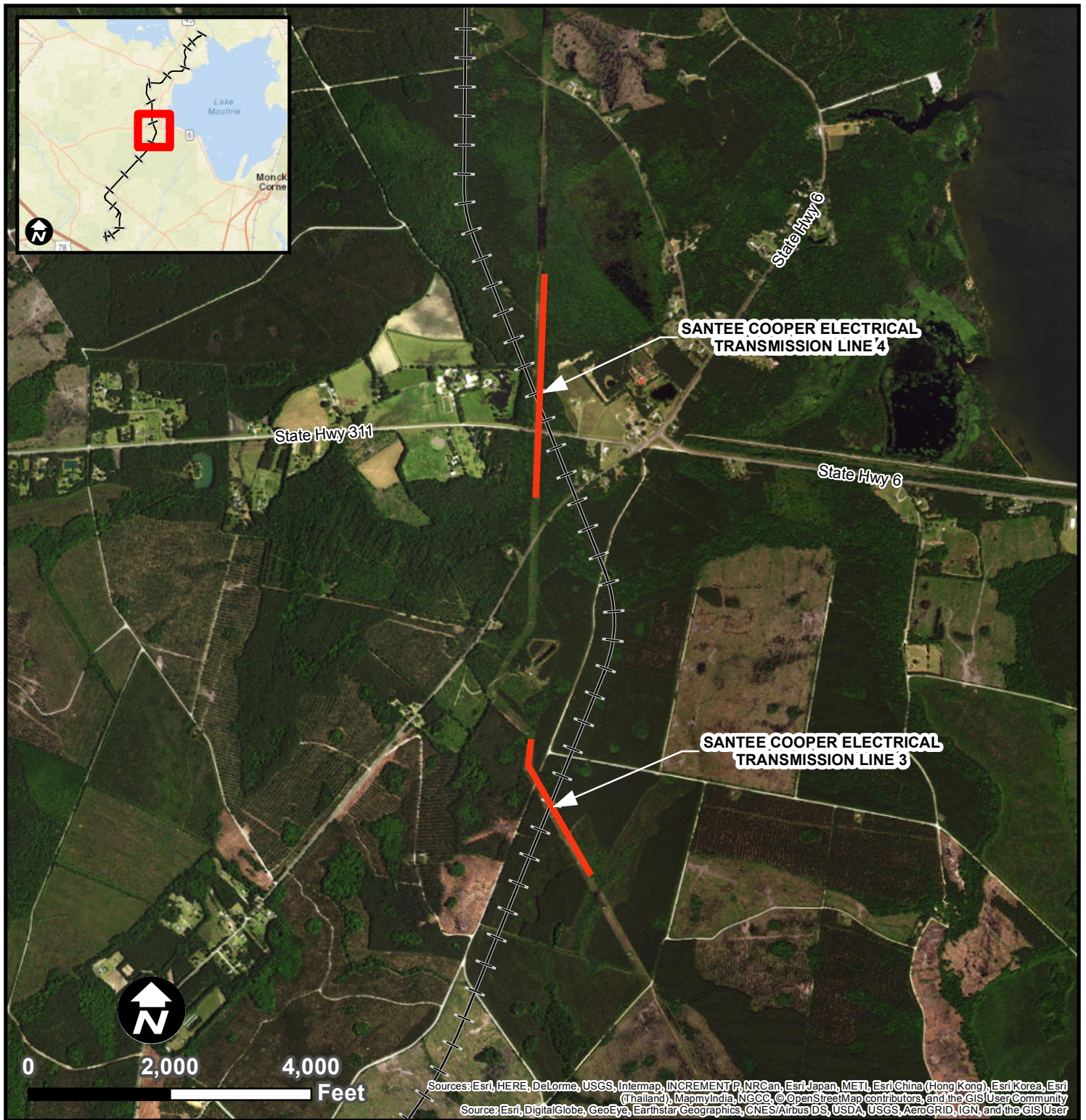
Drawn By: JMS

Reviewed By: BWS

Date: 5/2/2017

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**Santee Cooper Electrical
Transmission
Exhibit 2**



Document Path: F:\AMEC_Projects\2016\CampHallRailLine\GISMXDs\NewMapLayout\Santee_Transmission_EXHIBIT2.mxd



LEGEND

- Santee Cooper Transmission Line
- + + + Proposed Railroad

CAMP HALL RAIL LINE EXISTING UTILITY SANTEE COOPER ELECTRICAL TRANSMISSION - EXHIBIT 2

Camp Hall Commerce Park Rail Spur
Berkeley County, South Carolina

Job No. 6250160108

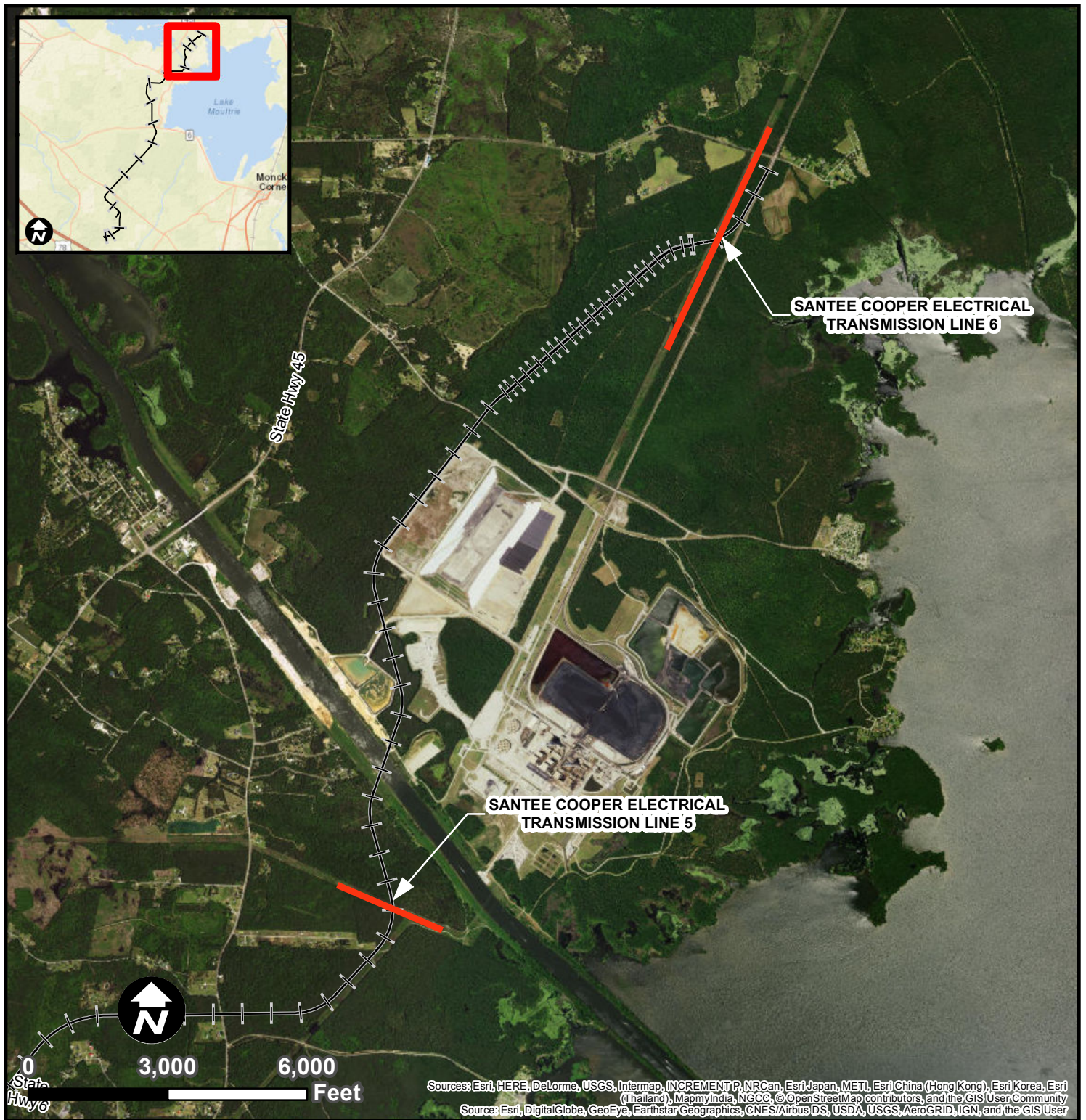
Drawn By: JMS

Reviewed By: BWS

Date: 5/2/2017

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**Santee Cooper Electrical
Transmission
Exhibit 3**



Document Path: F:\AMEC_Projects\2016\CampHallRailLine\GISMXDs\NewMapLayout\Santee_Transmission_Exhibit3.mxd



LEGEND

- Santee Cooper Transmission Line
- +— Proposed Railroad

CAMP HALL RAIL LINE EXISTING UTILITY Santee Cooper ELECTRICAL TRANSMISSION - EXHIBIT 3

Camp Hall Commerce Park Rail Spur
Berkeley County, South Carolina

Job No. 6250160108

Drawn By: JMS

Reviewed By: BWS

Date: 5/2/2017

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Berkeley Electric
Cooperative Electrical
Distribution
Exhibits

**Berkeley Electric Cooperative
Electrical Distribution
Exhibit 1**



Document Path: P:\Environmental\2012 + Projects\0108 - Palmetto Railways - Camp Hall Build-in\Utilities\GIS\BEC Ex1.mxd



Legend

- Power Line
- |— Proposed Railroad

CAMP HALL RAIL LINE EXISTING UTILITY BERKELEY ELECTRIC COOPERATIVE ELECTRICAL DISTRIBUTION - EXHIBIT 1

Camp Hall Commerce Park Rail Spur
Berkeley County, South Carolina

Job No. 6250160108

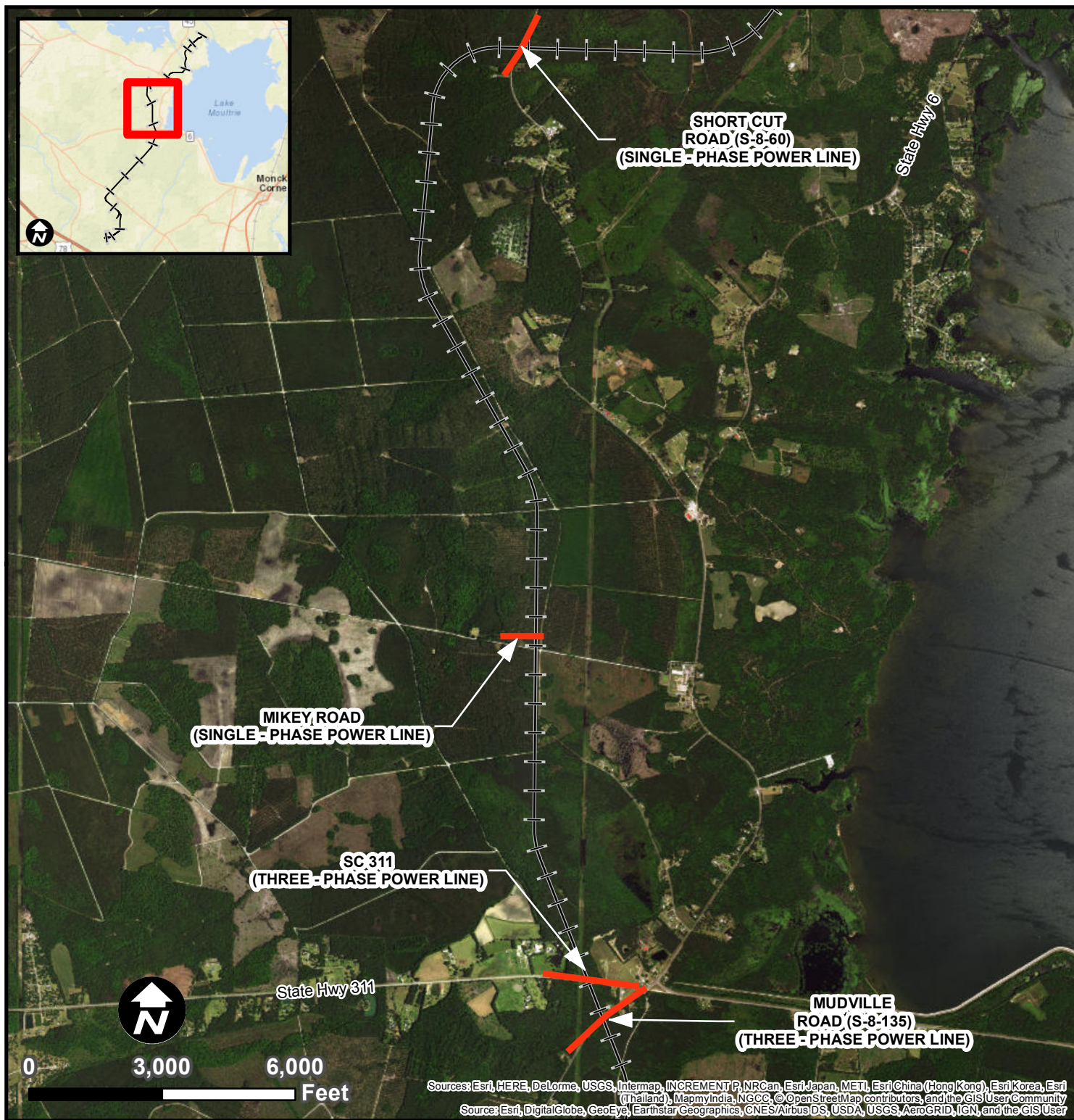
Drawn By: BWS

Reviewed By: AWC

Date: 6/28/2017

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**Berkeley Electric Cooperative
Electrical Distribution
Exhibit 2**



Document Path: F:\AMEC_Projects\2016\CampHallRailLine\GISMXDs\NewMapLayout\BCECEXHIBIT_2.mxd



LEGEND

— Power Line

— Proposed Railroad

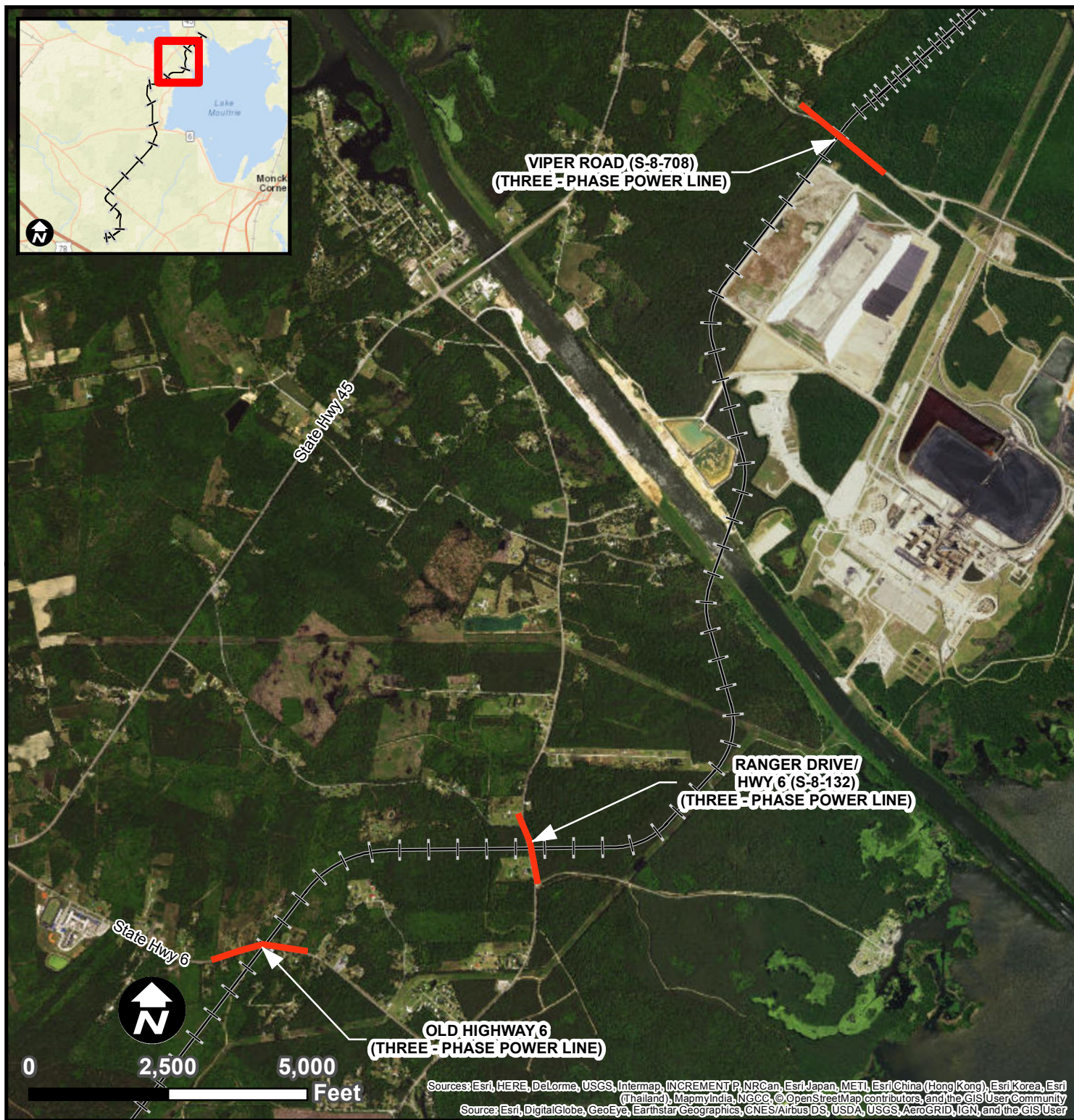
**CAMP HALL RAIL LINE EXISTING UTILITY
BERKELEY ELECTRIC COOPERATIVE
ELECTRICAL DISTRIBUTION - EXHIBIT 2**

Camp Hall Commerce Park Rail Spur
Berkeley County, South Carolina

Job No.	6250160108
Drawn By:	JMS
Reviewed By:	BWS
Date:	5/2/2017

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**Berkeley Electric Cooperative
Electrical Distribution
Exhibit 3**



Document Path: F:\AMEC_Projects\2016\CampHallRailLine\GISMXDs\NewMapLayout\BCEC\EXHIBIT_3.mxd



LEGEND

- Power Line
- +— Proposed Railroad

CAMP HALL RAIL LINE EXISTING UTILITY BERKELEY ELECTRIC COOPERATIVE ELECTRICAL DISTRIBUTION - EXHIBIT 3

Camp Hall Commerce Park Rail Spur
Berkeley County, South Carolina

Job No. 6250160108

Drawn By: JMS

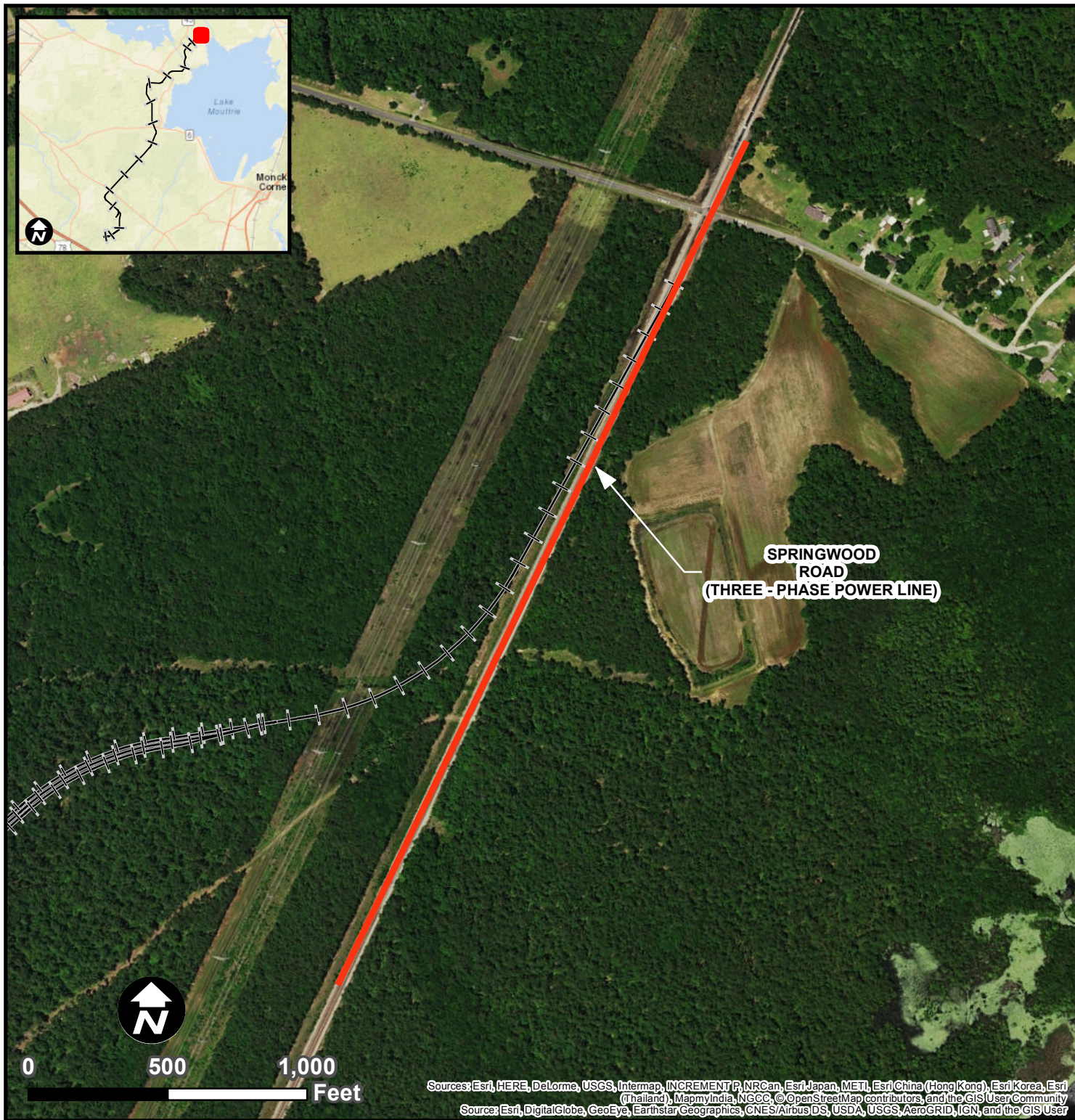
Reviewed By: BWS

Date: 5/2/2017

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Santee Cooper Electrical
Distribution
Exhibit

**Santee Cooper
Electrical Distribution
Exhibit 1**



Document Path: F:\AMEC_Projects\2016\CampHallRailLine\GISMXDs\NewMapLayout\SANTEEXHIBIT1.mxd



LEGEND

- 34 kV Three-Phase Power Line
- +—+— Proposed Railroad

CAMP HALL RAIL LINE EXISTING UTILITY SANTEE COOPER ELECTRICAL DISTRIBUTION - EXHIBIT 1 Camp Hall Commerce Park Rail Spur Berkeley County, South Carolina

Job No. 6250160108

Drawn By: JMS

Reviewed By: BWS

Date: 5/2/2017

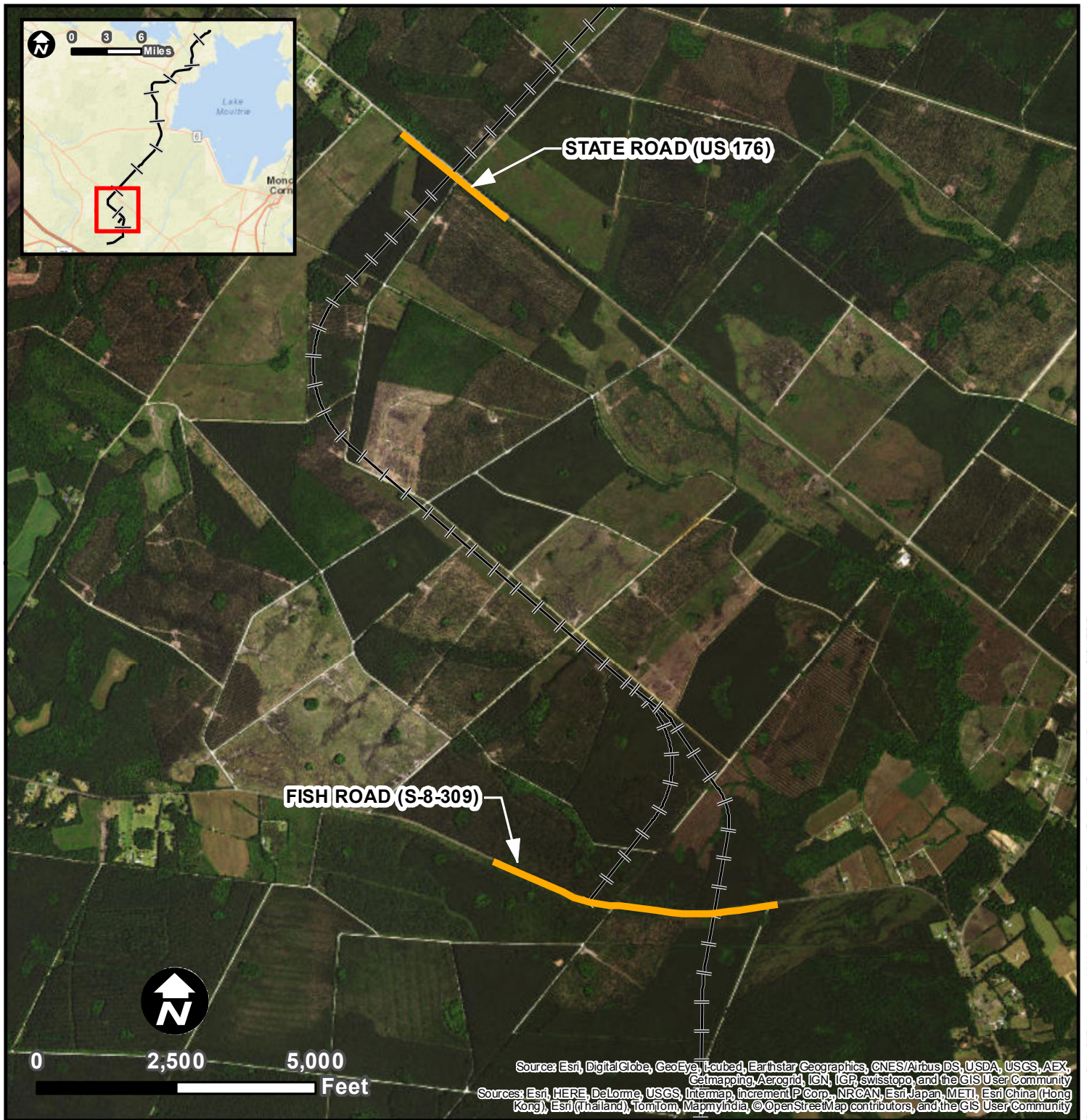
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Home Telephone Company

Exhibits

Home Telephone Company

Exhibit 1



Document Path: P:\Environmental\2012 + Projects\0108 - Palmetto Railways - Camp Hall Build-in\Utilities\GIS\HTC Ex1.mxd



Legend

- Telecom Line (Buried)
- +—+— Proposed Railroad

CAMP HALL RAIL LINE EXISTING UTILITY HOME TELEPHONE COMPANY EXHIBIT 1

Camp Hall Commerce Park Rail Spur
Berkeley County, South Carolina

Job No. 6250160108

Drawn By: BWS

Reviewed By: AWC

Date: 6/28/2017

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Home Telephone Company

Exhibit 2



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LEGEND

- Telecom Line (Buried)
- + + + Proposed Railroad

CAMP HALL RAIL LINE EXISTING UTILITY HOME TELEPHONE COMPANY EXHIBIT 2

Camp Hall Commerce Park Rail Spur
Berkeley County, South Carolina

Job No. 6250160108

Drawn By: JMS

Reviewed By: BWS

Date: 5/2/2017

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Home Telephone Company

Exhibit 3



Document Path: F:\AMEC_Projects\2016\CampHallRailLine\GISMXDs\NewMapLayout\HEMETELCO_EXHIBIT3.mxd



LEGEND

- Telecom Line (Buried)
- + + + Proposed Railroad

CAMP HALL RAIL LINE EXISTING UTILITY HOME TELEPHONE COMPANY EXHIBIT 3

Camp Hall Commerce Park Rail Spur
Berkeley County, South Carolina

Job No. 6250160108

Drawn By: JMS

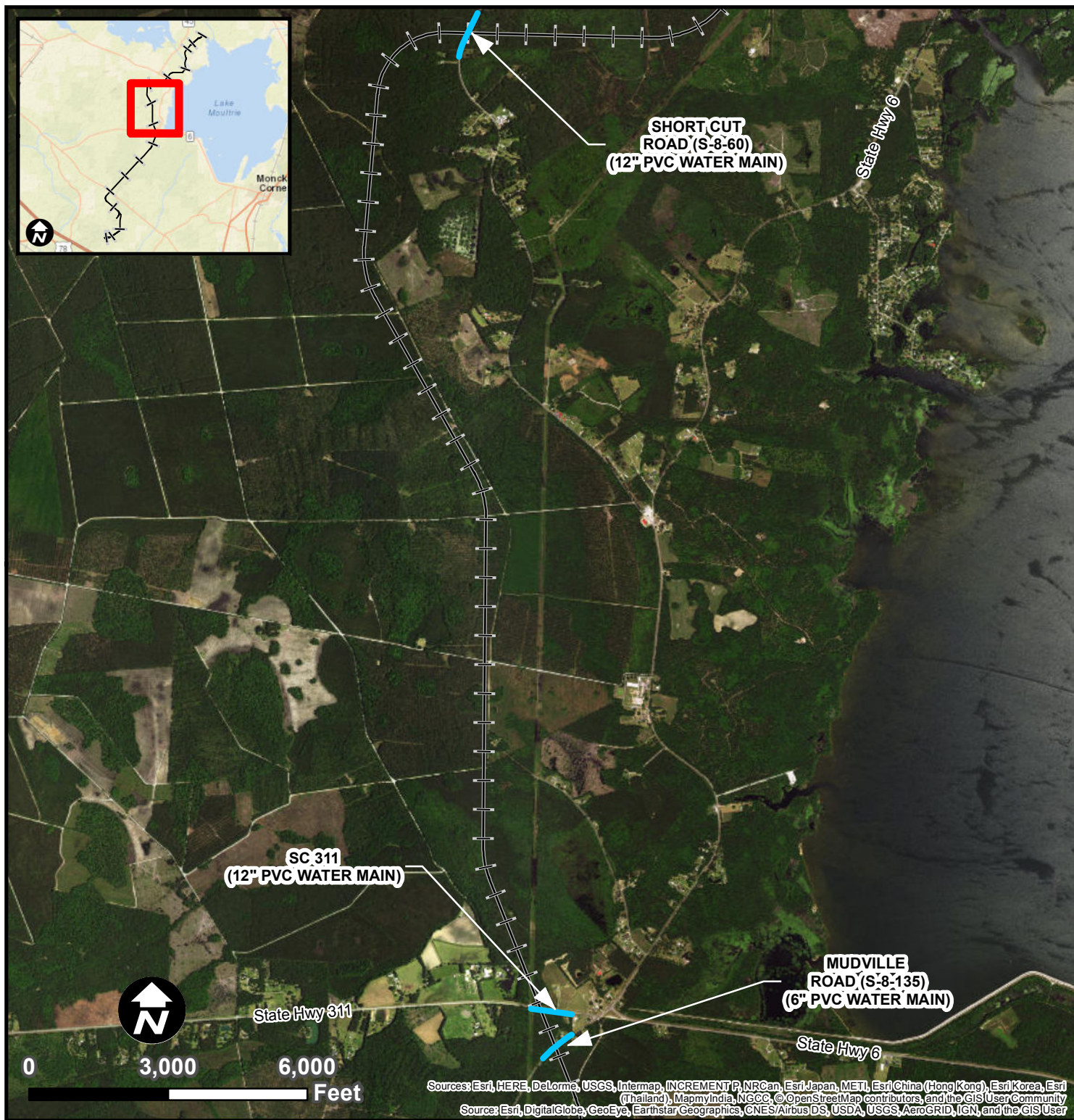
Reviewed By: BWS

Date: 5/2/2017

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Berkeley County
Water & Sanitation
Exhibits

**Berkeley County
Water & Sanitation
Exhibit 1**



Document Path: F:\AMEC_Projects\2016\CampHallRailLine\GISMXDs\NewMapLayout\BCW&S_EXHIBIT1.mxd



