

# **USACE PERMIT APPLICATION NO. SAJ-2019-00480**

**TRAIL RIDGE SOUTH MINE  
BRADFORD AND CLAY COUNTIES, FLORIDA  
SWCA PROJECT NO. 93087**

Submitted to

**United States Army Corps of Engineers**  
Tampa Regulatory Office  
10117 Princess Palm Drive, Suite 120  
Tampa FL, 33610

Prepared for

**The Chemours Company FC, LLC**  
PO Box 753  
Starke, FL 32091

Prepared by

Lawson Smith, Environmental Scientist

Kristen Bell, Lead Environmental Scientist

**SWCA Environmental Consultants**

567 Bishop Gate Lane  
Jacksonville, FL 32204  
[www.swca.com](http://www.swca.com)

SWCA Project No. 93087

December 2024







# Environmental Support Document

TRAIL RIDGE SOUTH MINE  
BRADFORD AND CLAY COUNTIES, FLORIDA  
SWCA PROJECT NO. 93087

DECEMBER 2024

PREPARED FOR  
**The Chemours Company FC, LLC**

PREPARED BY  
**SWCA Environmental Consultants**

## CONTENTS

### APPLICATION ITEMS

- **U.S. Army Corps of Engineers ENG Form 4345**
- **Environmental Support Document**
- 1.0 Introduction
  - 1.1 Mining Method and Operation
  - 1.2 Compliance with 40 CFR Part 230 Section 404(b)(1)
- 2.0 Existing Conditions
  - 2.1 Topography and Drainage
  - 2.2 Soils
  - 2.3 Land Use
- 3.0 Environmental Considerations
  - 3.1 Wetland and Surface Water Impacts
  - 3.2 Avoidance and Minimization of Impacts
  - 3.3 Alternative Plan Analysis
  - 3.4 Fish, Wildlife, Listed Species, and their Habitats
  - 3.5 Water Quality Preservation
  - 3.6 Public Interest
  - 3.7 Mitigation
- 4.0 Summary

### FIGURES

Figure 1 – Location Map  
Figure 2 – Aerial Map  
Figure 3 – USGS Topographic Map  
Figure 4 – Soils Map  
Figure 5 – FEMA Floodplain Map  
Figure 7 – Pre-Mining Land Use and Vegetation Map  
Figure 8 – Pre-Mining Wetlands  
Figure 9 – Pre-Mining Topography and Drainage Basin Map  
Figure 10 – Mine Plan  
Figure 11 – Wetland Impact Map  
Figure 13 – Post-Mining Land Use and Vegetation Map  
Figure 14 – Post-Mining Topography and Drainage Basin Map  
Figure 15 – Onsite Wetland Mitigation Map  
Figure 17 – Offsite Wetland Mitigation Map

### TABLES

Table 1 – Pre-Mining Land Use  
Table 2 – Wetlands and Surface Waters  
Table 3 – Wetland Impact Summary  
Table 4 – Mitigation Summary  
Table 5 – Mitigation Planting  
Table 6 – Post-Mining Land Use

## **ATTACHMENTS**

1. Preliminary Wetland Determination
2. Documents Previously Submitted to USACE and FDEP
3. UMAM Analysis
4. Onsite and Adjacent Parcels

## **EXHIBITS**

- A. Permit Boundary and Legal Description
- B. Environmental Resource Permit
- C. Listed Species Determination Keys
- D. SHPO Concurrence Letter
- E. Camp Blanding's 2022 Integrated Natural Resource Management Plan
- F. Financial Assurances
- G. Conservation Easement \*

*\* To be provided under separate cover.*

## 1 INTRODUCTION

Through this application, the permittee, The Chemours Company FC, LLC (Chemours), seeks to obtain a Standard Permit (SP) to begin heavy mineral mining operations on a  $\pm 2,884.4$ -acre parcel known as the Trail Ridge South Mine (the Project Area) (**Figure 1** and **Exhibit A**). The Project Area is located in Sections 6, 7, 12, 13, 18, 19, and 24, Township 7 South, Range 22 and 23 East in Bradford and Clay Counties, Florida. The Project Area has historically been managed for silviculture and as such is in various stages of pine growth. Unpaved, graded roads cross the Project Area to provide access for silviculture operations. Wetlands and ditches occur throughout the Project Area, and portions of the wetlands have been subject to timber harvesting and replanted with pine for silviculture. Wetland boundaries were delineated by a previous consultant (Kleinfelder) and have been approved in a Preliminary Jurisdictional Determination No. SAJ-2019-00480 (**Attachment 1**) by the U.S. Army Corps of Engineers (USACE). The following sections, prepared by SWCA Environmental Consultants (SWCA), provide information regarding the mining operation, existing site conditions, proposed mine plan, proposed wetland impacts and reclamation/restoration plan.

