September 3, 2021

Ms. Amanda Corll
Geenex Solar
7804-C Fairview Road #257
Charlotte, NC 28226

Telephone: (843) 323-9580
E-mail: Amanda.Corll@geenexsolar.com

RE: Desktop Environmental Resources Review
Macadamia Transmission Line
Washington County, North Carolina
Terracon Project No. 70217444

Dear Ms. Corll:

Terracon Consultants, Inc. (Terracon) is pleased to submit the enclosed Desktop Environmental Resources Review report for the Macadamia Transmission Line. The project includes the evaluation of the approximately 6.53-mile proposed transmission line corridor. This analysis was performed in accordance with Terracon Proposal No. P70217444 dated July 9, 2021.

We appreciate the opportunity to provide this desktop review for this project. If you have questions or comments regarding this document or require additional services, please contact us.

Sincerely,
Terracon Consultants, Inc.

Robert Turnbull
Natural Resources Department Manager

Jeff Harbour, PWS
Senior Scientist – Natural Resources

Desktop Environmental Resources Review
Macadamia Transmission Line
Washington County, North Carolina
Terracon Project No. 70217444

1.0 INTRODUCTION

Terracon Consultants, Inc. (Terracon) was retained by Geenex Solar (client) to perform a Desktop Environmental Resources Review at the above-referenced site. The proposed project site consists of an approximately 6.53-mile proposed transmission line corridor located near the Town of Plymouth in Washington County, North Carolina. The project location is depicted on Exhibit 1 in Appendix A.

The purposes of performing this review were to conduct background research in order to preliminarily characterize the existing site conditions, identify potential environmental impacts of the proposed transmission line and alternative routes, identify measures to mitigate those impacts, and provide a recommendation regarding whether suspect environmental issues may pose a constraint to development within the proposed project corridor.

2.0 SCOPE OF SERVICES

Terracon performed a desktop level review of environmental data and prepared this Environmental Resources Review report to summarize the desktop review, provide professional opinions about issues of concern or non-concern, and recommend permitting and next steps. A permit matrix is also included.

The desktop review included a review of the following environmental factors:

- Topography
- Surface Waters
- Flood Plains
- Wetlands
- Geology, Soils, and Groundwater
- Threatened and Endangered Species (state and federal)
- Cultural Resources (archaeological and historical - desktop review)
- Land Use & Special Planning Areas of Note

3.0 PROJECT LOCATION AND GENERAL INFORMATION

The project consists of an approximately 6.53-mile proposed transmission line corridor located in Washington County, North Carolina. The study corridor includes undisturbed forested

communities, agricultural land, rural residential areas, managed pine plantation and recent clearcut areas. The study corridor is depicted on Exhibit 1 in Appendix A.

4.0 DESKTOP REVIEW

Several maps, aerial photograph resources, and on-line databases were reviewed to assist with identifying potential environmental and natural resources factors that could pose developmental constraints for the site. Each source of data is described in detail below.

4.1 Topographic Map Review

The U.S. Department of the Interior Geologic Survey (USGS) topographic map of the site from the USGS web service was reviewed to identify potential environmental features within the project area. A map of the project is provided as Exhibit 1 in Appendix A. Site elevation is illustrated ranging from approximately 40 feet above Mean Sea Level (MSL) to approximately an elevation of 10 feet above MSL. Slopes are depicted as generally flat, with slightly steeper slopes near drainages. The majority of the project corridor appears to generally drain towards Conaby Creek and Welch Creek. Canoby Creek and Welch Creek flow to the Roanoke River, which is located north of the study area. The southern portion of the study area likely drains south towards the East Dismal Swamp.

4.1.1 Impacts and Mitigation

The Macadamia Transmission Line will have minimal effect on potential environmental features depicted on the USGS mapping. The Macadamia Transmission Line will be designed to span large drainages. No alterations to existing watershed will occur as a result of this project.

4.2 Surface Waters

A 2017 aerial photograph of the site was reviewed for land cover and potential surface waters on the site. The aerial photograph depicts the site as undisturbed forested communities, agricultural land, rural residential areas, managed pine plantation, and recent clearcut areas. Conaby Creek is also visible on aerial imagery just north of Morrattock Road. See Exhibit 2 in Appendix B.

Terracon completed a wetland and waters delineation for the Macadamia Transmission Line in August 2021. The Wetland and Waters Delineation Report is attached in Appendix L.

Approximately 1.7 miles of the project corridor at the southern end is located within the Tar-Pamlico River Basin. Certain surface waters in the Tar-Pamlico River Basin may be subject to a 50-foot riparian buffer. The Wetlands and Waters Delineation Report in Appendix L specifies which features with the Transmission Corridor are subject to a riparian buffer. The remainder of

the project corridor to the north is located within the Roanoke River Basin. No regulated buffers apply in the Roanoke River Basin.

4.2.1 Impacts and Mitigation

The Macadamia Transmission Line will have minimal impacts on surface water resources. The Macadamia Transmission Line will be designed to minimize or avoid impacts on surface water resources to the extent feasible. The Macadamia Transmission Line will be designed to span surface waters and ditches. If access roads are proposed along the transmission corridor, streams and ditches will be culverted to maintain flow and function.

Construction of the proposed Macadamia Transmission Line could potentially impact water quality. Short-term, minimal, water quality impacts may occur during the construction of the Macadamia Transmission Line even though avoidance and minimization measures (i.e., BMPs) will be implemented to prevent sedimentation. The primary potential impacts would be associated with the soils from areas disturbed during construction being washed by stormwater into adjacent waters during rainstorm events. Therefore, increased turbidity and localized sedimentation of the stream bottom may potentially occur from the runoff. If any of these events occur, however, these impacts would be temporary and would not significantly alter water quality conditions due to the minimal soil disturbance that is expected to occur in any one location during construction of the Macadamia Transmission Line. A Stormwater Pollution Prevention Plan (SWPPP) will be prepared that will identify BMPs to be implemented during construction to minimize erosion and sedimentation impacts to surface waters. Erosion and sedimentation abatement measures, for example, would be employed to decrease impacts to the hydrology. As an example, no fueling or maintenance of vehicles or application of herbicides would occur within 100 feet of streams, ditches, and waterways to protect against introduction of these materials into surface or groundwater systems. In addition, materials such as fuels, lubricants, paints, and solvents required for construction would be stored away from surface water resources according to appropriate regulatory standards. Lastly, any spills or leaks would be cleaned up immediately and leaking equipment removed from the area for proper maintenance.

4.3 Floodplains

Terracon reviewed Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) for Washington County and found that portions of the southern study area appear to be located within the AE Flood Hazard Zone. These include drainages associated with an unnamed tributary to Welch Creek, Conaby Creek, and an unnamed tributary to Conaby Creek. If these features cannot be avoided, then further detailed research and field work, including a hydrology and hydraulics analysis, is recommended. Certain activities could require FEMA involvement if any work would alter or affect the existing AE Flood Hazard Zone. The FEMA Flood Map is attached as Exhibit 3 in Appendix C.

4.3.1 Impacts and Mitigation

Portions of the Macadamia Transmission Line that cross FEMA designated floodplains will be spanned to avoid impacts. Proposed access roads and support structures will be located outside of the FEMA designated floodplains to avoid changes in elevations. If construction activities are proposed within FEMA designated floodplains, those areas will be restored to pre-construction contours.

4.4 Wetlands

The National Wetland Inventory (NWI) map of the site was reviewed to identify potential waters of the United States (WOTUS) and waters of the state. The map for the site was published by the U.S. Fish and Wildlife Service (USFWS) and depicts probable wetland areas and other surface waters based on stereoscopic analysis of high-altitude aerial photographs, topographic maps, and soil survey information. The NWI map indicates that wetland features are present in multiple portions of the study area, primarily along drainages. These features are likely comprised of forested, scrub/shrub, and emergent wetland types. A representative NWI map of the site is provided as Exhibit 4 in Appendix D.

Terracon was tasked with completing a wetland and waters delineation for the Transmission Corridor. The Wetland and Waters Delineation Report for the Macadamia Transmission Line is included in Appendix L. Terracon evaluated features that may be considered subject to jurisdiction and permitting requirements under Sections 404 and 401 of the Clean Water Act (CWA) and under the North Carolina Isolated and Other Non-404 Jurisdictional Wetlands and Waters program. The delineation methodology generally follows the guidance outlined in the Regional Supplement to the USACE Wetland Delineation Manual for the Atlantic and Gulf Coastal Plain Region, which states that areas must exhibit three distinct characteristics to be considered jurisdictional wetlands: 1) prevalence of hydrophytic (water tolerant) plants; 2) presence of hydric soils; and 3) sufficient wetland hydrology indicators within 12 inches of the ground surface. These field efforts confirmed the presence of wetlands on the site. As of the date of this report, the extent of jurisdictional features has not been reviewed or confirmed by the U.S. Army Corps of Engineers.

4.4.1 Impacts and Mitigation

Wetlands located in the transmission corridor will be spanned and placement of structures within wetlands will be avoided to the extent practicable. If it is not possible to span a wetland, several mitigation strategies can be identified to minimize impacts to wetlands including:

- Use of all-terrain construction equipment that is designed to minimize soil impact in damp areas;
- Use of the shortest route to the pole location in the wetland; and
- Assembling structures in upland areas, when feasible, before they are brought to the site

for installation.

In forested areas, a corridor (maximum 100 ft. wide) will be "grubbed" and reseeded with an herbaceous cover to facilitate access for operations and maintenance staff. However, this activity will not occur within any wetlands. Instead, operations and maintenance staff will access any structures within wetlands from along the transmission corridor from either side (not through) using temporary matting, as needed.

Wetlands impacted by construction will be restored as required by the USACE. Macadamia Solar will permit and mitigate temporary and permanent impacts to potentially jurisdictional waters, including required compensatory mitigation.

Wetlands can be also be impacted by soil erosion and sediment deposition during construction. Sedimentation and ground disturbance in wetlands can make them more susceptible to establishment of invasive plant species, such as reed canary grass, which could impact wetland function by reducing vegetative biodiversity and altering wildlife habitat. To address this, and as described in Section 4.2.1, Macadamia Solar will develop a SWPPP that complies with the North Carolina Sedimentation Pollution Control Act that outlines BMP placement to control off-site sedimentation and avoid potential soil run-off into wetlands.

4.5 Geology, Soils, and Groundwater

According to a review of the Natural Resources Conservation Service (NRCS) web soil survey data (Exhibit 5 in Appendix E), soils in the Transmission Corridor consist of the following:

- Altavista fine sandy loam – 0-2% slopes
- Augusta fine sandy loam
- Cape Fear loam, 0-2% slopes, rarely flooded
- Conetoe loamy fine sand, 0-3% slopes
- Dogue fine sandy loam, 0-3% slopes
- Dorovan muck, 0-2% slopes, frequently flooded
- Dragston loamy fine sand
- Muckalee loam
- Portsmouth fine sandy loam
- Roanoke loam
- Tomotley fine sandy loam
- Wahee fine sandy loam
- Wickham loamy sand, 0-4% slopes

Conetoe, Dogue, and Wickham soils are typically located in uplands. Altavista, Augusta, Cape Fear, Dragston, Portsmouth, Roanoke, Tomotley, and Wahee soils are typically located on marine flats and depressions. Dorovan and Muckalee soils are typically located in floodplains. Based on the review of the NRCS national hydric soils list, Dorovan, Muckalee, Portsmouth, Roanoke, and Tomotley soils are classified as hydric soils. Altavista, Augusta, Cape Fear, Dragston, and

Wahee soils are classified as non-hydric soils known to have inclusions of hydric soils. Based on our site reconnaissance, it is likely that *in situ* soil conditions are not consistent with the soil survey data. Additionally, most of the soils in the transmission corridor have been manipulated for silvicultural uses. As such, most of the site likely contains soils suitable for development.

The project is in the Coastal Plain physiographic region of North Carolina. The northern and central portions of the project corridor are specifically within the Atlantic Coast Flatwoods Land Resource Region; the southern portion of the project corridor is within the Tidewater Area Land Resource Region. The northern and central portions of the project corridor are also located within the Yorktown Formation and Duplin Formation, Undivided; the southern portion of the project corridor is mapped as Surficial deposits, undivided. The Yorktown Formation is characterized by fossiliferous clay with varying amounts of fine-grained sand, bluish gray color, and shell material commonly concentrated in lenses; mainly in the area of North Carolina north of the Neuse River. The Duplin Formation is characterized by shelly, medium- to coarse-grained sand, sandy marl, and limestone; mainly in the area south of the Neuse River. Surficial deposits are characterized by sand, clay, gravel, and peat deposited in marine, fluvial, eolian, and lacustrine environments.

Groundwater is provided from the Yorktown aquifer, which covers the northeast portion of the Coast Plain physiographic province. This aquifer ranges from 4 to 992 feet thick and is comprised of coarse sands. The North Carolina Division of Environmental Quality, Division of Water Resources (NCDWR) actively monitors groundwater levels and quality at well locations throughout the state. There are three NCDWR monitoring wells in Washington County. Based on well data in 2020 for these two wells, water levels are approximately 56 to 224 feet below the land surface. Additionally, NCDWR maps water supply watershed protection areas; there are none in Chowan County. The closest water supply watershed is associated with the Roanoke River in Martin County.

4.5.1 Impacts and Mitigation

Impacts to bedrock during construction or operation of the Macadamia Transmission Line are not anticipated, as the underlying geology is characterized by sand and clay. Macadamia Solar will also avoid any impacts to groundwater resources through Transmission Line design and construction techniques.

4.6 Threatened and Endangered Species

Terracon searched available data from the USFWS Information, Planning and Conservation System (IPaC) Endangered Species Act species list and the North Carolina Natural Heritage Program (NCNHP). The intent was to identify species of concern determined by the activities proposed at the site.

Based on a review of the USFWS data, one endangered species, two threatened species, one experimental, non-essential species, and one species listed as threatened due to similarity of

appearance are listed as potentially occurring in the vicinity of the project area. Five state-listed species are also listed within the vicinity of the project. One additional federal endangered species that is not listed in USFWS data is included in the NCNHP report as being within the project vicinity. A copy of the NCNHP and IPaC reports are included in Appendix J.

Terracon conducted field investigations to evaluate the Transmission Corridor for suitable habitat for Threatened and Endangered species. These investigations included the approximately 90% of the proposed transmission corridor over which Macadamia had site control at the time of the investigation. Suitable habitat is likely present for federally listed northern long-eared bat, red wolf, and American alligator. Suitable habitat was not identified for federally listed red-cockaded woodpecker or red knot. NCNHP records review indicates no occurrences of these federally listed species within or within 1.0 mile of the project. NCNHP records review does indicate an occurrence of federally listed Atlantic sturgeon within 1.0 mile of the project, in the Roanoke River.

Suitable habitats for state-listed helicta satyr, regal darner, coppery emerald, tidewater mucket, and eastern pondmussel are present within the site. NCNHP records indicate an occurrence of these species within or within 1.0 mile of the project boundary.

4.6.1 Impacts and Mitigation

Impacts to species of concern will be avoided. To avoid incidental take of Northern long-eared bat, clearing of forested areas will not occur during the roosting season (June 1 – July 31). Due to their federal listing status, red wolf and American alligator are not afforded protection and do not require Section 7 consultation with USFWS. Red wolf is an experimental population in Washington County and American alligator is listed due to similarity of appearance to another listed species. The Transmission Line will not impact the Roanoke River and therefore will not have any effect on the Atlantic sturgeon. State-listed species are not afforded protection on private lands in North Carolina.

4.7 Cultural Resources

Research conducted by the North Carolina Office of State Archaeology (OSA) on behalf of Terracon revealed that no previously recorded archaeological sites appear to be located within the immediate project area; however, three previously recorded archaeological sites have been recorded and one previous archaeological survey has been conducted within a one-mile radius of the project area. Site 31WH11 was recorded by East Carolina University in 1972. This precontact period archaeological site is unassessed for its *National Register of Historic Places* (NRHP) eligibility. Sites 31WH65 and 31WH66 were recorded during a survey of the Trowbridge-Pantego transmission line. No information was available for these historic period archaeological sites; which are considered unassessed for their NRHP eligibility.

Research conducted by Terracon using the North Carolina State Historic Preservation Office (SHPO) HPOWEB GIS service database revealed that 19 previously recorded historic properties

are located within one mile of the project corridor (**Table 1**). None of the structures are mapped within the project corridor.