LEGEND

- Water Main
- + + Proposed Railroad

CAMP HALL RAIL LINE EXISTING UTILITY BERKELEY COUNTY WATER & SANITATION EXHIBIT 1

Camp Hall Commerce Park Rail Spur
Berkeley County, South Carolina

Job No. 6250160108

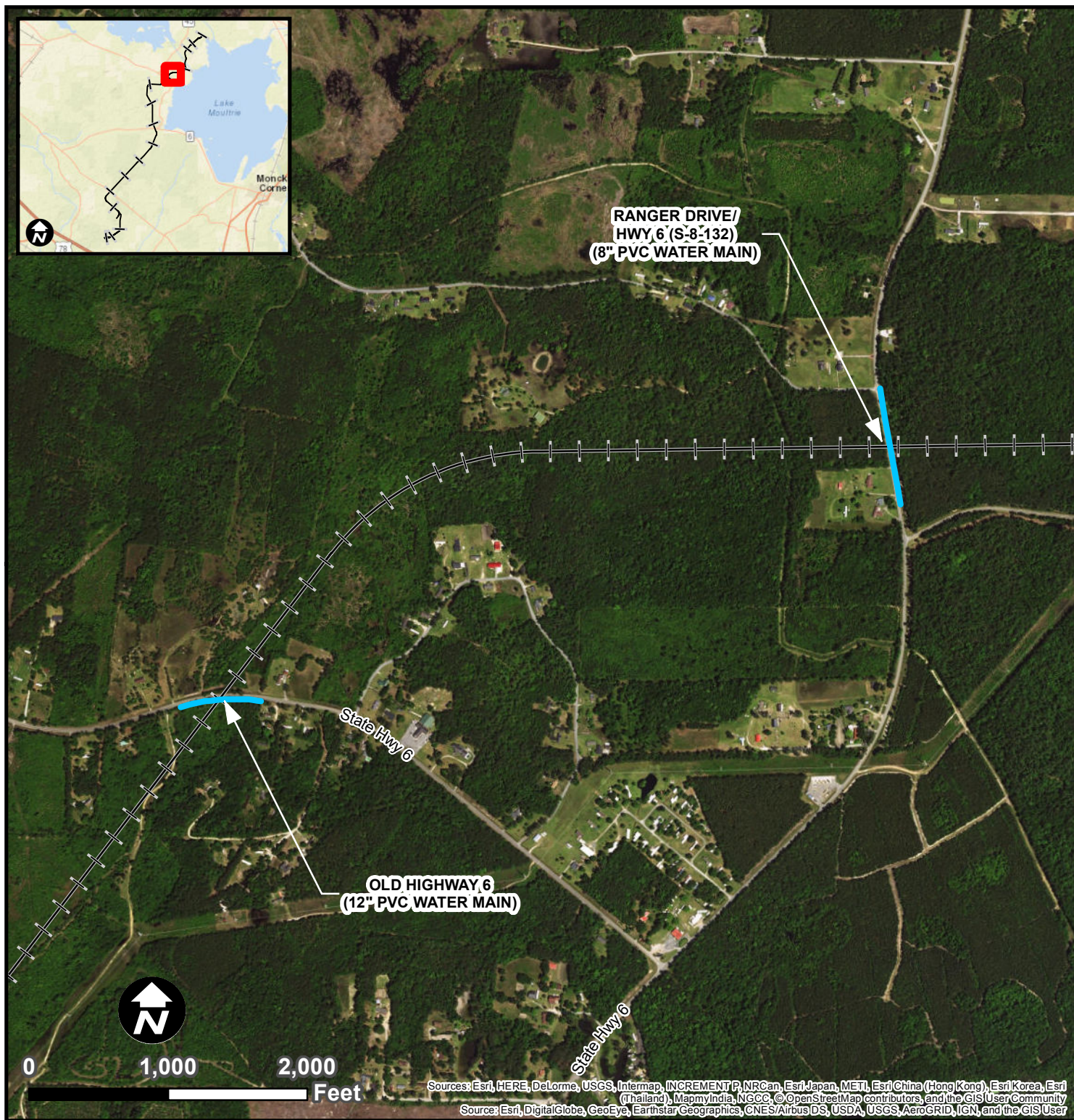
Drawn By: JMS

Reviewed By: BWS

Date: 5/2/2017

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**Berkeley County
Water & Sanitation
Exhibit 2**



Document Path: F:\AMEC_Projects\2016\CampHallRailLine\GISMXDs\NewMapLayout\SCW&S_EXHIBIT2.mxd



LEGEND

- Water Main
- + + + Proposed Railroad

CAMP HALL RAIL LINE EXISTING UTILITY BERKELEY COUNTY WATER & SANITATION EXHIBIT 2

Camp Hall Commerce Park Rail Spur
Berkeley County, South Carolina

Job No. 6250160108

Drawn By: JMS

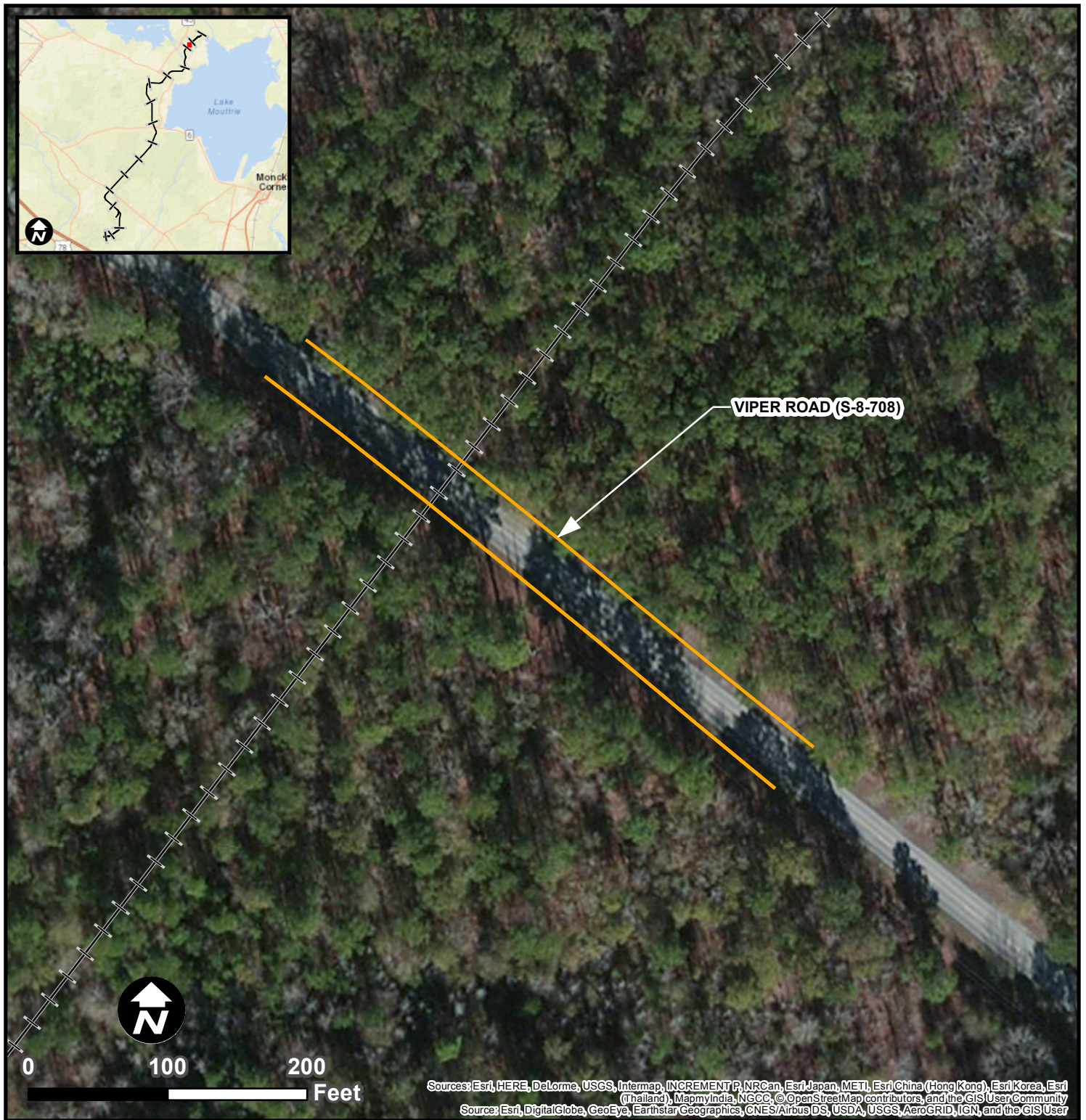
Reviewed By: BWS

Date: 5/2/2017

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TDS Telecom **Exhibit**

TDS Telecom Exhibit 1



Document Path: F:\AMEC_Projects\2016\CampHallRailLine\GISMXD\NewMapLayout\TDS_EXHIBIT1.mxd



LEGEND

- Telecom Line (Buried)
- - - Proposed Railroad

CAMP HALL RAIL LINE EXISTING UTILITY TDS TELECOM EXHIBIT 1

Camp Hall Commerce Park Rail Spur
Berkeley County, South Carolina

Job No. 6250160108

Drawn By: JMS

Reviewed By: BWS

Date: 5/2/2017

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Appendix G: Draft Wetlands Mitigation Plan

**CAMP HALL RAIL PROJECT
BERKELEY COUNTY, SOUTH CAROLINA
SAC: 2016-01395**



**540 East Bay Street
Charleston, South Carolina**

27 July 2017

Camp Hall Rail Project Conceptual Wetlands Mitigation Plan

Submitted by: Open Space Institute

7/20/17

Summary:

Impacts to jurisdictional Waters of the United States associated with the Camp Hall Rail Project will be accounted for with 1,308 freshwater wetlands restoration/preservation credits. The Permittee Responsible Mitigation Plan will generate approximately 1,258 credits from enhancement and preservation activities proposed on the Fairlawn C-1 tract (described below) and 60 wetland credits will be provided by the Francis Beidler Forest Mitigation Bank to account for wetland impacts in the Four Hole Swamp watershed.

Fairlawn C-1 Proposed Mitigation Tract (PMT) Work Plan

The Fairlawn C-1 property is an approximately 1,550-acre inholding strategically located within the Francis Marion National Forest proclamation boundary in Berkeley and Charleston Counties (Figure 1) and contains the headwaters of the Wando River, which drains into the Cooper River watershed. Of these 1,550 acres, 1,000 acres (hereafter PMT) are being proposed to offset the impacts associated with the Camp Hall Rail Project. Fairlawn has been identified as one of the highest-ranking priorities for the United States Forest Service (USFS) in the entire country, a view widely shared by other State and Federal natural resource agencies and environmental groups. The Open Space Institute is poised to acquire PMT, conduct restoration on the property and convey it to the USFS for this mitigation project. PMT is surrounded by conservation land and other mitigation, restoration, and enhancement projects. The property lies on a unique geological formation known as the Cainhoy Ridge, a known reservoir for rare, threatened, and endangered species. The surrounding areas of the 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 Ramsar Wetland of International Significance.

The primary impacts to the property include fire suppression and silviculture impacts. Mitigation activities include ecological enhancement and preservation of the site and then transference of the property to the USFS, which would assume long-term management and ownership obligations in accordance the Conservation Land Use Agreement between USFS and the Army Corps of Engineers. The PMT Work Plan will permanently protect and make open to the public 1,000 acres of land, including approximately 593 acres of wetlands.

The upland areas of the site were likely pine flatwoods grading toward pine savannah prior to loblolly pine conversion. Depressional areas scattered throughout the flatwoods/savannah are pond cypress ponds or swamp tupelo ponds. The lower landscape positions which appear as more linear features grade from flatwood/savannah to bottomland hardwoods. Areas within the bottomland hardwoods may grade into bald cypress-tupelo gum swamp where these areas may be inundated for most of the year.

1. Wetland Preservation

Wetland preservation within PMT is anticipated to protect approximately 43 acres of wetlands, as shown in Figure 2. The proposed wetland preservation areas lie within depressional wetland ponds and bottomland hardwood forest communities.

2. Natural Community Reestablishment (Wetland Enhancement)

The mitigation work plan proposes to re-establish native plant communities which were removed or encroached upon by past silvicultural activities to establish loblolly pine plantations. Longleaf pine flatwoods/savannahs will be established in areas which have recently been clear-cut or will be cleared as part of mitigation activities. Fringe hardwood or bottomland hardwood forest communities will be established within low wet areas which are not conducive to longleaf pine establishment through the Francis Marion National Forest Management Plan (FMNFMP).

A detailed wetland and vegetative community delineation has not been completed, therefore Figure 2 does not differentiate between enhancement activities. The wetland enhancement work plan to be implemented on PMT will be categorized by activities based on the existing habitats and are anticipated to include the following prescriptions:

a) Longleaf Pine Flatwoods/Savannah Establishment and Enhancement

Areas within PMT which are not currently in longleaf will be cleared and converted to a Longleaf Pine Flatwood/Savannah community. Loblolly pine will be logged prior to site preparation for longleaf pine planting. Logging will be conducted in such a way as to reduce damage to the soil and existing topography.

Clear-cut areas, either clear-cut prior to mitigation work or as part of the mitigation plan, will be mechanically prepared where necessary to allow for successful longleaf pine establishment. Logging decks, debris piles, and bark piles will be managed either by windrowing or burning, or some combination thereof. Minor mechanical site prep may be required to deal with existing bedded areas or those areas that have been heavily impacted by previous logging operations. The extent of mechanical site prep will be determined following additional data collection.

Following a spring and summer of growth in the clear-cut areas, a herbicide spray will be utilized to kill green vegetation and a site preparatory burn may be conducted to remove competing vegetation and woody debris.

Longleaf pine seedlings will be planted during the dormant season (December to March). Containerized bareroot seedlings will be used. Longleaf pine seedlings will be planted at a density of approximately 435 stems per acre. The FMNFMP prescribes continued burning and restoration activities that provide reasonable and material assurance of project success after conveyance to USFS.

b) Bottomland Hardwoods and Wet Pine Savannah Establishment

Wetland areas on the PMT which have previously been converted to loblolly pine plantations and are marginal for successful longleaf pine establishment will be thinned to a basal area of 40-50 square feet per acre to open the forest canopy. Over time, these areas will become mixed bottomland hardwood stands or wet pine savannahs depending on the USFS's fire regime and other natural factors.

c) Prescribed Burns

A prescribed burn schedule will be developed for the proposed pine savannah/flatwood enhancement areas. All initial and subsequent burns will be conducted by prescribed fire professionals, most likely USFS staff. It is anticipated that prescribed burning activities beyond the initial burn will be implemented by the U.S Forest Service pursuant to the FMNFFMP. Fire intensity will be adjusted in subsequent years to provide the best results of this habitat management technique. Burns will be conducted when conditions favor fire across the range of forest communities on PMT.

d) Stream Preservation

Stream preservation within PMT is anticipated to protect approximately 14,000 linear feet of streams. At this time, stream lengths have only been calculated using the available USGS Topographical maps and aerial imagery.

3. Planting Plan for Longleaf Pine Savanna / Flatwood Community

Longleaf pine will be planted at a density of approximately 435 trees per acre (10 ft. x 10 ft. spacing). Seedlings will be distributed uniformly during planting, while maintaining the proper average number of trees per acre. It is anticipated that herbaceous species will recruit naturally.

Table 1. Planting Plan, Longleaf Pine Savanna/Flatwood Community

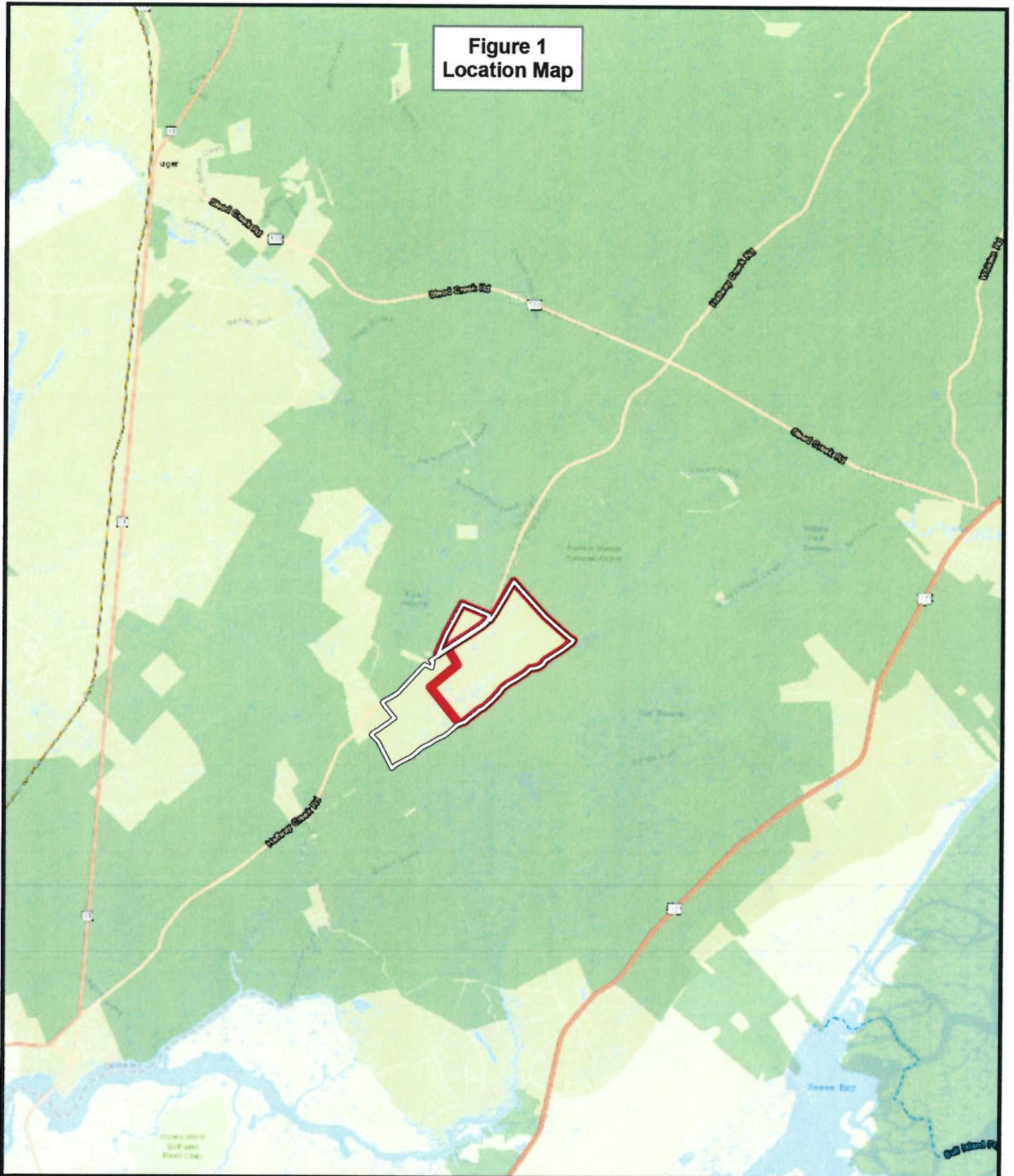
Scientific name	Common name	Frequency (Percent)	Stocking Rate per Acre
<i>Pinus palustris</i>	Longleaf Pine	100	435
Notes: Seedlings will be stocked at up to 435 stems per acre (10 foot by 10 foot spacing) to allow for natural mortality.			

4. Conveyance to the U.S. Forest Service

The PMT property will be conveyed to the USFS to be managed as additions to the Francis Marion National Forest, subject to the same protections and use requirements defined in the FMNFFMP. The land will be managed as USFS land in perpetuity through the Conservation Land Use Agreement and the FMNFFMP.

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 Project. Appropriate restrictive deed covenants will be put in place to ensure the lands are 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.

**Figure 1
Location Map**



Fairlawn C1

Berkeley and Charleston County
South Carolina

-  Fairlawn C1 Parcel
-  Mitigation Boundary - 1,000 Acres
-  Protected Lands

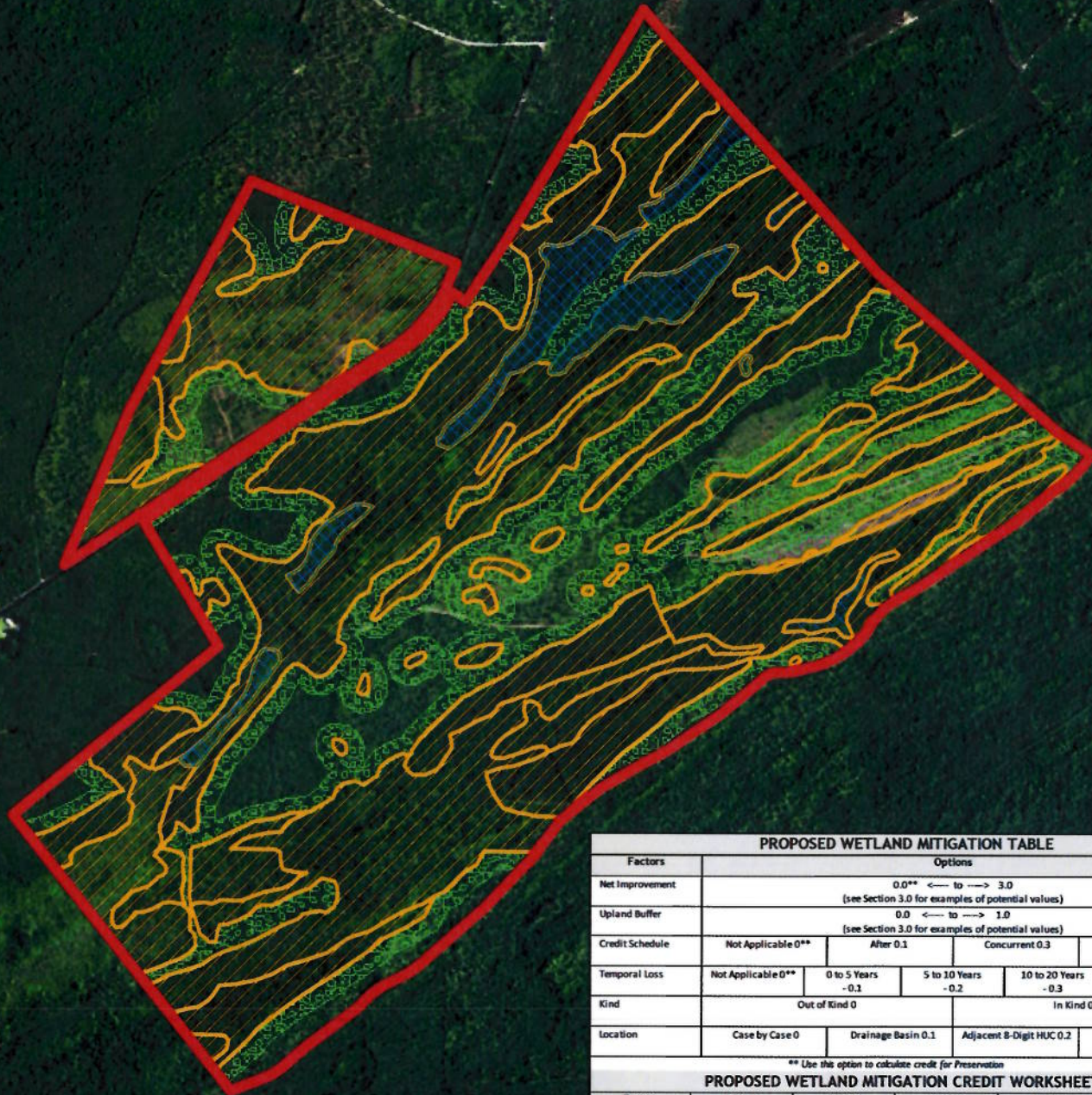


Notes:



0 6,000 12,000 Feet

Figure 2
Proposed Mitigation Plan



PROPOSED WETLAND MITIGATION TABLE				
Factors	Options			
Net Improvement	0.0** ← to → 3.0 (see Section 3.0 for examples of potential values)			
Upland Buffer	0.0 ← to → 1.0 (see Section 3.0 for examples of potential values)			
Credit Schedule	Not Applicable 0**	After 0.1	Concurrent 0.3	Before 0.5
Temporal Loss	Not Applicable 0**	0 to 5 Years -0.1	5 to 10 Years -0.2	10 to 20 Years -0.3 Over 20 Years -0.4
Kind	Out of Kind 0		In Kind 0.4	
Location	Case by Case 0	Drainage Basin 0.1	Adjacent 8-Digit HUC 0.2	8-Digit HUC 0.4

** Use this option to calculate credit for Preservation

PROPOSED WETLAND MITIGATION CREDIT WORKSHEET					
Factor	Area 1	Area 2	Area 3	Area 4	Area 5
Net Improvement	1.0	1.0	0.0		
Upland Buffer	0.8				
Credit Schedule	Concurrent	Concurrent	Not Applicable		
Temporal Loss	10 to 20 Years	10 to 20 Years	Not Applicable		
Kind	In Kind	In Kind	In Kind		
Location	8-Digit HUC	8-Digit HUC	8-Digit HUC		
Sum of Factors	2.6	1.8	0.8		
Mitigation Area	292	258	43		
M x A =	759.2	464.4	34.4		
Proposed Wetland Mitigation Credits = Σ (M x A) =					1258

Fairlawn C1

Berkeley and Charleston County
South Carolina

-  Mitigation Boundary - 1000 Acres
-  Wetland Enhancement - 550 Acres
-  Wetland Preservation - 43 Acres
-  150-Foot Upland Buffer - 292 Acres



Notes:



0 1,000 2,000 Feet

AVOIDANCE, MINIMIZATION AND MITIGATION PLAN

**CAMP HALL RAIL PROJECT
BERKELEY COUNTY, SOUTH CAROLINA
SAC: 2016-01395**

PREPARED FOR:



**PALMETTO RAILWAYS
540 EAST BAY STREET
CHARLESTON, SOUTH CAROLINA**

JULY 27, 2017

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1. EXECUTIVE SUMMARY

Development within the Camp Hall Commerce Park has increased the demand for rail service to interconnect the commerce park with the existing rail network of CSX Transportation in Berkeley County, South Carolina, in a manner that is logistically feasible to better serve the needs of industry within the Camp Hall Commerce Park for transportation, distribution, and logistics. To accomplish this, Palmetto Railways has determined a need to construct a rail spur from the CSXT A-line (via the CSXT Cross Subdivision) with the intent to enhance distribution for the industrial development and the tenants that locate at Camp Hall Commerce Park.

Palmetto Railways is requesting regulatory approval to locate, build, own, and operate an industrial rail line between Santee Cooper's Cross Generating Station and the Camp Hall Commerce Park in Berkeley County, South Carolina. The proposed rail line will service the new Volvo Cars North America's ("Volvo Cars") manufacturing facility, as well as future proposed development within the Camp Hall Commerce Park.

A detailed Alternatives Analysis was conducted to evaluate potential routes from existing Class 1 rail lines into the Camp Hall Commerce Park. The alternatives analysis reviewed potential impact environmental, economic, and socioeconomic resources, as well as cultural resources. Six alternative route alignments were considered under Level 1 of the alternatives analysis, with four alignments being advanced to Level 2 of the alternatives analysis. It was determined that the Cross option, beginning near Santee Cooper's Cross Generating Station and terminating at the Camp Hall Commerce Park, was the preferred alternative. Four separate Cross Route alignments were analyzed in Level 3 of the alternatives analysis, and Cross Route 3 (Proposed Project) is proposed as the most practical route with the least amount of overall impacts, as judged by the potential impacts to environment, economic, and socioeconomic resources.

The Proposed Project corridor is approximately 22.7 miles long by 200 feet wide [0.85 square mile (544 acres)] which will connect to the CSXT rail network near the Santee Cooper Cross Generating Station and travel south and west to the Camp Hall Commerce Park. The construction of the rail line will impact approximately 95 acres of jurisdictional wetlands, 169 feet of jurisdictional streams, and 0.06 acres of non-wetland waters. These estimates are preliminary and will likely be adjusted as the project design is finalized and additional avoidance and minimization measures are investigated.

Due to the absence of suitable existing wetland mitigation bank or an in-lieu fee program for the watershed, all required compensatory mitigation for impacts to wetlands and waters of the United States will be obtained through off-site, landscape scale, permittee-responsible mitigation activities utilizing the watershed approach.

2. PURPOSE AND NEED

The purpose of the Proposed Project is to locate, build, own and operate an industrial rail line that will connect to the existing Class 1 rail line with the Camp Hall Commerce Park. The need for the Proposed Project derives from the development within 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 Berkeley County, South Carolina, 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.

3. BACKGROUND

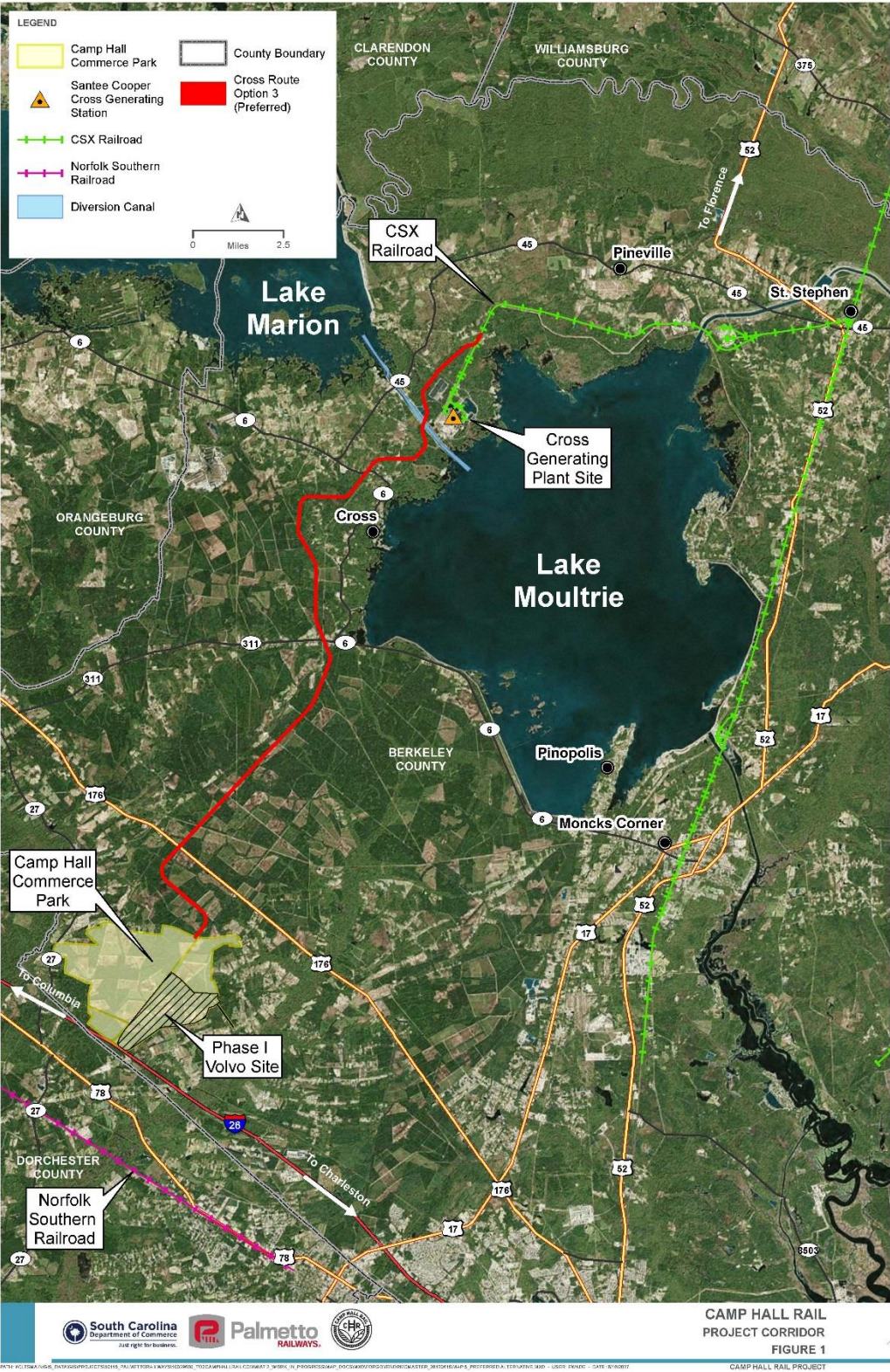
The Proposed Project involves the construction and operation of an industrial rail line which will connect the Camp Hall Commerce Park to existing railroad right-of-way, near the Santee Cooper Cross Generating Station in Berkeley County, South Carolina (Figure 1).

The Camp Hall Commerce Park comprises approximately 6,781 acres, of which 2,880 acres have been permitted by Berkeley County for development of Volvo Cars first North American factory (Project Soter – SAC-2015-0476-SIR). An additional 1,387 acres of the Camp Hall Commerce Park is being permitted for industrial development by Santee Cooper (SAC-2015-01764). The Proposed Project is intended to bring industrial rail service to these developments. Industrial rail service is an additional transportation mode that enhances options for distribution and logistics for the industrial development and the customers that locate at the Camp Hall Commerce Park. In addition, the proposed industrial rail service will support the State of South Carolina and Berkeley County's infrastructure needs and will help alleviate highway congestion involving large commercial trucks.