This project was originally reviewed and approved by the USACE in 2020 pending the issuance of the State Water Quality Certification. Prior to USACE receiving the State Water Quality Certification, the EPA approved Florida's State 404 Program, which became effective on Dec. 22, 2020, and all USACE pending permits were transferred to the Florida Department of Environmental Protection (FDEP) for processing. This project was subsequently reviewed, and Phase 1 was approved on June 6, 2022, under the FDEP State 404 Program, Permit no. ST404\_137482-022. The approval of Phase 2 is needed for Chemours to continue mining operations without any disruptions. Due to the FDEP being divested of its authority to issue State 404 Program permits on Feb 15, 2024, Chemours has requested the USACE review and approve the entire project for compliance consistency.

### 1.1 Mining Methods and Operations

#### Mining Methods

The Project Areas' mining footprint will consist of approximately 280 acres of mine cells ( $\pm 140$  acres per Mobile Mining Unit (MMU)). These mine cells will be designed at approximately 10 to 20 acres in size, and may be in various stages of the mining process at one time, including:

1. Site Preparation Stage
2. Active Mining Stage
3. Open 'Water Management' Stage
4. Tailings Stage
5. Contouring/Reclamation Stage

The variability in the mining depths of each cell affects the number of active mine cells required to provide a material mass balance and maintain the progression advancement of each MMU.

## **Site Preparation**

Prior to extraction of the mineral sands, all merchantable timber will be harvested in a manner consistent with silviculture best management practices (BMPs) and applicable regulations by the timber owner. Upon completion of timber harvesting, silt fencing and other applicable erosion control measures will be installed around the proposed mine cells.

Areas to be mined will be “root raked” and all wooden material will be burned per appropriate State/County regulations. The top 12 inches of topsoil will be removed and used to form the perimeter containment berms around the mining area for control of storm water runoff. All stormwater will be captured in the excavated pit. Perimeter containment berms are to be stabilized with slopes at a minimum of 3H:1V or flatter and seeded as needed to prevent erosion. Silt fencing will be utilized along the exterior edges of perimeter containment berms adjacent to wetlands to control erosion and sedimentation. See **Figure 10** and **Attachment 2: Figures 10A-10C** for details.

## **Active Mining**

Active Mining within the Project Area will be completed by utilizing two MMUs, track-mounted mobile mining station that consists of a feed hopper and shredder. Excavators will extract the mineral sands and deposit the excavated material into the feed hopper of the MMUs. The MMU shredder will then break apart oversize (roots, rocks and hardpan) from the excavated material prior to being slurried and pumped via High-density polyethylene (HDPE) pipeline to a single deck vibrating screen which also moves around the ore body as mining progresses to remove oversize. The oversize material from the screen will be used as backfill in the mined-out cells.

The screen undersize is re-slurried and pumped from the Project Area to the land-based separation site Mobile Concentrator (MC), which is located at a fixed location within the existing, previously permitted Maxville Mine. The MC will separate the heavy minerals from the quartz sand based upon differences in specific gravity.

The removal of the ore will be in 7 to 10-foot lifts or benches. The excavation will progress through the cell using multiple excavators to feed the MMU. The mine cells will be dewatered as excavation progresses and the water incorporated into the process water for reuse. Mining depth will average approximately 22 feet with a maximum depth of 40 feet.

The mining process for mineral sands will involve very little if any spoil or overburden, as would be encountered in other types of mining operations.

## **Open ‘Water Management’**

Only one mining cell is actively being mined with each MMU. Open ‘Water Management’ cell(s) will remain open and serve as interim supplementary water management cells until the material mass balance has been achieved in the preceding cell and tailing activities can advance to the next cell.

## **Tailings**

Once the ore has been separated from the quartz at the MC, the lighter specific gravity (SG) quartz sands (approximately 98% by volume) will become tailings and are pumped back to mined-out cells via HDPE pipeline where they are dewatered.

Excess water from tailings will be decanted, collected, and recycled back to the MMU to be used to slurry the new feed in the mining process.