Table 1: Historic Resources within One Mile of the Project Area

Resource ID	Name	Description	NRHP Eligibility	Within Project Corridor?
WH0028	Griffin-Fagan House	Historic Structure	Study List	No
WH0011	National Handle Company	Historic Structure	Study List	No
WH0045	Plymouth Country Club Estates HD	Historic District	Study List	No
WH0036	Cool Spring School	Historic Structure	Unassessed	No
WH0356	House	Historic Structure	Unassessed	No
WH0032	House	Historic Structure	Unassessed	No
WH0029	House	Historic Structure	Unassessed	No
WH0030	Wilson St Houses	Historic Structure	Unassessed	No
WH0033	Bonnie Johnson House	Historic Structure	Unassessed	No
WH0046	Little Richwood Development	Historic Area	Unassessed	No
WH0035	Lucas Family Farm	Historic Structure	Unassessed	No
WH0031	Owens Tenant Houses	Historic Structure	Unassessed	No
WH0034	Phelps Houses	Historic Structure	Unassessed	No
WH0043	Ransom-Clark House	Historic Structure	Unassessed	No
WH0357	Smith-Cooper House	Historic Structure	Unassessed	No
WH0390	Morattuck Church	Historic Structure	Demolished	No
WH0394	Owens House	Historic Structure	Demolished	No
WH0042	Walter Ellis Bateman House	Historic Structure	Unassessed	No
WH0041	William Joseph Belcher House	Historic Structure	Demolished	No

In addition to records search for previously recorded cultural resources, Terracon conducted an examination of readily available and relevant historical aerial photographs and maps in an attempt to locate possible historical structure locations within the proposed project boundaries. Aerial photographs and historical topographic maps did not appear to show any obvious above ground structures or cultural features, suggesting a low potential for historic period archaeological sites to be present within the project corridor.

No fieldwork was conducted as part of this cultural resources records review.

4.7.1 Impacts and Mitigation

While no previously mapped cultural resources have been recorded, this may be a reflection of a lack of cultural resource surveys in the area. In the event that federal permitting or funding is anticipated, a coordination letter should be submitted to the North Carolina State Historic

Preservation Office (SHPO) to determine if any archaeological investigations would be required under Section 106 of the *National Historic Preservation Act* (NHPA 1966, as amended). If SHPO does not request a cultural resources investigation of the project area, no further work would be recommended.

If cultural resource surveys are conducted and archaeological sites are recorded, impacts to these sites can be avoided by the following:

- Avoidance of subsurface disturbance within archaeological site boundaries.
- Use of matting over known archaeological site locations to avoid surface disturbance and compaction of the site by heavy equipment.
- Use of an archaeological monitor to observe the site during construction to assure that there are no impacts to the site.

4.8 Land Use and Special Planning Areas

To better categorize on-site habitats, the project corridor was demarcated using the National Land Use Land Cover (NLCD) dataset (Exhibit 6 in Appendix F). This resulted in community types being identified including the following:

- Cultivated Crops
- Deciduous Forest
- Developed, Low Intensity
- Developed, Open Space
- Emergent Herbaceous Wetlands
- Evergreen Forest
- Grassland/Herbaceous Land
- Mixed Forest
- Pasture/Hay
- Shrub/Scrub
- Woody Wetlands

No special planning areas were identified.

4.8.1 Impacts and Mitigation

Construction of the Macadamia Transmission Line will result in short-term adverse impacts on existing vegetation, including localized physical disturbance and soil compaction. Construction activities, such as site preparation and installation of structures, are anticipated to impact approximately vegetation near each structure (maximum 100-foot diameter around each

structure). Construction activities involving establishment and use of access roads, staging, and stringing areas would also have short-term impacts on vegetation by concentrating surface disturbance and equipment use.

Construction would also result in long-term impacts on vegetation by permanently removing vegetation at each structure and within portions of the ROW that are currently dominated by forest or other woody vegetation (maximum 100 ft. wide). Forested areas and shrub lands would be permanently converted to low-stature vegetation by clearing woody vegetation throughout the entire transmission corridor.

4.9 Natural Areas and Areas of Conservation Significance

A review of desktop information and maps has not identified designated natural areas or areas of conservation significance on the proposed tranmission corridor. Five Conservation Reserve Enhancement Program Easement managed areas are located within 1.0 mile of the site. All of these are located near the southern end of the study area. One private conservation easement, the Roanoke River Preserve, is present within 1.0 mile of the site, in the Roanoke River north of the project corridor. No other conservation areas are documented within 1 mile of the site (Exhibit 7 in Appendix G).

No NCNHP Natural Areas or Natural Communities are located within the project corridor. Two NCNHP Natural Areas, the ROA/Lower Roanoke River Aquatic Habitat and the Roanoke River Delta – Conaby Creek, are located within 1.0 mile of the project corridor. Two NCNHP Natural Communities, Brownwater Bottomland Hardwoods (Swamp Transition Subtype) and Tidal Swamp (Cypress-Gum Subtype), are located within 1.0 mile of the project corridor. The NCNHP Records Review report is included in Appendix J.

4.9.1 Impacts and Mitigation

Impacts to Natural Areas and Areas of Conservation Significance are avoided by the Macadamia Transmission Line. Construction activities will not occur in these areas.

4.10 Census Bureau Socioeconomics Data

Socioeconomics data from the U.S. Census Bureau for Washington County is presented below.

- **Population:**
  2010 - 13,193
  2019 (estimate) – 11,580
- **Age and Sex:**
  Persons under 5 years – 5.1%
  Persons under 18 years – 19.9%
  Persons 65 years and over – 25.3%

Female persons – 52.8%

- **Race and Hispanic Origin:**
  White – 47.7%
  Black or African American – 48.9%
  American Indian and Alaska Native – 0.9%
  Asian – 0.4%
  Native Hawaiian or Other Pacific Islander - <0.1%
  Two or More Races – 2.0%
  Hispanic or Latino – 5.6%
  White, not Hispanic or Latino – 44.2%
- **Population Characteristics:**
  Veterans, 2015-2019 – 937
  Foreign born persons, 2015-2019 – 1.6%
- **Housing:**
  Housing units – 6,450
  Owner-occupied housing unit rate – 66.5%
  Median value of owner-occupied housing units - $85,400
  Median selected monthly owner costs, with a mortgage - $1,125
  Median selected monthly owner costs, without a mortgage - $410
  Median gross rent - $607
  Building permits, 2020 - 5
- **Families & Living Arrangements:**
  Households – 4,977
  Persons per household – 2.37
  Living in the same house 1 year ago (age 1 year+) – 89.0%
  Language other than English spoken at home (age 5 years+) – 2.3%
- **Computer and Internet Use:**
  Households with a computer – 72.3%
  Households with a broadband Internet subscription – 62.8%
- **Education:**
  High School graduate or higher – 83.7%
  Bachelor's degree or higher – 11.5%
- **Health:**
  With a disability, under age 65 years – 14.7%
  Persons without health insurance – 14.1%
- **Economy:**
  In civilian labor force, total, percent of population age 16+ years – 47.6%
  In civilian labor force, female, percent of population age 16+ years – 43.6%
  Total health care and social assistance receipts/revenue, 2012 – $34,741,000
  Total manufacturers shipments, 2012 - $394,643,000
  Total retail sales, 2012 - $127,671,000
  Total retail sales per capita, 2012 - $10,024
- **Transportation:**
  Mean travel time to work (minutes), workers age 16+ - 24.2

- **Income & Poverty:**
  Median household income (in 2019 dollars), 2015-2019 - $35,979
  Per capita income in past 12 months (in 2019 dollars) - $23,431
  Persons in poverty, percent – 21.3%

4.10.1 Impacts and Mitigation

The Macadamia Transmission Line is not anticipated to have any significant effect on future Census Bureau data for Washington County, North Carolina.

4.11 Superfund Sites

A database search of the Environmental Protection Agency (EPA) Facility Registry Service for recorded Federal and State Superfund Sites was conducted to identify sites within 1.0 mile of the proposed transmission corridor. Exhibit 9 depicts the results of the database search. No superfund sites are located within the Transmission Corridor.

4.11.1 Impacts and Mitigation

The Macadamia Transmission Line is not anticipated to impact any Federal or State Superfund Sites. If impacts are proposed, ground disturbance within the Superfund sites will be avoided if possible. If ground disturbance during construction is not avoidable, specifications in the site Soil Management Plan will be followed.

5.0 MAN-MADE FEATURES

Man-made features that were identified and considered during the alternative selection process. These features are within 200 feet of the near Final Transmission line and include:

- Five residential structures on North Street, Middle Street, and Sandhill Road.
- Two residential structures on the west side of Ken Trowbridge Road.
- Crossing of two parallel railroad tracks on the west side of Ken Trowbridge Road.
- Three residential structures on the west side of Wilson Street Extension
- Two residential structures between Wilson Street Extension and U.S. Highway 64.
- One residential structure between U.S. Highway 64 and Cool Springs Road.
- Seven residential structures near the intersection of Cool Springs Road and Sexton Farm Road.
- Two residential structures along Morrattock Road.
- One residential structure near the intersection of NC Highway 32 and Parker Road.
- Nine public road crossings
- Existing powerline easements near the north end of the Transmission Line, on Wilson Street Extension, and along Cool Springs Road.

- Natural Gas easements along Ken Trowbridge Road and Morrattock Road.

These features are included on the structures study shown in Appendix M.

6.0 ALTERNATIVE PROJECT ROUTES

Alternative routes for the Macadamia Transmission line were considered by Geenex Solar during the siting process for the proposed project. Those alternatives are presented on exhibits with the near final Transmission Line in Appendix H.

The initial route for the Macadamia Transmission Line was adjacent to a new 115kV transmission line, but landowners on that route were not willing to expand that easement. Alternate Routes were investigated by Geenex Solar, but the Near Final Transmission Line route was chosen due to the willingness of landowners to allow easements. The Near Final Transmission Line route is further from the Plymouth Airport, parallels a greater amount of existing transmission easements, and could potentially require a lower acreage of tree clearing.

A report for the Westwood route study was completed by Main Line Energy Consultants, LLC in September 2019. The report for that study is attached in Appendix K. This report describes three proposed alternatives that were considered for the Macadamia Transmission Line. The proposed route described in this report has minimized the length through wooded locations. The alternatives shown in this report present routes that attempt to avoid conflicts with other utilities and the Plymouth Airport, but those alternatives result in a higher number of potentially impacted landowners.

7.0 GENERAL COMMENTS

This Desktop Environmental Resources Review was performed in accordance with generally accepted practices of this profession undertaken in similar studies at the same time and in the same geographical area. An assessment, such as the one performed at this site, is of limited scope, is noninvasive, and cannot eliminate the potential that environmental features are present at the site beyond what is identified by the limited scope of this review. In conducting the limited scope of services described herein, certain sources of information and public records were not reviewed. The limitations of this assessment should be recognized. This report has been prepared in accordance with generally accepted scientific and engineering evaluation practices. This report is for the exclusive use of the client for the project being discussed. No warranties, either expressed or implied, are intended or made.

Appendix A
Project Location

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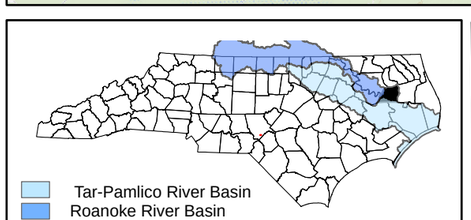
Sep 13 2021

Project Study Area
Alternate Route 1
Alternate Route 2
Alternate Route 3
Initial Route Option
Near Final
Option A
Option A (preferred)
Option B

0 2,000 4,000 8,000 Feet

USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed June, 2020.



N

Project No: 70217444

Scale: 1:48,000

File Name: Macadamia

Date: August 2021

Terracon

2401 Brentwood Road, Suite 107 Raleigh, NC 27604

Phone: (919) 873-2211 Fax: (919) 873-9555

Project Location

Macadamia Transmission Line
Plymouth, Washington County, North Carolina

EXHIBIT NO.

1

Appendix B
National Hydrography Dataset

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0 1,500 3,000 6,000 Feet

- Project Study Area
- CanalDitch
- StreamRiver
- LakePond
- SwampMarsh
- Alternate Route 1
- Alternate Route 2
- Alternate Route 3
- Initial Route Option
- Near Final
- Option A
- Option A (preferred)
- Option B

N

Project No:	70217444
Scale:	1:36,000
File Name:	Macadamia
Date:	August 2021

Terracon

2401 Brentwood Road, Suite 107 Raleigh, NC 27604

Phone: (919) 873-2211 Fax: (919) 873-9555

National Hydrography Dataset (NHD)

Macadamia Transmission Line
Plymouth, Washington County, North Carolina

EXHIBIT NO.

2

Appendix C
FEMA Map

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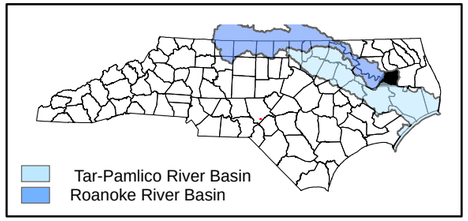
- Alternate Route 1
- Alternate Route 2
- Alternate Route 3
- Initial Route Option
- Near Final
- Option A
- Option A (preferred)
- Option B
- Project Study Area

Flood Hazard Zones

- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- Special Floodway
- Area of Undetermined Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard
- Area with Reduced Risk Due to Levee
- Area with Risk Due to Levee

0 1,500 3,000 6,000 Feet

USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed June, 2020.



N

Project No:	70217406
Scale:	1:36,000
File Name:	Macadamia
Date:	August 2021

Terracon

2401 Brentwood Road, Suite 107 Raleigh, NC 27604

Phone: (919) 873-2211 Fax: (919) 873-9555

FEMA MAP

Macadamia Transmission Line
Plymouth, Washington County, North Carolina

EXHIBIT NO.

3

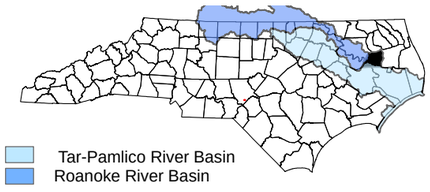
Appendix D
National Wetland Inventory

OFFICIAL COPY

Sep 13 2021

Project Study Area
Freshwater Emergent Wetland,PEM1A
Freshwater Forested/Shrub Wetland,PFO1A
Freshwater Forested/Shrub Wetland,PFO1AD
Freshwater Forested/Shrub Wetland,PFO1C
Freshwater Forested/Shrub Wetland,PFO6F
Freshwater Pond,PUBHx
Alternate Route 1
Alternate Route 2
Alternate Route 3
Initial Route Option
Near Final
Option A
Option A (preferred)
Option B

0 1,500 3,000 6,000 Feet



N

Project No: 70217444

Scale: 1:36,000

File Name: Macadamia

Date: August 2021

Terracon

2401 Brentwood Road, Suite 107 Raleigh, NC 27604

Phone: (919) 873-2211 Fax: (919) 873-9555

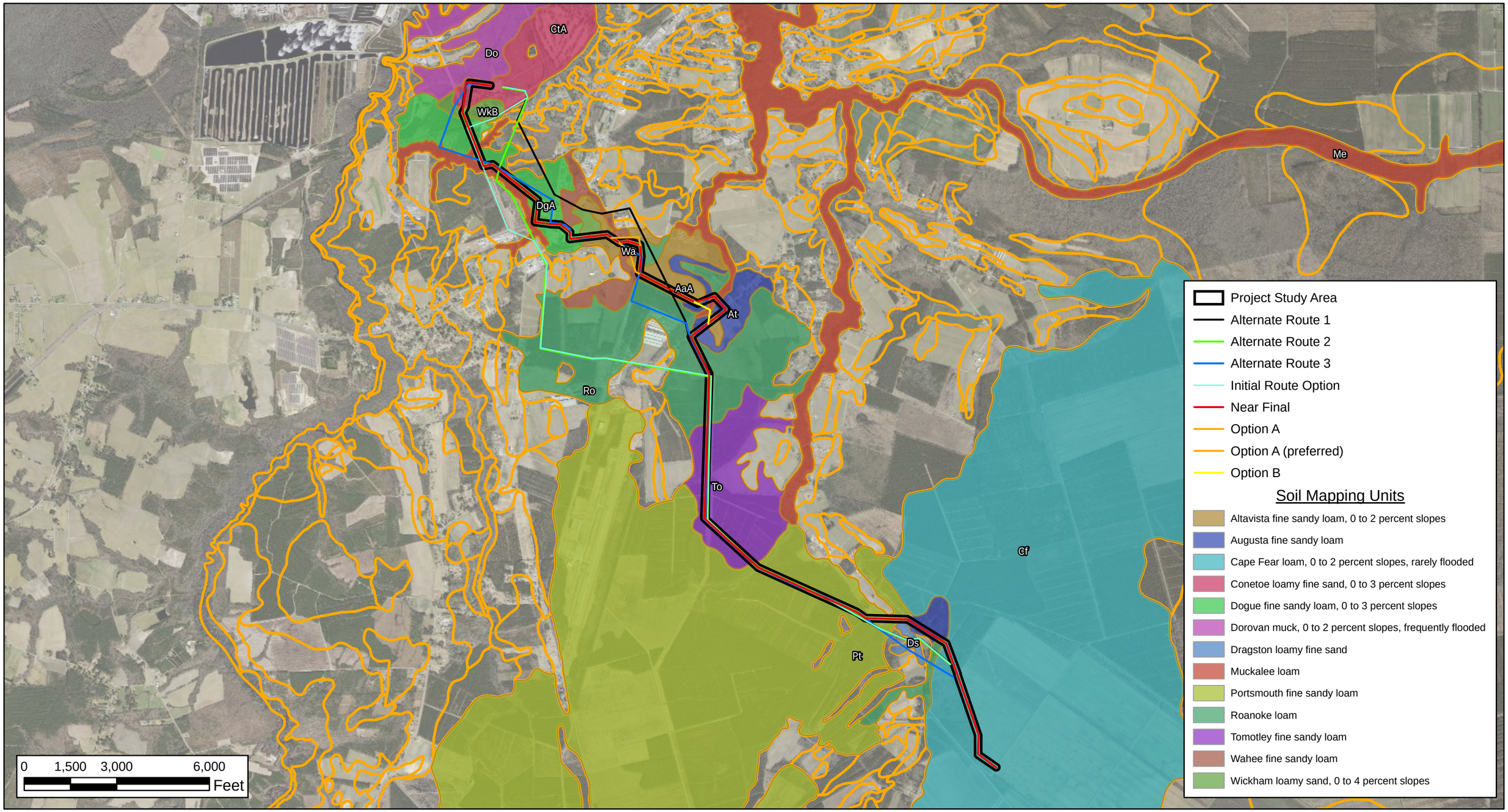
National Wetland Inventory (NWI)

Macadamia Transmission Line
Plymouth, Washington County, North Carolina

EXHIBIT NO.