The Proposed Project corridor is approximately 22.7 miles long by 200 feet wide (0.85 square mile) that will connect to the CSXT rail network near the Santee Cooper Cross Generating Station and travel south and west to the Camp Hall Commerce Park (Figure 1).

The Proposed Project corridor is located in the Middle Atlantic Coastal Plain region of South Carolina, which 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. Additionally, the Proposed Project area is located at the convergence of two distinct river basins: (1) the project area is located predominantly in the upper reaches of the Cypress Swamp Watershed of the

Figure 1. Project Corridor



Cooper River Basin and (2) a small portion of the project is on the lower boundary of the Lower Four Hole Swamp Watershed of the Edisto River Basin.

Land use within the project corridor is a mix of residential, commercial, silvicultural, and wetlands. The study area originates on Santee Cooper property adjacent to its Cross Generating Station, and crosses the Diversion Canal between Lake Marion and Lake Moultrie. South of the Diversion Canal. The project corridor includes the unincorporated rural community of Cross, with an estimated total population of 7,253 in 2015. Outside of the Cross community, the corridor runs south through intensively managed pine plantation in short pulp rotations, and then into the Camp Hall Commerce Park.

4. DESCRIPTION OF MITIGATION ACTIVITIES

4.1 Community Mitigation

4.1.1 Community Outreach

A Public, Agency, and Stakeholder Coordination Plan was developed to ensure that outreach to diverse groups takes place throughout the Project. This outreach will be to improve project awareness and education on the NEPA process. The primary goal of this plan is to foster open communication between a diverse public, agencies, stakeholders, and the Project Team to gain productive input leading to better decisions that meet the community's needs.

1. Encourage elected officials, area businesses and civic and community organizations to represent the interests of their constituents and to promote direct participation by their constituents throughout the process. These community leaders can help to reach, or at least to represent, the interest of hard-to-reach groups including youth, the elderly, minorities and low-income residents.
2. Continual public education of the NEPA process through communication tools.
3. Ongoing updates through direct mailings to those in the study area.
4. Use notices / flyers within communities at appropriate locations (community centers, grocery stores, public transportation centers).
5. Provide a variety of options for receiving input from the general public and other stakeholders.
6. Provide opportunities for following up on inquiries, requests and community concerns.

4.1.2 Community Programs and Activities

4.1.2.1 Broadband access

Through strategic teaming with local telecommunications company, PR is exploring opportunities to provide financial assistance for a broadband infrastructure improvement program for the communities surrounding the project area. Many of the census block in the Cross community are designated as un-served or under-served by the FCC for broadband access. This grant will be utilized to upgrade the broadband infrastructure in parts of the Greater Cross Community and provide service at a more affordable cost. This program will target those households that participate in any one of the many federal assistance programs such as Free or Reduced Lunch program offered through Berkeley County Schools of which 93% of the students in Cross area schools participate.

4.1.2.2 Community facilities

Through a partnership with the local representatives of the Berkeley County Council and Berkeley County School Board, PR is working to provide assistance with the improvement and upgrade of existing community and recreational facilities that are utilized by the Cross community.

4.2 Traffic and Transportation

“FRA's Office of Railroad Safety promotes and regulates safety throughout the Nation's railroad industry. The office executes its regulatory and inspection responsibilities through a diverse staff of railroad safety experts”.¹

At grade rail crossings are intersections where the rail line would cross an existing roadway at-grade. Depending on the type of roadway facility, the warning/control devices would need to be determined. These devices are similar to stop signs and/or traffic signals for a roadway intersection. At grade crossings include both private and public roadways. Additionally, public crossings could be both paved and unpaved roadways under the jurisdiction of a state, county, or local authority. Private roads are facilities that are not owned or maintained by a public authority and are not intended for public use. For public crossing that are determined as active crossings, active warning measures are required and would include gates that have flashing lights and bells. Passive crossings only have passive warning systems that include signs that are shaped as an “X” (referred to as a crossbuck), yield and stop signs, and if applicable pavement markings. The Manual of Uniform Traffic Control Devices (MUTCD) specifies all warning and control devices. The table below shows the various crossings, roadway types, and the preliminary warning device type proposed. This is still preliminary, and final crossing types would not be decided until the final design is progressed. PR has been made aware of specific

¹ Federal Railroad Administration (FRA). “Railroad Safety.” <https://www.fra.dot.gov/Page/P0010> (accessed June 21, 2017)

safety concerns with three of the proposed at-grade crossings (Shortcut Rd., Old Highway 6, and Ranger Road) through its community outreach and plans to implement early warning systems in those locations.

Crossing	Station	Roadway Type	Preliminary Crossing Device Type
State Road S-8-717 (Old Highway 6)	403+00	Paved Roadway	Active
Ranger Drive-Berkeley S-132 E	348+00	Paved Roadway	Active
SR 311	732+50	Paved Roadway	Active
Short Cut Road - Berkeley S-60 E	500+00	Paved Roadway	Active
State Road S-8-135 (Mudville Rd)	741+50	Paved Roadway	Active
US Highway 176	1117+50	Paved Roadway	Active
State Road S-8-708 (Viper Road)	184+25	Paved Roadway	Active
Fish Rd	1290+00	Paved Roadway	Active
Volvo Car Dr	123+00	Paved Roadway	Active
Fish Rd	147+75	Paved Roadway	Active
Calamus Pond Rd	907+00	Unpaved Roadway	Passive
George Wigfall Rd	655+00	Unpaved Roadway	Passive
George Wigfall Rd	678+50	Unpaved Roadway	Passive
Royalgates Ct	409+00	Unpaved Roadway	Passive
Santee Cooper Internal	236+00	Unpaved Roadway	Passive
Westvaco	752+50	Unpaved Roadway	Passive
Westvaco	816+75	Unpaved Roadway	Passive
George Wigfall Rd	655+00	Unpaved Roadway	Passive
37 - Access Roads	Various	Unpaved Roadway	Passive

During further project development, public awareness and rail safety awareness programs will be implemented. Public awareness programs could include open-house meetings with local officials to identify targeted audiences within the area, and workshops within schools, churches, and community associations. This type of outreach would provide information and materials on railroad safety. PR also intends to provide rail safety training to all emergency response personnel.

It is anticipated that Palmetto Railways will initiate the use of Operation Lifesaver. This is a nationwide, nonprofit information safety program dedicated to educating the public on how to reduce crashes, injuries and fatalities at at-grade rail crossings and on railroad rights-of-way. This public service creates awareness of the hazards that may occur on railroad property and at at-grade crossings in particular. Operation Lifesaver has developed an outreach education program specifically for children. Palmetto Railways will sponsor this in-school education program beginning in advance of start-up operations.

In addition, Palmetto Railways would provide a 24-hour emergency contact which first responders can call in the event of an emergency.

4.3 Hazardous Materials

To ensure the safest handling of hazardous materials, there are mandated requirements for rail, roadway, and intermodal facilities. The transportation of hazardous materials is regulated by the U.S. Department of Transportation (USDOT), the U.S. Department of Homeland Security, the U.S. Transportation Security Administration, and the Federal Railroad Administration (FRA), among others². Class I railroads have adopted special operating practices for hazardous materials transport that often exceed regulatory requirements to help ensure these materials are shipped safely and securely. If there is a need to transport hazardous materials to and from the Camp Hall Industrial Park, hazardous materials containers on the Camp Hall Commerce Park Rail Spur will be handled according to industry standard.

4.4 Noise and Vibration

1. Palmetto Railways will use continuously welded rail and steel ties to minimize noise associated with operation of the rail line.
2. Palmetto Railways will explore the feasibility of establishing Quiet Zones at the crossings of Ranger Road, Mudville Road, Shortcut Road, SC 311 and Old Highway 6.
3. Palmetto Railways plans to implement early warning systems at Shortcut Road, Old Highway 6 and Ranger Road.
4. Track and wheel maintenance is considered a viable mitigation option for groundborne vibration of freight trains; this can include regularly scheduled rail grinding, wheel truing programs, vehicle reconditioning programs, and use of wheel- flat detectors where feasible Rail car and locomotive maintenance will be performed on-site to ensure that all equipment is operating properly and efficiently to reduce brake and wheel noise.
5. Mitigation measures will be implemented for Pile Driving/Caissons/Drilled Shaft Foundations.
 - a. The contractor shall use a vibratory hammer to the maximum extent practicable.
 - b. The contractor shall use cushion blocks or other noise attenuation devices when using an impact hammer.
 - c. Pile driving activities shall be limited to no more than 12 hours per day (February - March, sturgeon; May - September, manatee).
 - d. Contractor shall use a "soft start" for a pile driving activities (i.e. - driving does not occur at full power at first).

² <https://www.csx.com/index.cfm/about-us/safety/hazardous-materials1/>

4.5 Air Quality

Palmetto Railways will implement options to minimize air emissions for the community and the environment of the region. The Camp Hall Commerce Park Rail Spur will comply with all applicable SCDHEC requirements.

Proposed mitigation measures include:

1. To reduce the emission of pollutants, appropriate construction best management practices (BMPs) will be observed and engines would be properly maintained.
2. A dust mitigation program to ensure emissions and fugitive dust are kept at a minimum may be implemented during development of the line.
3. It is expected that Palmetto Railways and their contractors will maintain their vehicles/equipment so that carbon monoxide, ozone-producing chemicals and other emissions are kept to a minimum.
4. Comply with Air Quality State Construction and Operating permit requirements, conditions, and reporting.
5. Operate and maintain air pollution control equipment in accordance with permit requirements.

4.6 Health and Safety

1. Appropriate lights and gates will be established at roadway crossings as discussed in the Traffic and Transportation section of this mitigation plan.
2. Palmetto Railways plans to implement early warning systems at Shortcut Road, Old Highway 6 and Ranger Road
3. Community workshops will be held within the Cross community to educate residents about rail and rail crossing safety and to answer questions about the project.
4. Palmetto Railways will coordinate with emergency services to address concerns with delays and will train local first responders on rail safety. PR intends to partner with the Berkeley County Emergency Services Division and the Cross Rural Fire District to upgrade equipment and/or facilities to improve services for the Cross Community.
5. Palmetto Railways will be active in Operation Lifesaver (OL). The mission of OL is to end collisions, death, and injuries at highway-rail grade crossings and on railroad property through a nationwide network of volunteers who work to educate people about rail safety. Palmetto Railways will consider sponsoring this in-school education program beginning in advance of start-up operations. Some of the topics covered in this education effort includes rail crossing safety, trespass prevention, and passenger rail/transit safety; school bus driver training will be offered in all area schools.

4.7 Natural Environment Mitigation

Palmetto Railways has made every effort to account for the impacts to the natural environment, including geology and soils, wetlands, water resources and floodplains, biotic communities, and protected species.

4.7.1 Geology and Soils

Proposed minimization and mitigation measures regarding geology and soils include:

1. Implement a Storm Water Pollution and Prevention Plans (SWPPP) as required by the National Pollutant Discharge Elimination System (NPDES) permit, including management of sediment and erosion control.
2. Implement a Spill Prevention Control and Countermeasures (SPCC) Plan for petroleum products.
3. Use BMPs and/or methods of managing sediment and erosion control during construction pursuant to the South Carolina Stormwater Management Handbook (SCDHEC August 2005).
4. Following construction, implement soil stabilization and vegetation management measures.

4.7.2 Wetlands

Proposed minimization and mitigation measures regarding wetlands include:

1. Design the Camp Hall Commerce Park Rail Spur to minimize impacts to Waters of the U.S.
2. Where possible, limit the placement of pilings for bridges within waterways.
3. Compensatory mitigation will be required to offset the permanent impacts. The permanent impacts for this project fall into three categories: fill, dredge, and flood/impound. "Fill" refers to depositing material used for the primary purpose of replacing an aquatic area with dry land. "Dredge" means to dig or excavate.
4. Design culverts and bridges to maintain existing flow/exchange and hydrology for wetland areas and marshes.
5. Submit application for Section 404 Permit as promulgated by Clean Water Act and comply with any requirements as determined by the Corps. Delineated wetlands (95.23 acres), streams (169-feet), and linear conveyances (693-feet) will be considered as part of the permit process.

It is anticipated that all required compensatory mitigation for impacts to wetlands and waters of the United States will be provided by a combination of Permittee Responsible Mitigation (PRM)

and mitigation bank credits. For impacts within the Four Hole Swamp watershed, PR proposed to purchase wetland credits from the Francis Beidler Forest Mitigation Bank. For impacts within the Cooper River watershed, PRM is proposed at the Fairlawn C1 Parcel site, a 1,550-acre site within Francis Marion National Forest that will consist of both enhancement and preservation of wetlands and streams. Mitigation activities include enhancement of 550 acres of wetlands, the preservation of 43 acres of wetlands and the preservation of approximately 14,000 linear feet of streams. The property will be transferred to United States Forest Service (USFS), which will permanently protect the site and make open to the public 1,000 acres of land, including 539 acres of wetlands.

4.7.3 Water Resources and Floodplains

Proposed minimization and mitigation measures regarding water resources and floodplains include:

1. To mitigate potential water quality impacts from the proposed rail line, a variety of post-construction stormwater BMPs will be used to convey, filter, and dissipate runoff from the new rail line, including but not limited to: vegetated swales, vegetated filter strips, stream bank stabilization, and channelized flow dissipation.
2. Implement a SWPPP as required by the industrial storm water NPDES permit.
3. Erosion prevention BMPs that may be implemented include dust control, mulching, blown straw, hydro-mulching/seeding, erosion control blankets, turf reinforcement mats, and outlet protection (i.e. rip-rap).
4. Runoff control and conveyance BMPs that may be implemented include diversion ditches/dikes, pipe slope drains, drainage swales, and level spreader.
5. Sediment control BMPs that may be implemented include sediment basins, sediment traps, silt fences, ditch checks, stabilized construction entrances, storm drain inlet protection, and sediment tubes.
6. All construction BMPs will be designed, implemented, and maintained per the guidance in the SCDHEC Storm Water Management BMP Handbook (August 2005).
7. Obtain a NPDES Phase II Construction General Permit (CGP) to address water quality and quantity.
8. "Flood/Impound," means to collect or confine the flow of a riverine system by means of a dike, embankment, or other man-made barrier. Appropriate rail design measures will be implemented to ensure minimal impact to floodplains. This will likely include placement of appropriately sized bridges or culverts under the road crossings to allow water and aquatic organisms to pass relatively unhindered.

9. Design culverts and/or bridges to maintain existing surface water drainage patterns and to prevent erosion.
10. Design culverts and/or bridges to allow aquatic organisms to pass relatively unhindered.
11. Adhere to Berkeley County's stormwater regulations associated with the specific implementation of various stormwater management facilities (i.e. ditches, culverts, secondary collection systems, etc.).
12. Culverts and bridges will be designed to maintain existing flow and hydrology for wetland areas and to prevent flooding upstream. Road culverts will be designed to the 25-year storm event.
13. Major drainage systems (i.e. large ditches and canals draining more than 200 acres) will be designed to carry the 50-year storm event within its banks.

4.7.4 Protected Species

Proposed minimization and mitigation measures regarding protected species include:

1. A Spill Prevention, Control, and Countermeasures Plan (SPCC) will be implemented during construction and operations to minimize the impact of a potential spill on protected species.
2. Structures over water and/or other benthic resources will be aligned so as to minimize the over-water footprint as much as possible.
3. The bald eagle is protected by the Bald and Golden Eagle Protection Act (BGEPA) even though it has been delisted under the Endangered Species Act. This law, originally passed in 1940, provides for the protection of the bald eagle and the golden eagle (as amended in 1962) by prohibiting the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit Bald Eagle sitting in tree (16 U.S.C. 668(a); 50 CFR 22). "Take" includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb (16 U.S.C. 668c; 50 CFR 22.3). Bald eagles will be protected by adherence to the BGEPA.
4. Over 1,000 migratory birds, including the bald eagle, are protected under the Migratory Bird Treaty Act (MBTA) of 1918. Under the MBTA, it is illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to Federal regulations. The Camp Hall project will comply with the MBTA by following all laws and regulations pertaining to the removal/take of nests in the project area.
5. It is anticipated that the proposed action "may effect, but is not likely to adversely affect four protected species". These species include American chaffseed, Canby's dropwort,

shortnose sturgeon, and wood stork. The following BMPs will be employed to help to ensure the protection of these species and any other protected species.

6. General BMPs: The following BMPs will be implemented during construction by the contractor responsible for the execution of the work. These will be required in addition to conditions set forth in regulatory permit(s).
 - a. Prior to construction, the Contractor shall be required to submit a Work Plan describing their proposed construction approach, methodology, and equipment to be used. This plan will be reviewed by the Owner and/or their representative(s) to ensure compliance with applicable regulatory conditions and BMPs. The contractor shall also be required to attend and document his/her attendance at the Pre-Construction Conference meeting.
 - b. Once construction is initiated, the Contractor shall be required to complete the project in an expeditious manner in order to minimize the period of disturbance to environmental resources.
 - c. Land disturbing activities shall not encroach into any wetland areas outside of the permitted impact area.
 - d. The Contractor will be required to implement BMPs that will minimize erosion and migration of sediments on and off the upland project site, including reclaimed lands, during and after construction. The contractor will also be required to conduct inspections at a minimum of at least once every calendar week or within 24 hours of the end of a storm event of 0.5 inches or greater, until final stabilization is reached on all areas of the construction site.
 - e. The contractor will be required to ensure that oil, tar, trash, debris, and other pollutants do not enter the adjacent waters or wetlands during construction.
 - f. All construction personnel will be instructed on the potential presence of protected species in the construction area as described in the Protected Species Assessment and the need to prevent entrapment, harm, or other impacts to these animals.
 - g. All construction personnel will be advised that there are civil and criminal penalties for harming, harassing, or killing protected species.
 - h. All in-water construction activities will be completed during daylight hours.
7. Pile Driving/Caissons/Drilled Shaft Foundations:
 - a. The contractor shall be required to implement measures to control and/or contain suspended sediments resulting from construction activities.

- b. Siltation barriers, if required, shall be made of material in which a Protected Species cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid entrapment of protected species.
 - c. The contractor shall use a vibratory hammer to the maximum extent practicable.
 - d. The contractor shall use cushion blocks or other noise attenuation devices when using an impact hammer.
 - e. Pile driving activities shall be limited to no more than 12 hours per day (February - March, sturgeon; May - September, manatee).
 - f. Contractor shall use a "soft start" for a pile driving activities (i.e. - driving does not occur at full power at first).
8. Vessel Operations:
- a. Shallow draft vessels that maximize the navigational clearance between the vessel and the river bottom (e.g. "jon boats", flat-bottomed barges, etc.) should be used where possible.
 - b. All vessels associated with the construction project shall operate at "no wake/idle" speeds whenever possible while in the construction area and while in water depths where the draft of the vessel provides less than a four-foot clearance from the bottom.
 - c. If a protected species is seen within 300 feet of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection. These precautions shall include cessation of operation of any moving equipment closer than 50 feet of a protected species. Operation of any mechanical construction equipment shall cease immediately if a Protected Species is seen within a 50-ft. radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition. Contact the USFWS immediately at (843) 727-4707.
 - d. Any collision with and/or injury to a West Indian manatee shall be reported immediately to the USFWS, Charleston Field Office, (843) 727-4707.

4.8 Historic Properties/Cultural Resources Mitigation

4.8.1 Cultural Resources

Proposed mitigation measures regarding cultural resources include:

- 1. The proposed rail project has the potential to cause an adverse effect to the Diversion Canal. Consultation with State Historic Preservation Officer (SHPO) and other parties

will be undertaken to identify ways to minimize and mitigate these possible adverse effects.

2. The Garrett Cemetery was identified during this investigation. The western edge of the survey corridor is approximately 75 feet outside of the cemetery boundaries; however, proposed impacts associated with the rail line itself will only occur within a zone approximately 175 feet from the cemetery boundary. A 50-foot buffer will be established around the resource. Avoidance of the cemetery and this buffer will be complied with. The proposed undertaking, as planned, will not impact the cemetery or its buffer
3. The Bulltown Ditch was identified north and east of the Santee Cooper power plant and was determined to be eligible for NRHP listing under A and C. The current alignment of this rail project will cross this resource at its northern end adjacent to the existing CSX Cross subdivision rail line. This section of the Bulltown Ditch has already been impacted by the construction of the existing CSX Cross subdivision and a transmission easement, both of which allow the ditch to pass beneath them through a culvert system. Steps will be taken to minimize this potential damage during construction and measures will be put in place to stabilize the bank of the Bulltown Ditch near where the rail line would cross the ditch.
4. In addition to the proposed Bulltown Ditch crossing, a portion of the rail line near the existing Santee-Cooper Power Plant runs parallel to the ditch approximately 150 feet away; this distance is sufficient to avoid impacts during construction.
5. Measures will be put in place to ensure impacts do not occur outside of the proposed APE in the vicinity of the Diversion Canal, Bulltown Ditch, and Garrett Cemetery. These are general recommendations for ways to minimize the potential to adversely affect the three significant historic resources; specific measures to minimize adverse effects will be developed in consultation with the South Carolina SHPO.
6. Coordination with SHPO is ongoing. If additional minimization and mitigation measures are incorporated into the project, this plan will be updated.

U.S. Army Corps of Engineers – Charleston District - Regulatory Division
REQUEST FOR CORPS JURISDICTIONAL DETERMINATION (JD) / DELINEATION
(For Jurisdictional Status and Identifying Wetlands and Other Aquatic Resources)

I. PROPERTY AND AGENT INFORMATION

A. Site Details/Location:

Site Name: Palmetto Railways Camp Hall Cross Route Additional Area Date: 6/8/17
City/Township/Parish: Pringletown & Cross County: Berkeley
Latitude/Longitude: 33.400609 N, -80.101882 W to 33.162642 N, -80.235351 W Acreage: ~242
Tax Map Sequence (TMS) #(s): 032-00-03-048, 081-00-00-034, 137-00-00-022, 157-00-00-003

Property Address(es): Pringletown, SC to Cross, SC

☒ Please attach a survey/plat map and vicinity map identifying location and review area for the JD/delineation. An accurate depiction of the review area must be provided (survey, tax map, or GPS coordinates). Tax maps may only be used if the site includes the entire tax map parcel.

B. Requestor of Jurisdictional Determination/Delineation (if there are multiple property owners, please attach additional pages)

Name: Tarek Ravenel
Company Name (if applicable): Palmetto Railways
Address: 540 East Bay Street, Charleston, SC 29403
Phone: (843) 727-2067 Email: travenel@palmettorail.com
Check one: ☐ I currently own this property
☐ I plan to purchase this property
☒ Other, please explain Plan to obtain property through eminent domain

C. Agent/Environmental Consultant Acting on Behalf of the Requestor (if applicable):

Consultant/Agent Name: Robert Strange
Company Name: Sabine & Waters, Inc.
Address: P.O. Box 1072, Summerville, SC 29484 Phone: (843)871-5383
Email: RSTRANGE@SABINC.NET

II. REASON FOR REQUEST (check all that apply)

- ☐ I intend to construct/develop a project or perform activities on this site which would be designed to avoid all aquatic resources.
- ☐ I intend to construct/develop a project or perform activities on this site which would be designed to avoid all jurisdictional aquatic resources under Corps authority.
- ☒ I intend to construct/develop a project or perform activities on this site which may require authorization from the Corps, and the Jurisdictional Determination would be used to avoid and minimize impacts to jurisdictional aquatic resources and as an initial step in a future permitting process.
- ☐ I intend to construct/develop a project or perform activities on this site which may require authorization from the Corps; this request is accompanied by my permit application and the jurisdictional determination is to be used in the permitting process.
- ☐ I intend to construct/develop a project or perform activities in a navigable water of the U.S. which is subject to the ebb and flow of the tide.
- ☒ A Corps jurisdictional determination is required in order to obtain my local/state authorization.
- ☐ I intend to contest jurisdiction over a particular aquatic resource and the request the Corps to confirm that jurisdiction does/does not exist over the aquatic resource on the parcel.
- ☐ I believe that the site may be comprised entirely of dry land.
- ☐ Other: _____

*Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Program of the U.S. Army Corps of Engineers; Final Rule for 33 CFR Parts 320-332.

Principal Purpose: The information that you provide will be used in evaluating your request to determine whether there are any aquatic resources within the project area subject to federal jurisdiction under the regulatory authorities referenced above.

Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public, and may be made available as part of a public notice as required by federal law. Your name and property location where federal jurisdiction is to be determined will be included in the approved jurisdictional determination (AJD), which will be made available to the public on the District's website and on the Headquarters USACE website.

Disclosure: Submission of requested information is voluntary; however, if information is not provided, the request for an jurisdictional determination cannot be evaluated nor can a jurisdictional determination be issued.

III. TYPE OF REQUEST:

- ☐ **Approved¹ Jurisdictional Determination (AJD) Only**
- ☒ **Preliminary² Jurisdictional Determination (PJD) Only**
- ☐ **Approved Jurisdictional Determination (AJD)** with submittal of a Pre-Construction Notification or Department of the Army permit application
- ☐ **Preliminary Jurisdictional Determination (PJD)** with submittal of a Pre-Construction Notification or Department of the Army permit application
- ☐ **Delineation of Wetlands and/or Other Aquatic Resources Only Conducted By Agent/Environmental Consultant** with submittal of a Pre-Construction Notification or Department of the Army permit application (No jurisdictional determination requested)
- ☐ I request that the **Corps delineate** the wetlands and/or other aquatic resources that may be present on my property with the attached **Pre-Construction Notification or Department of the Army permit application**
- ☐ I request that the **Corps delineate** the wetlands and/or other aquatic resources that may be present on my property **with an AJD or PJD**
- ☐ **"No Permit Required" (NPR) Letter** as I believe my proposed activity is not regulated³
- ☐ **Unclear** as to which jurisdictional determination I would like to request and require additional information to inform my decision

¹Approved – An AJD is defined in Corps regulations at 33 CFR 331.2. As explained in further detail in RGL 16-01, an AJD is used to indicate that this office has identified the presence or absence of wetlands and/or other aquatic resources on a site, including their accurate location(s) and boundaries, as well as their jurisdictional status. AJDs are valid for 5 years.

²Preliminary – A PJD is defined in Corps regulations at 33 CFR 331.2. As explained in further detail in RGL 16-01, a PJD is used to indicate that this office has identified the approximate location(s) and boundaries of wetlands and/or other aquatic resources on a site that are presumed to be subject to regulatory jurisdiction of the Corps of Engineers. Unlike an AJD, a PJD does not represent a definitive, official determination that there are, or that there are not, jurisdictional aquatic resources on a site, and does not have an expiration date.

³ "No Permit Required" (NPR) Letter- A NPR letter may be provided by the Corps to notify the requestor that an activity will not require a permit (authorization) from the Corps; this letter can only be used if the proposed activity is not a regulated activity, regardless of where the activity may occur. A NPR letter cannot be used to indicate the presence or absence of wetlands and/or other aquatic resources, nor can it be used to determine their jurisdictional status.

IV. LEGAL RIGHT OF ENTRY

By signing below, I am indicating that I have the authority, or am acting as the duly authorized agent of a person or entity with such authority, to and do hereby grant U.S. Army Corps of Engineers personnel right of entry to legally access the property(ies) subject to this request for the purposes of conducting on-site investigations (e.g., digging and refilling shallow holes) and issuing a jurisdictional determination. I acknowledge that my signature is an affirmation that I possess the requisite property rights to request a jurisdictional determination on the properties subject to this request.

540 East Bay Street, Charleston, SC 29403

Mailing Address

travenel@palmettorail.com

Email Address

032-00-03-048, 081-00-00-034, 137-00-00-022, 157-00-00-003

Property Address / TMS #(s)

(843) 727-2067

Daytime Phone Number

*Signature:

Printed Name and Date

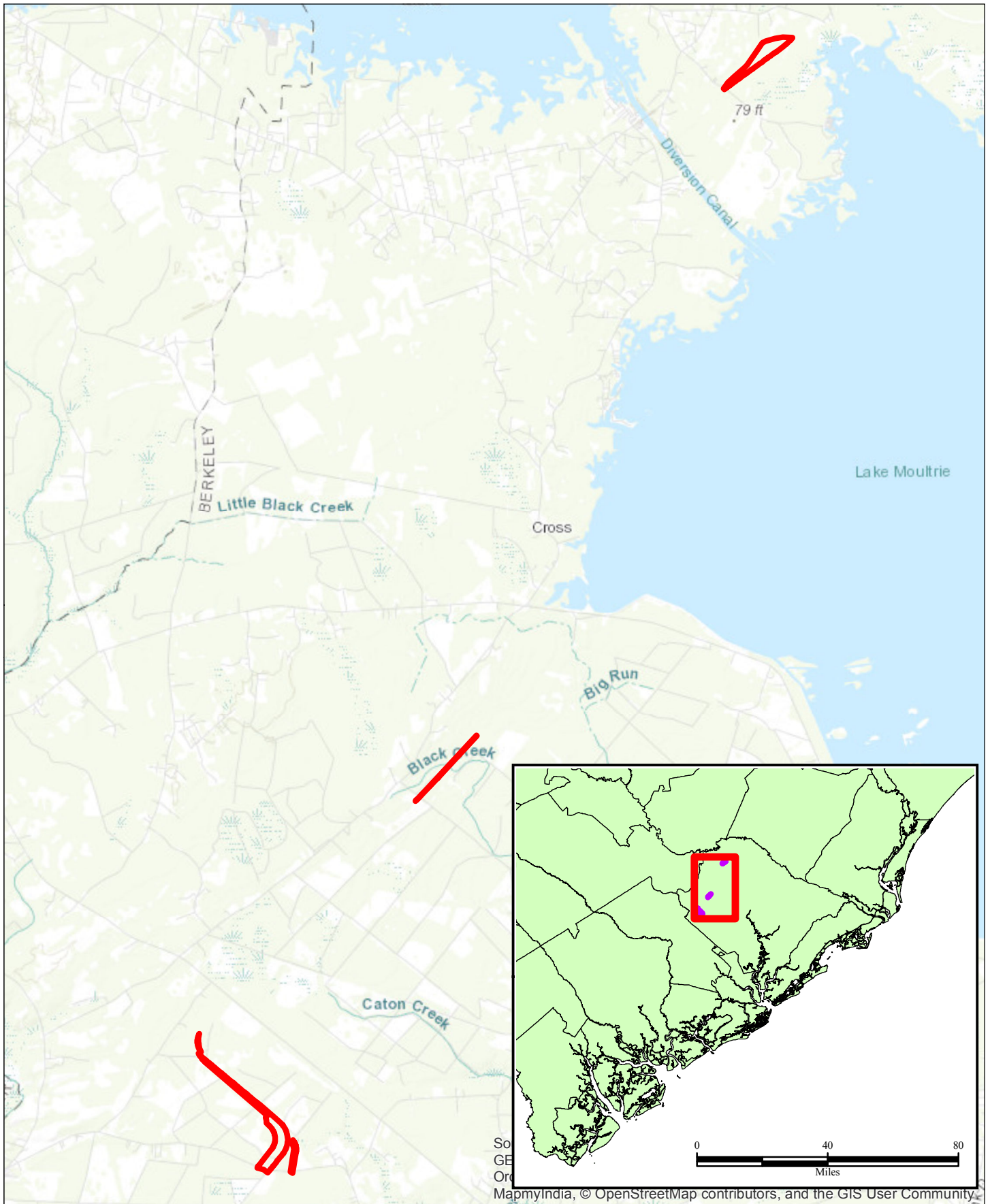
Charleston Office: US Army Corps of Engineers Regulatory Division 69A Hagood Avenue Charleston, SC 29403 (ph) 843-329-8044	Columbia Office: US Army Corps of Engineers Regulatory Office 1835 Assembly Street, Room 865 B-1 Columbia, SC 29201 (ph) 803-253-3444	Conway Office: US Army Corps of Engineers Regulatory Office 1949 Industrial Park Road, Room 140 Conway, SC 29526 (ph) 843-365-4239
--	---	--

*Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Program of the U.S. Army Corps of Engineers; Final Rule for 33 CFR Parts 320-332.

Principal Purpose: The information that you provide will be used in evaluating your request to determine whether there are any aquatic resources within the project area subject to federal jurisdiction under the regulatory authorities referenced above.

Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public, and may be made available as part of a public notice as required by federal law. Your name and property location where federal jurisdiction is to be determined will be included in the approved jurisdictional determination (AJD), which will be made available to the public on the District's website and on the Headquarters USACE website.