### **Contouring/Reclamation**

Once the tailings are sufficiently dewatered, reclamation activities, including recontouring of the mined areas so the topography is similar to pre-mining conditions, topsoil placement, and revegetation will be conducted. Native herbaceous vegetation will be reestablished from the replaced topsoil. Temporary groundcover may be seeded/planted (millet or rye) to assist with erosion control, as needed.

### **Erosion and Sediment Control**

Erosion and sedimentation control plans will be based on the Florida Stormwater, Erosion, and Sedimentation Control Inspectors Manual prepared by the FDEP and the Florida Department of Transportation (FDOT) (2008).

All berms used for stormwater containment will be constructed in accordance with standard BMP's. Along the outside toe of all berms, silt fencing will be installed adjacent to undisturbed wetland areas for erosion and sediment control.

A maintenance road will be located at the outside toe of the perimeter containment berms to allow for inspection and access for repair, as needed. Inspection and maintenance of berms will be conducted per the Best Management Practices Plan to ensure integrity of the systems, as specified in FDEP permitted conditions.

### **Stormwater Management**

Water quality certification in the form of the State Environmental Resource Permit (ERP) has been issued under Permit No. MMR\_137482-018 (**Exhibit B**).

The stormwater management approach utilized will minimize the active mine footprint and the amount of rainfall captured within the mine's water management system. The following provides an explanation of the stormwater management system: As previously described, The Project Areas mining footprint will consist of multiple components: 1) the site preparation stage, 2) an active mining stage, 3) an open 'water management' stage, 4) a tailings stage, and 5) a reclamation stage. The Project Area's mining footprint will be approximately 280-acres.

Stormwater runoff from events up to a 25-year, 24-hour storm event will be contained within the active mining pit and the open 'water management cell(s)', which will be capable of storing the designed storm event.

Stormwater captured in the mine pit is pumped down and utilized as process water. Excess process water will be treated and discharged as described in FDEP Industrial Wastewater (IWW) permit, Permit No. FLOA00014.

Areas outside the Project Area's 280-acre mining footprint, including undisturbed areas and fully reclaimed areas will not require stormwater management as these areas are outside the disturbance activities.

## 1.2 Compliance with 40 CFR Part 230 Section 404(b)(1)

Pursuant to Title 40 Code of Federal Regulations (CFR) Part 230 Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material, the proposed permit modification has been prepared to address the following guidelines:

Title 40 CFR Part 230 Section 404(b)(1)		
Subpart	Evaluation Criteria	Document Section
<b>Subpart A – General</b>	Purpose, policy and definitions	1.0 – Introduction
<b>Subpart B – Compliance with Guidelines</b>	Restrictions, determinations, cumulative effects, secondary effects, alternatives	3.0 – Environmental Considerations
<b>Subpart C – Potential Impacts on Physical and Chemical Characteristics</b>	Water quality, water fluctuation, and flow pattern considerations	3.5 – Water Quantity and Quality Impacts
<b>Subpart D – Potential Impacts on Biological Characteristics</b>	Threatened and endangered species, general wildlife considerations	3.4 – Fish, Wildlife, Listed Species and their Habitats
<b>Subpart E – Potential Impacts on Special Aquatic Sites</b>	Sanctuaries and refuges, wetlands	3.1 – Wetland and Surface Water Impacts
<b>Subpart F – Potential Effects on Human Use</b>	Public interest	3.6 – Public Interest
<b>Subpart G – Evaluation and Testing</b>	Dredge and fill material considerations	Not Applicable
<b>Subpart H – Actions to Minimize Effects</b>	Avoidance and minimization considerations	3.2 – Avoidance and Minimization Impacts
<b>Subpart I – Planning to Shorten Permit Processing Time</b>	Identification of disposal sites	Not Applicable
<b>Subpart J – Compensatory Mitigation for Loss of Aquatic Resource</b>	Mitigation considerations	3.7 – Mitigation

## 2 EXISTING CONDITIONS

### 2.1 Topography and Drainage

The Project Area is located along the border between Clay and Bradford Counties along a narrow sand ridge known as the Trail Ridge.

General topography of the Project Area was evaluated by reviewing Light Detection and Ranging (LIDAR) elevation data collected in 2011 and 2012, and field inspections of existing site conditions (**Figure 9**). LIDAR data provided detailed topography for the Project Area in 1-foot contour intervals. Topography within the Project Area is relatively flat with higher elevations located in the northeastern quadrant. Topography is gently sloping to lower elevations in a southwestern direction.