4

Appendix E
NRCS Soils



N

Project No:	70217406
Scale:	1:36,000
File Name:	Macadamia
Date:	August 2021

Terracon
2401 Brentwood Road, Suite 107 Raleigh, NC 27604
Phone: (919) 873-2211 Fax: (919) 873-9555

NRCS Soils

Macadamia Transmission Line
Plymouth, Washington County, North Carolina

EXHIBIT NO.

5

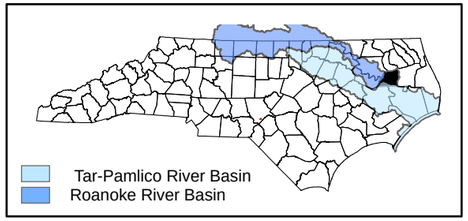
Appendix F
National Land Use Cover

OFFICIAL COPY

Sep 13 2021

Project Study Area
Cultivated Crops
Deciduous Forest
Developed, Low Intensity
Developed, Open Space
Emergent Herbaceous Wetlands
Evergreen Forest
Grassland/Herbaceous
Mixed Forest
Pasture/Hay
Shrub/Scrub
Woody Wetlands
Alternate Route 1
Alternate Route 2
Alternate Route 3
Initial Route Option
Near Final
Option A
Option A (preferred)
Option B

0 1,500 3,000 6,000
Feet



N

Project No: 70217406
Scale: 1:36,000
File Name: Macadamia
Date: August 2021

Terracon
2401 Brentwood Road, Suite 107 Raleigh, NC 27604
Phone: (919) 873-2211 Fax: (919) 873-9555

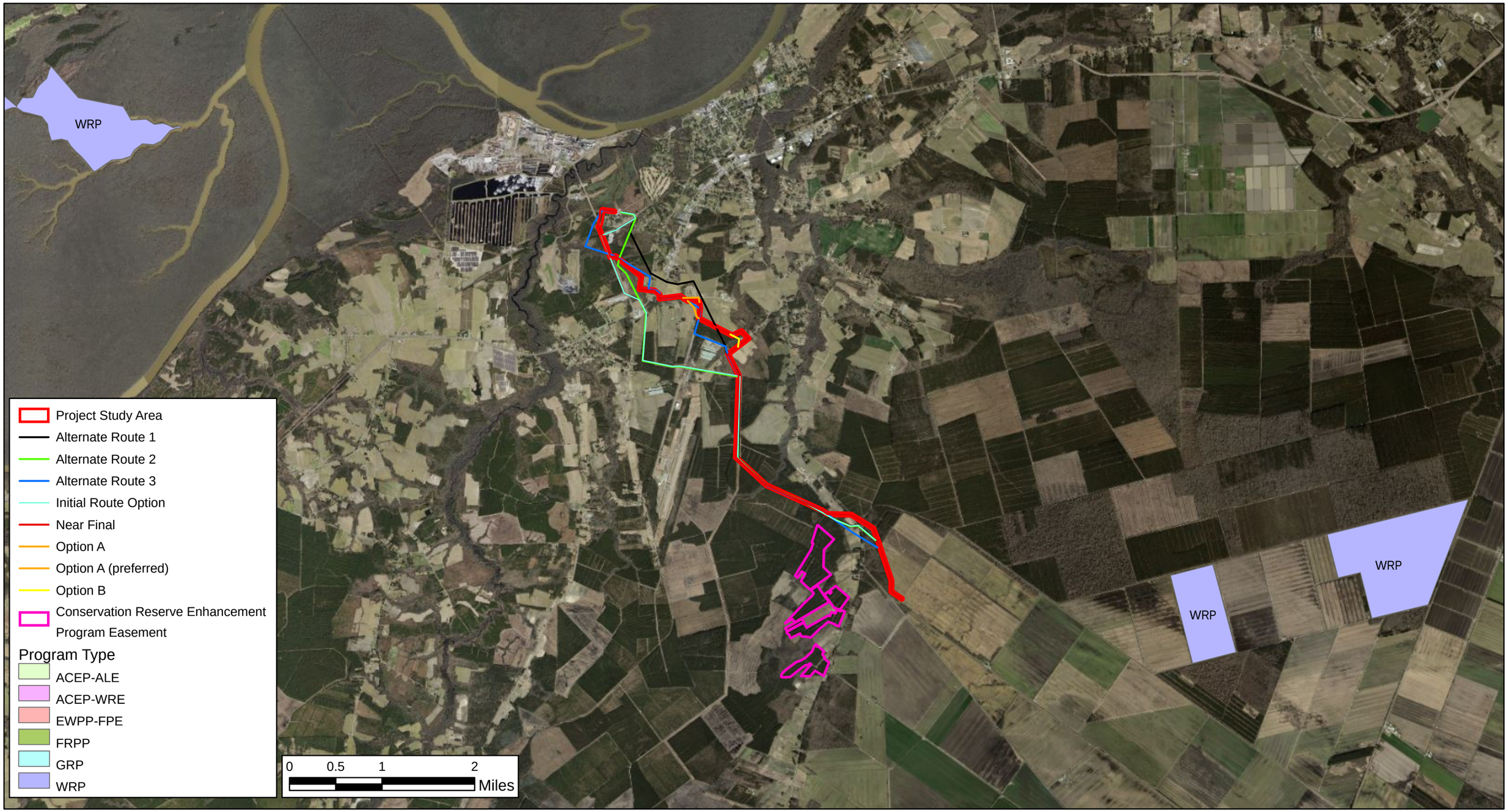
National Land Use Land Cover (NLCD)

Macadamia Transmission Line
Plymouth, Washington County, North Carolina

EXHIBIT NO.

6

Appendix G
Conservation Easements



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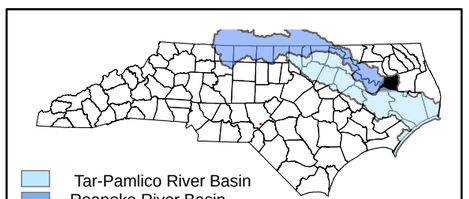
Sep 13 2021



N

Project No: 70217406

Scale: 1:63,360

File Name: Macadamia

Date: August 2021

Terracon

2401 Brentwood Road, Suite 107 Raleigh, NC 27604

Phone: (919) 873-2211 Fax: (919) 873-9555

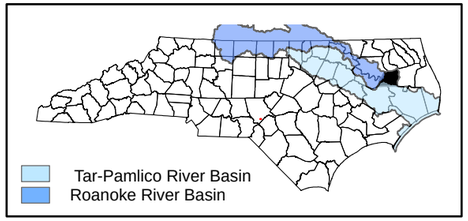
Conservation Easements

Macadamia Transmission Line
Plymouth, Washington County, North Carolina

EXHIBIT NO.

7

Appendix H
Alternative Routes



N

Project No:	70217444
Scale:	1:36,000
File Name:	Macadamia
Date:	August 2021

Terracon

2401 Brentwood Road, Suite 107 Raleigh, NC 27604

Phone: (919) 873-2211 Fax: (919) 873-9555

Alternative Routes

Macadamia Transmission Line
Plymouth, Washington County, North Carolina

EXHIBIT NO.

8

Appendix I
Superfund Sites

OFFICIAL COPY

Sep 13 2021

JAMESVILLE ROAD SOLAR, LLC

JAMESVILLE ROAD SOLAR, LLC

CBT SERVICES INC

135239 - WEYERHAEUSER NR COMPANY

136298 - DOMTAR PAPER COMPANY LLC

WEYERHAEUSER CC MPANY

WEYERHAEUSER NR DBA PLYMOUTH LUMBER MILL

ARRANTS LOGGING INCORPORATED

PERDUE GRAIN AND OILSEED, LLC - PLYMOUTH

GOLF ROAD TEXACO

FEYER FORD & MERCURY INC

SPECIALTY MINERALS INC

HAKS

WASHINGTON COUNTY SCHOOLS

WASHINGTON CO BOARD OF ED

PLYMOUTH WATER SYSTEM

GEO SPECIALTY CHEMICALS INC

CROP PRODUCTION SERVICES

CAROLINA MAT INC

GOSPEL LIGHT CH OF CHRIST

MILL POND SOLAR, LLC

PROMISE LAND CHURCH OF CHRIST

DAILY BREAD DINER

PLYMOUTH

PLYMOUTH AIRPORT

PLYMOUTH MUNICIPAL AIRPORT, RUNWAY 21 EXT

PLYMOUTH MUNI

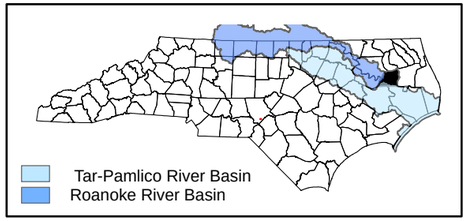
RIDDICK REPAIR

CORDON'S STORE

OIL SPILL (TRACTOR TRAILER - INTERSTATE BRANDS CORP.)

0 1,500 3,000 6,000 Feet

- Project Study Area
- Alternate Route 1
- Alternate Route 2
- Alternate Route 3
- Initial Route Option
- Near Final
- Option A
- Option A (preferred)
- Option B
- FACILITY_INTERESTS



N

Project No:	70217406
Scale:	1:36,000
File Name:	Macadamia
Date:	August 2021

Terracon

2401 Brentwood Road, Suite 107 Raleigh, NC 27604

Phone: (919) 873-2211 Fax: (919) 873-9555

EPA Facility Registry Service

Macadamia Transmission Line
Plymouth, Washington County, North Carolina

EXHIBIT NO.

9

Appendix J
USFWS and NCNHP Records

IPaC **U.S. Fish & Wildlife Service**

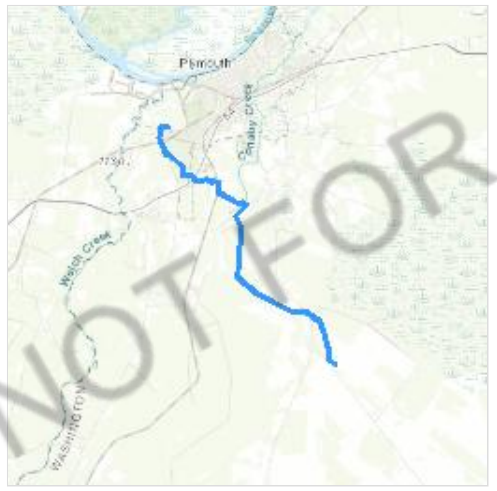
IPaC resource list

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

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

Location

Washington County, North Carolina



Local office

Raleigh Ecological Services Field Office

(919) 856-4520
(919) 856-4556

MAILING ADDRESS
Post Office Box 33726
Raleigh, NC 27636-3726

PHYSICAL ADDRESS
551 Pylon Drive, Suite F

Raleigh, NC 27606-1487

Endangered species

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

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

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

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

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

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

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

---

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

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

Mammals

NAME	STATUS

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

Red Wolf Canis rufus — EXPN
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/37

Birds

NAME	STATUS

Red Knot Calidris canutus rufa — Threatened
Wherever found
There is **proposed** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/1864

Red-cockaded Woodpecker Picoides borealis — Endangered
Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/7614

Reptiles

NAME	STATUS

American Alligator Alligator mississippiensis — SAT
Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/776

Critical habitats

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

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

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

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

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

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

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

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

American Kestrel Falco sparverius paulus — Breeds Apr 1 to Aug 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9587

Bald Eagle Haliaeetus leucocephalus — Breeds Sep 1 to Jul 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626

Probability of Presence Summary

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

Probability of Presence (■)

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

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

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

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

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

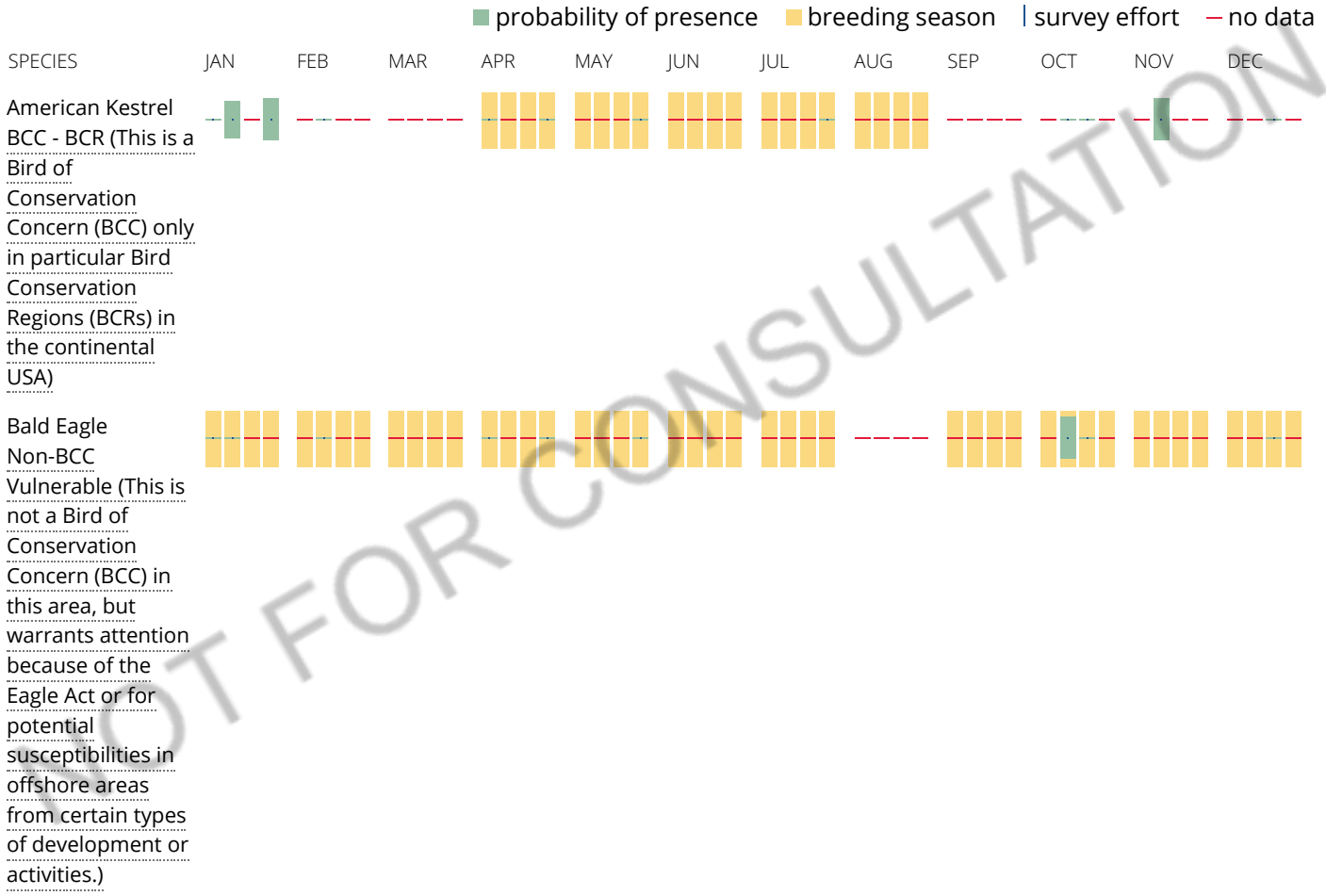
Survey Effort (|)

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

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

No Data (–)
A week is marked as having no data if there were no survey events for that week.