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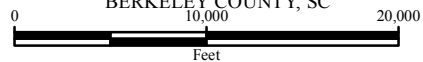
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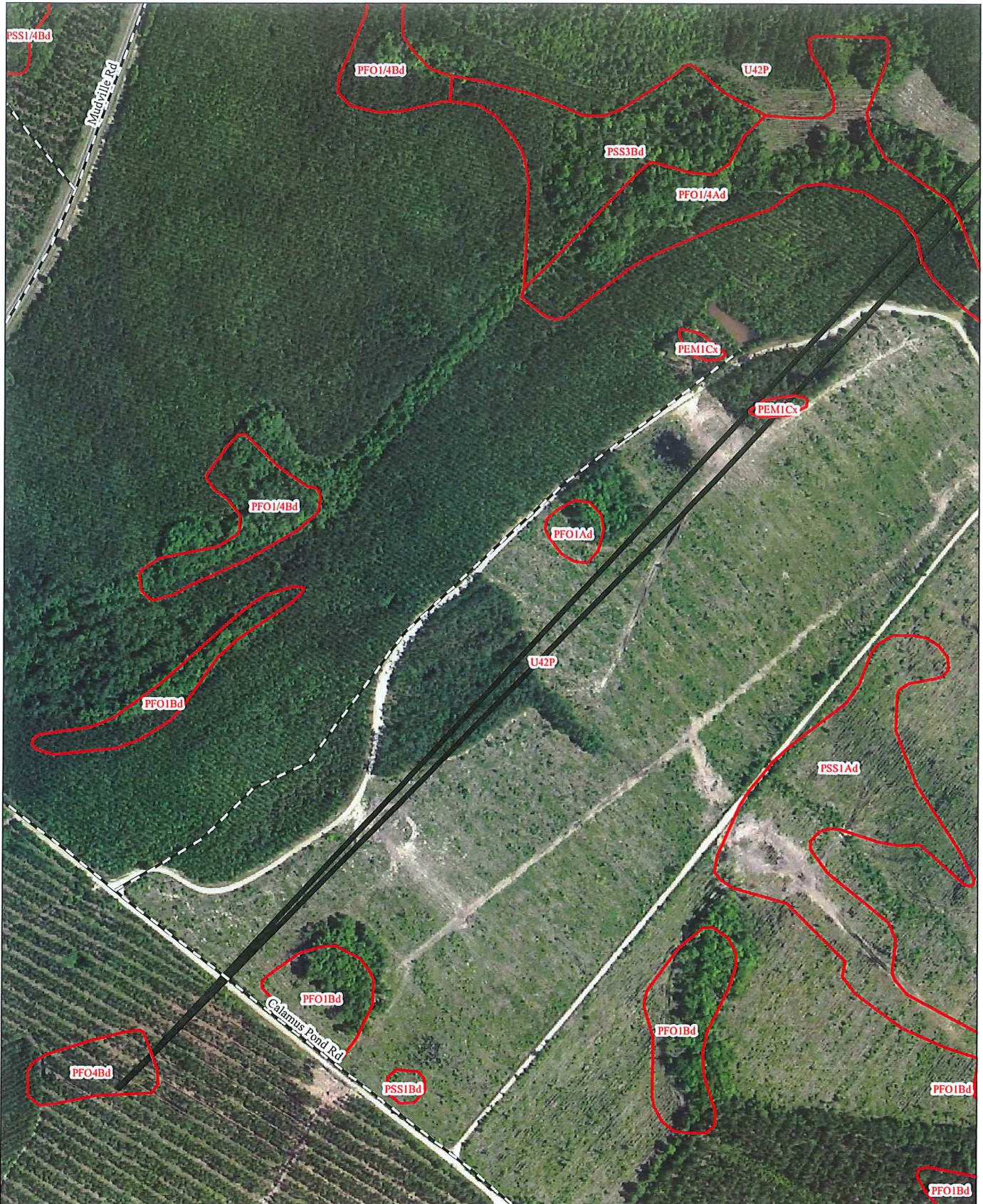
LOCATION MAP
 PREPARED FOR PALMETTO RAILWAYS
 PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
 BERKELEY COUNTY, SC



LEGEND

PROJECT AREA: +/- 242.5 AC

LONG: -80.101882 W LAT: 33.400609 N (NORTHERNMOST POINT)
 LONG: -80.235351 W LAT: 33.162642 N (SOUTHERNMOST POINT)



EXTERNAL SOURCES: NAIP 2015 TRUE COLOR AERIAL, U.S. CENSUS ROADS, U.S. FISH AND WILDLIFE NWI

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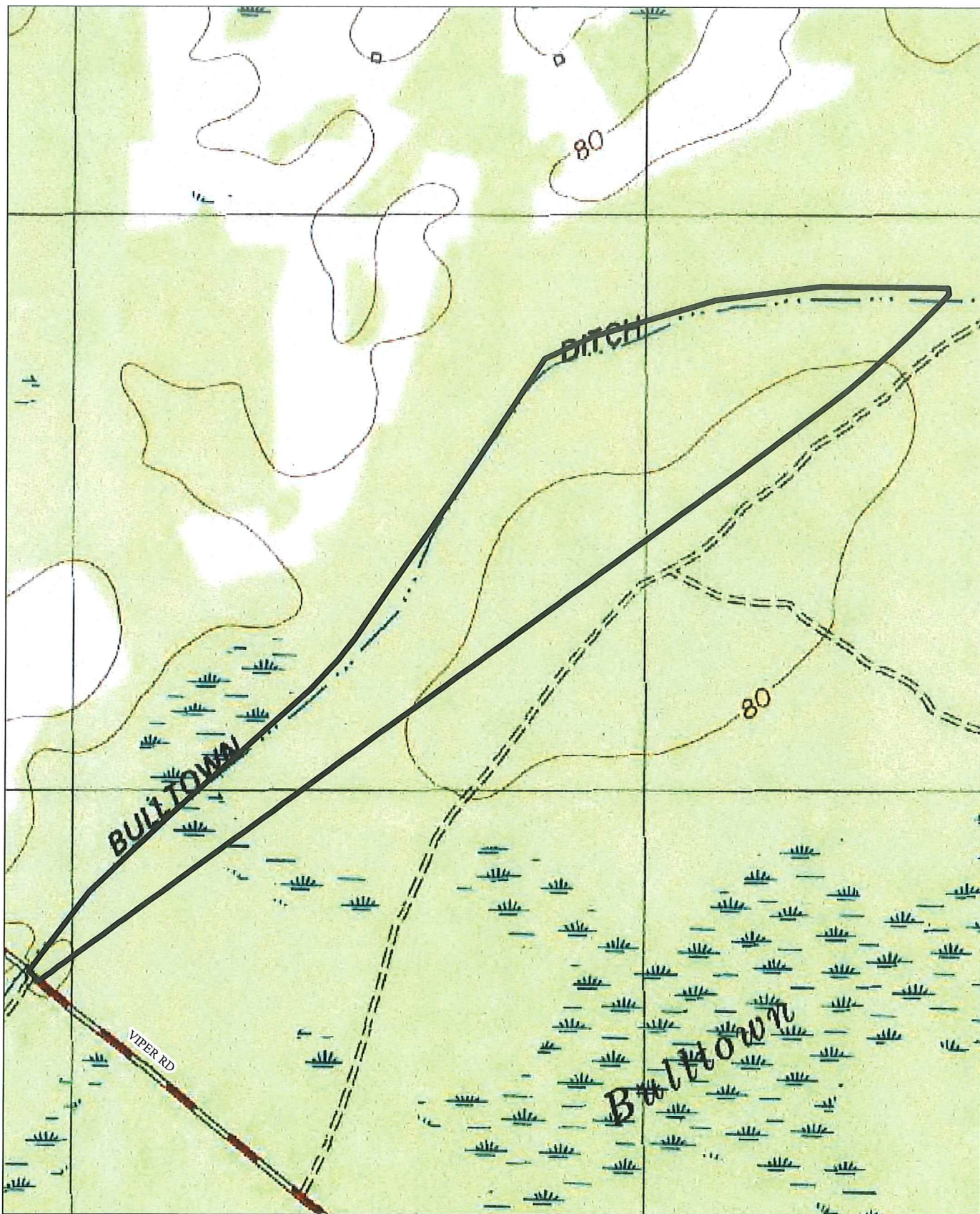
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NWI MAP - PAGE 3 OF 5
 PREPARED FOR PALMETTO RAILWAYS
 PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
 BERKELEY COUNTY, SC

0 400 800
 Feet

LEGEND	
	PROJECT AREA: +/- 242.5 AC
	NWI
	ROADS



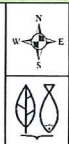
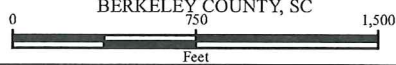
EXTERNAL SOURCES: USGS TOPO PINEVILLE QUAD

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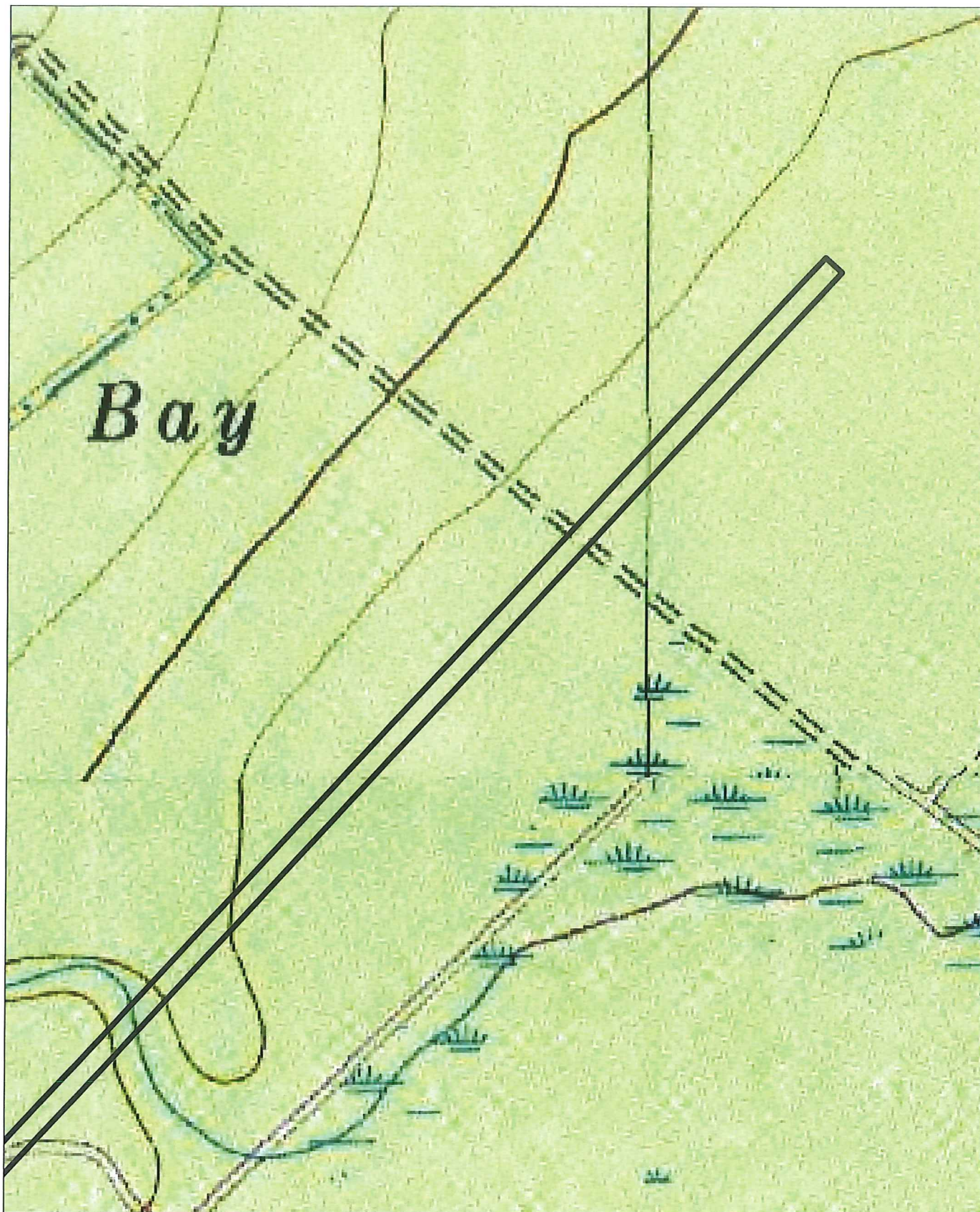
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TOPOGRAPHIC MAP (PINEVILLE QUAD) - PAGE 1 OF 5
 PREPARED FOR PALMETTO RAILWAYS
 PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
 BERKELEY COUNTY, SC



LEGEND

 PROJECT AREA: +/- 242.5 AC



EXTERNAL SOURCES: USGS TOPO CROSS QUAD

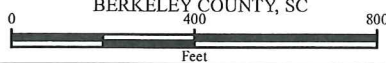
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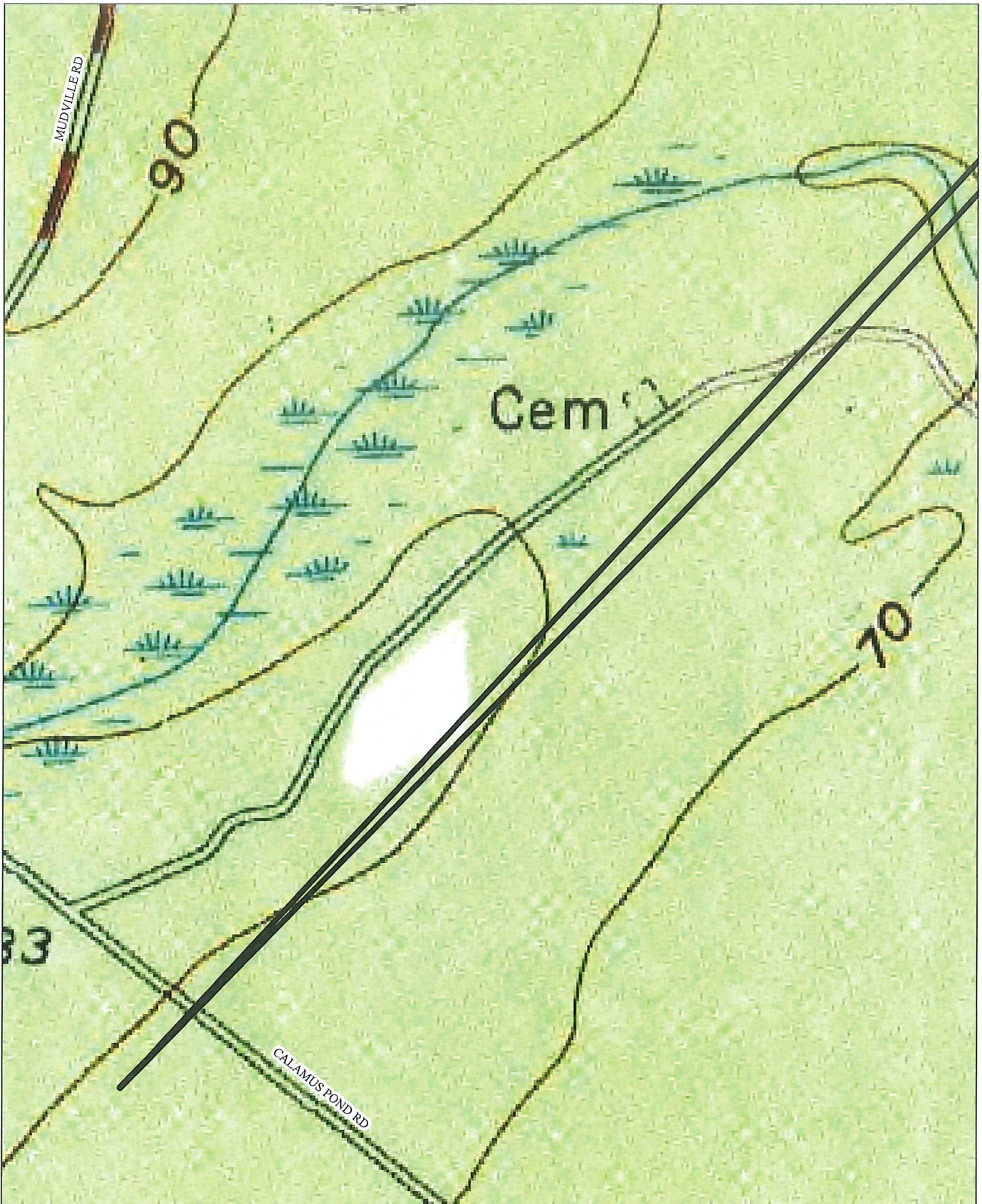
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TOPOGRAPHIC MAP (CROSS QUAD) - PAGE 2 OF 5
PREPARED FOR PALMETTO RAILWAYS
PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
BERKELEY COUNTY, SC



LEGEND

 PROJECT AREA: +/- 242.5 AC



EXTERNAL SOURCES: USGS TOPO SUMMERVILLE NW QUAD

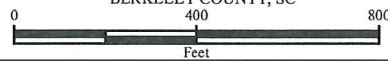
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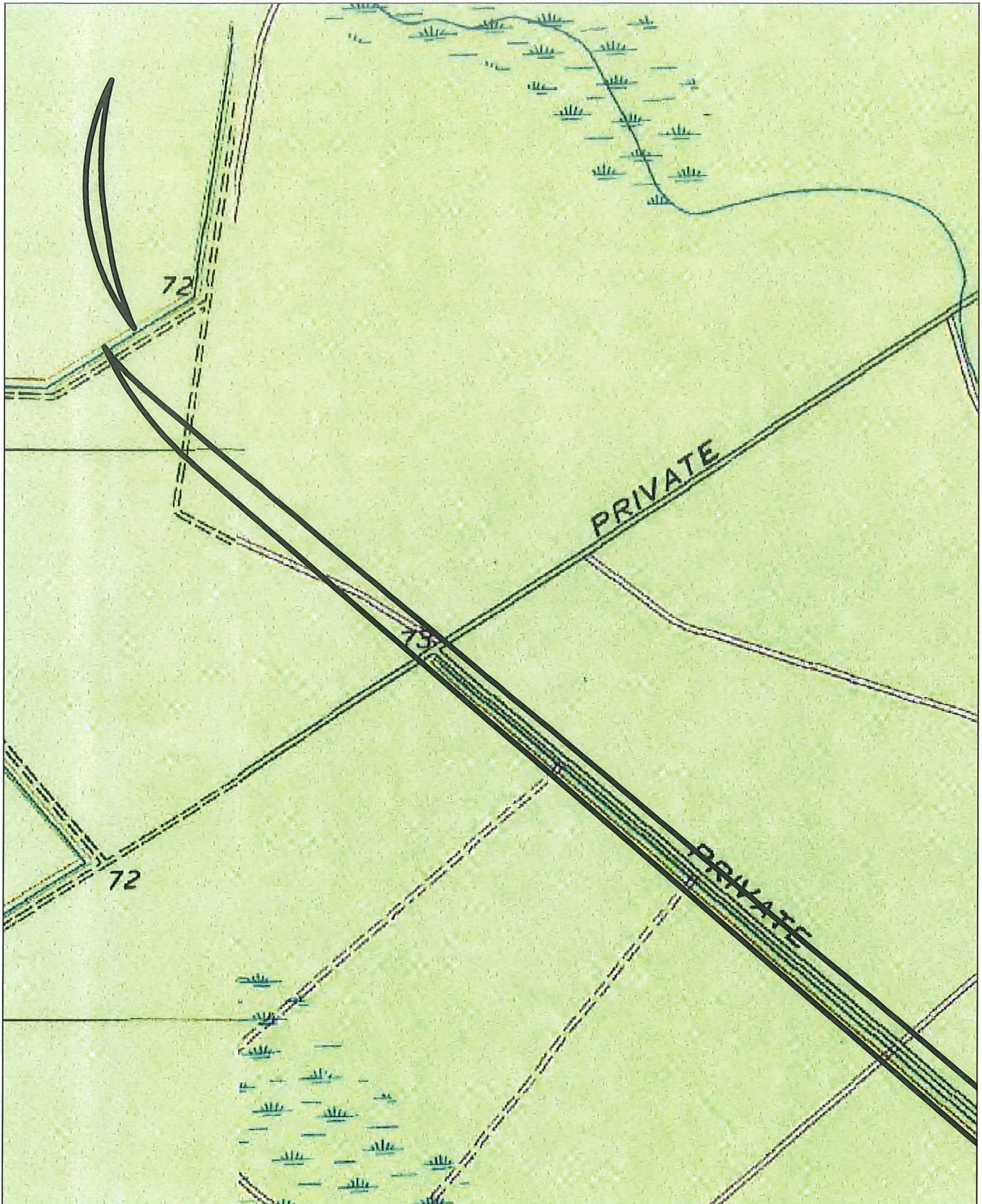
TOPOGRAPHIC MAP (SUMMERVILLE NW QUAD) - PAGE 3 OF 5

PREPARED FOR PALMETTO RAILWAYS
 PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
 BERKELEY COUNTY, SC



LEGEND

PROJECT AREA: +/- 242.5 AC



EXTERNAL SOURCES: USGS TOPO SUMMERVILLE NW QUAD

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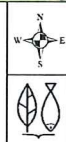
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TOPOGRAPHIC MAP (SUMMERVILLE NW QUAD) - PAGE 4 OF 5

PREPARED FOR PALMETTO RAILWAYS
 PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
 BERKELEY COUNTY, SC

0 750 1,500
 Feet



LEGEND

 PROJECT AREA: +/- 242.5 AC



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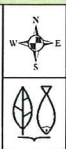
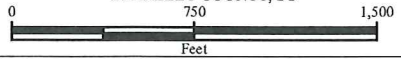
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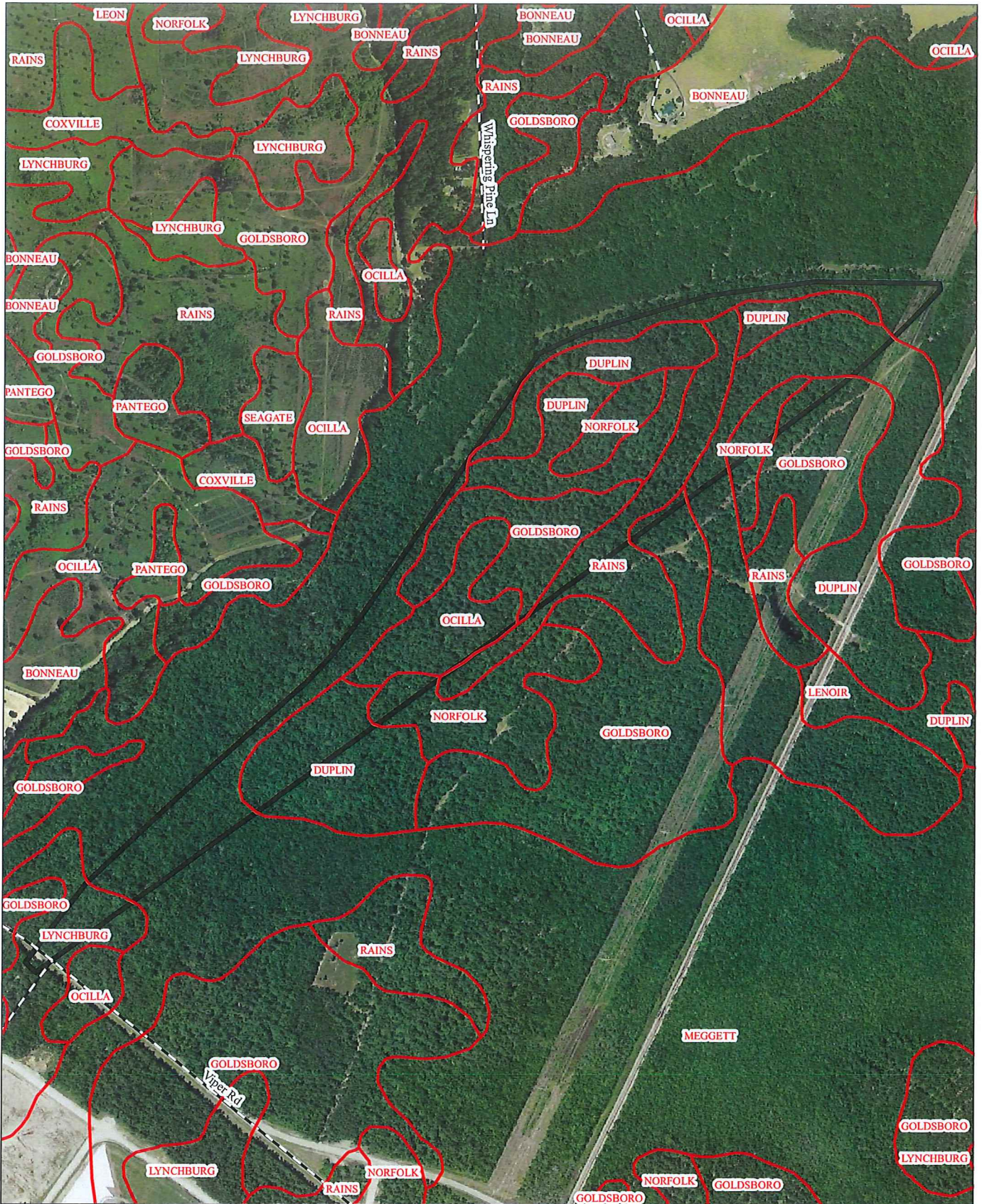
TOPOGRAPHIC MAP (SUMMERVILLE NW QUAD) - PAGE 5 OF 5

PREPARED FOR PALMETTO RAILWAYS
PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
BERKELEY COUNTY, SC



LEGEND

PROJECT AREA: +/- 242.5 AC



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MAPPED SOILS - PAGE 1 OF 5
 PREPARED FOR PALMETTO RAILWAYS
 PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
 BERKELEY COUNTY, SC

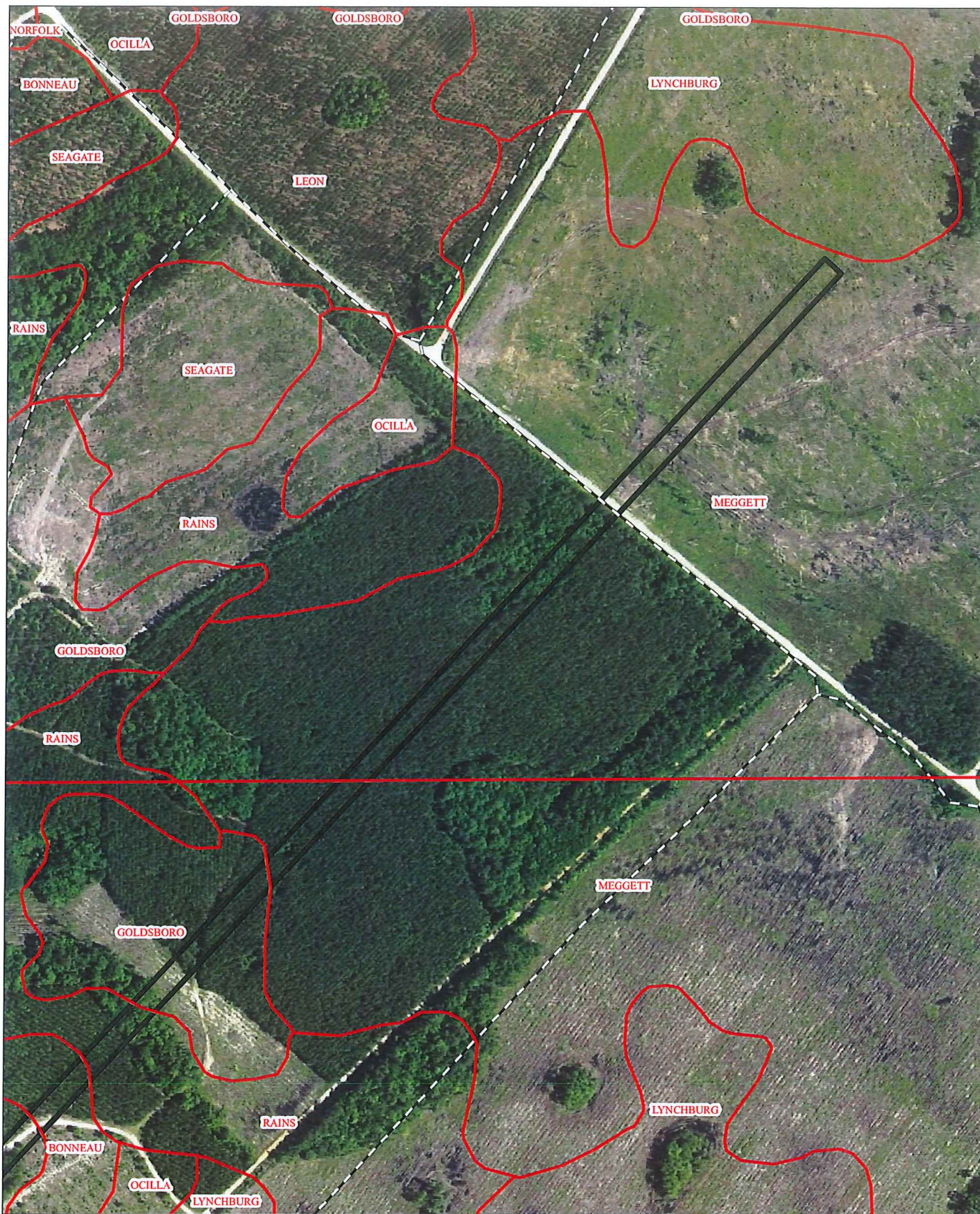
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 Feet

LEGEND

PROJECT AREA: +/- 242.5 AC

SOILS

ROADS



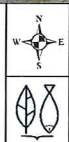
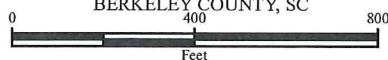
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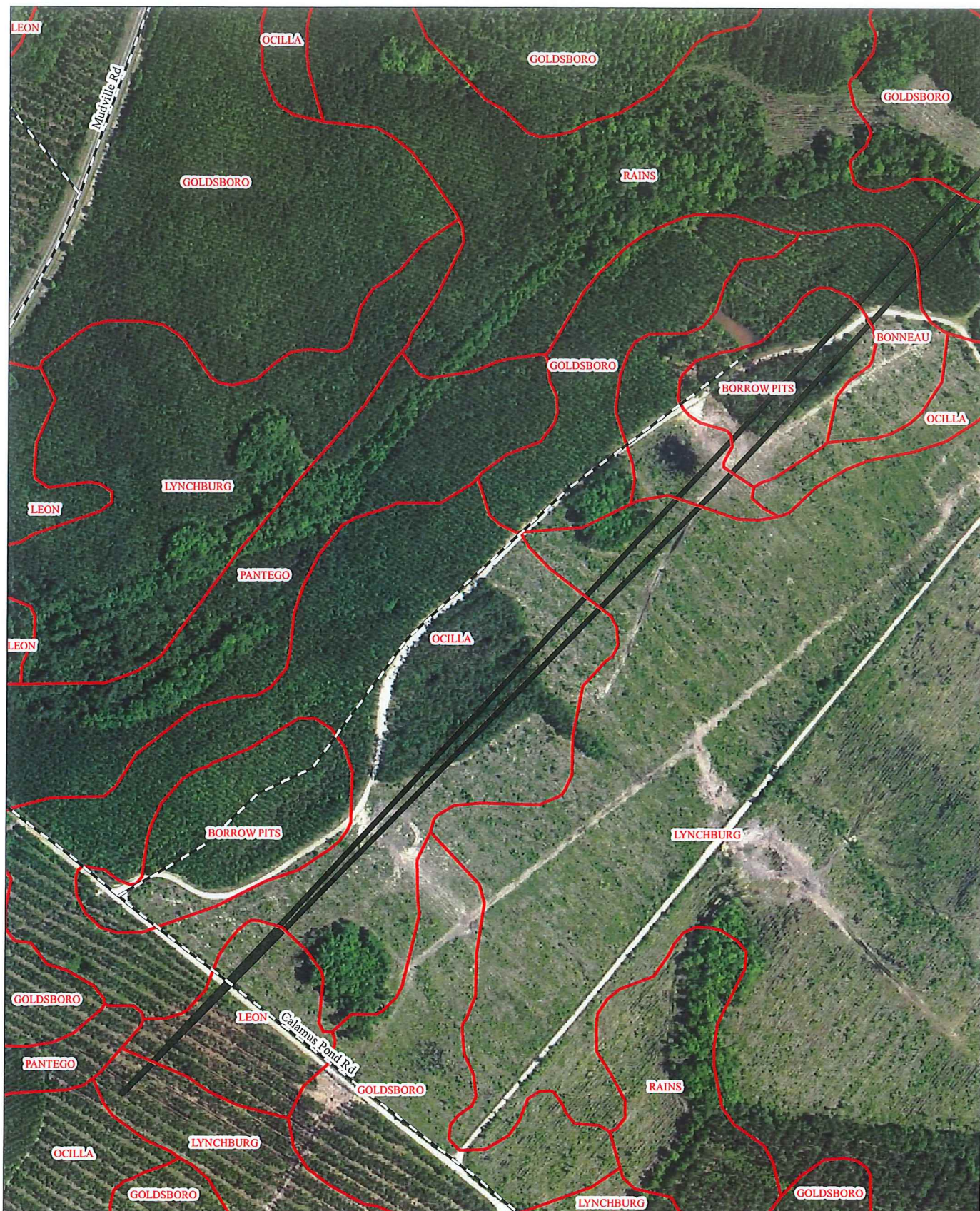
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MAPPED SOIL - PAGE 2 OF 5
 PREPARED FOR PALMETTO RAILWAYS
 PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
 BERKELEY COUNTY, SC