Natural elevations range from approximately 170 feet to 215 feet (NAVD88). Wetland elevations typically range from 172 feet to 193 feet (NAVD88), and upland environments generally range from 193 feet to 215 feet (NAVD88).

Anthropogenic or engineered elevation features within the Project Area include tailings and open water features remnant from a former mining operation, which occurred in the 1960s prior to reclamation requirements. Features remaining in this area include ditches, berms, open water, and dirt roads. The highest elevation within the Project Area is associated with this previously mined area in the northeastern corner of the Project Area, which continues offsite to the east. A perimeter berm and adjacent canal separates the remnant tailings mound and open water feature from the remainder of the un-mined area of the Project Area.

Unimproved roads are located throughout the Project Area. These roads are typically 20-30 feet in width and often exhibit an adjacent roadside ditch. Dirt road elevations range from 182 feet to 195 feet (NAVD88) and the adjacent ditch is typically 1-2 feet lower than the road elevation.

The elevated bed of a former railroad spur, currently used as an unimproved road, traverses the Camp Blanding portion of the Project Area in a north south direction. Elevations along this area typically range from 188 feet to 193 feet (NAVD88) with an adjacent ditch located on each side approximately 2.5 feet to 4 feet below the spur elevation.

The Project Area lies under the jurisdictions of the Suwannee River Water Management District (SRWMD) and St. Johns River Water Management District (SJRWMD) within the Santa Fe River Basin. Wetlands occur throughout the project area and flow southwest and offsite to wetlands and tributaries of the Santa Fe Swamp and River system (**Figure 9**).

Current drainage patterns within the Project Area have been somewhat altered from historic conditions due to water management practices associated with silviculture (ditching) and mining activities that took place prior to 1975.



## 2.2 Soils

The Soil Survey of Clay County, Florida (USDA, Soil Conservation Service, 1989) and the Soil Survey of Bradford County, Florida (USDA, Soil Conservation Service, 1996) were consulted and indicate the following soil types within the Project Area (**Figure 4**):

### Bradford County Soils

Mascotte Sand, 0 to 2 percent slopes (4) - is composed of 70% non-hydric Mascotte component and 20% hydric Mascotte component. The non-hydric component is found on flats on marine terraces on coastal plains and consists of sandy and loamy marine deposits. The natural drainage class is poor. The hydric component is similar to the non-hydric component, however a seasonal zone of saturation at six inches is present from June to September.

Plummer-Plummer Wet, Sands (6) - is composed of 55% non-hydric Plummer component, and 35% hydric Plummer component. The non-hydric component is found on flats on marine terrace of the coastal plain and consists of sandy and loamy marine deposits. Natural drainage is poor, and a seasonal zone of water saturation is at 12 inches from June to September. The hydric component is similar to the non-hydric component; however, drainage is very poor and seasonal zone of water saturation is present at the surface from June to September.

Surrency and Pantego soils, depressional (7) - is composed of 80% Surrency component and is found in depressions on marine terraces of coastal plains. The soil is frequently ponded and soil saturation is found at the surface year-round.

Leon Fine Sand, 0 to 2 percent slopes (9) - is composed of 75% non-hydric Leon component, and 10% hydric Leon component. The non-hydric component is found in flatwoods on marine terrace of the coastal plain and consists of sandy marine deposits. Natural drainage is poor, and the soil type is typically associated with North Florida Flatwoods ecological communities. A seasonal zone of water saturation is at 12 inches from June to September. The hydric component is similar to the non-hydric component; however, a seasonal zone of water saturation is at 3 inches from June to September. The hydric component is found on flats on marine terraces of the coastal plain and also associated with North Florida Flatwoods ecological communities.

Allanton loamy sand (11) - is composed of 80% Allanton component. The soil is associated with floodplains on marine terraces of the coastal plain. Natural drainage is very poor, and the soil is frequently flooded. A seasonal zone of saturation is found at 6 inches from June to October.

Sapelo fine sand (12) - is composed of 80% non-hydric and 10% hydric component. The non-hydric component is found on flats on marine terraces on coastal plains. Natural drainage is poor; however, it is not flooded or ponded. A seasonal zone of water saturation is at 12 inches from March to September.

Pamlico and Croatan mucks (14) - is composed of 51% Pamlico component and 40% Croatan component. Both the Pamlico and Croatan components are found in depressions on marine terrace of the coastal plain and consist of herbaceous organic material over sandy marine deposits. Natural drainage is very poor, and the soil is frequently ponded. A seasonal zone of water saturation is present at the surface year-round.