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



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

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

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

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

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

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

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

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

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

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

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

What are the levels of concern for migratory birds?

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

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

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

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review.

Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

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

What if I have eagles on my list?

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

Proper Interpretation and Use of Your Migratory Bird Report

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

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

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

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

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

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

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

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

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

NC DEPARTMENT OF
NATURAL AND CULTURAL RESOURCES

Roy Cooper, **Governor**
D. Reid Wilson, **Secretary**
Walter Clark
Director, Division of Land and Water Stewardship

NCNHDE-15370

August 10, 2021

Katie Talavera
Terracon Inc.
2401 Brentwood Road, Suite 107
Raleigh, NC 27603
RE: Macadamia; 70217444

Dear Katie Talavera:

The North Carolina Natural Heritage Program (NCNHP) appreciates the opportunity to provide information about natural heritage resources for the project referenced above.

Based on the project area mapped with your request, a query of the NCNHP database indicates that there are no records for rare species, important natural communities, natural areas, and/or conservation/managed areas within the proposed project boundary. Please note that although there may be no documentation of natural heritage elements within the project boundary, it does not imply or confirm their absence; the area may not have been surveyed. The results of this query should not be substituted for field surveys where suitable habitat exists. In the event that rare species are found within the project area, please contact the NCNHP so that we may update our records.

The attached 'Potential Occurrences' table summarizes rare species and natural communities that have been documented within a one-mile radius of the property boundary. The proximity of these records suggests that these natural heritage elements may potentially be present in the project area if suitable habitat exists. Tables of natural areas and conservation/managed areas within a one-mile radius of the project area, if any, are also included in this report.

If a Federally-listed species is found within the project area or is indicated within a one-mile radius of the project area, the NCNHP recommends contacting the US Fish and Wildlife Service (USFWS) for guidance. Contact information for USFWS offices in North Carolina is found here: https://www.fws.gov/offices/Directory/ListOffices.cfm?statecode=37.

Please note that natural heritage element data are maintained for the purposes of conservation planning, project review, and scientific research, and are not intended for use as the primary criteria for regulatory decisions. Information provided by the NCNHP database may not be published without prior written notification to the NCNHP, and the NCNHP must be credited as an information source in these publications. Maps of NCNHP data may not be redistributed without permission.

The NC Natural Heritage Program may follow this letter with additional correspondence if a Dedicated Nature Preserve, Registered Heritage Area, Land and Water Fund easement, or Federally-listed species are documented near the project area.

If you have questions regarding the information provided in this letter or need additional assistance, please contact Rodney A. Butler at rodney.butler@ncdcr.gov or 919-707-8603.

Sincerely,
NC Natural Heritage Program

Natural Heritage Element Occurrences, Natural Areas, and Managed Areas Within a One-mile Radius of the Project Area
Macadamia
Project No. 70217444
August 10, 2021
NCNHDE-15370

Element Occurrences Documented Within a One-mile Radius of the Project Area

Taxonomic Group	EO ID	Scientific Name	Common Name	Last Observation Date	Element Occurrence Rank	Accuracy	Federal Status	State Status	Global Rank	State Rank
Butterfly	34487	Neonympha helicta	Helicta Satyr	1980-Pre	H	5-Very Low	---	Significantly Rare	G3G4	S1?
Butterfly	34501	Neonympha helicta	Helicta Satyr	1980-Pre	H	5-Very Low	---	Significantly Rare	G3G4	S1?
Dragonfly or Damselfly	32039	Coryphaeschna ingens	Regal Darner	2004-Pre	H?	5-Very Low	---	Significantly Rare	G5	S2?
Dragonfly or Damselfly	33762	Somatochlora georgiana	Coppery Emerald	2004-Pre	H?	5-Very Low	---	Significantly Rare	G3G4	S1?
Freshwater Bivalve	8894	Leptodea ochracea	Tidewater Mucket	2000-08-09	H?	3-Medium	---	Threatened	G3G4	S2
Freshwater Bivalve	10524	Ligumia nasuta	Eastern Pondmussel	2000-08-09	H?	3-Medium	---	Threatened	G4	S2
Freshwater Fish	38940	Acipenser oxyrinchus oxyrinchus	Atlantic Sturgeon	2015-06-02	E	4-Low	Endangered	Endangered	G3T3	S2
Mammal	23088	Canis rufus	Red Wolf	2019	Er	5-Very Low	Experimental, nonessential	Threatened	G1Q	S1
Natural Community	7326	Brownwater Bottomland Hardwoods (Swamp Transition Subtype)	---	2012	C	2-High	---	---	G3G4	S3
Natural Community	15490	Tidal Swamp (Cypress--Gum Subtype)	---	2020-05-23	BC	2-High	---	---	G3G4	S4

Natural Areas Documented Within a One-mile Radius of the Project Area

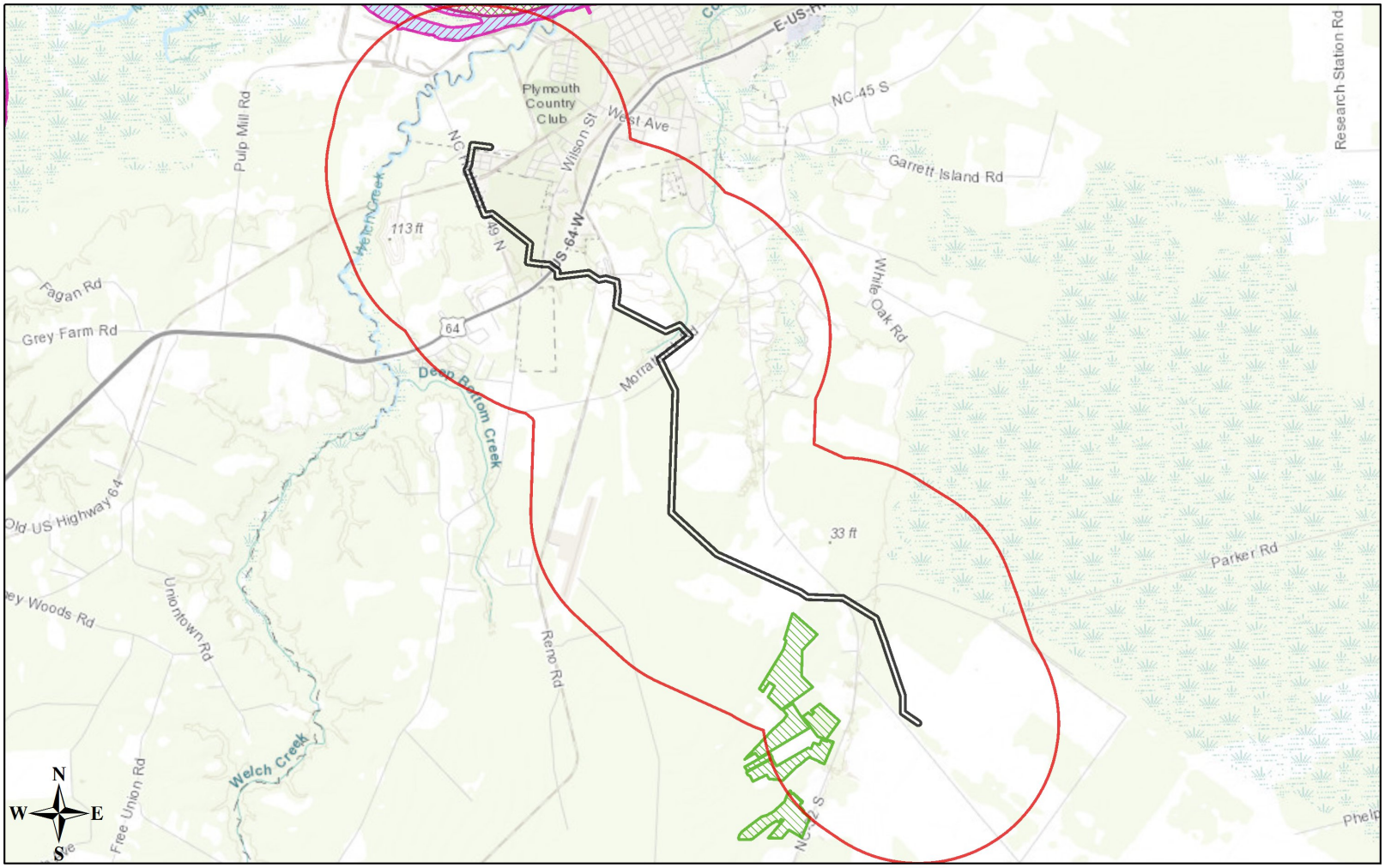
Site Name	Representational Rating	Collective Rating
ROA/Lower Roanoke River Aquatic Habitat	R2 (Very High)	C4 (Moderate)
Roanoke River Delta--Conaby Creek	R1 (Exceptional)	C3 (High)

Managed Areas Documented Within a One-mile Radius of the Project Area

Managed Area Name	Owner	Owner Type
Roanoke River Preserve	The Nature Conservancy	Private
Conservation Reserve Enhancement Program Easement	NC Department of Agriculture, Division of Soil and Water Conservation	State
Conservation Reserve Enhancement Program Easement	NC Department of Agriculture, Division of Soil and Water Conservation	State
Conservation Reserve Enhancement Program Easement	NC Department of Agriculture, Division of Soil and Water Conservation	State
Conservation Reserve Enhancement Program Easement	NC Department of Agriculture, Division of Soil and Water Conservation	State
Conservation Reserve Enhancement Program Easement	NC Department of Agriculture, Division of Soil and Water Conservation	State
Conservation Reserve Enhancement Program Easement	NC Department of Agriculture, Division of Soil and Water Conservation	State

Definitions and an explanation of status designations and codes can be found at https://ncnhde.natureserve.org/help. Data query generated on August 10, 2021; source: NCNHP, Q2 July 2021. Please resubmit your information request if more than one year elapses before project initiation as new information is continually added to the NCNHP database.

NCNHDE-15370: Macadamia



August 10, 2021

- Project Boundary
- Buffered Project Boundary
- NHP Natural Area (NHNA)
- Managed Area (MAREA)

1:63,230

0 0.5 1 2 mi

0 0.75 1.5 3 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Appendix K
Westwood Route Study

Macadamia Solar Route Study

Macadamia Solar Project: Plymouth, NC

Westwood

(Rev. 0)

September 5, 2019

Prepared by: Main Line Energy Consultants

September 5, 2019

Main Line Energy Consultants LLC (MLEC) has conducted a preliminary route study of a proposed overhead Gen-Tie line between the Macadamia Solar Project and the Trowbridge Substation in Plymouth, NC. The proposed line will eventually consist of self-supporting structures carrying a single circuit of conductor. This preliminary route study was approached via two methods; a desktop review of Archeological sites, properties, wetlands, and other obstacles using google earth, and a site visit to identify potential hazards not identified in the KMZ.

Wetland information was collected from the USGS Wetlands website. Archeological site and parcel data were provided by Westwood. Based on the provided information, Archeological and Historical sites should not be a major concern for any of the routes proposed.

Using the information gathered, MLEC has provided four KMZs. One outlining the proposed line route, one outlining each of the alternative route options, and one with all routes included. This KMZ displays obstacles identified in the field as well as parcel data, wetlands, and archeological site information. In addition to these KMZs, MLEC has provided detailed descriptions of the three routes and a decision matrix in this report. This has been provided for all of the routes, as shown in Figure 1 below.

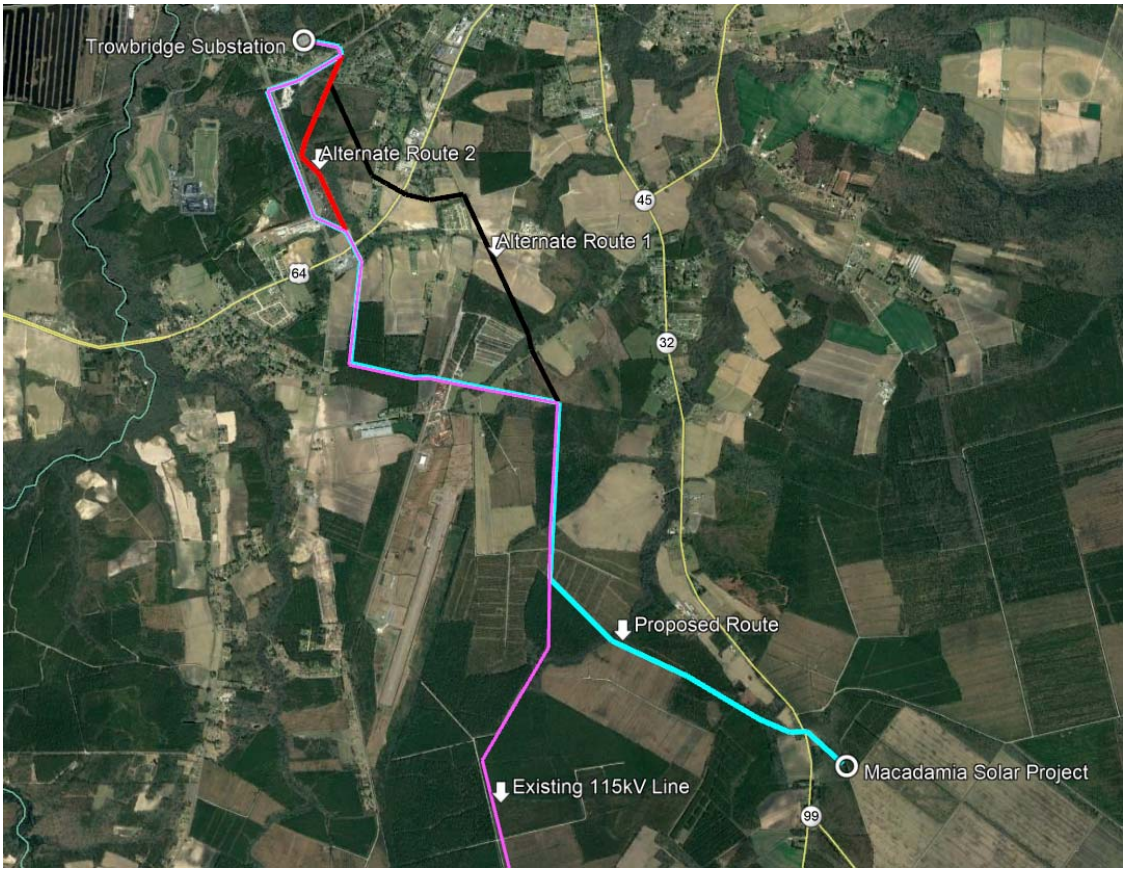


Figure 1: Overview of the three proposed routes for the Macadamia Solar Project.

Proposed Route

The original provided route intended to follow the existing Pantego – Trowbridge 115kV line for the as long as reasonably possible between the Macadamia Solar Project and the Trowbridge Substation. This resulted in the 5.85-mile route shown in Figure 2 below. Of this route, 3 miles appear to be heavily wooded.