LEGEND

- PROJECT AREA: +/- 242.5 AC
- SOILS
- ROADS



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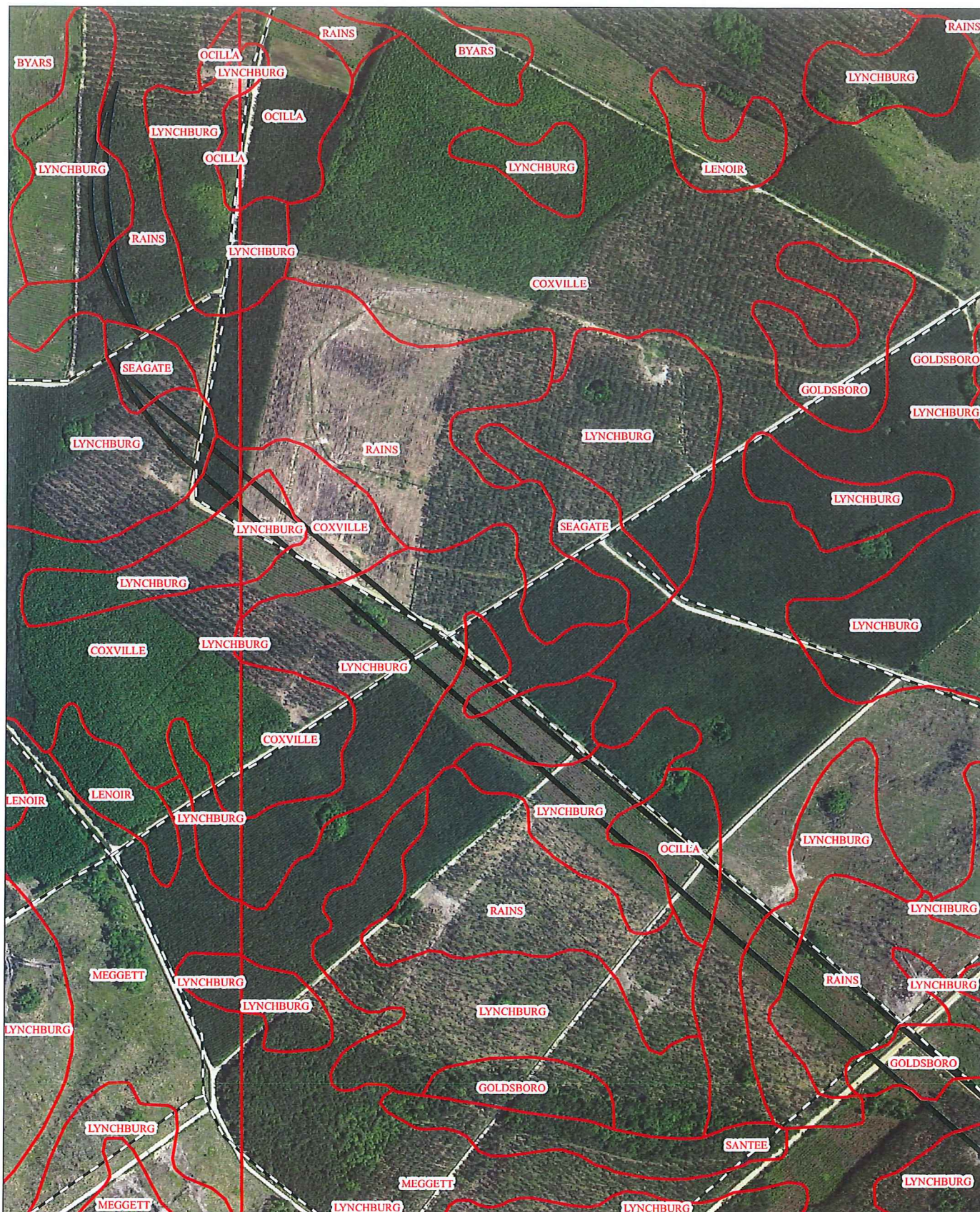
MAPPED SOILS - PAGE 3 OF 5
 PREPARED FOR PALMETTO RAILWAYS
 PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
 BERKELEY COUNTY, SC

0 400 800
 Feet



LEGEND

- PROJECT AREA: +/- 242.5 AC
- SOILS
- ROADS



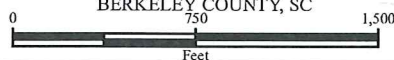
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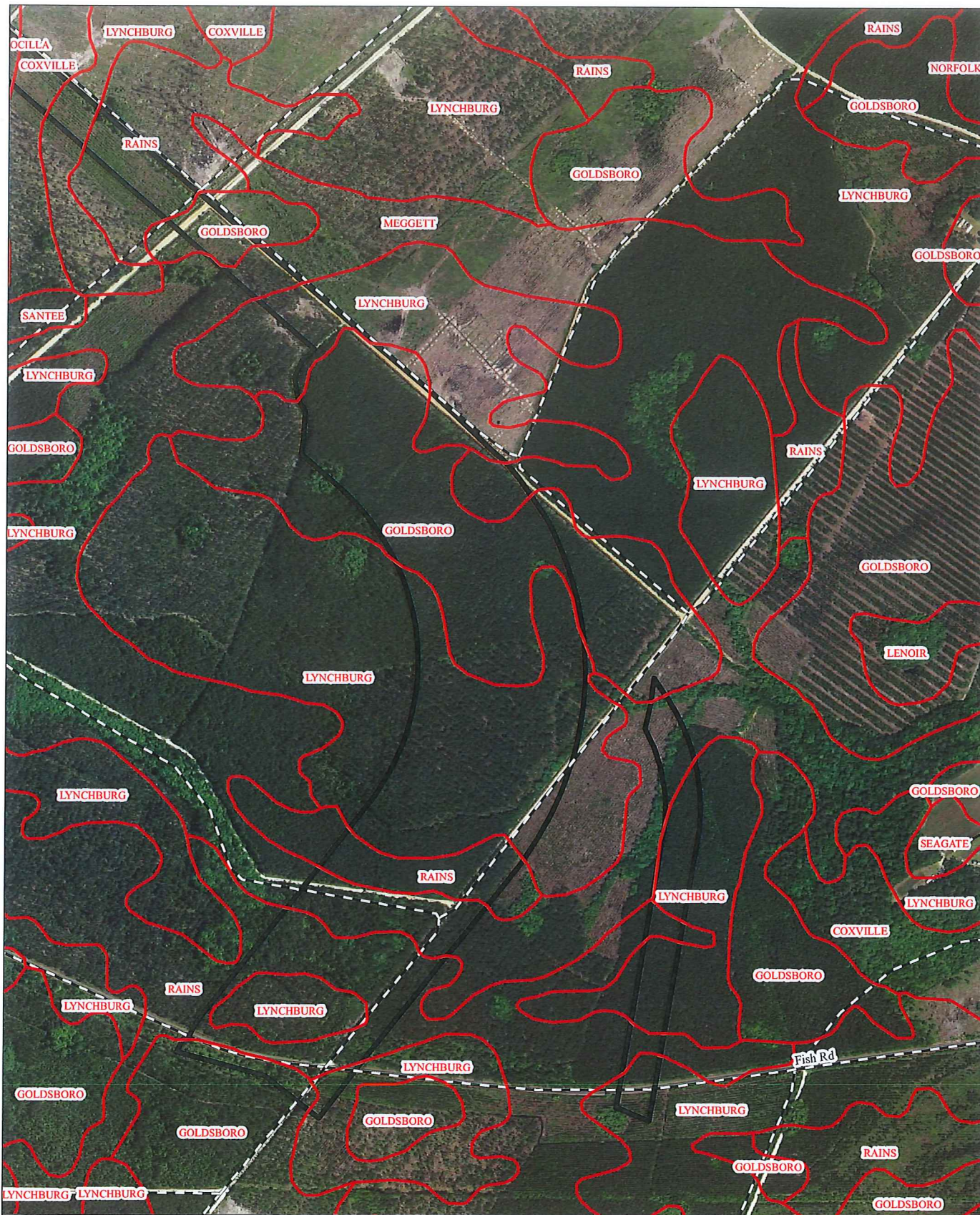
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MAPPED SOILS - PAGE 4 OF 5
 PREPARED FOR PALMETTO RAILWAYS
 PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
 BERKELEY COUNTY, SC



LEGEND

- PROJECT AREA: +/- 242.5 AC
- SOILS
- ROADS



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 PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
 BERKELEY COUNTY, SC



LEGEND

- PROJECT AREA: +/- 242.5 AC
- SOILS
- ROADS

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cross Route Additional Area City/County: Berkeley Sampling Date: 4/28/17-5/3/17
 Applicant/Owner: Palmetto Railways State: SC Sampling Point: DP 1 UP
 Investigator(s): Robert Strange Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): < 2%
 Subregion (LRR or MLRA): LRR T Lat: 33.39453754 Long: -80.11236375 Datum: NAD 83
 Soil Map Unit Name: Ocilla NWI classification: U42P

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? ☐ Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? ☐ (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present?	Yes ☐ No ☒	
Wetland Hydrology Present?	Yes ☐ No ☒	
Remarks: DP 1 UP does not meet the three wetland requirements. Sampling was conducted from April 28 thru May 3, 2017. Site conditions could be described as an average of high temperatures in the mid to upper 80s and approx. 0.5" of rainfall per week.		

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☐ Surface Water (A1) ☐ Aquatic Fauna (B13) ☐ High Water Table (A2) ☐ Marl Deposits (B15) (LRR U) ☐ Saturation (A3) ☐ Hydrogen Sulfide Odor (C1) ☐ Water Marks (B1) ☐ Oxidized Rhizospheres along 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)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ FAC-Neutral Test (D5) ☐ Sphagnum moss (D8) (LRR T, U)
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____		Wetland Hydrology Present? Yes ☐ No ☒
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: SCDNR 2006 aerials		
Remarks: Wetland hydrology was not present on sample dates due to lack of indicators.		

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

 Sampling Point: DP 1 UP

Tree Stratum (Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Pinus taeda</u>	<u>15</u>	<u>YES</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>7</u> (A) Total Number of Dominant Species Across All Strata: <u>11</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>64</u> (A/B)
2. <u>Carya glabra</u>	<u>10</u>	<u>YES</u>	<u>FACU</u>	
3. <u>Quercus alba</u>	<u>10</u>	<u>YES</u>	<u>FACU</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>35</u> = Total Cover 50% of total cover: <u>17.5</u> 20% of total cover: <u>7</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling Stratum (Plot size: <u>30 ft</u>)				
1. <u>Liquidambar styraciflua</u>	<u>10</u>	<u>YES</u>	<u>FAC</u>	
2. <u>Quercus nigra</u>	<u>5</u>	<u>YES</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>15</u> = 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>)				Hydrophytic Vegetation Indicators: ☐ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ☐ 3 - Prevalence Index is ≤3.0 ¹ ☐ Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Morella cerifera</u>	<u>5</u>	<u>YES</u>	<u>FAC</u>	
2. <u>Persea borbonia</u>	<u>5</u>	<u>YES</u>	<u>FACW</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>10</u> = Total Cover 50% of total cover: <u>5</u> 20% of total cover: <u>2</u>				Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) 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.
Herb Stratum (Plot size: <u>30 ft</u>)				
1. <u>Callicarpa americana</u>	<u>5</u>	<u>YES</u>	<u>FACU</u>	
2. <u>Andropogon virginicus</u>	<u>5</u>	<u>YES</u>	<u>FAC</u>	
3. <u>Chasmanthium sessiliflorum</u>	<u>10</u>	<u>YES</u>	<u>FAC</u>	
4. <u>Collinsonia serotina</u>	<u>5</u>	<u>YES</u>	<u>NA</u>	
<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>)				Hydrophytic Vegetation Present? Yes ☒ No ☐
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				
Remarks: (If observed, list morphological adaptations below). <u>Hydrophytic vegetation present within sample area.</u>				

SOIL

Sampling Point: DP 1 UP

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		
0-8"	10YR 3/3	100					SL	
8-15"	10YR 4/3	100					SL	
15-20"+	10YR 5/4	100					SL	

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

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

- ☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5)
☐ Organic Bodies (A6) (LRR P, T, U)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)
☐ Muck Presence (A8) (LRR U)
☐ 1 cm Muck (A9) (LRR P, T)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Coast Prairie Redox (A16) (MLRA 150A)
☐ Sandy Mucky Mineral (S1) (LRR O, S)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Dark Surface (S7) (LRR P, S, T, U)

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

Indicators for Problematic Hydric 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: Hydric soil is not present, due to lack of indicator(s).

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cross Route Additional Area City/County: Berkeley Sampling Date: 4/28-5/3/17
 Applicant/Owner: Palmetto Railways State: SC Sampling Point: DP 1 Wet
 Investigator(s): Robert Strange Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): < 2%
 Subregion (LRR or MLRA): LRR T Lat: 33.39518871 Long: -80.11227938 Datum: NAD 83
 Soil Map Unit Name: OCILLA NWI classification: U42P

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? ☐ Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? ☐ (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	Is the Sampled Area within a Wetland?	Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐		
Wetland Hydrology Present?	Yes ☒ No ☐		
Remarks: DP 1 Wet meets the three wetland requirements. Sampling was conducted from April 28 thru May 3, 2017. Site conditions could be described as an average of high temperatures in the mid to upper 80s and approx. 0.5" of rainfall per week.			

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 along 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 ☐ Depth (inches): <u>0-6"</u>	Wetland Hydrology Present? Yes ☒ No ☐	
Water Table Present?	Yes ☒ No ☐ Depth (inches): <u>surface</u>		
Saturation Present? (includes capillary fringe)	Yes ☒ No ☐ Depth (inches): <u>surface</u>		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: SCDNR 2006 aerials			
Remarks: Wetland hydrology was present on sample dates.			

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

Sampling Point: DP 1 Wet

Tree Stratum (Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Quercus nigra</u>	<u>10</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>Nyssa sylvatica</u>	<u>10</u>	<u>YES</u>	<u>FAC</u>	
3. <u>Quercus michauxii</u>	<u>10</u>	<u>YES</u>	<u>FACW</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>30</u> = Total Cover 50% of total cover: <u>15</u> 20% of total cover: <u>6</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling Stratum (Plot size: <u>30 ft</u>)				
1. <u>Liquidambar styraciflua</u>	<u>5</u>	<u>YES</u>	<u>FAC</u>	
2. <u>Acer rubrum</u>	<u>5</u>	<u>YES</u>	<u>FAC</u>	
3. <u>Quercus nigra</u>	<u>5</u>	<u>YES</u>	<u>FAC</u>	
4. _____	_____	_____	_____	
<u>15</u> = 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>)				Hydrophytic Vegetation Indicators: ☐ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ☐ 3 - Prevalence Index is ≤3.0 ¹ ☐ Problematic Hydrophytic Vegetation ¹ (Explain)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</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 (6 m) 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.
Herb Stratum (Plot size: <u>30 ft</u>)				
1. <u>Woodwardia areolata</u>	<u>10</u>	<u>YES</u>	<u>OBL</u>	
2. <u>Sabal minor</u>	<u>5</u>	<u>NO</u>	<u>FACW</u>	
3. <u>Chasmanthium laxum</u>	<u>15</u>	<u>YES</u>	<u>FACW</u>	
4. _____	_____	_____	_____	
<u>30</u> = Total Cover 50% of total cover: <u>15</u> 20% of total cover: <u>6</u>				
Woody Vine Stratum (Plot size: <u>30 ft</u>)				Hydrophytic Vegetation Present? Yes ☒ No ☐
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				
Remarks: (If observed, list morphological adaptations below). Hydrophytic vegetation is present.				

SOIL

Sampling Point: DP 1 Wet

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		
0-12"	10YR 2/1	95	5YR 3/4	5	C	PL	SL	
12-20"+	10YR 6/1	90	10YR 2/1	5	C	M	LS	
			10YR 6/4	5	C	M	LS	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)			Indicators for Problematic Hydric Soils ³ :		
☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR S, T, U)	☐ 1 cm Muck (A9) (LRR O)			
☐ Histic Epipedon (A2)	☐ Thin Dark Surface (S9) (LRR S, T, U)	☐ 2 cm Muck (A10) (LRR S)			
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (LRR O)	☐ Reduced Vertic (F18) (outside MLRA 150A,B)			
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)	☐ Piedmont Floodplain Soils (F19) (LRR P, S, T)			
☐ Stratified Layers (A5)	☐ Depleted Matrix (F3)	☐ Anomalous Bright Loamy Soils (F20)			
☐ Organic Bodies (A6) (LRR P, T, U)	☐ Redox Dark Surface (F6)	☐ (MLRA 153B)			
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)	☐ Depleted Dark Surface (F7)	☐ Red Parent Material (TF2)			
☐ Muck Presence (A8) (LRR U)	☐ Redox Depressions (F8)	☐ Very Shallow Dark Surface (TF12)			
☐ 1 cm Muck (A9) (LRR P, T)	☐ Marl (F10) (LRR U)	☐ Other (Explain in Remarks)			
☐ 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)					

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 ☐
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Remarks: Hydric soil is present, due to observation of indicator(s).

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cross Route Additional Area City/County: Berkeley Sampling Date: 4/28-5/3/17
 Applicant/Owner: Palmetto Railways State: SC Sampling Point: DP 2 UP
 Investigator(s): Robert Strange Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): < 2%
 Subregion (LRR or MLRA): LRR T Lat: 33.24923351 Long: -80.18798645 Datum: NAD 83
 Soil Map Unit Name: MEGETT NWI classification: PFO1/4Ad

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? ☐ Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? ☐ (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is the Sampled Area within a Wetland?	Yes ☐	No ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			
Remarks: DP 2 UP does not meet the three wetland requirements. Sampling was conducted from April 28 thru May 3, 2017. Site conditions could be described as an average of high temperatures in the mid to upper 80s and approx. 0.5" of rainfall per week.					

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☐ Surface Water (A1) ☐ Aquatic Fauna (B13) ☐ High Water Table (A2) ☐ Marl Deposits (B15) (LRR U) ☐ Saturation (A3) ☐ Hydrogen Sulfide Odor (C1) ☐ Water Marks (B1) ☐ Oxidized Rhizospheres along 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)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ FAC-Neutral Test (D5) ☐ Sphagnum moss (D8) (LRR T, U)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: SCDNR 2006 aerials			
Remarks: Wetland hydrology was not present on sample dates due to lack of indicators.			

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

 Sampling Point: DP 2 UP

Tree Stratum (Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Pinus taeda</u>	<u>6</u>	<u>yes</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>5</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>6</u> = Total Cover 50% of total cover: <u>3</u> 20% of total cover: <u>1.2</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling Stratum (Plot size: <u>30 ft</u>)				Hydrophytic Vegetation Indicators: ☐ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ☐ 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.
1. <u>Quercus nigra</u>	<u>5</u>	<u>yes</u>	<u>FAC</u>	
2. <u>Liquidambar styraciflua</u>	<u>7</u>	<u>yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>12</u> = Total Cover 50% of total cover: <u>6</u> 20% of total cover: <u>2.4</u>				
Shrub Stratum (Plot size: <u>30 ft</u>)				
1. <u>Morella cerifera</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>				
Herb Stratum (Plot size: <u>30 ft</u>)				
1. <u>Andropogon capillipes</u>	<u>8</u>	<u>yes</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>8</u> = Total Cover 50% of total cover: <u>4</u> 20% of total cover: <u>1.6</u>				
Woody Vine Stratum (Plot size: <u>30 ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				
Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) 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 ☒ No ☐				
Remarks: (If observed, list morphological adaptations below). Hydrophytic vegetation is present.				

SOIL

Sampling Point: DP 2 UP

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		
0-4	10YR 4/1	100				LS	
4-16	2.5YR 6/4	100				LS	
16-20+	10YR 6/3	98	10YR 6/6	2	C	M	LS

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils³:
☐ 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)

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 ☒
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Remarks: Hydric soil is not present, due to lack of indicator(s).

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cross Route Additional Area City/County: Berkeley Sampling Date: 4/28-5/3/17
 Applicant/Owner: Palmetto Railways State: SC Sampling Point: DP 2 Wet
 Investigator(s): Robert Strange Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): < 2%
 Subregion (LRR or MLRA): LRR T Lat: 33.24968659 Long: -80.18746677 Datum: NAD 83
 Soil Map Unit Name: MEGETT NWI classification: U42P

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? ☐ Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? ☐ (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is the Sampled Area within a Wetland?	Yes ☒	No ☐
Hydric Soil Present?	Yes ☒	No ☐			
Wetland Hydrology Present?	Yes ☒	No ☐			
Remarks: DP 2 Wet meets the three wetland requirements. Sampling was conducted from April 28 thru May 3, 2017. Site conditions could be described as an average of high temperatures in the mid to upper 80s and approx. 0.5" of rainfall per week.					

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☐ Surface Water (A1) ☐ Aquatic Fauna (B13) ☒ High Water Table (A2) ☐ Marl Deposits (B15) (LRR U) ☒ Saturation (A3) ☐ Hydrogen Sulfide Odor (C1) ☐ Water Marks (B1) ☐ Oxidized Rhizospheres along 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)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ FAC-Neutral Test (D5) ☐ Sphagnum moss (D8) (LRR T, U)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☒ No ☐ Depth (inches): <u>10"+</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>7"+</u> (includes capillary fringe)		Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: SCDNR 2006 aeriels			
Remarks: Wetland hydrology was present on sample dates.			

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

 Sampling Point: DP 2 Wet

Tree Stratum (Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Pinus taeda</u>	<u>60</u>	<u>YES</u>	<u>FAC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
<u>60</u> = 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>Pinus taeda</u>	<u>4</u>	<u>yes</u>	<u>FAC</u>
2. <u>Liquidambar styraciflua</u>	<u>3</u>	<u>yes</u>	<u>FAC</u>
3. <u>Ilex opaca</u>	<u>2</u>	<u>yes</u>	<u>FACW</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
<u>9</u> = Total Cover 50% of total cover: <u>4.5</u> 20% of total cover: <u>1.8</u>			
Shrub Stratum (Plot size: <u>30 ft</u>)			
1. <u>Lyonia lucida</u>	<u>5</u>	<u>yes</u>	<u>FACW</u>
2. <u>Quercus nigra</u>	<u>3</u>	<u>yes</u>	<u>FAC</u>
3. <u>Carpinus caroliniana</u>	<u>2</u>	<u>yes</u>	<u>FAC</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
<u>10</u> = 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>Woodwardia areolata</u>	<u>10</u>	<u>yes</u>	<u>OBL</u>
2. <u>Toxicodendron radicans</u>	<u>10</u>	<u>yes</u>	<u>FAC</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
<u>20</u> = 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>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
<u>5</u> = Total Cover 50% of total cover: <u>2.5</u> 20% of total cover: <u>1</u>			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 10 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

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

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 (6 m) 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



No



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

Hydrophytic vegetation is present.

SOIL

Sampling Point: DP 2 Wet

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		
0-6	10YR 3/1	100					SL
6-12	10YR 6/2	98	10YR 5/6	2	C	M	SL
12-20+	10YR 6/1	95	10YR 5/6	5	C	M	SL

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

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

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cross Route Additional Area City/County: Berkeley Sampling Date: 4/28-5/3/17
 Applicant/Owner: Palmetto Railways State: SC Sampling Point: DP 3 UP
 Investigator(s): Robert Strange Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): < 2%
 Subregion (LRR or MLRA): LRR T Lat: 33.24578233 Long: -80.19182169 Datum: NAD 83
 Soil Map Unit Name: BONNEAU NWI classification: U42P

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? ☐ Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? ☐ (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	Is the Sampled Area within a Wetland?	Yes ☐ No ☒
Hydric Soil Present?	Yes ☐ No ☒		
Wetland Hydrology Present?	Yes ☐ No ☒		
Remarks: DP 3 UP does not meet the three wetland requirements. Sampling was conducted from April 28 thru May 3, 2017. Site conditions could be described as an average of high temperatures in the mid to upper 80s and approx. 0.5" of rainfall per week.			

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☐ Surface Water (A1) ☐ Aquatic Fauna (B13) ☐ High Water Table (A2) ☐ Marl Deposits (B15) (LRR U) ☐ Saturation (A3) ☐ Hydrogen Sulfide Odor (C1) ☐ Water Marks (B1) ☐ Oxidized Rhizospheres along 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)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ FAC-Neutral Test (D5) ☐ Sphagnum moss (D8) (LRR T, U)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? Yes ☐ No ☒ Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: SCDNR 2006 aerials			
Remarks: Wetland hydrology was not present on sample dates due to lack of indicators.			

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

 Sampling Point: **DP 3 UP**

Tree Stratum (Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling Stratum (Plot size: <u>30 ft</u>)				Hydrophytic Vegetation Indicators: ☐ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ☐ 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.
1. <u>Liquidambar styraciflua</u>	<u>5</u>	<u>no</u>	<u>FAC</u>	
2. <u>Acer rubrum</u>	<u>5</u>	<u>no</u>	<u>FAC</u>	
3. <u>Pinus taeda</u>	<u>60</u>	<u>yes</u>	<u>FAC</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>70</u> = Total Cover 50% of total cover: <u>35</u> 20% of total cover: <u>14</u>				
Shrub Stratum (Plot size: <u>30 ft</u>)				
1. <u>Morella cerifera</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>				
Herb Stratum (Plot size: <u>30 ft</u>)				
1. <u>Panicum sp.</u>	<u>5</u>	<u>yes</u>	<u>FAC</u>	
2. <u>Chasmanthium laxum</u>	<u>5</u>	<u>yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>10</u> = Total Cover 50% of total cover: <u>5</u> 20% of total cover: <u>2</u>				
Woody Vine Stratum (Plot size: <u>30 ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				
Remarks: (If observed, list morphological adaptations below). <u>Hydrophytic vegetation is present.</u>				Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) 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 ☒ No ☐

SOIL

Sampling Point: DP 3 UP

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		
0-7	10YR 5/3	100					LS
7-12	10YR 6/3	100					LS
12-15	10YR 6/6	100					SL
15-20+	10YR 5/6	100					SCL

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) ☐ Histosol (A1) ☐ Histic Epipedon (A2) ☐ Black Histic (A3) ☐ Hydrogen Sulfide (A4) ☐ Stratified Layers (A5) ☐ Organic Bodies (A6) (LRR P, T, U) ☐ 5 cm Mucky Mineral (A7) (LRR P, T, U) ☐ Muck Presence (A8) (LRR U) ☐ 1 cm Muck (A9) (LRR P, T) ☐ Depleted Below Dark Surface (A11) ☐ Thick Dark Surface (A12) ☐ Coast Prairie Redox (A16) (MLRA 150A) ☐ Sandy Mucky Mineral (S1) (LRR O, S) ☐ Sandy Gleyed Matrix (S4) ☐ Sandy Redox (S5) ☐ Stripped Matrix (S6) ☐ Dark Surface (S7) (LRR P, S, T, U)	☐ Polyvalue Below Surface (S8) (LRR S, T, U) ☐ Thin Dark Surface (S9) (LRR S, T, U) ☐ Loamy Mucky Mineral (F1) (LRR O) ☐ Loamy Gleyed Matrix (F2) ☐ Depleted Matrix (F3) ☐ Redox Dark Surface (F6) ☐ Depleted Dark Surface (F7) ☐ Redox Depressions (F8) ☐ Marl (F10) (LRR U) ☐ Depleted Ochric (F11) (MLRA 151) ☐ Iron-Manganese Masses (F12) (LRR O, P, T) ☐ Umbric Surface (F13) (LRR P, T, U) ☐ Delta Ochric (F17) (MLRA 151) ☐ Reduced Vertic (F18) (MLRA 150A, 150B) ☐ Piedmont Floodplain Soils (F19) (MLRA 149A) ☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)	Indicators for Problematic Hydric 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)
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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 ☒
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Remarks: Hydric soil is not present, due to lack of indicator(s).

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cross Route Additional Area City/County: Berkeley Sampling Date: 4/28-5/3/17
 Applicant/Owner: Palmetto Railways State: SC Sampling Point: DP 3 Wet
 Investigator(s): Robert Strange Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): < 2%
 Subregion (LRR or MLRA): LRR T Lat: 33.24549265 Long: -80.18798645 Datum: NAD 83
 Soil Map Unit Name: Lynchburg NWI classification: U42P

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? ☐ Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? ☐ (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒ No ☐	Is the Sampled Area within a Wetland?	Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐		
Wetland Hydrology Present?	Yes ☒ No ☐		
Remarks: DP 3 Wet meets the three wetland requirements. Sampling was conducted from April 28 thru May 3, 2017. Site conditions could be described as an average of high temperatures in the mid to upper 80s and approx. 0.5" of rainfall per week.			

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☐ Surface Water (A1) ☐ Aquatic Fauna (B13) ☒ High Water Table (A2) ☐ Marl Deposits (B15) (LRR U) ☒ Saturation (A3) ☐ Hydrogen Sulfide Odor (C1) ☐ Water Marks (B1) ☐ Oxidized Rhizospheres along 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)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ FAC-Neutral Test (D5) ☐ Sphagnum moss (D8) (LRR T, U)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☒ No ☐ Depth (inches): 8"+ Saturation Present? Yes ☒ No ☐ Depth (inches): 6"+ (includes capillary fringe)		Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: SCDNR 2006 aerials			
Remarks: Wetland hydrology was present on sample dates.			

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

Sampling Point: DP 3 Wet

Tree Stratum (Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling Stratum (Plot size: <u>30 ft</u>) 1. <u>Pinus taeda</u> <u>20</u> <u>yes</u> <u>FAC</u> 2. <u>Quercus nigra</u> <u>5</u> <u>no</u> <u>FAC</u> 3. <u>Liquidambar styraciflua</u> <u>5</u> <u>no</u> <u>FAC</u> 4. _____ 5. _____ 6. _____ <u>30</u> = Total Cover 50% of total cover: <u>15</u> 20% of total cover: <u>6</u>				Hydrophytic Vegetation Indicators: ☐ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ☐ 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.
Shrub Stratum (Plot size: <u>30 ft</u>) 1. <u>Clethra alnifolia</u> <u>5</u> <u>yes</u> <u>FACW</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>				Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) 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.
Herb Stratum (Plot size: <u>30 ft</u>) 1. <u>Scleria triolomerata</u> <u>7</u> <u>yes</u> <u>FACW</u> 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____ <u>7</u> = Total Cover 50% of total cover: <u>3.5</u> 20% of total cover: <u>1.4</u>				
Woody Vine Stratum (Plot size: <u>30 ft</u>) 1. <u>Rubus argutus</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>				Hydrophytic Vegetation Present? Yes ☒ No ☐
Remarks: (If observed, list morphological adaptations below). Hydrophytic vegetation is present.				

SOIL

Sampling Point: DP 3 Wet

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					SL	
6-11	10YR 6/2	98	10YR 5/6	2	C	M	SL	
11-20+	10YR 6/1	95	10YR 5/6	5	C	M	SL	

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

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

- ☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5)
☐ Organic Bodies (A6) (LRR P, T, U)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)
☐ Muck Presence (A8) (LRR U)
☐ 1 cm Muck (A9) (LRR P, T)
☒ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Coast Prairie Redox (A16) (MLRA 150A)
☐ Sandy Mucky Mineral (S1) (LRR O, S)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Dark Surface (S7) (LRR P, S, T, U)

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

Indicators for Problematic Hydric 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: Hydric soil is present, due to observation of indicator(s).

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cross Route Additional Area City/County: Berkeley Sampling Date: 4/28-5/3/17
 Applicant/Owner: Palmetto Railways State: SC Sampling Point: DP 4 UP
 Investigator(s): Robert Strange Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): < 2%
 Subregion (LRR or MLRA): LRR T Lat: 33.17941653 Long: -80.24127607 Datum: NAD 83
 Soil Map Unit Name: OCILLA NWI classification: U42P

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? ☐ Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? ☐ (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is the Sampled Area within a Wetland?	Yes ☐	No ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			
Remarks: DP 4 UP does not meet the three wetland requirements. Sampling was conducted from April 28 thru May 3, 2017. Site conditions could be described as an average of high temperatures in the mid to upper 80s and approx. 0.5" of rainfall per week.					

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 along 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 ☒	Depth (inches):	
Water Table Present?	Yes ☐ No ☒	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes ☐ No ☒	Depth (inches):	
		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: SCDNR 2006 aeriels			
Remarks: Wetland hydrology was not present on sample dates due to lack of indicators.			

SOIL

Sampling Point: DP 4 UP

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		
0-4	10YR 3/1	100				LS	
4-15	2.5Y 6/2	100				LS	
15-20+	10YR 6/3	95	10YR 6/6	5	C	M	LS

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils³:
☐ 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)

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 ☒
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Remarks: Hydric soil is not present, due to lack of indicator(s).

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cross Route Additional Area City/County: Berkeley Sampling Date: 4/28-5/3/17
 Applicant/Owner: Palmetto Railways State: SC Sampling Point: DP 4 Wet
 Investigator(s): Robert Strange Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): < 2%
 Subregion (LRR or MLRA): LRR T Lat: 33.17941653 Long: -80.24127607 Datum: NAD 83
 Soil Map Unit Name: OCILLA NWI classification: U42P

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? ☐ Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? ☐ (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is the Sampled Area within a Wetland?	Yes ☒	No ☐
Hydric Soil Present?	Yes ☒	No ☐			
Wetland Hydrology Present?	Yes ☒	No ☐			
Remarks: DP 4 Wet meets the three wetland requirements. Sampling was conducted from April 28 thru May 3, 2017. Site conditions could be described as an average of high temperatures in the mid to upper 80s and approx. 0.5" of rainfall per week.					

HYDROLOGY

Wetland Hydrology Indicators: 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)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ FAC-Neutral Test (D5) ☐ Sphagnum moss (D8) (LRR T, U)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): <u>7"+</u>		Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: <u>SCDNR 2006 aeriels</u>			
Remarks: <u>Wetland hydrology was present on sample dates.</u>			

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

 Sampling Point: DP 4 Wet

Tree Stratum (Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	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. _____	_____	_____	_____	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling Stratum (Plot size: <u>30 ft</u>)				
1. <u>Pinus taeda</u>	<u>60</u>	<u>yes</u>	<u>FAC</u>	
2. <u>Liquidambar styraciflua</u>	<u>5</u>	<u>yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>65</u> = 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>)				Hydrophytic Vegetation Indicators: ☐ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ☐ 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.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				
Herb Stratum (Plot size: <u>30 ft</u>)				Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) 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>Arundinaria gigantea</u>	<u>5</u>	<u>yes</u>	<u>FACW</u>	
2. <u>Andropogon virginicus</u>	<u>10</u>	<u>yes</u>	<u>FAC</u>	
3. <u>Woodwardia areolata</u>	<u>5</u>	<u>yes</u>	<u>OBL</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>20</u> = 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>)				Hydrophytic Vegetation Present? Yes ☒ No ☐
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				
Remarks: (If observed, list morphological adaptations below). <u>Hydrophytic vegetation is present.</u>				

SOIL

Sampling Point: DP 4 Wet

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		
0-7	10YR 3/1	100					SL	
7-11	10YR 6/2	100					SL	
11-20+	10YR 6/1	95	10YR 5/6	5	C	M	SL	

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

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

- ☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5)
☐ Organic Bodies (A6) (LRR P, T, U)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)
☐ Muck Presence (A8) (LRR U)
☐ 1 cm Muck (A9) (LRR P, T)
☒ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Coast Prairie Redox (A16) (MLRA 150A)
☐ Sandy Mucky Mineral (S1) (LRR O, S)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Dark Surface (S7) (LRR P, S, T, U)

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

Indicators for Problematic Hydric 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: Hydric soil is present, due to observation of indicator(s).

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cross Route Additional Area City/County: Berkeley Sampling Date: 4/28-5/3/17
 Applicant/Owner: Palmetto Railways State: SC Sampling Point: DP 5 UP
 Investigator(s): Robert Strange Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): < 2%
 Subregion (LRR or MLRA): LRR T Lat: 33.16326179 Long: -80.22944003 Datum: NAD 83
 Soil Map Unit Name: LYNCHBURG NWI classification: U42P

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? ☐ Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? ☐ (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is the Sampled Area within a Wetland?	Yes ☐	No ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			
Remarks: DP 5 UP does not meet the three wetland requirements. Sampling was conducted from April 28 thru May 3, 2017. Site conditions could be described as an average of high temperatures in the mid to upper 80s and approx. 0.5" of rainfall per week.					

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☐ Surface Water (A1) ☐ Aquatic Fauna (B13) ☐ High Water Table (A2) ☐ Marl Deposits (B15) (LRR U) ☐ Saturation (A3) ☐ Hydrogen Sulfide Odor (C1) ☐ Water Marks (B1) ☐ Oxidized Rhizospheres along 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)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ FAC-Neutral Test (D5) ☐ Sphagnum moss (D8) (LRR T, U)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: SCDNR 2006 aeriels			
Remarks: Wetland hydrology was not present on sample dates due to lack of indicators.			

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

 Sampling Point: DP 5 UP

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>6</u> (A) Total Number of Dominant Species Across All Strata: <u>9</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66%</u> (A/B)
2. <u>Liquidambar styraciflua</u>	<u>15</u>	<u>YES</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>45</u> = Total Cover 50% of total cover: <u>22.5</u> 20% of total cover: <u>9</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling Stratum (Plot size: <u>30 ft</u>)				
1. <u>Liquidambar styraciflua</u>	<u>10</u>	<u>YES</u>	<u>FAC</u>	
2. <u>Pinus taeda</u>	<u>10</u>	<u>YES</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>20</u> = Total Cover 50% of total cover: <u>10</u> 20% of total cover: <u>4</u>				Hydrophytic Vegetation Indicators: ☐ 1 - Rapid Test for Hydrophytic Vegetation ☐ 2 - Dominance Test is >50% ☐ 3 - Prevalence Index is ≤3.0 ¹ ☐ Problematic Hydrophytic Vegetation ¹ (Explain)
Shrub Stratum (Plot size: <u>30 ft</u>)				
1. <u>Morella cerifera</u>	<u>10</u>	<u>YES</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>10</u> = Total Cover 50% of total cover: <u>5</u> 20% of total cover: <u>2</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 (6 m) 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.
Herb Stratum (Plot size: <u>30 ft</u>)				
1. <u>Pteridium aquilinum</u>	<u>10</u>	<u>YES</u>	<u>FACU</u>	
2. <u>Asplenium platyneuron</u>	<u>5</u>	<u>YES</u>	<u>FACU</u>	
3. <u>Rubus allegheniensis</u>	<u>5</u>	<u>YES</u>	<u>UPL</u>	
4. _____	_____	_____	_____	
<u>20</u> = Total Cover 50% of total cover: <u>10</u> 20% of total cover: <u>4</u>				Hydrophytic Vegetation Present? Yes ☐ No ☒
Woody Vine Stratum (Plot size: <u>30 ft</u>)				
1. <u>Vitis rotundifolia</u>	<u>5</u>	<u>YES</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>5</u> = Total Cover 50% of total cover: <u>2.5</u> 20% of total cover: <u>1</u>				
Remarks: (If observed, list morphological adaptations below). Hydrophytic vegetation not present				

SOIL

Sampling Point: DP 5 UP

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		
0-7	10YR 2/2	50				SL	
7-11	10YR 4/3	100				SL	
12-20	10YR 5/4	100				SL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils³:
☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR S, T, U)	☐ 1 cm Muck (A9) (LRR O)
☐ Histic Epipedon (A2)	☐ Thin Dark Surface (S9) (LRR S, T, U)	☐ 2 cm Muck (A10) (LRR S)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (LRR O)	☐ Reduced Vertic (F18) (outside MLRA 150A,B)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)	☐ Piedmont Floodplain Soils (F19) (LRR P, S, T)
☐ Stratified Layers (A5)	☐ Depleted Matrix (F3)	☐ Anomalous Bright Loamy Soils (F20)
☐ Organic Bodies (A6) (LRR P, T, U)	☐ Redox Dark Surface (F6)	(MLRA 153B)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)	☐ Depleted Dark Surface (F7)	☐ Red Parent Material (TF2)
☐ Muck Presence (A8) (LRR U)	☐ Redox Depressions (F8)	☐ Very Shallow Dark Surface (TF12)
☐ 1 cm Muck (A9) (LRR P, T)	☐ Marl (F10) (LRR U)	☐ Other (Explain in Remarks)
☐ 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)		

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 ☒
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Remarks: Hydric soil indicators not present

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cross Route Additional Area City/County: Berkeley Sampling Date: 4/28-5/3/17
 Applicant/Owner: Palmetto Railways State: SC Sampling Point: DP 5 WET
 Investigator(s): Robert Strange Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): < 2%
 Subregion (LRR or MLRA): LRR T Lat: 33.16389998 Long: -80.2292171 Datum: NAD 83
 Soil Map Unit Name: LYNCHBURG NWI classification: U42P

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? ☐ Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? ☐ (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is the Sampled Area within a Wetland?	Yes ☒	No ☐
Hydric Soil Present?	Yes ☒	No ☐			
Wetland Hydrology Present?	Yes ☒	No ☐			
Remarks: DP 5 WET meets the three wetland requirements. Sampling was conducted from April 28 thru May 3, 2017. Site conditions could be described as an average of high temperatures in the mid to upper 80s and approx. 0.5" of rainfall per week.					

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 along 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:		Wetland Hydrology Present? Yes ☒ No ☐	
Surface Water Present? Yes ☐ No ☒	Depth (inches): _____		
Water Table Present? Yes ☐ No ☒	Depth (inches): _____		
Saturation Present? (includes capillary fringe) Yes ☐ No ☒	Depth (inches): <u>4</u>		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: SCDNR 2006 aeriels			
Remarks: Wetland hydrology was present on sample dates.			

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

 Sampling Point: **DP 5 WET**

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liquidambar styraciflua	15	YES	FAC
2. Pinus taeda	30	YES	FAC
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
45 = Total Cover			
50% of total cover: 22.5		20% of total cover: 9	
Sapling Stratum (Plot size: 30 ft)			
1. Quercus nigra	10	YES	FAC
2. Pinus taeda	10	YES	FAC
3. Acer rubrum	10	YES	FAC
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
30 = Total Cover			
50% of total cover: 15		20% of total cover: 6	
Shrub Stratum (Plot size: 30 ft)			
1. Morella cerifera	20	YES	FAC
2. Lyonia Lucida	10	YES	FACW
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
30 = Total Cover			
50% of total cover: 15		20% of total cover: 6	
Herb Stratum (Plot size: 30 ft)			
1. Woodwardia areolata	20	YES	OBL
2. Osmunda cinnamomea	10	YES	FACW
3. Smilax glauca	5	NO	FAC
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: 30 ft)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
0 = Total Cover			
50% of total cover: 0		20% of total cover: 0	

Dominance Test worksheet:

 Number of Dominant Species That Are OBL, FACW, or FAC: 9 (A)

 Total Number of Dominant Species Across All Strata: 9 (B)

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

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

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 (6 m) 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



No



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

Hydrophytic vegetation is present.

SOIL

Sampling Point: DP 5 WET

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		
0-8	10YR 2/1	100					SL	
8-14	10YR 4/1	90	10YR 6/6	10	C	M	CL	
14-20	10YR 5/2	95	2.5YR 5/6	5	C	M	C	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils³:
☐ 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)	☐ 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 ☐
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Remarks: Hydric soil is present, due to observation of indicator(s).

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cross Route Additional Area City/County: Berkeley Sampling Date: 4/28-5/3/17
 Applicant/Owner: Palmetto Railways State: SC Sampling Point: DP 6 UP
 Investigator(s): Robert Strange Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): < 2%
 Subregion (LRR or MLRA): LRR T Lat: 33.16827847 Long: -80.23170419 Datum: NAD 83
 Soil Map Unit Name: Lynchburg NWI classification: U42P

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? ☐ Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? ☐ (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is the Sampled Area within a Wetland?	Yes ☐	No ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			
Remarks: DP 6 UP does not meet the three wetland requirements. Sampling was conducted from April 28 thru May 3, 2017. Site conditions could be described as an average of high temperatures in the mid to upper 80s and approx. 0.5" of rainfall per week.					

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 along 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 ☒	Depth (inches):	
Water Table Present?	Yes ☐ No ☒	Depth (inches):	
Saturation Present?	Yes ☐ No ☒	Depth (inches):	
(includes capillary fringe)		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: SCDNR 2006 aerals			
Remarks: Wetland hydrology was not present on sample dates due to lack of indicators.			

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

 Sampling Point: DP 6 UP

Tree Stratum (Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Pinus taeda</u>	<u>50</u>	<u>YES</u>	<u>FAC</u>
2. _____	_____	_____	_____
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>Pinus taeda</u>	<u>5</u>	<u>yes</u>	<u>FAC</u>
2. <u>Acer rubrum</u>	<u>10</u>	<u>yes</u>	<u>FAC</u>
3. <u>Liquidambar styraciflua</u>	<u>10</u>	<u>yes</u>	<u>FAC</u>
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>Persea borbonia</u>	<u>5</u>	<u>yes</u>	<u>FACW</u>
2. <u>Vaccinium stamineum</u>	<u>5</u>	<u>yes</u>	<u>FACU</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
<u>10</u> = 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. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>			
Woody Vine Stratum (Plot size: <u>30 ft</u>)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

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

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 (6 m) 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 ☒ No ☐

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

Hydrophytic vegetation is present.

SOIL

Sampling Point: DP 6 UP

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		
0-5	10YR 2/1	100					LS
5-15	2.5Y 4/3	100					LS
15-20+	10YR 6/3	95	10YR 6/6	5	C	M	LS

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils ³ :
☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR S, T, U)	☐ 1 cm Muck (A9) (LRR O)
☐ Histic Epipedon (A2)	☐ Thin Dark Surface (S9) (LRR S, T, U)	☐ 2 cm Muck (A10) (LRR S)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (LRR O)	☐ Reduced Vertic (F18) (outside MLRA 150A,B)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)	☐ Piedmont Floodplain Soils (F19) (LRR P, S, T)
☐ Stratified Layers (A5)	☐ Depleted Matrix (F3)	☐ Anomalous Bright Loamy Soils (F20)
☐ Organic Bodies (A6) (LRR P, T, U)	☐ Redox Dark Surface (F6)	☐ (MLRA 153B)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)	☐ Depleted Dark Surface (F7)	☐ Red Parent Material (TF2)
☐ Muck Presence (A8) (LRR U)	☐ Redox Depressions (F8)	☐ Very Shallow Dark Surface (TF12)
☐ 1 cm Muck (A9) (LRR P, T)	☐ Marl (F10) (LRR U)	☐ Other (Explain in Remarks)
☐ 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)		

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 ☒
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Remarks: Hydric soil is not present, due to lack of indicator(s).

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cross Route Additional Area City/County: Berkeley Sampling Date: 4/28-5/3/17
 Applicant/Owner: Palmetto Railways State: SC Sampling Point: DP 6 Wet
 Investigator(s): Robert Strange Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): < 2%
 Subregion (LRR or MLRA): LRR T Lat: 33.16741169 Long: -80.23190197 Datum: NAD 83
 Soil Map Unit Name: Lynchburg NWI classification: U42P

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? ☐ Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? ☐ (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is the Sampled Area within a Wetland?	Yes ☒	No ☐
Hydric Soil Present?	Yes ☒	No ☐			
Wetland Hydrology Present?	Yes ☒	No ☐			

Remarks:

DP 6 Wet meets the three wetland requirements. Sampling was conducted on from 4/28-5/3/17. Site conditions could be described as an average of high temperatures in the low to upper 80s and approx. .5" of rainfall per week.

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 along 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 ☒	Depth (inches):	
Water Table Present?	Yes ☒ No ☐	Depth (inches):	10"+
Saturation Present?	Yes ☒ No ☐	Depth (inches):	4"+
(includes capillary fringe)		Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
SCDNR 2006 aerials			

Remarks:

Wetland hydrology was present on sample dates.

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

 Sampling Point: DP 6 Wet

Tree Stratum (Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Pinus taeda</u>	<u>40</u>	<u>YES</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>8</u> (A)
2. <u>Liquidambar styraciflua</u>	<u>10</u>	<u>YES</u>	<u>FAC</u>	
3. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>8</u> (B)
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
6. _____	_____	_____	_____	
<u>50</u> = Total Cover 50% of total cover: <u>25</u> 20% of total cover: <u>10</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling Stratum (Plot size: <u>30 ft</u>)				
1. <u>Acer rubrum</u>	<u>10</u>	<u>yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: ☐ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ☐ 3 - Prevalence Index is ≤3.0 ¹ ☐ Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u>Liquidambar styraciflua</u>	<u>10</u>	<u>yes</u>	<u>FAC</u>	
3. <u>Pinus taeda</u>	<u>10</u>	<u>yes</u>	<u>FAC</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) 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.
6. _____	_____	_____	_____	
<u>30</u> = Total Cover 50% of total cover: <u>15</u> 20% of total cover: <u>6</u>				Hydrophytic Vegetation Present? Yes ☒ No ☐
Shrub Stratum (Plot size: <u>30 ft</u>)				
1. <u>Lyonia lucida</u>	<u>40</u>	<u>yes</u>	<u>FACW</u>	
2. <u>Persea borbonia</u>	<u>10</u>	<u>yes</u>	<u>FACW</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>50</u> = 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>Woodwardia areolata</u>	<u>10</u>	<u>yes</u>	<u>OBL</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>10</u> = Total Cover 50% of total cover: <u>5</u> 20% of total cover: <u>2</u>				
Woody Vine Stratum (Plot size: <u>30 ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				
Remarks: (If observed, list morphological adaptations below). Hydrophytic vegetation is present.				

SOIL

Sampling Point: DP 6 Wet

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					SL	
6-15	10YR 4/2	95	10YR 6/8	5	C	M	SCL	
15-20	10YR 5/1	95	10YR 6/8	5	C	M	SCL	

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

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

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cross Route Additional Area City/County: Berkeley Sampling Date: 6/1/17
 Applicant/Owner: Palmetto Railways State: SC Sampling Point: DP 7 UP
 Investigator(s): Robert Strange Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): < 2%
 Subregion (LRR or MLRA): LRR T Lat: 33.173345 Long: -80.234599 Datum: NAD 83
 Soil Map Unit Name: Goldsboro NWI classification: U42P

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? ☐ Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? ☐ (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is the Sampled Area within a Wetland?	Yes ☐	No ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			
Remarks: DP 7 UP does not meet the three wetland requirements. Sampling was conducted from June 1, 2017. Site conditions could be described as an average of high temperatures in the upper 80s and approx. 1-2" of rainfall per week.					

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☐ Surface Water (A1) ☐ Aquatic Fauna (B13) ☐ High Water Table (A2) ☐ Marl Deposits (B15) (LRR U) ☐ Saturation (A3) ☐ Hydrogen Sulfide Odor (C1) ☐ Water Marks (B1) ☐ Oxidized Rhizospheres along 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)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ FAC-Neutral Test (D5) ☐ Sphagnum moss (D8) (LRR T, U)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? Yes ☐ No ☒ Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: SCDNR 2006 aerials			
Remarks: Wetland hydrology was not present on sample dates due to lack of indicators.			

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

 Sampling Point: DP 7 UP

Tree Stratum (Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:																																											
1. <u>Pinus taeda</u>	<u>70</u>	<u>YES</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A)																																											
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>7</u> (B)																																											
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>86</u> (A/B)																																											
4. _____	_____	_____	_____																																												
5. _____	_____	_____	_____																																												
6. _____	_____	_____	_____																																												
<u>70</u> = Total Cover 50% of total cover: <u>35</u> 20% of total cover: <u>14</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____																																											
Sapling Stratum (Plot size: <u>30 ft</u>) <u>25</u> = Total Cover 50% of total cover: <u>12.5</u> 20% of total cover: <u>5</u>				Hydrophytic Vegetation Indicators: ☐ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ☐ 3 - Prevalence Index is ≤3.0 ¹ ☐ Problematic Hydrophytic Vegetation ¹ (Explain)																																											
Shrub Stratum (Plot size: <u>30 ft</u>) <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">1. <u>Lyonia lucida</u></th> <th style="width: 10%;">5</th> <th style="width: 10%;">yes</th> <th style="width: 10%;">FACW</th> </tr> </thead> <tbody> <tr> <td>2. <u>Vaccinium stamineum</u></td> <td><u>5</u></td> <td><u>yes</u></td> <td><u>FACU</u></td> </tr> <tr><td>3. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>4. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>5. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>6. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> </tbody> </table>					1. <u>Lyonia lucida</u>	5	yes	FACW	2. <u>Vaccinium stamineum</u>	<u>5</u>	<u>yes</u>	<u>FACU</u>	3. _____	_____	_____	_____	4. _____	_____	_____	_____	5. _____	_____	_____	_____	6. _____	_____	_____	_____																			
1. <u>Lyonia lucida</u>	5	yes	FACW																																												
2. <u>Vaccinium stamineum</u>	<u>5</u>	<u>yes</u>	<u>FACU</u>																																												
3. _____	_____	_____	_____																																												
4. _____	_____	_____	_____																																												
5. _____	_____	_____	_____																																												
6. _____	_____	_____	_____																																												
<u>10</u> = Total Cover 50% of total cover: <u>5</u> 20% of total cover: <u>2</u>				Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) 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.																																											
Herb Stratum (Plot size: <u>30 ft</u>) <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">1. <u>Osmunda cinnamomea</u></th> <th style="width: 10%;">5</th> <th style="width: 10%;">YES</th> <th style="width: 10%;">FACW</th> </tr> </thead> <tbody> <tr><td>2. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>3. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>4. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>5. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>6. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>7. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>8. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>9. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>10. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>11. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> </tbody> </table>					1. <u>Osmunda cinnamomea</u>	5	YES	FACW	2. _____	_____	_____	_____	3. _____	_____	_____	_____	4. _____	_____	_____	_____	5. _____	_____	_____	_____	6. _____	_____	_____	_____	7. _____	_____	_____	_____	8. _____	_____	_____	_____	9. _____	_____	_____	_____	10. _____	_____	_____	_____	11. _____	_____	_____
1. <u>Osmunda cinnamomea</u>	5	YES	FACW																																												
2. _____	_____	_____	_____																																												
3. _____	_____	_____	_____																																												
4. _____	_____	_____	_____																																												
5. _____	_____	_____	_____																																												
6. _____	_____	_____	_____																																												
7. _____	_____	_____	_____																																												
8. _____	_____	_____	_____																																												
9. _____	_____	_____	_____																																												
10. _____	_____	_____	_____																																												
11. _____	_____	_____	_____																																												
<u>5</u> = Total Cover 50% of total cover: <u>2.5</u> 20% of total cover: <u>1</u>				Hydrophytic Vegetation Present? Yes ☒ No ☐																																											
Woody Vine Stratum (Plot size: <u>30 ft</u>) <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">1. _____</th> <th style="width: 10%;">_____</th> <th style="width: 10%;">_____</th> <th style="width: 10%;">_____</th> </tr> </thead> <tbody> <tr><td>2. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>3. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>4. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>5. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> </tbody> </table>					1. _____	_____	_____	_____	2. _____	_____	_____	_____	3. _____	_____	_____	_____	4. _____	_____	_____	_____	5. _____	_____	_____	_____																							
1. _____	_____	_____	_____																																												
2. _____	_____	_____	_____																																												
3. _____	_____	_____	_____																																												
4. _____	_____	_____	_____																																												
5. _____	_____	_____	_____																																												
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>																																															
Remarks: (If observed, list morphological adaptations below). <u>Hydrophytic vegetation is present.</u>																																															

SOIL

Sampling Point: DP 7 UP

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		
0-7	10YR 2/1	100					LS
7-15	2.5Y 4/3	100					LS
15-20+	10YR 6/3	95	10YR 6/6	5	C	M	LS

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils³:
☐ 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)

☐ 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: Hydric soil is not present, due to lack of indicator(s).

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cross Route Additional Area City/County: Berkeley Sampling Date: 6/1/17
 Applicant/Owner: Palmetto Railways State: SC Sampling Point: DP 7 Wet
 Investigator(s): Robert Strange Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): < 2%
 Subregion (LRR or MLRA): LRR T Lat: 33.172937 Long: -80.235139 Datum: NAD 83
 Soil Map Unit Name: Goldsboro NWI classification: U42P

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? ☐ Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? ☐ (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is the Sampled Area within a Wetland?	Yes ☒	No ☐
Hydric Soil Present?	Yes ☒	No ☐			
Wetland Hydrology Present?	Yes ☒	No ☐			
Remarks: DP 7 Wet meets the three wetland requirements. Sampling was conducted on June 1, 2017. Site conditions could be described as an average of high temperatures in the upper 80s and approx. 1-2" of rainfall per week.					

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☒ Surface Water (A1) ☐ Aquatic Fauna (B13) ☒ High Water Table (A2) ☐ Marl Deposits (B15) (LRR U) ☒ Saturation (A3) ☐ Hydrogen Sulfide Odor (C1) ☐ Water Marks (B1) ☐ Oxidized Rhizospheres along 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)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ FAC-Neutral Test (D5) ☐ Sphagnum moss (D8) (LRR T, U)
Field Observations: Surface Water Present? Yes ☒ No ☐ Depth (inches): <u>6"</u> Water Table Present? Yes ☒ No ☐ Depth (inches): <u>10"+</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>4"+</u> (includes capillary fringe)		Wetland Hydrology Present? Yes ☒ No ☐
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: <u>SCDNR 2006 aerials</u>		
Remarks: <u>Wetland hydrology was present on sample dates.</u>		

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

 Sampling Point: DP 7 Wet

Tree Stratum (Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Nyssa sylvatica</u>	<u>10</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>Liquidambar styraciflua</u>	<u>10</u>	<u>YES</u>	<u>FAC</u>	
3. <u>Nyssa biflora</u>	<u>10</u>	<u>YES</u>	<u>OBL</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>30</u> = Total Cover 50% of total cover: <u>15</u> 20% of total cover: <u>6</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling Stratum (Plot size: <u>30 ft</u>)				
1. <u>Acer rubrum</u>	<u>10</u>	<u>yes</u>	<u>FAC</u>	
2. <u>Liquidambar styraciflua</u>	<u>10</u>	<u>yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>20</u> = Total Cover 50% of total cover: <u>10</u> 20% of total cover: <u>25</u>				
Shrub Stratum (Plot size: <u>30 ft</u>)				Hydrophytic Vegetation Indicators: ☐ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ☐ 3 - Prevalence Index is ≤3.0 ¹ ☐ Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Lyonia lucida</u>	<u>40</u>	<u>yes</u>	<u>FACW</u>	
2. <u>Persea borbonia</u>	<u>10</u>	<u>yes</u>	<u>FACW</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>50</u> = Total Cover 50% of total cover: <u>25</u> 20% of total cover: <u>10</u>				Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) 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.
Herb Stratum (Plot size: <u>30 ft</u>)				
1. <u>Woodwardia areolata</u>	<u>10</u>	<u>yes</u>	<u>OBL</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>10</u> = Total Cover 50% of total cover: <u>5</u> 20% of total cover: <u>2</u>				
Woody Vine Stratum (Plot size: <u>30 ft</u>)				Hydrophytic Vegetation Present? Yes ☒ No ☐
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>0</u> = Total Cover 50% of total cover: <u>0</u> 20% of total cover: <u>0</u>				
Remarks: (If observed, list morphological adaptations below). Hydrophytic vegetation is present.				

Sampling Point: DP 7 Wet

Atlantic and Gulf Coastal Plain Region – Version 2.0

Photo Layout



DP 1 UP



DP 1 Wet



DP 2 UP



DP 2 Wet



DP 3 UP



DP 3 Wet



DP 4 Up



DP 4 Wet



DP 5 UP



DP 5 Wet



DP 6 UP



DP 6 Wet



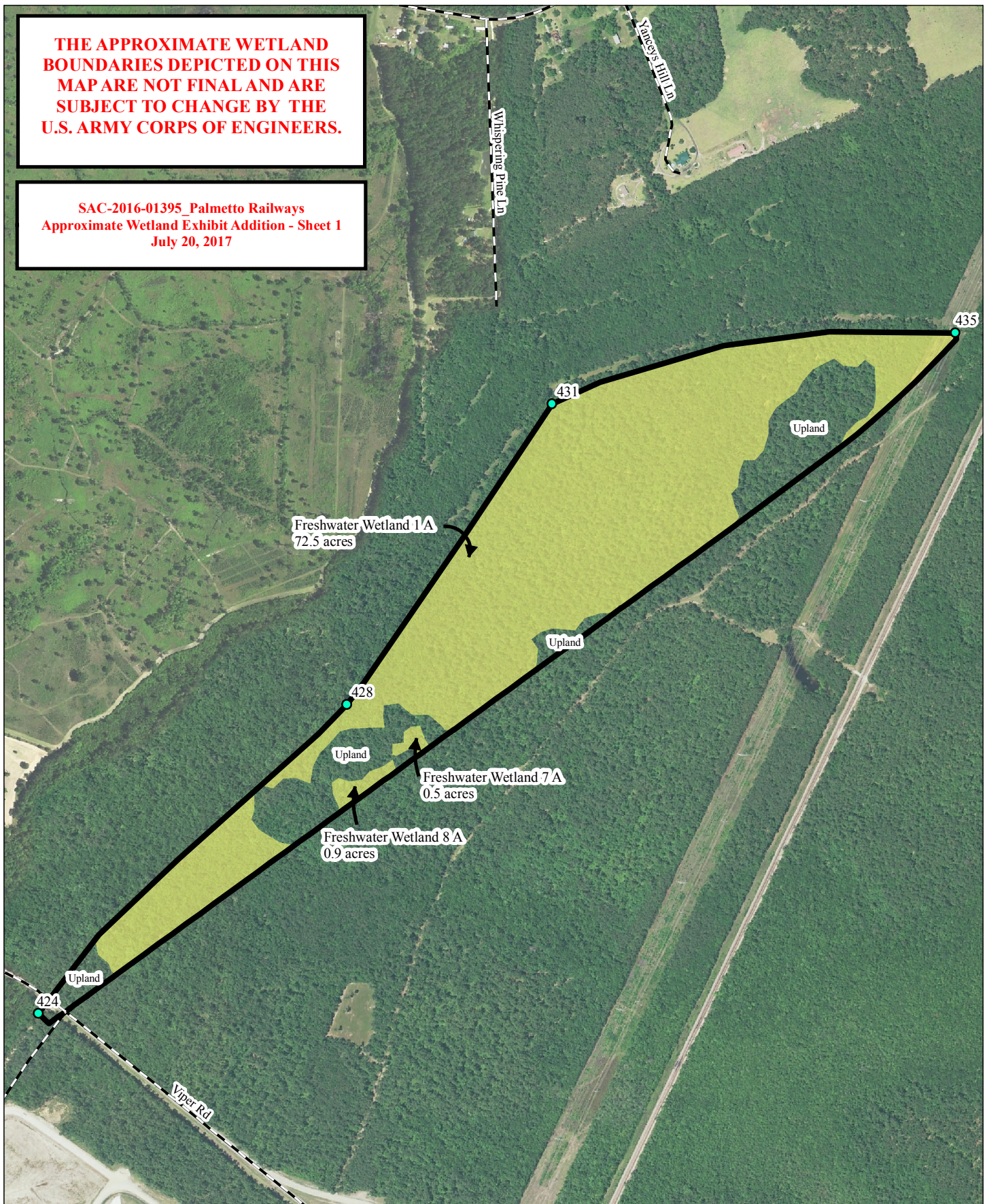
DP 7 UP



DP 7 WET

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SAC-2016-01395 Palmetto Railways
Approximate Wetland Exhibit Addition - Sheet 1
July 20, 2017



EXTERNAL SOURCES: NAIP 2015 TRUE COLOR AERIAL, U.S. CENSUS ROADS

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APPROXIMATE WETLAND EXHIBIT - PAGE 1 OF 5
PREPARED FOR PALMETTO RAILWAYS
PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
BERKELEY COUNTY, SC