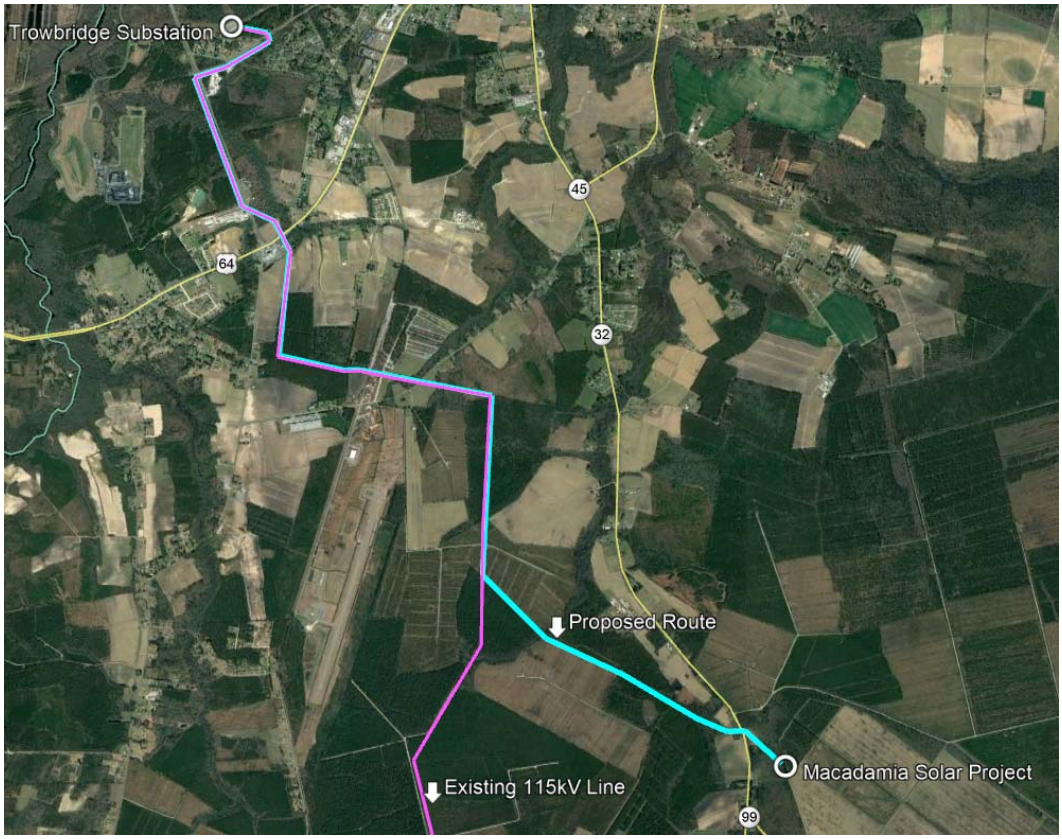


Figure 2: Original Proposed Route.

This route crosses approximately 27 unique parcel owners and six distribution crossings. This route also crosses through six potential wetlands. There are two State highway crossings and one Railroad crossing. Additionally, this route crosses over an existing house that appears to be abandoned, as shown in Figure 3. The greatest risk found with using this route is the portion along Ken Trowbridge Rd in which this line would be paralleling the existing 115kV line, shown in Figure 4. There is approximately 100ft between the existing line and the roadway. Within that area is an existing fence owned by Dominion Power Company and a gas line. This gas line may make it impossible to follow parallel to the line at this location.

Figure 3: Abandoned house at the Route 45 crossing.

Figure 4: Proposed location of line paralleling 115kV line along Ken Trowbridge Rd. Gas line marker identified in photo.

Alternate Route 1

The objective of Alternate Route 1 was to exit the existing 115kV ROW earlier to provide a shorter run to the Trowbridge Substation. This resulted in a 5.14-mile line route, as shown in Figure 5. Of this route, 3.7 miles appear to be heavily wooded.

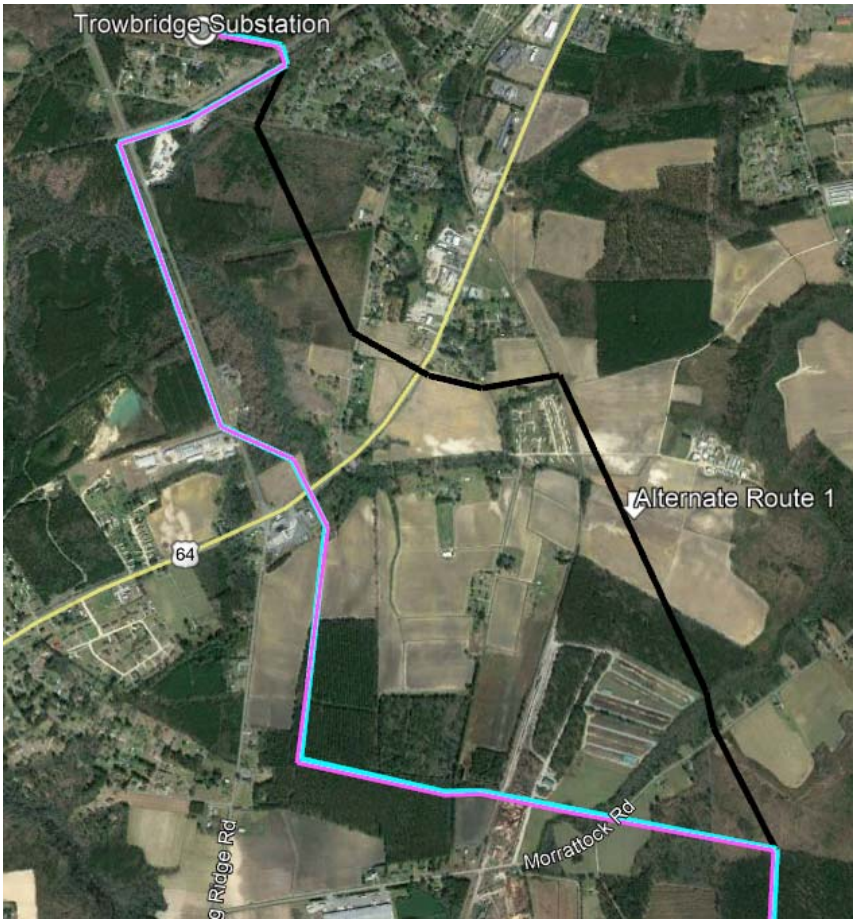


Figure 5: Alternate Route 1 with the Original Proposed Route and 115kV line route.

Additionally, this route pulls the line further away from the Plymouth Municipal Airport. This could reduce regulatory burdens with the FAA. Most importantly, this route strives to avoid the potential design conflicts previously mentioned along Ken Trowbridge Rd that the proposed route contends with. The resulting route crosses 23 unique parcel owners, seven distribution lines, and five wetlands. There are two State highway crossings and one Railroad crossing. This route also crosses the same abandoned house shown in Figure 3.

Alternate Route 2

The objective of Alternate Route 2 was to follow the existing 115kV ROW similar to the original proposed option but avoid the potential gas line conflict along Ken Trowbridge Rd shown in Figure 4. This resulted in a 5.56-mile line route, as shown in Figure 6. Of this route, 3.8 miles appear to be heavily wooded.

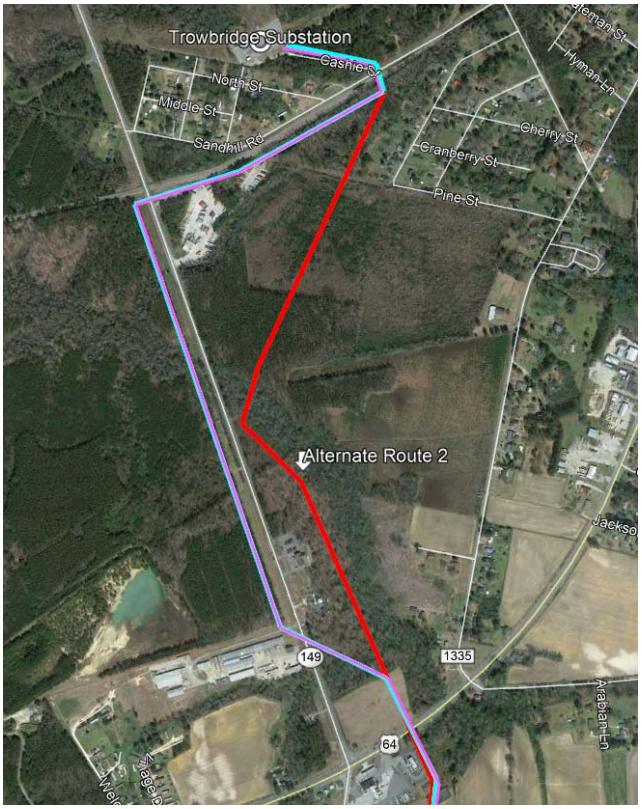


Figure 6: Alternate Route 2 with the Original Proposed Route and 115kV line route.

The resulting route mirrors most of the originally proposed route and as such, has similar hazards. This route crosses 28 unique parcel owners, five distribution lines, and six wetlands. There are two State highway crossings and one Railroad crossing. This route also crosses the same abandoned house shown in Figure 3.

Appendix A

Route Decision Matrix

WES-19-012 Macadamia Solar Route Study
Comparison of Proposed Route and Alternate Routes 1 and 2

Line Length	Proposed Route	Alt 1	Alt 2
Total (mi)	5.85	5.14	5.56
Length through Wooded locations (mi)	3.02	3.7	3.81

Landowner Information	Proposed Route	Alt 1	Alt 2
Total Number of Landowners Crossed	27	23	28
Number of Landowners Crossed without Dominion Power Easement	5	17	10

WES-19-012 Macadamia Solar Route Study
Proposed Route

*Line Obstacles include, but are not limited to wetlands, archaeological sites (if known), railroad crossings, river crossings, and/or state/county highway crossings
**Unique line characteristic types include Long spans, structural obstacles, and/or items that could pose a specific threat to the success of the proposed route
***Easement information is based on provided KMZ. Locations without easement information were estimated using observable boundaries in google earth

Line Length	
Total (mi)	5.85
Length through Wooded locations (mi)	3.02

Landowner Information	
Total Number of Landowners Crossed	27
Number of Landowners Crossed without Dominion Power Easement	5

Unique Line Concerns		
Type**	Location on Line	Other Info
Dominion Power Gas Line	North end. Parrallel Route 149.	Likely to cause design issues.
House	Start of Line	Appears Abandoned
Line Obstacles/Constraints		
Type*	Location on Line	Other Info
Wetland	NW of Route 32 crossing	USGS Identified
Wetland	South East of 115kV line merge	USGS Identified
Wetland	North of 115kV line merge	USGS Identified
Wetland	Both sides of Morratock Rd	USGS Identified
Wetlands	North of Route 64 Crossing	USGS Identified
wetlands	Parallel to Railroad at end of line	USGS Identified
Distribution Line	West of Route 45	Site Verified
Distribution Line	East of Morratock Rd	Site Verified
Distribution Line & Buried Cable	Route 64 Crossing	Site Verified
Distribution Line	Ken Trowbridge Rd Crossing	Site Verified
Distribution Line	Area Parallel to Railroad near end of line	Google Earth Verified
Distribution Line	Sandhill Road Crossing	Site Verified
Railroad Crossing	End of Line	
State Route 32 Crossing	Start of Line	
State Route 64 Crossing	Northern quarter of line.	

Easement Information		
Landowner	Location on Line	FID
Pruden, Albert Jr.	Both sides of Rt 45 crossing	66
White, Jack	West of Albert Pruden	70
Weyerhaeuser Company	West of Jack White	25/26/20
Askew, Timothy	North of WH C. 20	19
Cooper, Arnita Lanier	North of Timothy Askew	37
Unknown 1	West of Arnita Cooper	N/A
Unknown 2	Northwest of Morratock Road Crossing	N/A
Norfolk Southern Railroad	West of Unknown 2	42
Unknown 3	West of Norfolk Souther Railroad	N/A
Trade Land Company	North of Unknown 3	22
Unknown 4 (Dunkin' Donuts/Wendy's)	Between Trade Land Co. and J.S.C. Inc.	N/A
J.S.Z. Inc.	North of Rt 64 crossing, East of Rt 149	31
Carolina Mat Inc.	West of 149 crossing	53/34
Domtar Paper Company	North of CMI 34	30
Bell, Peter	North of DPC 30	33
Domtar Paper Company	North of Peter Bell	29/32
CSX Transportation Inc.	East of DPC and Rt 149 Crossing	28
First Properties Inc.	West of CSX 28	43
Bryant, A.A.	West of CSX 28	47
Lutz, Eugene	West of CSX 28	44
Pratt, Arnold	West of CSX 28	45/46
Moore Property, LLC	West of CSX 28	48/49
Peyton, Alan	West of CSX 28	50/51
CSX Railroad	North of Alan Peyton	54
Unknown 5	Cashie Street, from Sandhill Road to Substation	N/A
Venue Holdings LLC.	Both sides of Cashie Street	52
Virginia Electric & Power Company	West of Venue Holdings	27

WES-19-012 Macadamia Solar Route Study
Alternate Route 1

*Line Obstacles include, but are not limited to wetlands, archaeological sites (if known), railroad crossings, river crossings, and/or state/county highway crossings

**Unique line characteristic types include Long spans, structural obstacles, and/or items that could pose a specific threat to the success of the proposed route

***Easement information is based on provided KMZ. Locations without easement information were estimated using observable boundaries in google earth

Line Length	
Total (mi)	5.14
Length through Wooded locations (mi)	3.7

Landowner Information	
Total Number of Landowners Crossed	23
Number of Landowners Crossed without Dominion Power Easement	17

Unique Line Characteristics		
Type**	Location on Line	Other Info
House	Start of Line	Appears Abandoned
Line Obstacles/Constraints		
Type*	Location on Line	Other Info
Wetland	NW of Route 32 crossing	USGS Identified
Wetland	South East of 115kV line merge	USGS Identified
Wetland	North of 115kV line merge	USGS Identified
Wetland	North of Morratock Rd	USGS Identified
wetlands	Parallel to Railroad at end of line	USGS Identified
Distribution Line	West of Route 45	Site Verified
Distribution Line	East of Morratock Rd	Site Verified
Distribution Line & Buried Cable	North of Route 64 Crossing	Site Verified
Distribution Line	Ken Trowbridge Rd Crossing	Google Earth Verified
Distribution Line	Wilson Str Crossing	Google Earth Verified
Distribution Line	Area Parallel to Railroad near end of line	Google Earth Verified
Distribution Line	Sandhill Road Crossing	Site Verified
Railroad Crossing	End of Line	
State Route 32 Crossing	Start of Line	
State Route 64 Crossing	Northern quarter of line.	

Easement Information***		
Landowner	Location on Line	FID
Pruden, Albert Jr.	Both sides of Rt 45 crossing	66
White, Jack	West of Albert Pruden	70
Weyerhaeuser Company	West of Jack White	25/26/20
Askew, Timothy	North of WH C. 20	19
Cooper, Arnita Lanier	North of Timothy Askew	37
Unknown 6	Between Anita Cooper and Mahlon Moore	N/A
Moore, Mahlon	North of Morattock Road Crossing	40
Sexton Farms LLC	East of Norfolk Southern Railroad Crossing	38
Unknown 7	Both sides of Norfolk Southern Railroad Crossing	N/A
Unknown 8	East of Rt 64 crossing	N/A
Unknown 9	Between Rt 64 and Wilson Street	N/A
Unknown 10	West of Wilson Street	N/A
Unknown 11	Where Alt Route 1 & Alt Route 2 converge	N/A
Bryant, A.A.	West of CSX 28	47
Lutz, Eugene	West of CSX 28	44
Pratt, Arnold	West of CSX 28	45/46
Moore Property, LLC	West of CSX 28	48/49
Peyton, Alan	West of CSX 28	50/51
CSX Railroad	North of Alan Peyton	54
Unknown 5	Cashie Street, from Sandhill Road to Substation	N/A
Venue Holdings LLC.	Both sides of Cashie Street	52
Virginia Electric & Power Company	West of Venue Holdings	27

WES-19-012 Macadamia Solar Route Study
Alternate Route 2

*Line Obstacles include, but are not limited to wetlands, archaeological sites (if known), railroad crossings, river crossings, and/or state/county highway crossings
**Unique line characteristic types include Long spans, structural obstacles, and/or items that could pose a specific threat to the success of the proposed route
***Easement information is based on provided KMZ. Locations without easement information were estimated using observable boundaries in google earth

Line Length	
Total (mi)	5.56
Length through Wooded locations (mi)	3.81

Landowner Information	
Total Number of Landowners Crossed	28
Number of Landowners Crossed without Dominion Power Easement	10

Unique Line Characteristics		
Type**	Location on Line	Other Info
House	Start of Line	Appears Abandoned
Line Obstacles/Constraints		
Type*	Location on Line	Other Info
Wetland	NW of Route 32 crossing	USGS Identified
Wetland	South East of 115kV line merge	USGS Identified
Wetland	North of 115kV line merge	USGS Identified
Wetland	Both sides of Morratock Rd	USGS Identified
Wetlands	North of Route 64 Crossing	USGS Identified
wetlands	Parallel to Railroad at end of line	USGS Identified
Distribution Line	West of Route 45	Site Verified
Distribution Line	East of Morratock Rd	Site Verified
Distribution Line & Buried Cable	Route 64 Crossing	Site Verified
Distribution Line	Area Parallel to Railroad near end of line	Google Earth Verified
Distribution Line	Sandhill Road Crossing	Site Verified
Railroad Crossing	End of Line	
State Route 32 Crossing	Start of Line	
State Route 64 Crossing	Northern quarter of line.	