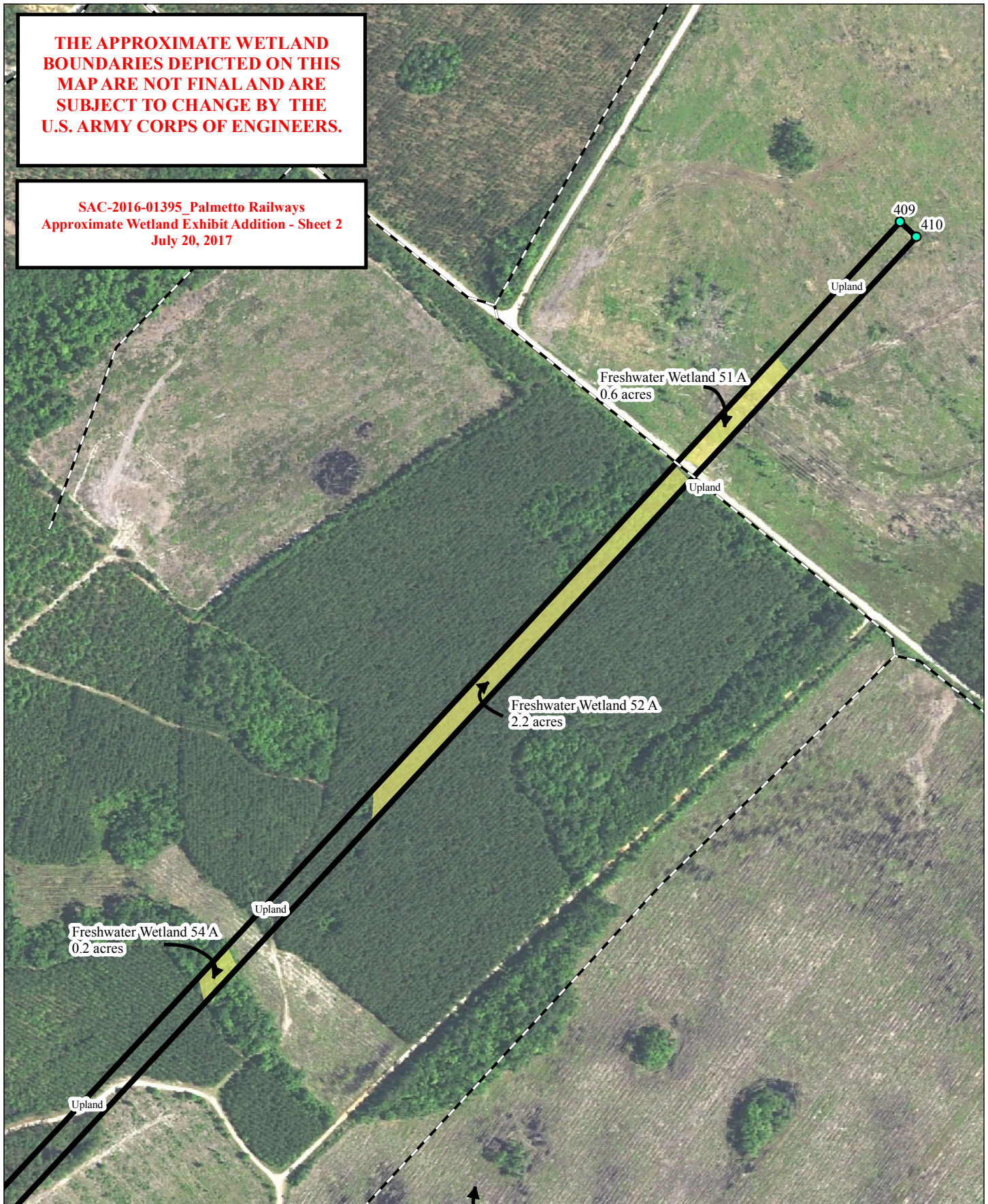


LEGEND

- PROJECT AREA: +/- 242.5 AC
- FRESHWATER WETLANDS: +/- 159.1 AC
- PROJECT AREA POINT IDENTIFIERS
- ROADS

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**SAC-2016-01395 Palmetto Railways
Approximate Wetland Exhibit Addition - Sheet 2
July 20, 2017**



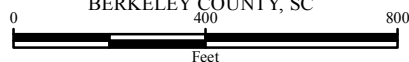
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843.871.5383 (phone) 843.871.2050 (fax)
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PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
BERKELEY COUNTY, SC

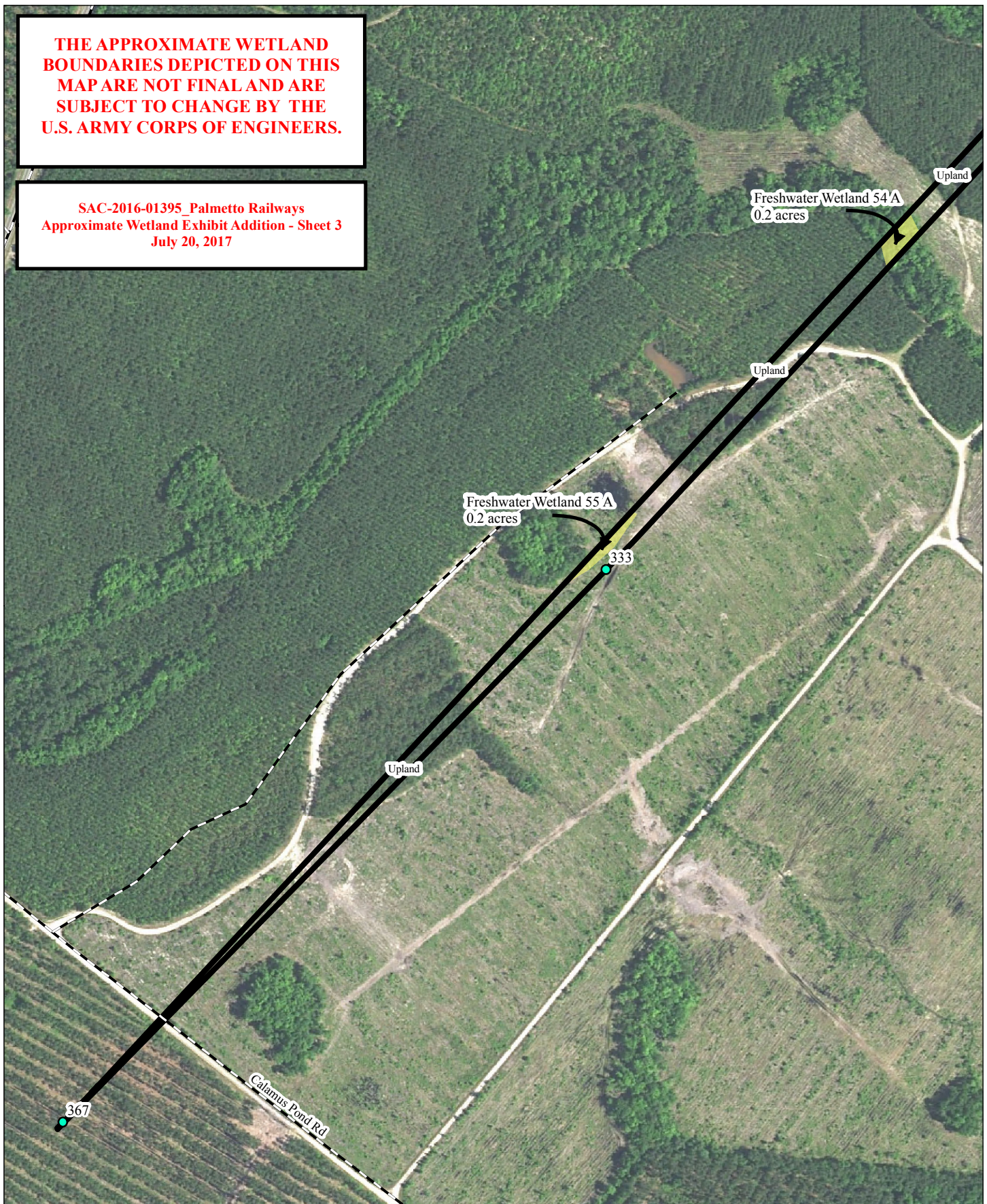


LEGEND

- PROJECT AREA: +/- 242.5 AC
- FRESHWATER WETLANDS: +/- 159.1 AC
- PROJECT AREA POINT IDENTIFIERS
- ROADS

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Approximate Wetland Exhibit Addition - Sheet 3
July 20, 2017**



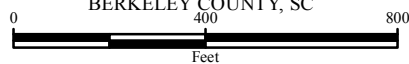
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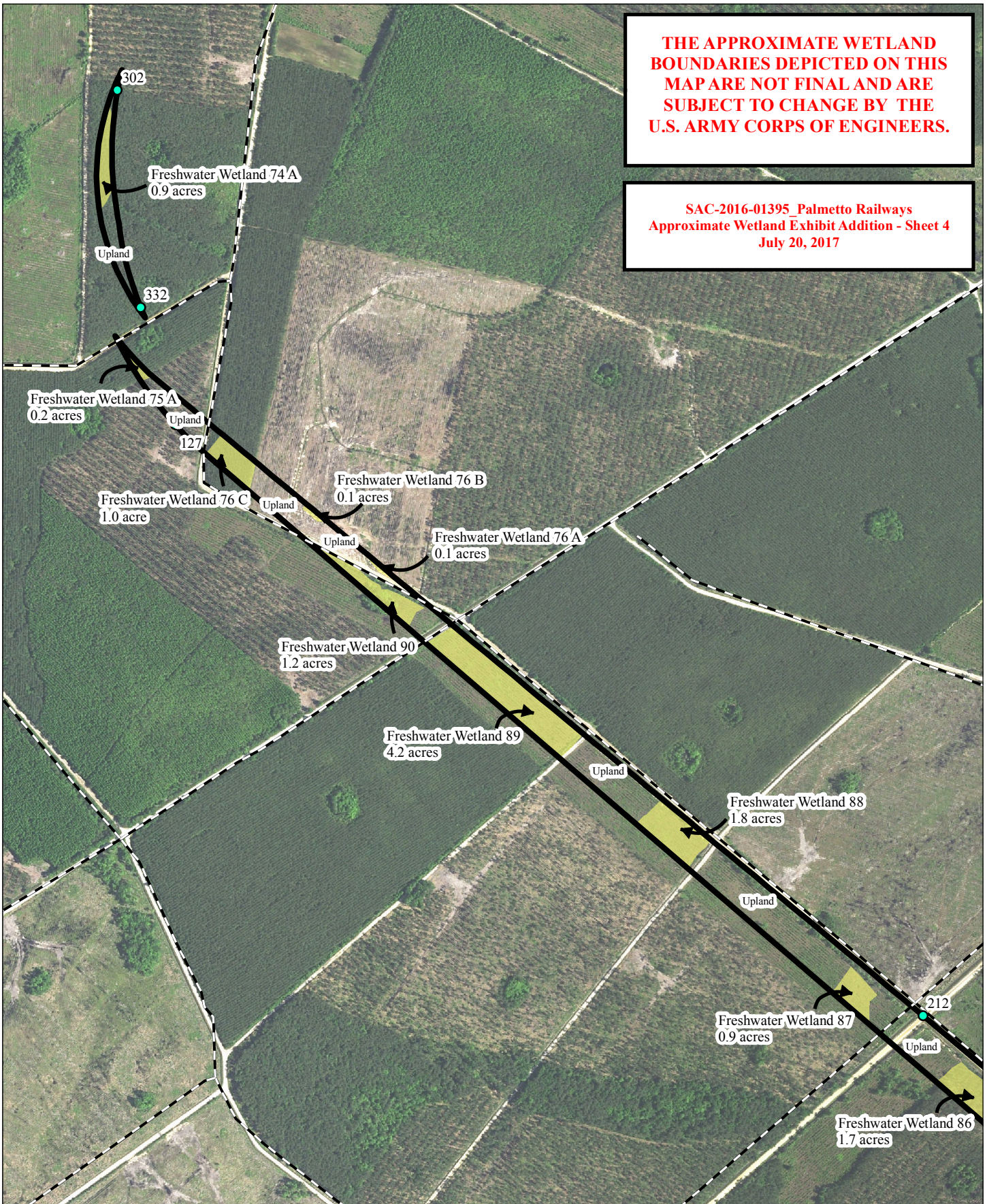


LEGEND

- PROJECT AREA: +/- 242.5 AC
- FRESHWATER WETLANDS: +/- 159.1 AC
- PROJECT AREA POINT IDENTIFIERS
- ROADS

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Approximate Wetland Exhibit Addition - Sheet 4
July 20, 2017**



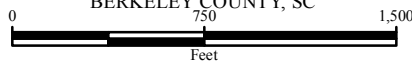
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BERKELEY COUNTY, SC

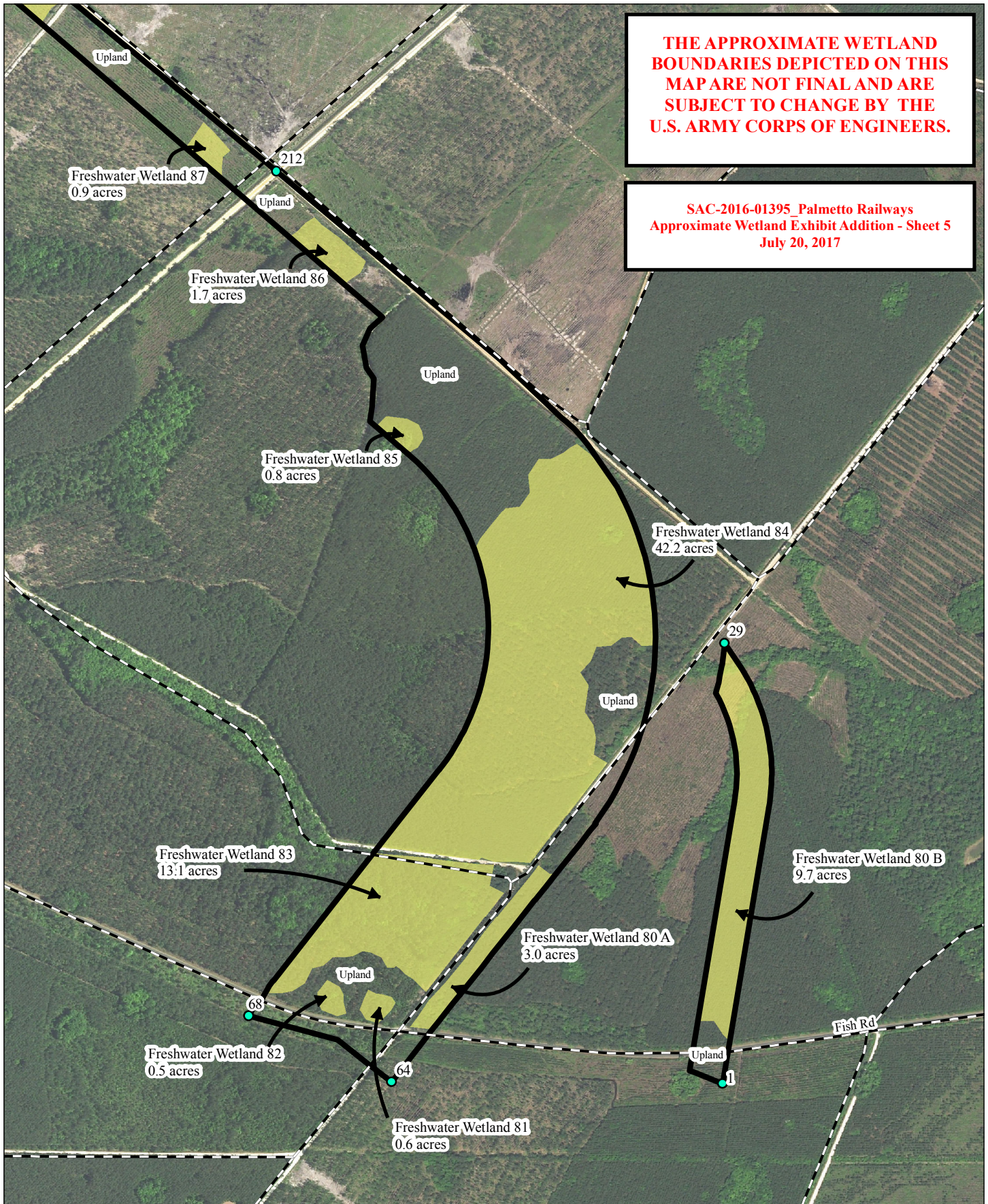


LEGEND

- PROJECT AREA: +/- 242.5 AC
- FRESHWATER WETLANDS: +/- 159.1 AC
- PROJECT AREA POINT IDENTIFIERS
- ROADS

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Approximate Wetland Exhibit Addition - Sheet 5
July 20, 2017**



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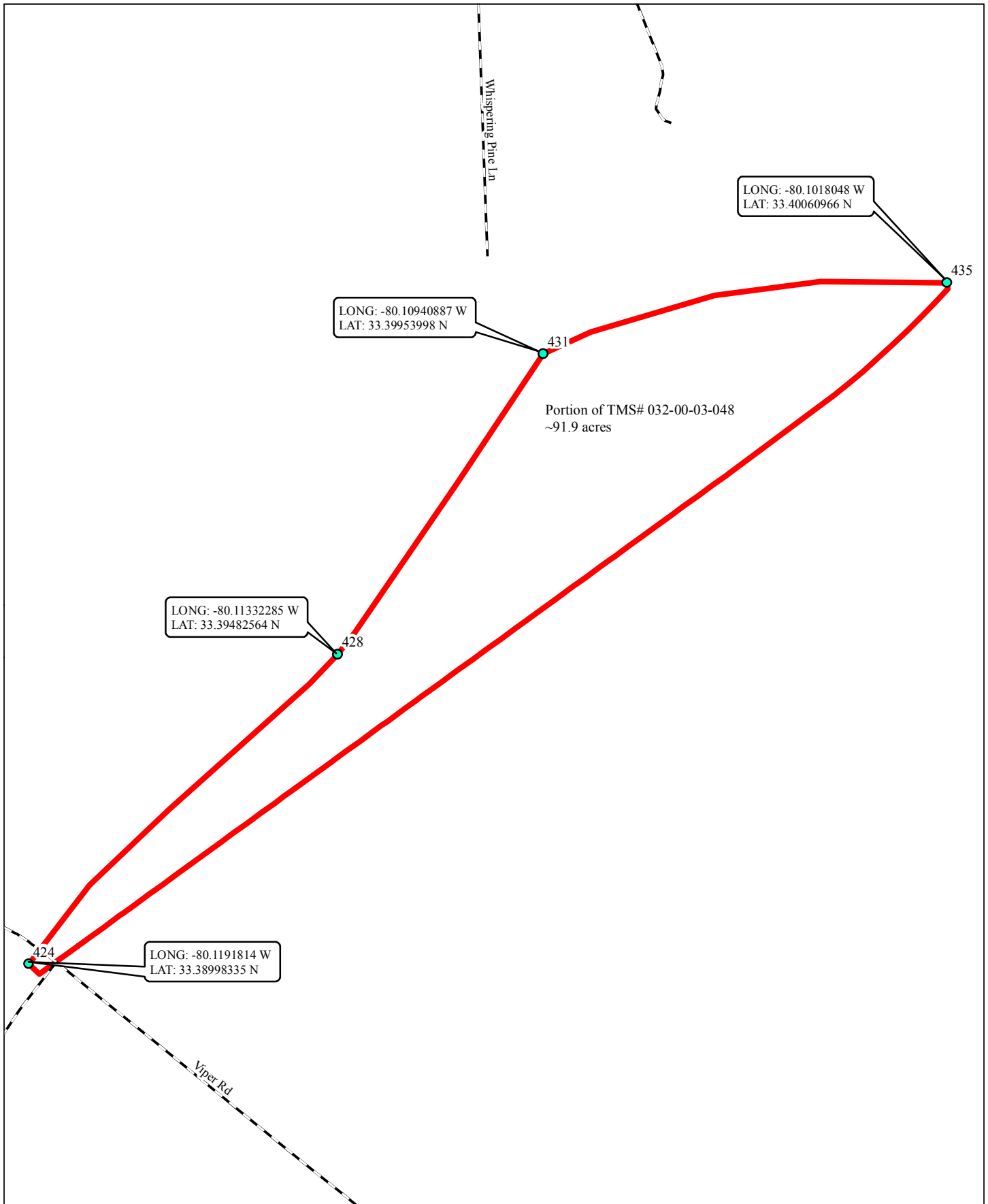
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APPROXIMATE WETLAND EXHIBIT - PAGE 5 OF 5
PREPARED FOR PALMETTO RAILWAYS
PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
BERKELEY COUNTY, SC



LEGEND

- PROJECT AREA: +/- 242.5 AC
- FRESHWATER WETLANDS: +/- 159.1 AC
- PROJECT AREA POINT IDENTIFIERS
- ROADS



EXTERNAL SOURCES: U.S. CENSUS ROADS

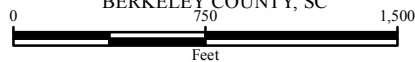
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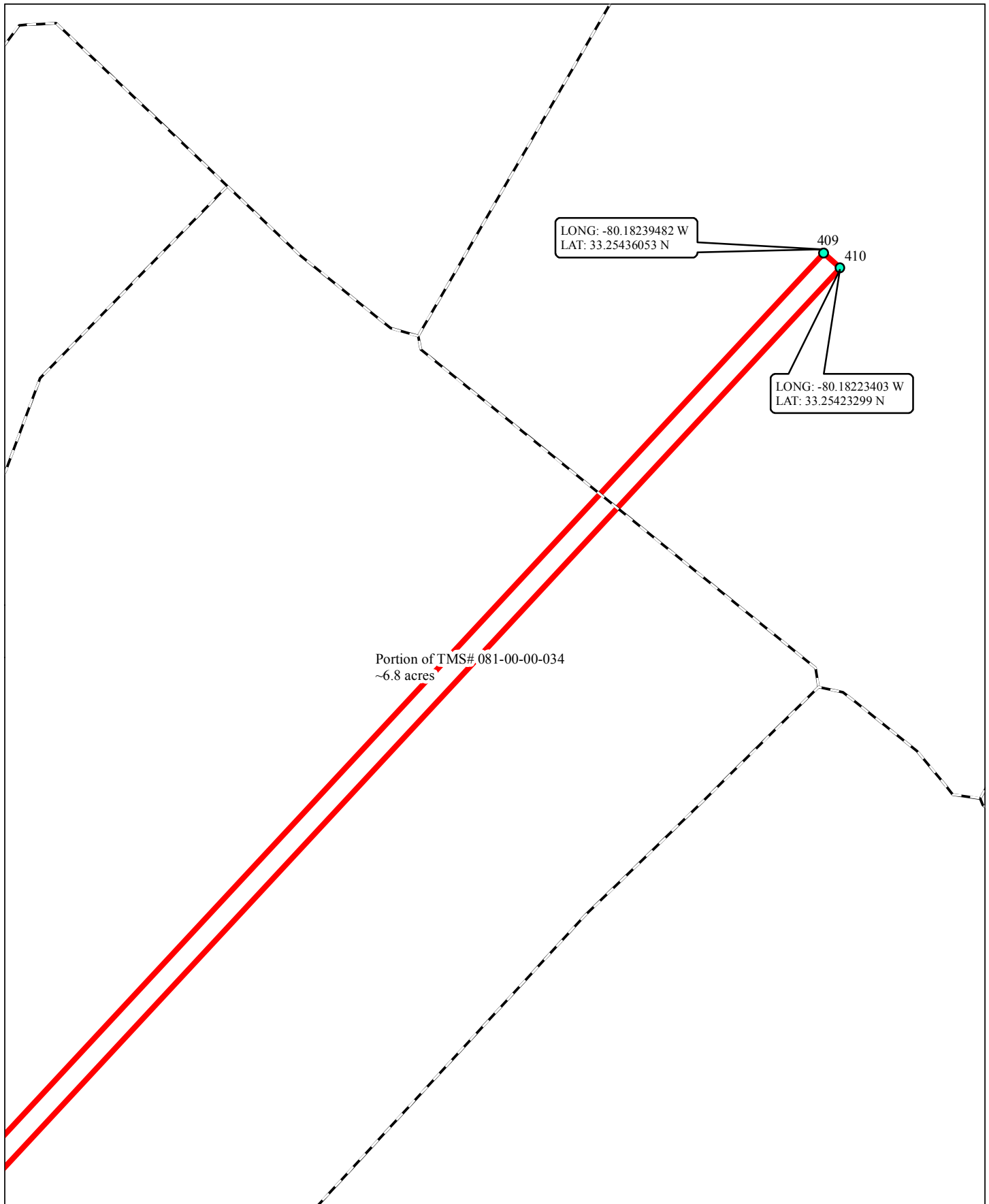
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TAX MAP - PAGE 1 OF 16
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BERKELEY COUNTY, SC



LEGEND

- PROJECT AREA: +/- 242.5 AC
- PROJECT AREA POINT IDENTIFIERS
- ROADS



EXTERNAL SOURCES: U.S. CENSUS ROADS

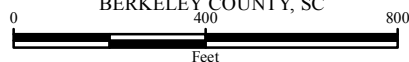
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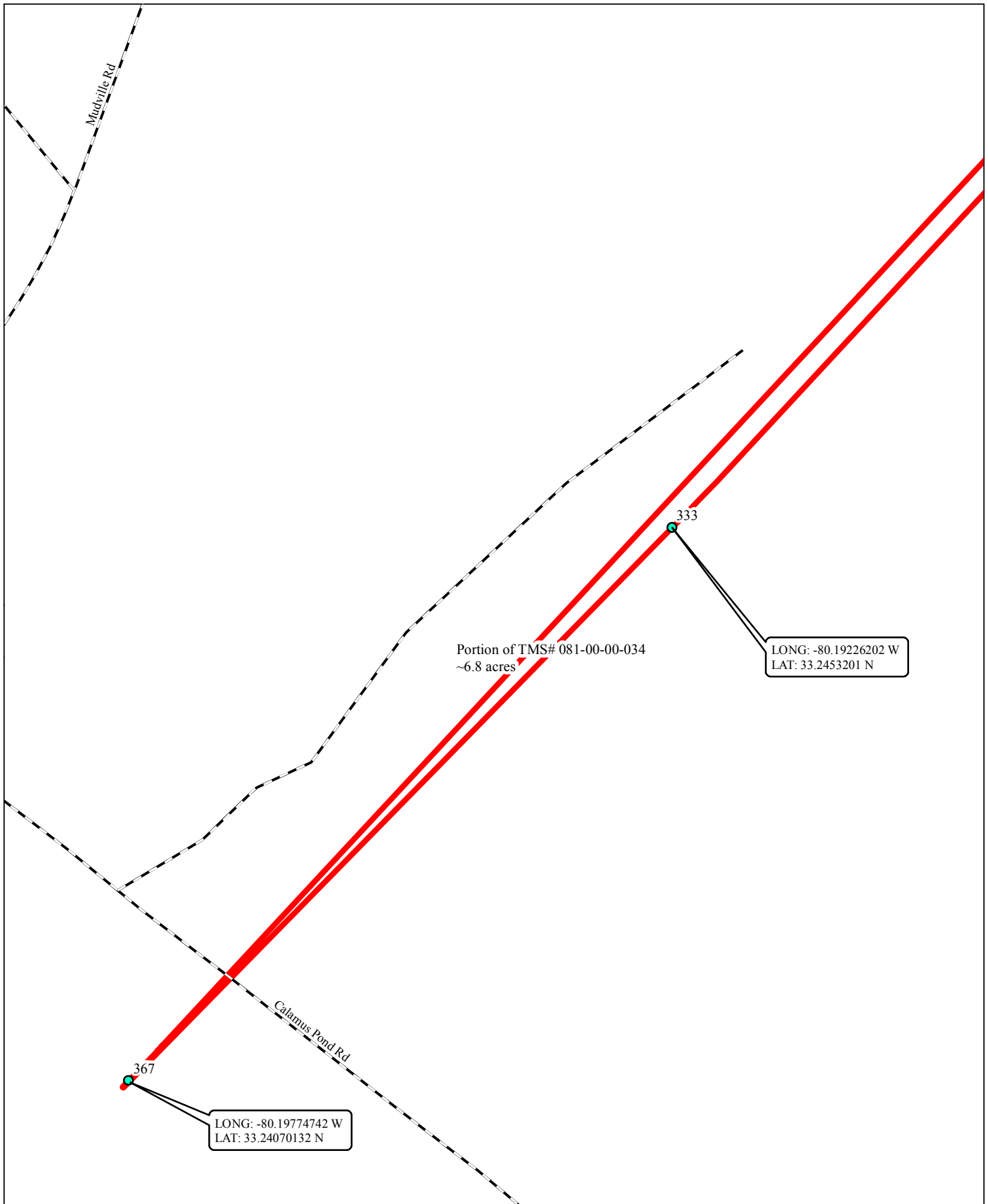
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TAX MAP - PAGE 2 OF 16
PREPARED FOR PALMETTO RAILWAYS
PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
BERKELEY COUNTY, SC



LEGEND

- PROJECT AREA: +/- 242.5 AC
- PROJECT AREA POINT IDENTIFIERS
- ROADS



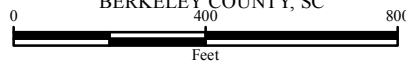
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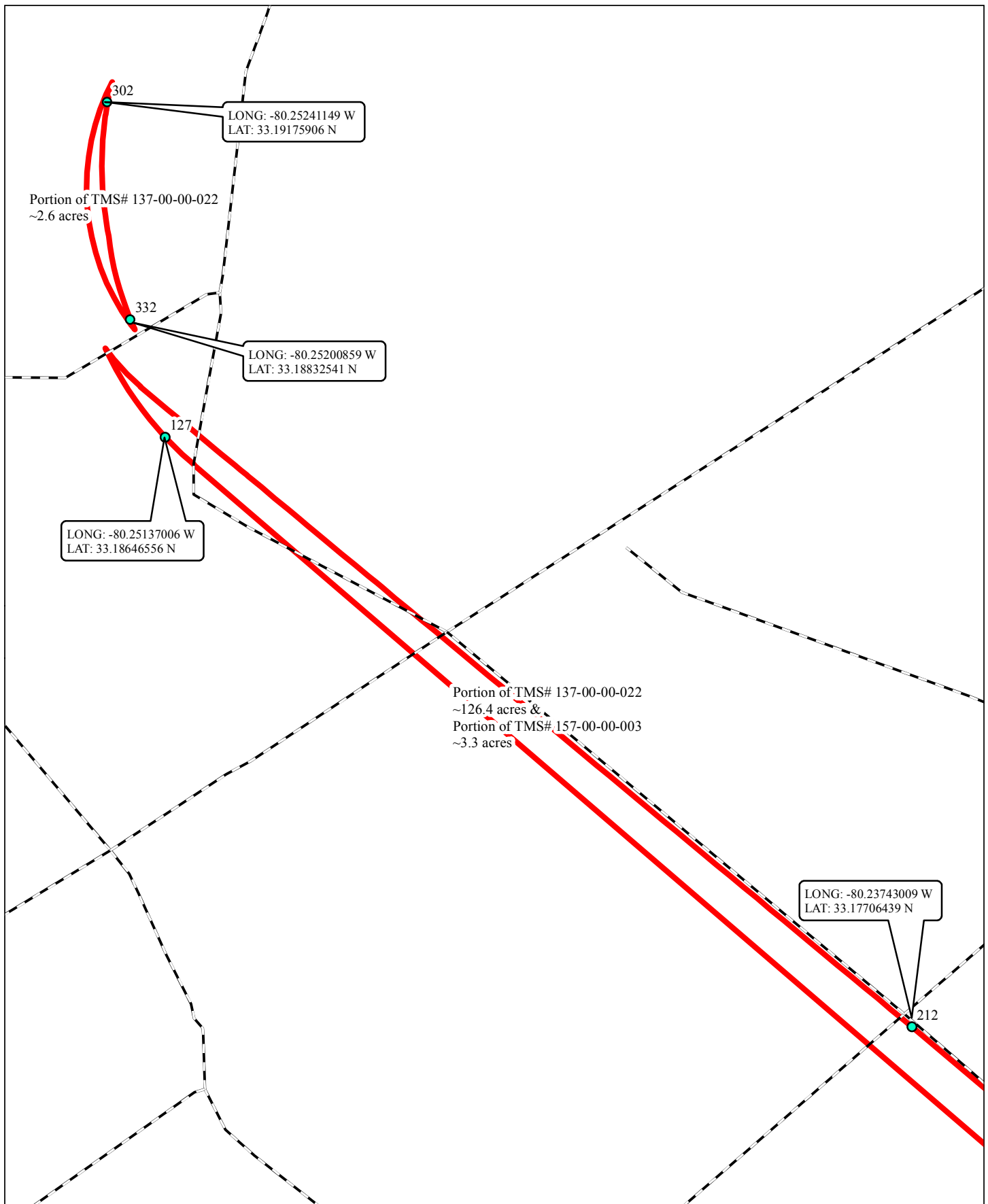
REVISED: 6/5/2017

TAX MAP - PAGE 3 OF 16
 PREPARED FOR PALMETTO RAILWAYS
 PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
 BERKELEY COUNTY, SC