Easement Information		
Landowner	Location on Line	FID
Pruden, Albert Jr.	Both sides of Rt 45 crossing	66
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Weyerhaeuser Company	West of Jack White	25/26/20
Askew, Timothy	North of WH C. 20	19
Cooper, Arnita Lanier	North of Timothy Askew	37
Unknown 1	West of Arnita Cooper	N/A
Unknown 2	Northwest of Morratock Road Crossing	N/A
Norfolk Southern Railroad	West of Unknown 2	42
Unknown 3	West of Norfolk Souther Railroad	N/A
Trade Land Company	North of Unknown 3	22
Unknown 4 (Dunkin' Donuts/Wendy's)	Between Trade Land Co. and J.S.C. Inc.	N/A
J.S.Z. Inc.	North of Rt 64 crossing, East of Rt 149	31
Unknown 12	North of J.S.C. East of Rt 149	N/A
Domtar Paper Company	East of Rt 149	30
Bell, Peter	North of DPC 30	33
Unknown 13	Northeast of Peter Bell	N/A
Unknown 11	Where Alt Route 1 & Alt Route 2 converge	N/A
Bryant, A.A.	West of CSX 28	47
Lutz, Eugene	West of CSX 28	44
Pratt, Arnold	West of CSX 28	45/46
Moore Property, LLC	West of CSX 28	48/49
Peyton, Alan	West of CSX 28	50
Peyton, Alan	West of CSX 28	51
CSX Railroad	North of Alan Peyton	54
Unknown 5	Cashie Street, from Sandhill Road to Substation	N/A
Venue Holdings LLC.	Both sides of Cashie Street	52
Virginia Electric & Power Company	West of Venue Holdings	27

Appendix L
Wetland and Waters Delineation Report

Wetland and Waters Delineation

Macadamia Transmission Line

Washington County, North Carolina

September 3, 2020

Terracon Project No. 70217444

Prepared for:
Geenex Solar
Charlotte, North Carolina

Prepared by:
Terracon Consultants, Inc.
Raleigh, North Carolina

Terracon

September 3, 2020

Ms. Amanda Corll
Geenex Solar
7804-C Fairview Road #257
Charlotte, NC 28226

Telephone: (843) 323-9580
E-mail: Amanda.Corll@geenexsolar.com

Re: Wetland and Waters Delineation
Macadamia Transmission Line
Washington County, North Carolina
Terracon Project No. 70217444

Dear Ms. Corll:

Terracon Consultants, Inc. (Terracon) has completed the requested wetlands and waters of the U.S. (WOTUS) delineation for the Macadamia Transmission Line located in Washington County, NC (Figure 1). Terracon was tasked with evaluating features that may be considered subject to jurisdiction and permitting requirements under Sections 404 and 401 of the Clean Water Act (CWA). As of the date of this report, this wetland and WOTUS delineation includes the approximately 90% of the proposed transmission corridor over which Macadamia has site control at this time.

Background Research

Prior to the initiation of field efforts, several available resources were reviewed, including the U.S. Geological Survey 7.5-minute topographic quadrangles of Plymouth West and Plymouth East, NC, the NRCS Soil Survey of Washington County, NC, aerial photography, and other publicly available mapping resources. Field work was conducted by Terracon staff in July and August 2021.

Topography

Topography in the study area is flat. Elevations range from a high of approximately 40 feet above mean sea level (MSL) down to approximately 5 feet MSL (Exhibit 1) based on a review of USGS mapping.

Soils

The general soil associations within the transmission corridor are the Augusta-Altavista-Wahee association, the Dragston-Conetoe-Altavista association, and the Cape Fear-Portsmouth-Roanoke association. The Augusta-Altavista-Wahee association is characterized as nearly level and gently sloping, well drained and somewhat excessively drained soils that have a sandy surface layer and dominantly loamy subsoil or sandy underlying material; on uplands. The Dragston-Conetoe-Altavista association is characterized as nearly level and gently sloping, somewhat poorly drained, well drained, and moderately well drained soils that have a sandy or loamy surface layer and a loamy and sandy subsoil; on uplands. The Cape Fear-Portsmouth-Roanoke association is characterized as nearly level, very poorly drained and poorly drained soils that have a loamy surface layers and a loamy or clayey subsoil; on stream terraces. Exhibit 2 depicts thirteen soil mapping units potentially occurring in the study area. The Dorovan, Muckalee, Portsmouth, Roanoke, and Tomotley soil mapping units are considered hydric soils. Altavista, Augusta, Cape Fear, Dragston, and Wahee soils are classified as non-hydric soils known to have inclusions of hydric soils.

Clean Water Act Waters of the United States

Section 404 of the CWA requires regulation of discharges into waters of the U.S. (WOTUS). Although the principal administrative agency of the CWA is the U.S. Environmental Protection Agency (EPA), the U.S. Army Corps of Engineers (USACE) has major responsibility for implementation, permitting, and enforcement of provisions of the CWA. Water bodies such as rivers, lakes, and streams are subject to jurisdictional consideration under the Section 404 program. However, by regulation, certain wetlands are also considered WOTUS. The Navigable Waters Protection Rule (NWPR) has been implemented by the EPA to clarify the extent of federal jurisdiction. However, wetlands and other waterbodies that do not fall under federal regulation may be subject to jurisdiction by the N.C Division of Water Resources (NCDWR) under the state's Isolated and Other Non-404 Jurisdictional Wetlands and Waters program.

Our delineation methodology generally follows the guidance outlined in the Regional Supplement to the USACE Wetland Delineation Manual for the Atlantic and Gulf Coastal Plain Region, which states that areas must exhibit three distinct characteristics to be considered jurisdictional wetlands: 1) prevalence of hydrophytic (water tolerant) plants; 2) presence of hydric soils; and 3) sufficient wetland hydrology indicators within 12 inches of the ground surface.

The Transmission Corridor was also reviewed for the presence of stream channels and tributaries using criteria provided by the USACE and the North Carolina Division of Water Resources (NCDWR). When present, intermittent and perennial stream channels, and certain surface waters, are also considered WOTUS under Section 404 of the CWA.

Preliminary Delineation Results

Our review of the 6.53-mile Macadamia Transmission Line identified twenty-three (23) wetlands and five (5) tributaries (Exhibit 3). One additional wetland was previously delineated at the southern end of the Transmission Corridor. These features may be subject to Section 404/401 jurisdiction by the USACE and/or NCDWR. Potential wetlands were flagged with pink-and-black and blue flagging and potential tributaries were flagged with orange and blue flagging. At this

time, this delineation does not include the property at the northern end of the Transmission Corridor, but addresses the remainder of the proposed corridor over which Macadamia has site control at this time.

These delineation results are considered preliminary and are subject to change pending site review by the USACE. Exhibit 3 depicts the approximate location and extent of the potential wetlands and tributaries and was prepared using non-survey grade, sub-meter GPS data. Exhibit 3 is not a replacement for a traditional survey. It is suitable for preliminary planning purposes only and for use by a surveyor to aid in locating flags. All potential wetlands and tributaries will likely be subject to Section 404/401 jurisdiction.

The following tables contain the specific information for the potential wetlands and tributaries that were identified and delineated inside the property boundary. The potential wetlands were classified according to the North Carolina Wetland Assessment Method (NCWAM).

Table 1. Potential Wetlands on the Macadamia Transmission Line

Wetland #	NCWAM Classification	Hydrophytic Vegetation	Hydric Soil (Munsell color)	Hydrology
W1	Bottomland Hardwood Forest	Red maple, sweetgum, lamp rush	2.5Y 5/2 with redox concentrations	High water table, saturation, water-stained leaves
W2	Bottomland Hardwood Forest	Sweetgum, red maple, poison ivy	10YR 4/2 with redox concentrations	High water table, saturation, water-stained leaves
W3	Hardwood Flat	Sweetgum, red maple, Chinese privet	2.5Y 5/2 with redox concentrations	Surface water, high water table, water-stained leaves
W4	Bottomland Hardwood Forest	Sweetgum, red maple, netted chain-fern	2.5Y 5/2	High water table, saturation, water-stained leaves
W5	Pine Flat	Sweetgum, red maple, netted chain-fern	7.5YR 5/1 with redox concentrations	High water table, saturation, water-stained leaves
W6	Pine Flat	Black willow, blackberry, lamp rush	2.5Y 6/1 with redox concentrations	Surface water, high water table, water-stained leaves

Wetland #	NCWAM Classification	Hydrophytic Vegetation	Hydric Soil (Munsell color)	Hydrology
W7	Pine Flat	Sweetgum, red maple, netted chain-fern	2.5Y 6/1 with redox concentrations	Surface water, high water table, water-stained leaves
W8	Pine Flat	Sweetgum, red maple, netted chain-fern	2.5Y 6/1 with redox concentrations	Surface water, high water table, water-stained leaves
W9	Pine Flat	Red maple, willow oak, lamp rush	2.5Y 6/2 with redox concentrations	Saturation, water-stained leaves, oxidized rhizospheres
W10	Pine Flat	Loblolly pine, red maple, lamp rush	2.5Y 4/1 with redox concentrations	Surface water, high water table
W11	Riverine Swamp Forest	Sweetgum, black willow, lamp rush	10YR 5/1 with redox concentrations	Surface water, high water table
W12	Pine Flat	Loblolly pine, red maple, lamp rush	2.5Y 6/1 with redox concentrations	Surface water, high water table
W13	Pine Flat	Loblolly pine, red maple, lamp rush	10YR 4/1 with redox concentrations	Surface water, high water table, water-stained leaves
W14	Pine Flat	Sweetgum, red maple, saw-tooth blackberry	2.5Y 4/1 with redox concentrations	Surface water, high water table, water-stained leaves
W15	Hardwood Flat	Lamp rush, red maple, bushy bluestem	2.5Y 5/1 with redox concentrations	High water table, saturation
W16	Hardwood Flat	Loblolly pine, red maple, giant cane	2.5Y 6/1 with redox concentrations	High water table, saturation, water-stained leaves
W17	Hardwood Flat	Lamp rush, shallow sedge, bushy bluestem	2.5Y 5/1 with redox concentrations	High water table, saturation

Wetland #	NCWAM Classification	Hydrophytic Vegetation	Hydric Soil (Munsell color)	Hydrology
W18	Hardwood Flat	Red maple, willow oak, lamp rush	2.5Y 3/2 with redox concentrations	High water table, saturation, water-stained leaves
W19	Hardwood Flat	Sweetgum, red maple, lamp rush	2.5Y 4/1 with redox concentrations	High water table, saturation
W20	Hardwood Flat	Red maple, sweetgum, lamp rush	2.5Y 4/1 with redox concentrations	High water table, saturation, water-stained leaves
W21	Hardwood Flat	Sweetgum, red maple, saw-tooth blackberry	2.5Y 4/1 with redox concentrations	High water table, saturation, water-stained leaves
W22	Hardwood Flat	Sweetgum, red maple, saw-tooth blackberry	2.5Y 4/1 with redox concentrations	High water table, saturation, water-stained leaves
W23	Hardwood Flat	Red maple, sweetgum, giant cane	2.5Y 4/1 with redox concentrations	High water table, saturation, water-stained leaves

Table 2. Potential Waters on the Macadamia Transmission Line

Waters #	Flow Regime	NCDWQ Stream ID Form Score	Approximate Width (ft)
T1	Perennial	30.5	5
T2	Intermittent	26.5	3
T3	Perennial	31.5	12
T4	Intermittent	22	4

Waters #	Flow Regime	NCDWQ Stream ID Form Score	Approximate Width (ft)
T5	Intermittent	20	3

Twenty-two (22) potentially jurisdictional ditches were also identified within the study area. Final discretion lies with USACE regarding jurisdiction with the ditch features. These features exhibited water-stained leaves, standing water, and sporadic emergent hydrophytic vegetation growing throughout with a flow pattern more indicative of an ephemeral channel. The USACE stance on these ditch features will likely depend on the condition at the time of agency review; however, based on our best professional judgment, these features may be considered jurisdictional tributaries with low aquatic function.

Clean Water Act Permitting

Most impacts to WOTUS, which are deemed under the jurisdiction of either the federal or state regulatory authority (USACE or NCDWR, respectively) must first be permitted pursuant to Section 404 and Section 401 of the CWA and/or the State's Isolated and Other Non-404 Jurisdictional Wetlands and Waters program. Activities so authorized are subject to additional requirements to comply with water quality and storm water management. The Nationwide Permit program (NWP) administered by USACE provides permitting of impacts which do not exceed pre-determined thresholds. Please note the potential wetland and tributary appear to be hydrologically connected to other WOTUS based on our professional opinion. These features will likely be subject to Section 404 jurisdiction. If determined necessary, Terracon can prepare and submit a Preliminary Jurisdictional Determination (PJD) request to USACE to obtain written concurrence.

Riparian Buffers

The majority of the Macadamia Transmission Line is within the Roanoke River basin. No riparian buffer rules regulated by the state of North Carolina apply to the Roanoke River basin. Approximately 1.7 miles of the project corridor at the southern end is located within the Tar-Pamlico River Basin. Per the Tar-Pamlico River Basin Riparian Buffer Rule, a 50-ft riparian buffer may apply to streams and other water bodies that are mapped on either the most current version of the 1:24,000 scale (7.5 minute) USGS quadrangle topographic maps (Exhibit 1) and/or the published county Soil Survey as prepared by NRCS (Exhibit 2).

The previously delineated ditch at the southern end of the Transmission Corridor is depicted on the USGS topographic map. Because the previous delineation in this portion of the study area classified this feature as a ditch, it is likely that it should not be subject to the Tar-Pamlico River Riparian Buffer Rules. However, concurrence from NCDWR will be required in order to exempt this feature from a 50-ft. Tar-Pamlico riparian buffer.

Recommendations

Potential WOTUS (wetlands and tributaries) have been identified on the Macadamia Transmission Line. If impacts to wetlands or WOTUS are proposed, a PJD request package,

suitable for submittal to the USACE, can be prepared for this property. Note however, a PJD review is not a prerequisite for Section 404/401 permitting; however, it is recommended. Terracon's professional opinion is that all wetlands and waters will be subject to 404 jurisdiction and 404/401 permitting would be needed to impact these features. Concurrence from NCDWR will be required to exempt a previously delineated ditch from the Tar-Pamlico Riparian Buffer Rules. It is important to note that applying for a Section 404 permit from USACE also triggers the need for compliance with the Endangered Species Act and the Historic Preservation Act. Terracon is experienced with ensuring compliance with the above regulatory requirements as well as offering full service permitting assistance.

If you have any questions regarding this report or need assistance with any other aspect of this project, please contact us at (919) 617-9153.

Sincerely,
Terracon Consultants, Inc.

Robert Turnbull
Department Manager

Jeff Harbour, PWS
Senior Scientist

0 2,000 4,000 8,000 Feet

USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed June, 2020.

Project Study Area

N

Project No:	70217406
Scale:	1:48,000
File Name:	Macadamia
Date:	September 2021

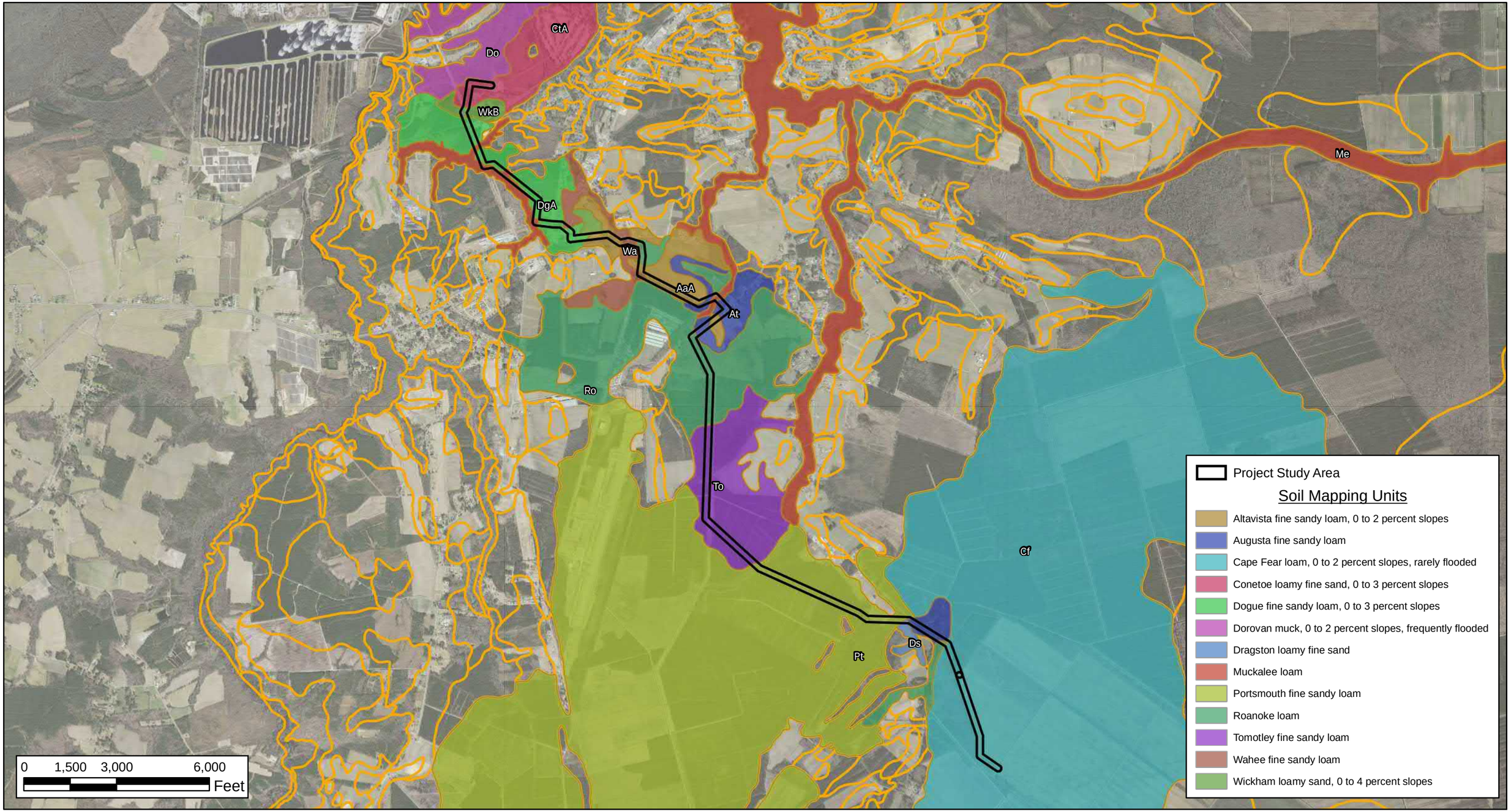
Terracon
2401 Brentwood Road, Suite 107 Raleigh, NC 27604
Phone: (919) 873-2211 Fax: (919) 873-9555

Project Location

Macadamia Transmission Line
Plymouth, Washington County, North Carolina

EXHIBIT NO.

1



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Project No: 70217406
Scale: 1:36,000
File Name: Macadamia
Date: September 2021

Terracon
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NRCS Soils

Macadamia Transmission Line
Plymouth, Washington County, North Carolina

EXHIBIT NO. **2**

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Sep 13 2021

Unknown

NC-149 HWY

Center Ave

Middle St

North St

Park Ave

Cashie St

Sandhill Rd

Campbell St

Park Ave

Oakford Ave

Cherry St

Cranberry St

Pine St

Wilson St

Project Study Area
Potential Wetland
Potential Ditch
Potential Tributary
Previously Delineated Ditch
Previously Delineated Wetland
2018.08.15_Wetland Delineation_Timmons_Macadamia-Site

0 200 400 800
Feet

N

Project No: 70217444

Scale: 1:4,800

File Name: Macadamia_JD

Date: September 2021

Terracon

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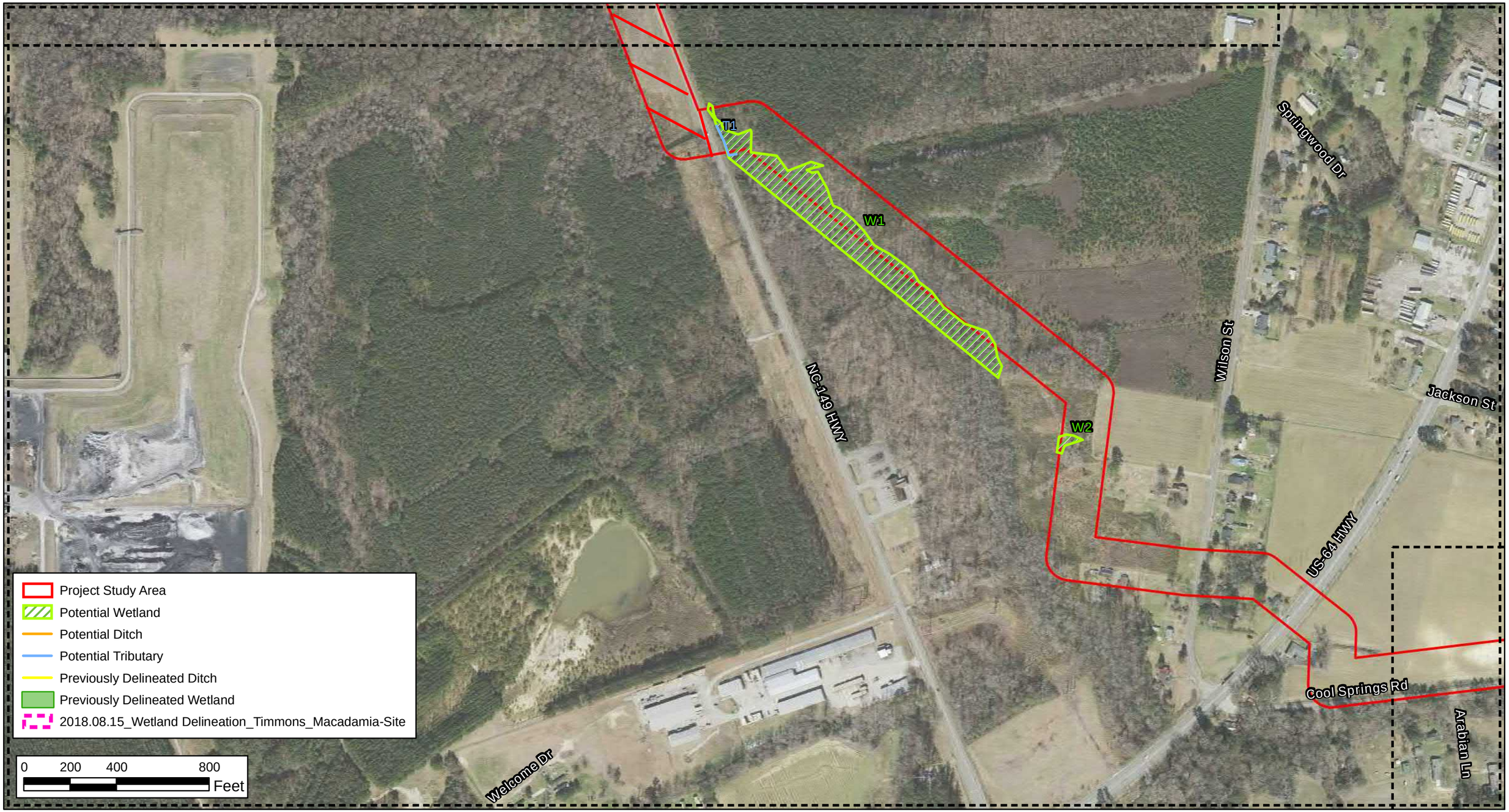
Potential Wetlands and Waters

Macadamia Transmission Line
Plymouth, Washington County, North Carolina

EXHIBIT NO.

3a



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Project No:	70217444
Scale:	1:4,800
File Name:	Macadamia_JD
Date:	September 2021

Terracon
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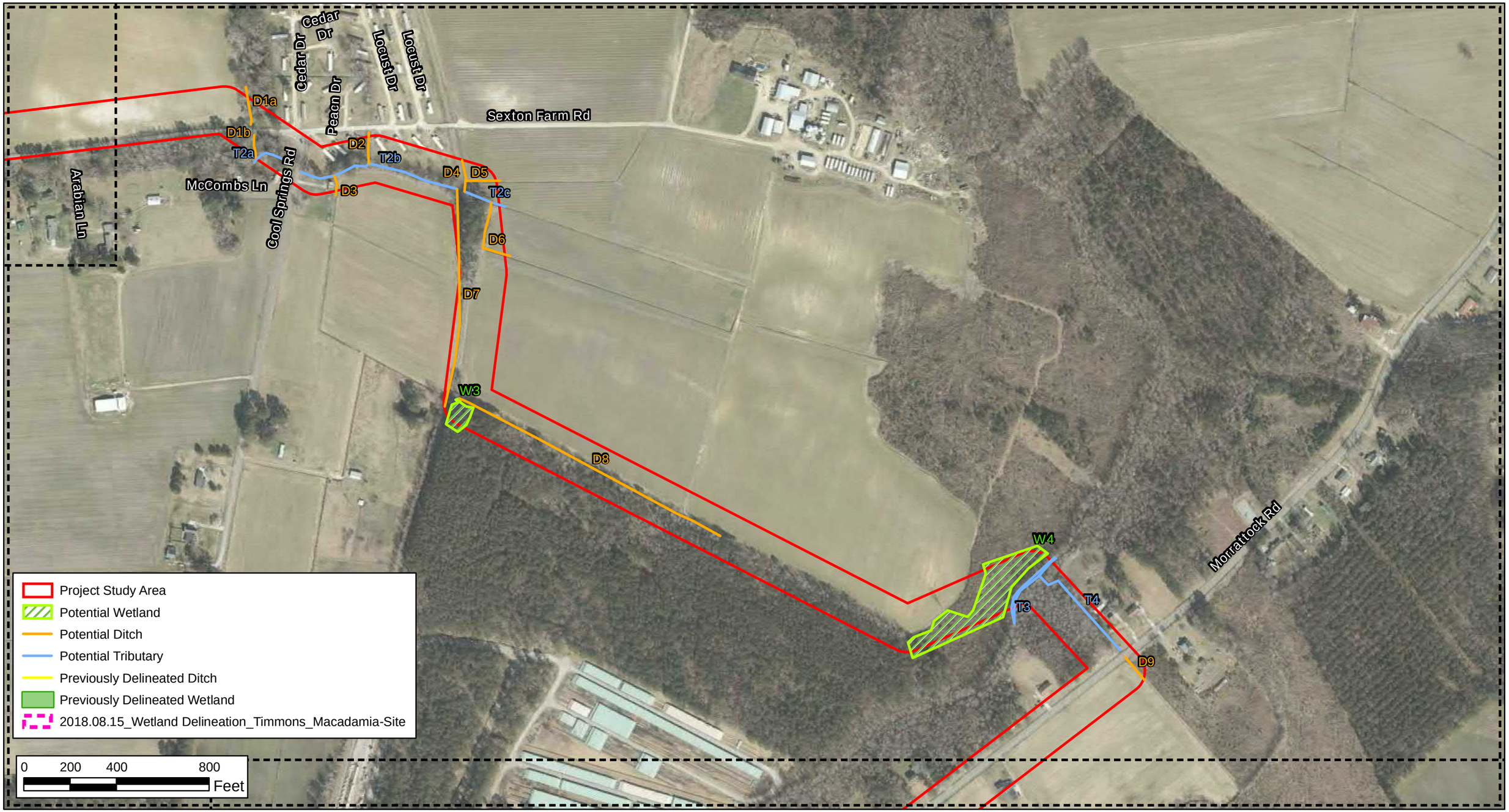
Potential Wetlands and Waters

Macadamia Transmission Line
Plymouth, Washington County, North Carolina

EXHIBIT NO.

3b



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Sep 13 2021

N

Project No:	70217444
Scale:	1:4,800
File Name:	Macadamia_JD
Date:	September 2021

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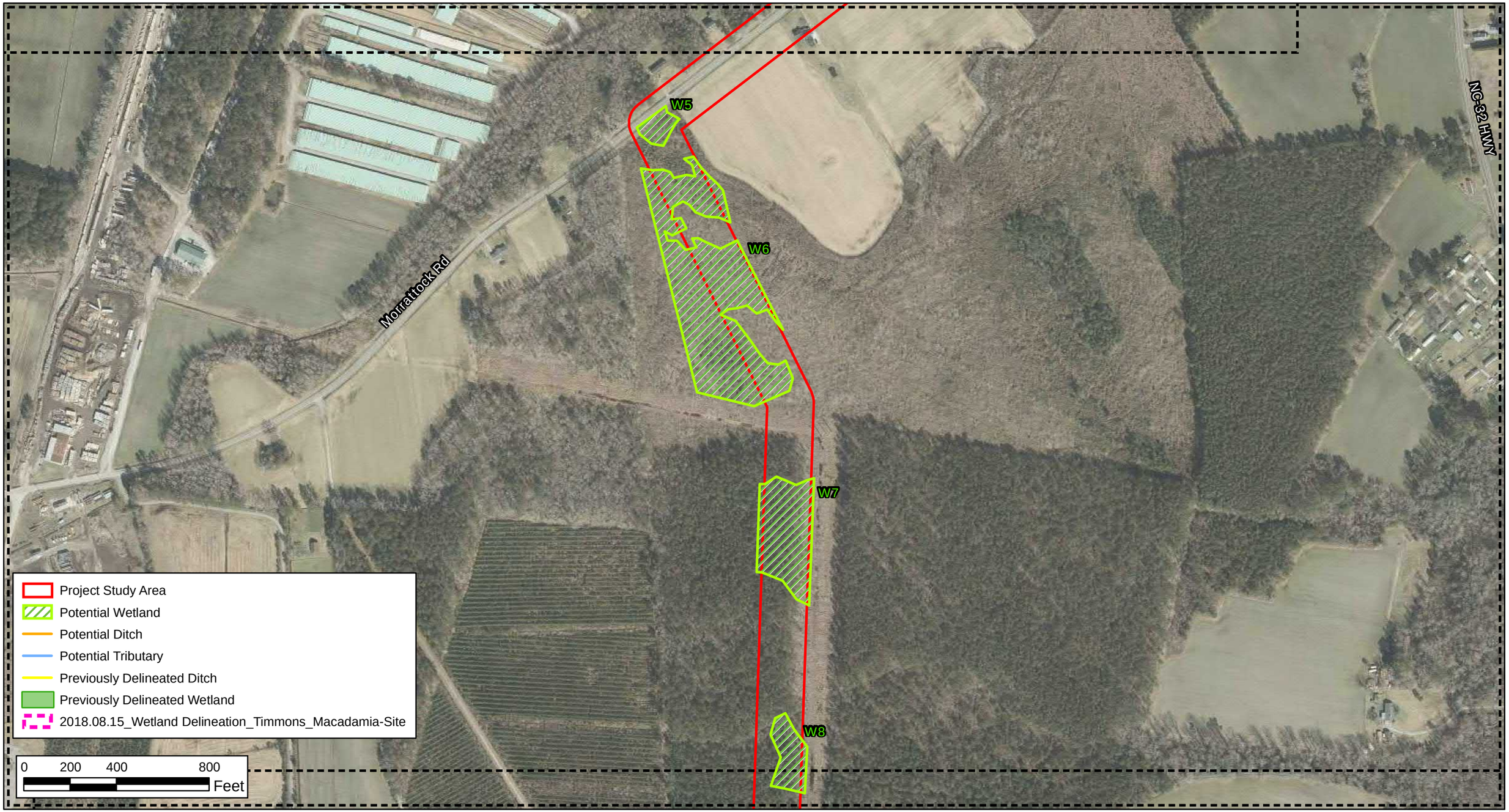
Potential Wetlands and Waters

Macadamia Transmission Line
Plymouth, Washington County, North Carolina

EXHIBIT NO.