LEGEND

- PROJECT AREA: +/- 242.5 AC
- PROJECT AREA POINT IDENTIFIERS
- - - ROADS



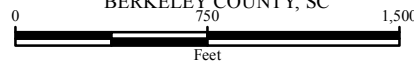
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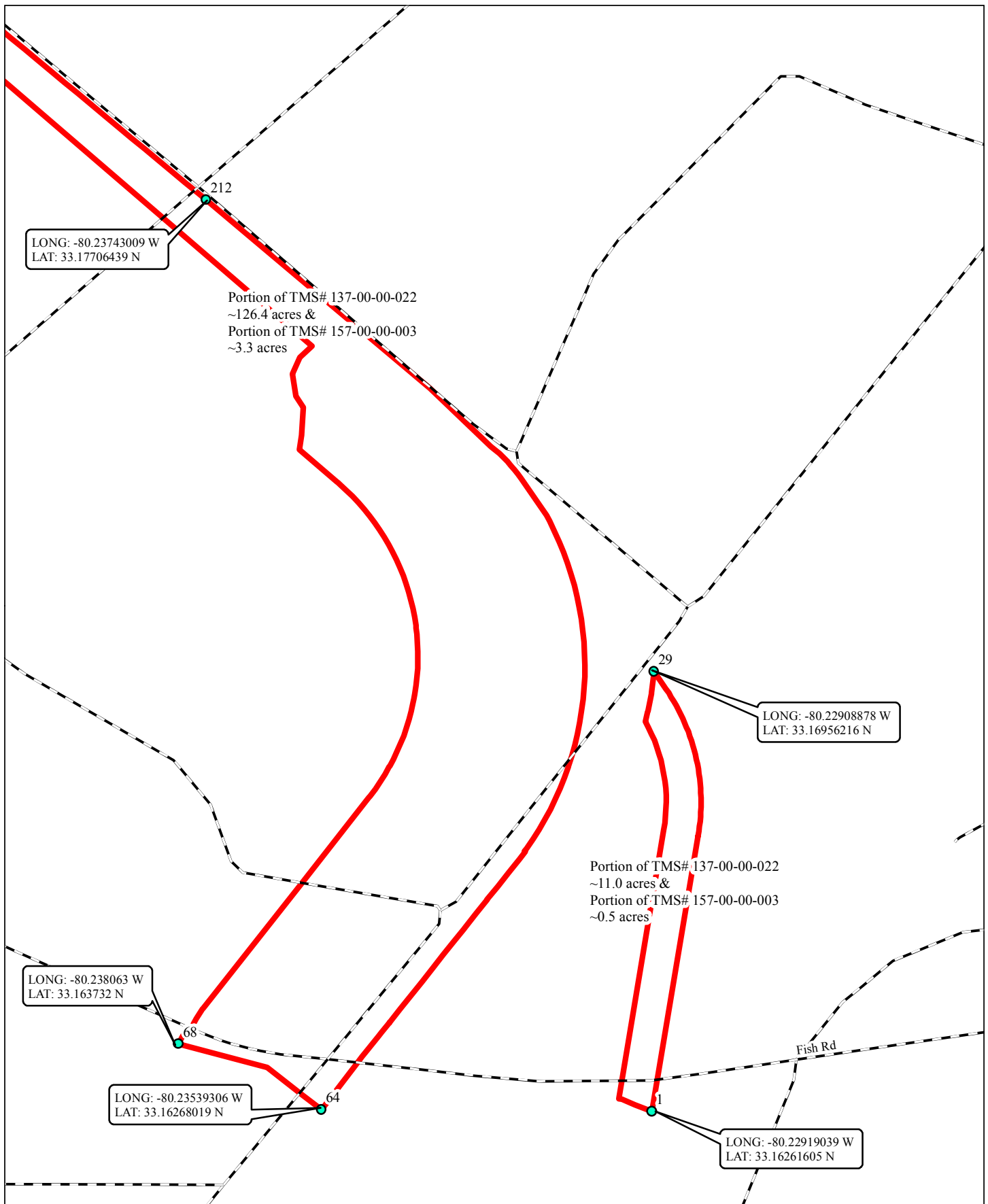
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TAX MAP - PAGE 4 OF 16
PREPARED FOR PALMETTO RAILWAYS
PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
BERKELEY COUNTY, SC



LEGEND

- PROJECT AREA: +/- 242.5 AC
- PROJECT AREA POINT IDENTIFIERS
- ROADS



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TAX MAP - PAGE 5 OF 16
PREPARED FOR PALMETTO RAILWAYS
PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
BERKELEY COUNTY, SC



LEGEND

- PROJECT AREA: +/- 242.5 AC
- PROJECT AREA POINT IDENTIFIERS
- ROADS

**SAC-2016-01395_Palmetto Railways
Supplemental Sketch Addition - Sheet 1
July 20, 2017**



EXTERNAL SOURCES: NAIP 2015 TRUE COLOR AERIAL, U.S. CENSUS ROADS

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SUPPLEMENTAL SKETCH - PAGE 1 OF 5
PREPARED FOR PALMETTO RAILWAYS
PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
BERKELEY COUNTY, SC

0 750 1,500
Feet

LEGEND

 PROJECT AREA: +/- 242.5 AC

 PROJECT AREA POINTS

 ROADS

**SAC-2016-01395_Palmetto Railways
Supplemental Sketch Addition - Sheet 2
July 20, 2017**



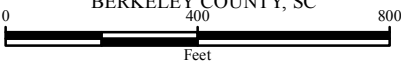
EXTERNAL SOURCES: NAIP 2015 TRUE COLOR AERIAL, U.S. CENSUS ROADS

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SUPPLEMENTAL SKETCH - PAGE 2 OF 5
PREPARED FOR PALMETTO RAILWAYS
PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
BERKELEY COUNTY, SC



LEGEND

- PROJECT AREA: +/- 242.5 AC
- PROJECT AREA POINTS
- ROADS

**SAC-2016-01395_Palmetto Railways
Supplemental Sketch Addition - Sheet 3
July 20, 2017**



EXTERNAL SOURCES: NAIP 2015 TRUE COLOR AERIAL, U.S. CENSUS ROADS

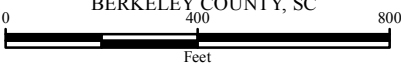
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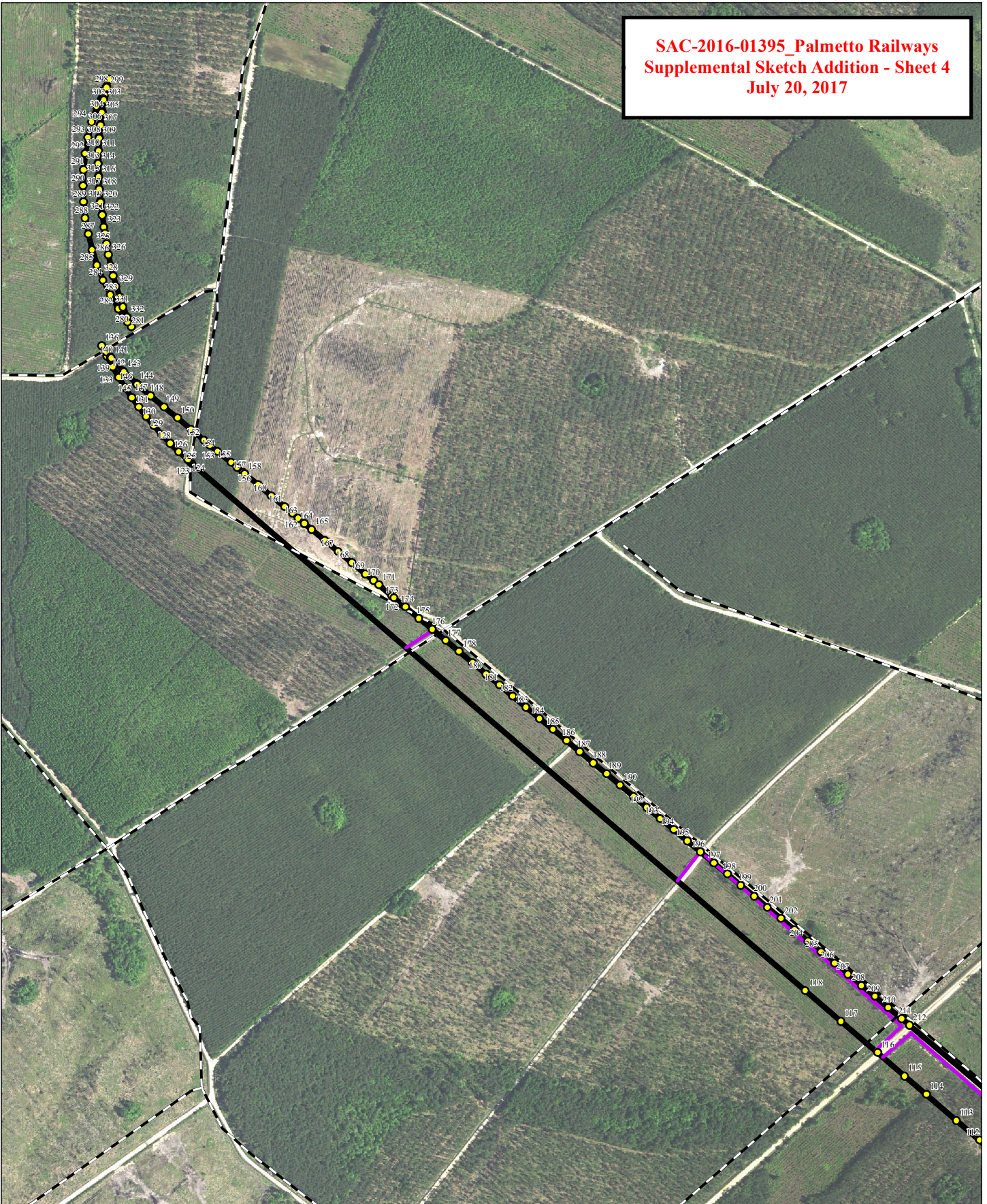
SUPPLEMENTAL SKETCH - PAGE 3 OF 5
PREPARED FOR PALMETTO RAILWAYS
PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
BERKELEY COUNTY, SC



LEGEND

-  PROJECT AREA: +/- 242.5 AC
-  PROJECT AREA POINTS
-  ROADS

**SAC-2016-01395_Palmetto Railways
Supplemental Sketch Addition - Sheet 4
July 20, 2017**



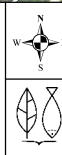
EXTERNAL SOURCES: NAIP 2015 TRUE COLOR AERIAL, U.S. CENSUS ROADS

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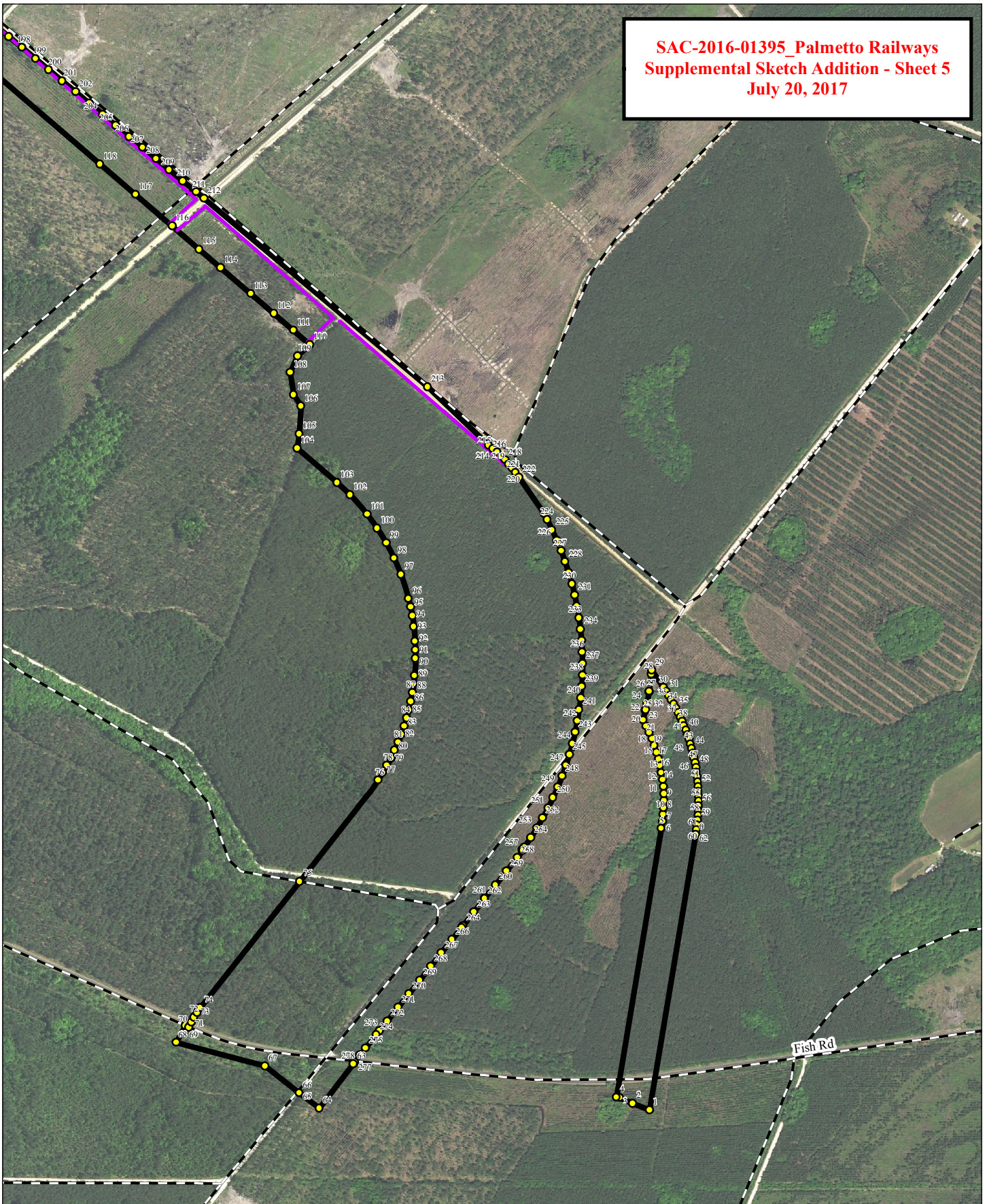
SUPPLEMENTAL SKETCH - PAGE 4 OF 5
PREPARED FOR PALMETTO RAILWAYS
PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
BERKELEY COUNTY, SC



LEGEND

- PROJECT AREA: +/- 242.5 AC
- PROJECT AREA POINTS
- DITCHES
- ROADS

**SAC-2016-01395_Palmetto Railways
Supplemental Sketch Addition - Sheet 5
July 20, 2017**



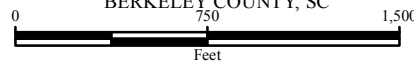
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**SUPPLEMENTAL SKETCH - PAGE 5 OF 5
PREPARED FOR PALMETTO RAILWAYS
PROJECT NAME - CROSS ROUTE ADDITIONAL AREA
BERKELEY COUNTY, SC**



LEGEND

- PROJECT AREA: +/- 242.5 AC
- PROJECT AREA POINTS
- DITCHES
- ROADS

PALMETTO RAILWAYS - CROSS ROUTE ADDITIONAL AREA		
PROJECT AREA POINT IDENTIFIERS	LATITUDE	LONGITUDE
0	33.16696202	-80.22828472
1	33.16261605	-80.22919039
2	33.16272549	-80.22950441
3	33.16281181	-80.22975212
4	33.16282306	-80.22980977
5	33.16706068	-80.22892776
6	33.16717008	-80.2289069
7	33.16728013	-80.22889161
8	33.16739063	-80.22888195
9	33.16750138	-80.2288779
10	33.16761217	-80.2288795
11	33.1677228	-80.22888673
12	33.16783307	-80.22889958
13	33.16794277	-80.22891802
14	33.16805172	-80.22894203
15	33.1681597	-80.22897156
16	33.16826652	-80.22900655
17	33.16837198	-80.22904694
18	33.16847589	-80.22909267
19	33.16857806	-80.22914363
20	33.16867831	-80.22919974
21	33.16877644	-80.2292609
22	33.1689233	-80.22921297
23	33.16894196	-80.22920771
24	33.16903992	-80.22918433
25	33.16921146	-80.22914338
26	33.16922088	-80.22914114
27	33.16923038	-80.22913968
28	33.169503	-80.22909786
29	33.16956216	-80.22908878
30	33.16928608	-80.22886641
31	33.16922255	-80.22881657
32	33.16915803	-80.22876857
33	33.16909254	-80.22872245
34	33.16902614	-80.22867823
35	33.16895885	-80.22863594
36	33.16889072	-80.22859559
37	33.16882178	-80.22855723
38	33.16875209	-80.22852086
39	33.16868167	-80.22848651
40	33.16861058	-80.2284542
41	33.16853885	-80.22842395
42	33.16846652	-80.22839578
43	33.16839363	-80.2283697

PROJECT AREA POINT IDENTIFIERS	LATITUDE	LONGITUDE
44	33.16832024	-80.22834573
45	33.16824638	-80.22832388
46	33.1681721	-80.22830417
47	33.16809744	-80.2282866
48	33.16802244	-80.22827119
49	33.16794714	-80.22825795
50	33.1678716	-80.22824688
51	33.16779586	-80.22823799
52	33.16771996	-80.22823129
53	33.16764394	-80.22822678
54	33.16756786	-80.22822446
55	33.16749175	-80.22822433
56	33.16741566	-80.2282264
57	33.16733963	-80.22823066
58	33.16726371	-80.22823711
59	33.16718795	-80.22824575
60	33.16711238	-80.22825657
61	33.16703706	-80.22826956
62	33.16696202	-80.22828472
63	33.16337957	-80.23474486
64	33.16268019	-80.23539306
65	33.1629235	-80.23576418
66	33.16292548	-80.23576716
67	33.16335422	-80.23640566
68	33.163732	-80.238063
69	33.163995	-80.237889
70	33.163971	-80.237825
71	33.164051	-80.237781
72	33.16413	-80.23773
73	33.164206	-80.237673
74	33.164279	-80.23761
75	33.166262	-80.235727
76	33.16785	-80.23424
77	33.167965	-80.234152
78	33.168082	-80.23407
79	33.168201	-80.233993
80	33.168323	-80.233921
81	33.168447	-80.233856
82	33.168574	-80.233795
83	33.168702	-80.233741
84	33.168831	-80.233692
85	33.168962	-80.233649
86	33.169095	-80.233612
87	33.169228	-80.233581
88	33.169362	-80.233555
89	33.169498	-80.233536

PROJECT AREA POINT IDENTIFIERS	LATITUDE	LONGITUDE
90	33.169769	-80.233517
91	33.169905	-80.233516
92	33.170041	-80.233521
93	33.170275	-80.233545
94	33.170446	-80.233574
95	33.17058	-80.233603
96	33.170713	-80.233639
97	33.171098	-80.233779
98	33.171354	-80.233905
99	33.171597	-80.23405
100	33.171829	-80.234217
101	33.172051	-80.234405
102	33.172359	-80.234722
103	33.172555	-80.234966
104	33.173103	-80.235712
105	33.173331	-80.235671
106	33.17377	-80.235633
107	33.173946	-80.23577
108	33.174298	-80.235837
109	33.174561	-80.235695
110	33.174741	-80.235458
111	33.174963	-80.235761
112	33.175233	-80.236129
113	33.175548	-80.236558
114	33.175962	-80.237122
115	33.176258	-80.237526
116	33.176627	-80.238028
117	33.177128	-80.238711
118	33.177615	-80.239374
119	33.18600882	-80.25080925
120	33.18602292	-80.25082846
121	33.18603722	-80.25084791
122	33.18605174	-80.25086757
123	33.18606644	-80.25088736
124	33.18606649	-80.25088742
125	33.18619484	-80.2510537
126	33.18632791	-80.25121465
127	33.18646556	-80.25137006
128	33.18660761	-80.25151975
129	33.1867539	-80.25166356
130	33.18690426	-80.25180131
131	33.18705851	-80.25193283
132	33.18721646	-80.25205798
133	33.18737794	-80.2521766
134	33.18754274	-80.25228855
135	33.18771069	-80.25239371

PROJECT AREA POINT IDENTIFIERS	LATITUDE	LONGITUDE
136	33.18788157	-80.25249195
137	33.18778377	-80.25240196
138	33.18770042	-80.25232527
139	33.18769485	-80.25231985
140	33.18768927	-80.25231444
141	33.18768567	-80.25231068
142	33.18748053	-80.25209309
143	33.18746666	-80.25207732
144	33.18727455	-80.25184296
145	33.1872673	-80.25183353
146	33.18726319	-80.25182818
147	33.18708398	-80.25158029
148	33.18708213	-80.2515777
149	33.1869051	-80.25132764
150	33.18672807	-80.25107757
151	33.18655103	-80.25082751
152	33.18637398	-80.25057744
153	33.18630158	-80.25047517
154	33.18619696	-80.25032738
155	33.18601992	-80.25007732
156	33.18594074	-80.24996549
157	33.18586157	-80.24985366
158	33.18584287	-80.24982725
159	33.18566584	-80.24957719
160	33.1854888	-80.24932713
161	33.18531176	-80.24907707
162	33.18520899	-80.24893193
163	33.18513472	-80.24882702
164	33.18505196	-80.24871014
165	33.18495767	-80.24857696
166	33.18478063	-80.2483269
167	33.18460359	-80.24807685
168	33.18442655	-80.24782679
169	33.1842495	-80.24757674
170	33.1841407	-80.24742308
171	33.18407246	-80.24732669
172	33.18389541	-80.24707664
173	33.18386615	-80.24703531
174	33.18371837	-80.24682659
175	33.18354132	-80.24657654
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178	33.18301018	-80.2458264
179	33.18283313	-80.24557636
180	33.18265609	-80.24532631
181	33.18247905	-80.24507627

PROJECT AREA POINT IDENTIFIERS	LATITUDE	LONGITUDE
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183	33.18212494	-80.24457619
184	33.18194789	-80.24432615
185	33.18177084	-80.24407611
186	33.1815938	-80.24382607
187	33.18141674	-80.24357605
188	33.18123968	-80.243326
189	33.18106264	-80.24307597
190	33.18088558	-80.24282593
191	33.18070853	-80.2425759
192	33.18053148	-80.24232587
193	33.18035442	-80.24207584
194	33.18017737	-80.24182581
195	33.18000031	-80.24157579
196	33.17982325	-80.24132575
197	33.1796462	-80.24107573
198	33.17946914	-80.24082571
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200	33.17911502	-80.24032565
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203	33.17858384	-80.23957559
204	33.17840678	-80.23932557
205	33.17822972	-80.23907556
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207	33.1778756	-80.23857552
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210	33.17734442	-80.23782549
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219	33.17283413	-80.23174502
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221	33.1726971	-80.23161621
222	33.17262569	-80.23155638
223	33.17204049	-80.231085
224	33.17195504	-80.23103087
225	33.17179139	-80.23093618
226	33.17162494	-80.23084867
227	33.17145591	-80.23076845

PROJECT AREA POINT IDENTIFIERS	LATITUDE	LONGITUDE
228	33.17128452	-80.23069564
229	33.17111101	-80.23063033
230	33.17093561	-80.23057261
231	33.17075855	-80.23052256
232	33.17058006	-80.23048024
233	33.1704004	-80.23044572
234	33.17021979	-80.23041903
235	33.17003849	-80.23040021
236	33.16985672	-80.23038929
237	33.16967475	-80.23038628
238	33.1694928	-80.23039118
239	33.16931112	-80.230404
240	33.16912996	-80.23042471
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253	33.16708284	-80.23126829
254	33.16692975	-80.23138532
255	33.16678037	-80.23150892
256	33.16673928	-80.23154563
257	33.16673339	-80.23153082
258	33.16661848	-80.2316411
259	33.16640459	-80.23184637
260	33.16619069	-80.23205165
261	33.16598058	-80.23225327
262	33.16597679	-80.23225691
263	33.1657629	-80.23246217
264	33.16554901	-80.23266743
265	33.16551842	-80.23269679
266	33.16533512	-80.2328727
267	33.16512122	-80.23307796
268	33.16490733	-80.23328322
269	33.16469344	-80.23348848
270	33.16447954	-80.23369374
271	33.16426565	-80.233899
272	33.16405175	-80.23410426
273	33.16390058	-80.23424934

PROJECT AREA POINT IDENTIFIERS	LATITUDE	LONGITUDE
274	33.16383786	-80.23430952
275	33.16362396	-80.23451478
276	33.16351472	-80.23461959
277	33.16341006	-80.23472003
278	33.16337957	-80.23474486
279	33.18832541	-80.25200859
280	33.18816745	-80.25192836
281	33.18824663	-80.25200122
282	33.18845926	-80.25217006
283	33.18868128	-80.25232084
284	33.18891161	-80.25245285
285	33.18914911	-80.25256542
286	33.18939265	-80.25265801
287	33.18964103	-80.25273019
288	33.18989301	-80.25278158
289	33.19014741	-80.25281193
290	33.19040297	-80.25282111
291	33.19065844	-80.25280905
292	33.19091259	-80.25277584
293	33.19116415	-80.25272162
294	33.19141194	-80.25264666
295	33.19165472	-80.25255133
296	33.19189133	-80.25243608
297	33.19207966	-80.25232551
298	33.19196299	-80.25236016
299	33.19195317	-80.25236285
300	33.19183245	-80.25239314
301	33.19176478	-80.25241013
302	33.19175906	-80.25241149
303	33.19175489	-80.25241239
304	33.19156517	-80.25245142
305	33.19155521	-80.25245325
306	33.19136442	-80.25248398
307	33.19135441	-80.25248538
308	33.19116267	-80.25250779
309	33.19115275	-80.25250872
310	33.19096058	-80.25252275
311	33.19095051	-80.25252326
312	33.19075804	-80.2525289
313	33.19075326	-80.25252899
314	33.19074796	-80.25252897
315	33.19055544	-80.25252621
316	33.19054536	-80.25252585
317	33.19035306	-80.25251469
318	33.1903434	-80.25251393
319	33.19015117	-80.25249435

PROJECT AREA POINT IDENTIFIERS	LATITUDE	LONGITUDE
320	33.19014115	-80.25249311
321	33.18995005	-80.25246523
322	33.18994007	-80.25246355
323	33.18974996	-80.25242735
324	33.18965323	-80.25240893
325	33.18948285	-80.25238296
326	33.18931334	-80.25235002
327	33.18914488	-80.25231014
328	33.18897768	-80.25226337
329	33.18881193	-80.25220976
330	33.18864784	-80.25214937
331	33.1884856	-80.25208229
332	33.18832541	-80.25200859
333	33.2453201	-80.19226202
334	33.24064474	-80.19780286
335	33.24064957	-80.19780862
336	33.2406506	-80.19780741
337	33.24065223	-80.19780547
338	33.24065387	-80.19780353
339	33.24065551	-80.19780159
340	33.24065715	-80.19779965
341	33.24065879	-80.1977977
342	33.24066043	-80.19779576
343	33.24066207	-80.19779382
344	33.24066371	-80.19779187
345	33.24066535	-80.19778993
346	33.240667	-80.19778798
347	33.24066864	-80.19778603
348	33.24067029	-80.19778408
349	33.24067193	-80.19778213
350	33.24067358	-80.19778019
351	33.24067523	-80.19777824
352	33.24067688	-80.19777628
353	33.24067853	-80.19777433
354	33.24068018	-80.19777238
355	33.24068183	-80.19777043
356	33.24068349	-80.19776847
357	33.24068514	-80.19776652
358	33.24068679	-80.19776456
359	33.24068845	-80.19776261
360	33.24069011	-80.19776065
361	33.24069176	-80.19775869
362	33.24069342	-80.19775673
363	33.24069508	-80.19775477
364	33.24069674	-80.19775282
365	33.24069841	-80.19775086

PROJECT AREA POINT IDENTIFIERS	LATITUDE	LONGITUDE
366	33.24070007	-80.19774889
367	33.24070132	-80.19774742
368	33.24070242	-80.19774612
369	33.24070511	-80.19774303
370	33.24094688	-80.19746405
371	33.24094944	-80.19746115
372	33.24095113	-80.19745923
373	33.24095282	-80.19745731
374	33.24095452	-80.1974554
375	33.24095622	-80.19745348
376	33.24095792	-80.19745157
377	33.24095961	-80.19744965
378	33.24096131	-80.19744774
379	33.240963	-80.19744583
380	33.2409647	-80.19744392
381	33.24096639	-80.19744201
382	33.24096809	-80.19744011
383	33.24096978	-80.1974382
384	33.24097147	-80.1974363
385	33.24097316	-80.19743439
386	33.24097485	-80.19743249
387	33.24097654	-80.19743059
388	33.24097823	-80.19742869
389	33.24097992	-80.19742679
390	33.24098161	-80.19742489
391	33.2409833	-80.19742299
392	33.24098499	-80.1974211
393	33.24098667	-80.1974192
394	33.24098836	-80.19741731
395	33.24099004	-80.19741541
396	33.24099173	-80.19741352
397	33.24099341	-80.19741163
398	33.24099509	-80.19740974
399	33.24099677	-80.19740785
400	33.24099845	-80.19740596
401	33.24100013	-80.19740407
402	33.24100181	-80.19740218
403	33.24100349	-80.1974003
404	33.24100517	-80.19739841
405	33.24100685	-80.19739653
406	33.24100853	-80.19739465
407	33.2410102	-80.19739276
408	33.24101146	-80.19739135
409	33.25436053	-80.18239482
410	33.25423299	-80.18223403
411	33.24570843	-80.19181142

PROJECT AREA POINT IDENTIFIERS	LATITUDE	LONGITUDE
412	33.24555331	-80.19198803
413	33.24540019	-80.1921671
414	33.2453201	-80.19226202
415	33.39026186	-80.11825774
416	33.39011568	-80.11850223
417	33.39011741	-80.11850353
418	33.39006619	-80.1185858
419	33.39006169	-80.11859282
420	33.39005982	-80.11859565
421	33.38994279	-80.11879139
422	33.38993999	-80.11879599
423	33.3898231	-80.11898448
424	33.38998335	-80.1191814
425	33.39122103	-80.1180286
426	33.39240563	-80.11651668
427	33.39436615	-80.11385835
428	33.39482564	-80.11332285
429	33.39517393	-80.11299418
430	33.39750147	-80.11105699
431	33.39953998	-80.10940887
432	33.39988141	-80.1085078
433	33.40043867	-80.10617599
434	33.40064413	-80.10418107
435	33.40060966	-80.1018048
436	33.40051264	-80.10178779
437	33.40030046	-80.10202578
438	33.40007464	-80.10228964
439	33.39985338	-80.10255896
440	33.39963679	-80.1028336
441	33.39942494	-80.10311346
442	33.39921794	-80.10339842
443	33.39901586	-80.10368837
444	33.39884749	-80.10394025
445	33.39762532	-80.10593993
446	33.39759982	-80.10598258
447	33.39744031	-80.10624946
448	33.39728081	-80.10651633
449	33.3971213	-80.1067832
450	33.39696179	-80.10705007
451	33.39680228	-80.10731694
452	33.39664277	-80.10758381
453	33.39648326	-80.10785067
454	33.39632375	-80.10811755
455	33.39630101	-80.10815558
456	33.39616423	-80.10838441
457	33.39600472	-80.10865127

PROJECT AREA POINT IDENTIFIERS	LATITUDE	LONGITUDE
458	33.39584521	-80.10891814
459	33.39568569	-80.109185
460	33.39552618	-80.10945186
461	33.39536666	-80.10971872
462	33.39534694	-80.1097517
463	33.39520715	-80.10998558
464	33.39504763	-80.11025244
465	33.39488812	-80.1105193
466	33.39472859	-80.11078615
467	33.39456907	-80.11105301
468	33.39441208	-80.11131563
469	33.39440955	-80.11131986
470	33.39425003	-80.11158672
471	33.39415366	-80.11174794
472	33.39409051	-80.11185357
473	33.39397284	-80.11205042
474	33.39393099	-80.11212042
475	33.39377147	-80.11238727
476	33.39369223	-80.11251983
477	33.39361195	-80.11265412
478	33.39345243	-80.11292097
479	33.39329291	-80.11318783
480	33.39315829	-80.11341299
481	33.39313338	-80.11345467
482	33.39297386	-80.11372151
483	33.39281433	-80.11398835
484	33.39265481	-80.1142552
485	33.39259241	-80.11435957
486	33.39249528	-80.11452205
487	33.39233576	-80.11478889
488	33.39217623	-80.11505573
489	33.3920167	-80.11532256
490	33.39185718	-80.1155894
491	33.39169765	-80.11585625
492	33.39153811	-80.11612308
493	33.39137859	-80.11638992
494	33.39121906	-80.11665675
495	33.39105953	-80.11692359
496	33.39089999	-80.11719042
497	33.39077615	-80.11739755
498	33.39074045	-80.11745725
499	33.39058092	-80.11772408
500	33.39055436	-80.11776851
501	33.39042139	-80.11799091
502	33.39026186	-80.11825774