3c



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Scale:	1:4,800
File Name:	Macadamia_JD
Date:	September 2021

Terracon
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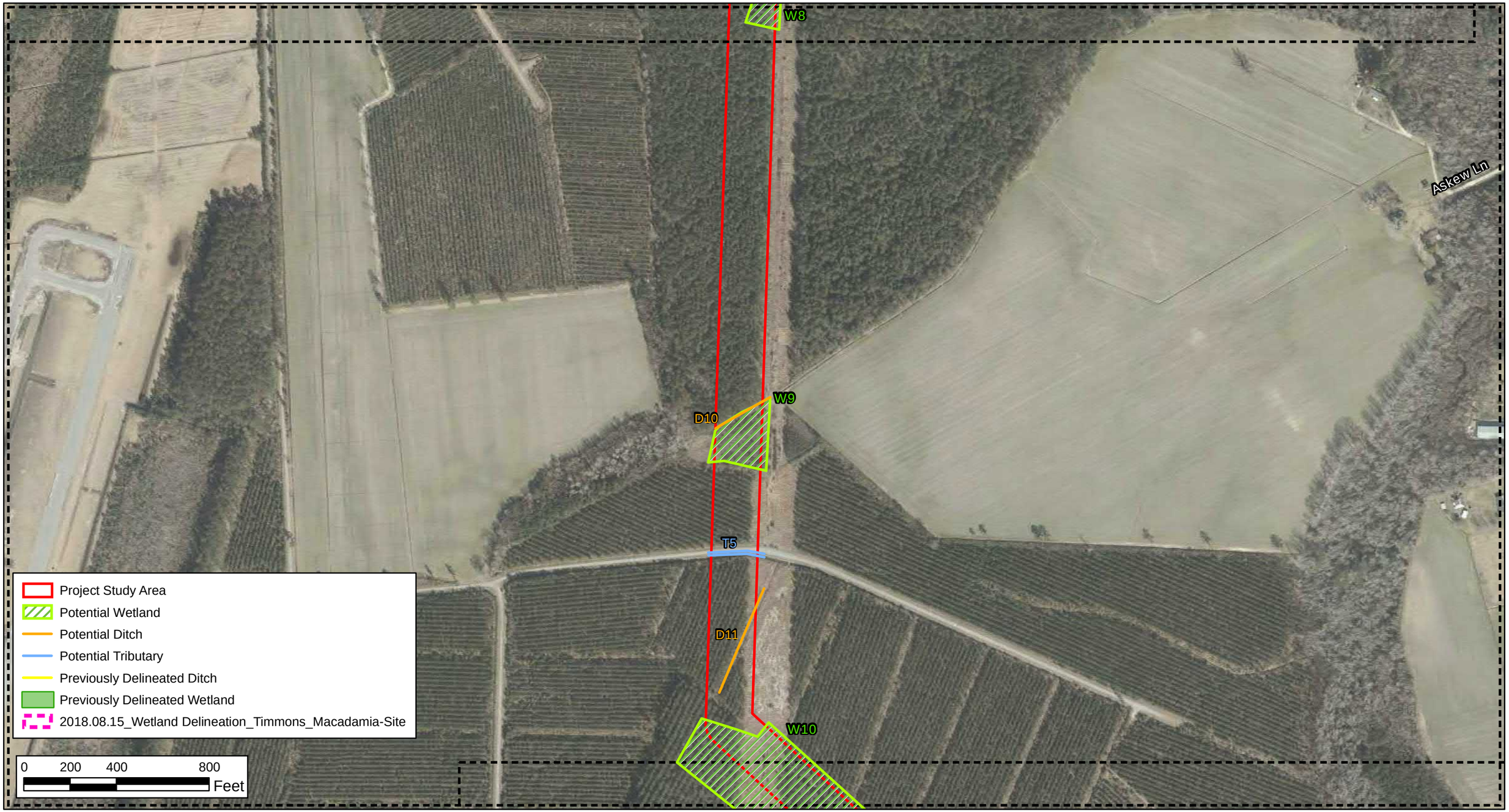
Potential Wetlands and Waters

Macadamia Transmission Line
Plymouth, Washington County, North Carolina

EXHIBIT NO.

3d



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Project No: 70217444

Scale: 1:4,800

File Name: Macadamia_JD

Date: September 2021

Terracon
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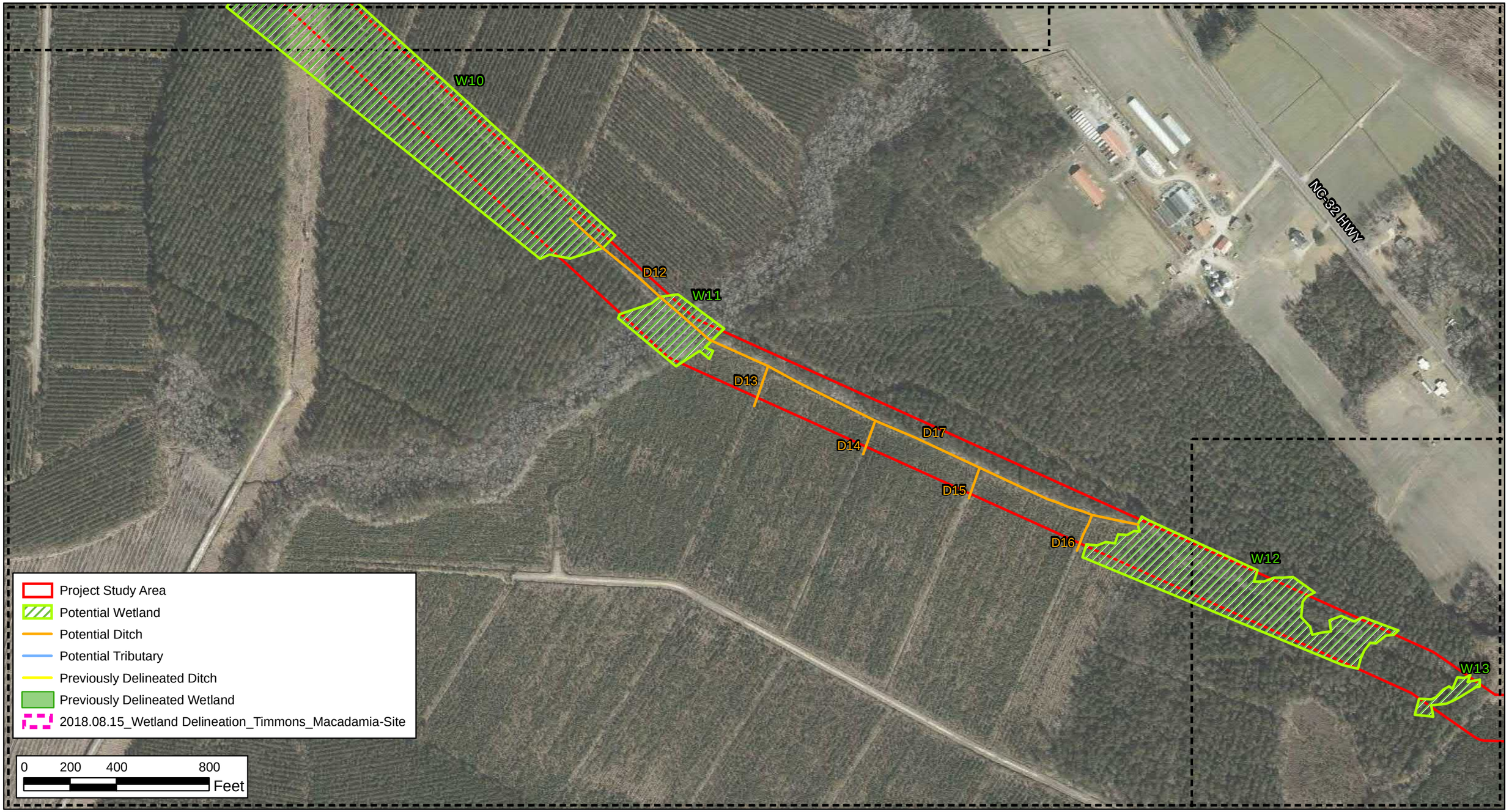
Phone: (919) 873-2211 Fax: (919) 873-9555

Potential Wetlands and Waters

Macadamia Transmission Line
Plymouth, Washington County, North Carolina

EXHIBIT NO.

3e



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N

Project No:	70217444
Scale:	1:4,800
File Name:	Macadamia_JD
Date:	September 2021

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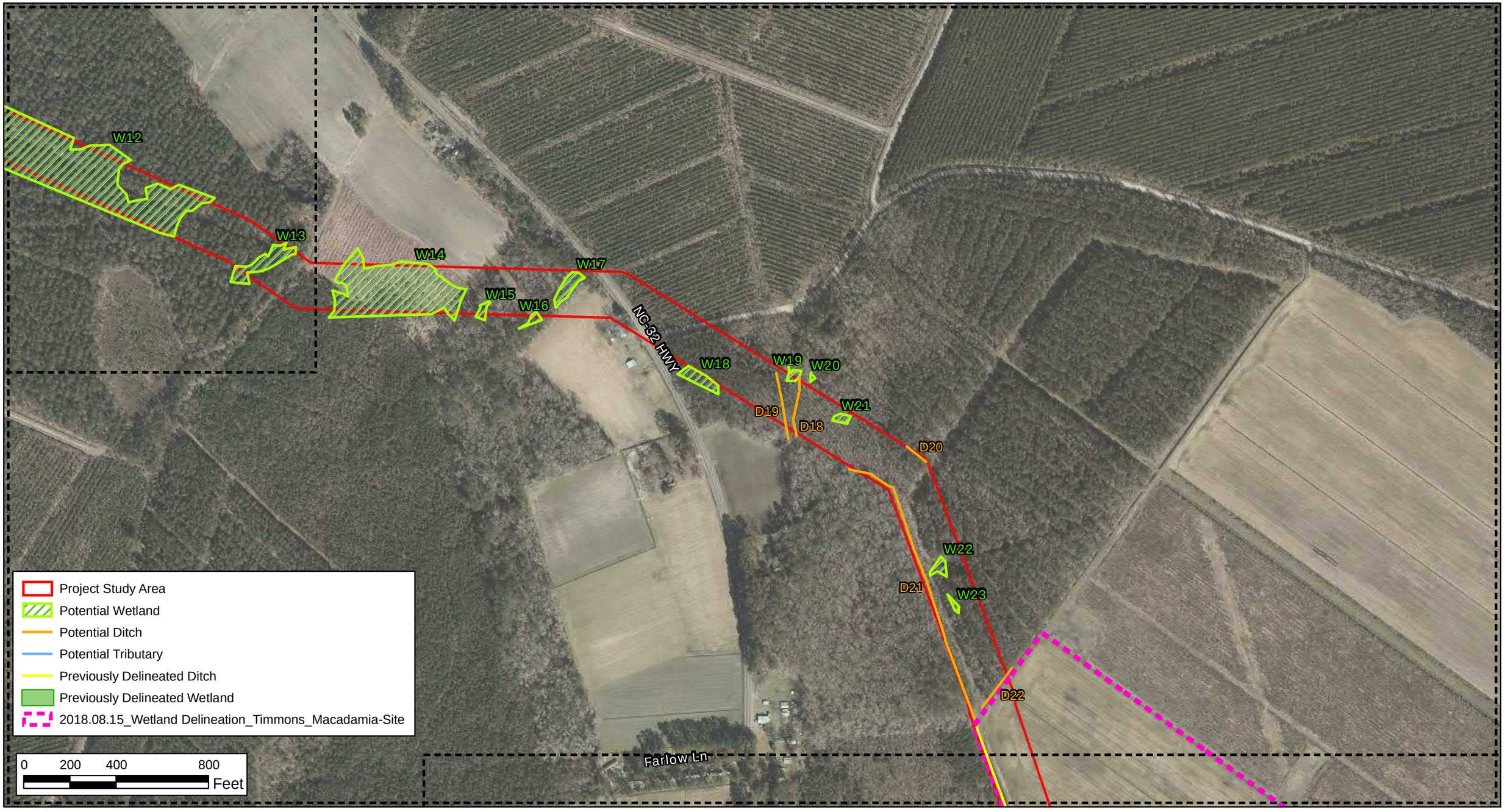
Potential Wetlands and Waters

Macadamia Transmission Line
Plymouth, Washington County, North Carolina

EXHIBIT NO.

3f



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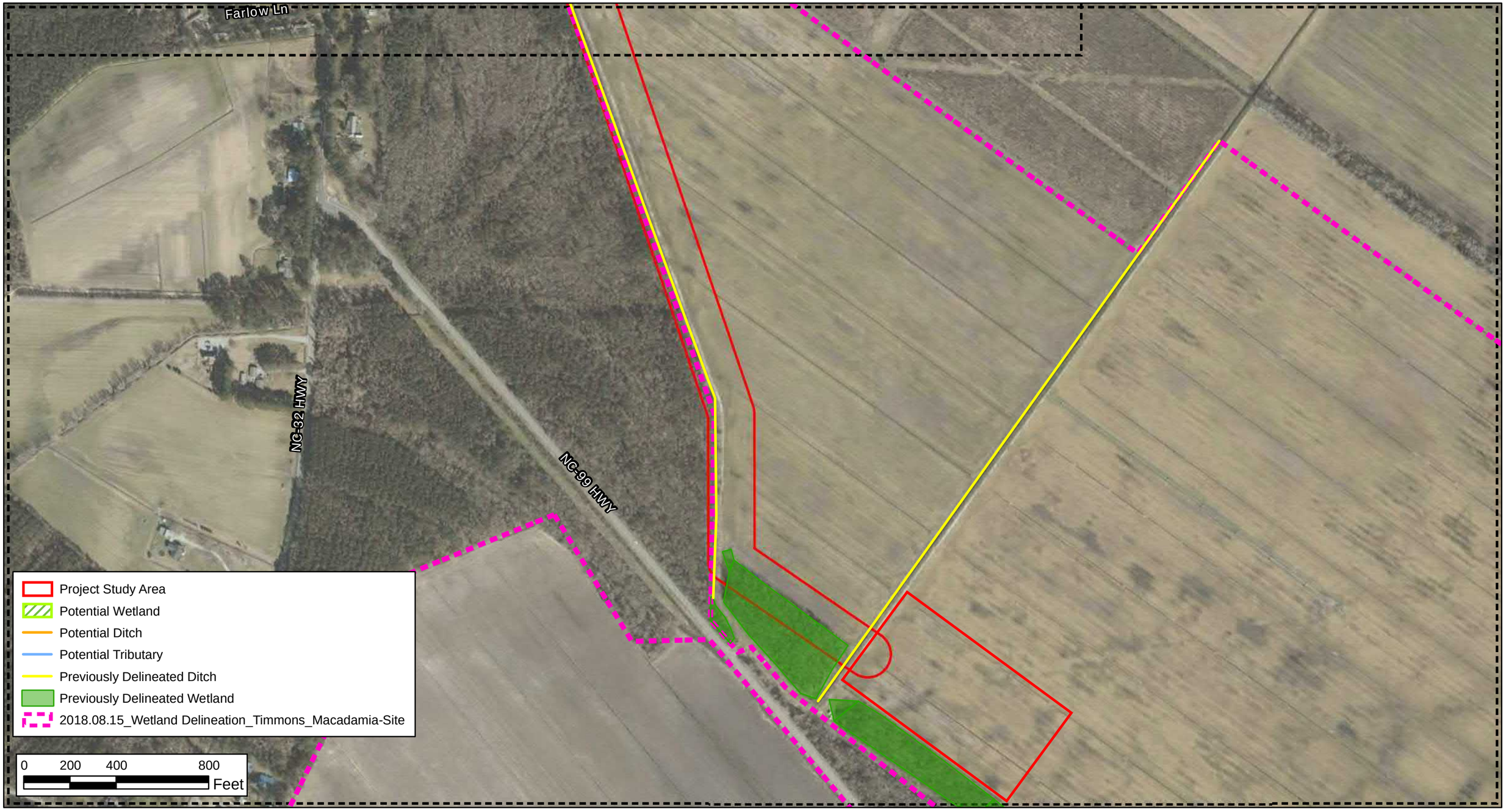
Potential Wetlands and Waters

Macadamia Transmission Line
Plymouth, Washington County, North Carolina

EXHIBIT NO.

3g



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Potential Wetlands and Waters

Macadamia Transmission Line
Plymouth, Washington County, North Carolina

EXHIBIT NO.

3h

Appendix M
Structures Study

Macadamia Solar:
Structure Study