Pottsburg sand (15) - is composed of 90% Pottsburg component and consists of sandy marine deposits on flats on marine terraces of the coastal plain. Natural drainage is poor, and a seasonal zone of water saturation is found at 9 inches from March to September.

Leon sand, 0 to 2 percent slopes (19) - This soil is composed of 90% non-hydric Leon component. This soil type is found on flats on marine terraces of the coastal plain and consists of sandy marine deposits. Natural drainage is poor; however, this soil type is not flooded or ponded. A seasonal zone of water saturation is at 15 inches from March to September. This soil is associated with north Florida pine flatwoods communities.

Pelham complex, 0 to 2 percent slopes (23) - This soil type is found on broad, nearly smooth flatwoods intermixed with ponds and scattered, grassy depressions that formed on thick beds of loamy marine sediment. Natural drainage is poor. The water table for this soil is within 12 inches of the surface from July through March.

Starke mucky fine sand, depressional (24) - is composed of 92% Starke component. This soil type is found in depressions on marine terrace of the coastal plain and consists of sandy and loamy marine deposits. Natural drainage is very poor and is frequently ponded. A seasonal zone of water saturation is present at the surface from January to October.

Pottsburg fine sand (31) - is composed of 70% non-hydric Pottsburg component, and 10% hydric Pottsburg component. The non-hydric component is found in flatwoods on marine terraces of the coastal plain and consists of sandy marine deposits. Natural drainage is poor, and the soil type is typically associated with North Florida Flatwoods ecological communities. The hydric component is found on flats on marine terrace of the coastal plain and has a seasonal zone of water saturation at 4 inches from June to September. Similar to the non-hydric component it is associated with North Florida Flatwoods ecological communities.

Meadowbrook and Allanton soils, frequently flooded (45) - is composed of 65% Meadowbrook component and 20% Allanton component. This soil type is found in floodplains on marine terrace of the coastal plain and consists of sandy and loamy marine deposits. Natural drainage is poor to very poor and is frequently flooded. A seasonal zone of water saturation is at 6 inches from May to October.

Allanton fine sand, frequently flooded (58) - is composed of 80% Allanton component. This soil type is found in depressions on marine terraces of the coastal plain and consists of sandy marine deposits. Natural drainage is very poor and is frequently ponded. A seasonal zone of water saturation is at 6 inches from June to October.

### **Clay County Soils**

Hurricane fine sand, 0 to 5 percent slopes (3) – is composed of 85% Hurricane component. This soil type is found on rises on marine terraces of the coastal plain and consists of sandy marine deposits. Natural drainage is somewhat poorly drained, and the soil type is typically associated with Longleaf Pine Turkey oak hill ecological communities.

Penney fine sand, 0 to 5 percent slopes (5) – is composed of 85% Penney component. This soil type is found on ridges on marine terraces of the coastal plain and consists of eolian or sandy marine deposits. Natural drainage is excessively drained, and the soil type is typically associated with Longleaf Pine Turkey oak hill ecological communities.

Mandarin fine sand, 0 to 5 percent slopes (6) – is composed of 80% Mandarin component. This soil type is found on flats on marine terraces of the coastal plain and consists of sandy mine spoil or earthy material. Natural drainage is somewhat poorly drained; however, the soil type is not flooded or ponded.

Centenary fine sand, 0 to 5 percent slopes (7) – is composed of 85% Centenary component. This soil type is found on rises on marine terrace of the coastal plain and consists of sandy marine deposits. Natural drainage is moderately well, and the soil type is typically associated with Longleaf Pine Turkey oak hill ecological communities.

Leon fine sand, 0 to 2 percent slopes (9) – is composed of 75% non-hydric Leon component, and 10% hydric Leon component. The non-hydric component is found in flatwoods on marine terrace of the coastal plain and consists of sandy marine deposits. Natural drainage is poor, and the soil type is typically associated with North Florida Flatwoods ecological communities. A seasonal zone of water saturation is at 12 inches from June to September. The hydric component is similar to the non-hydric component; however, a seasonal zone of water saturation is at 3 inches from June to September. The hydric component is found on flats on marine terrace of the coastal plain and also associated with North Florida Flatwoods ecological communities.

Allanton and Rutledge mucky fine sands, depressional (11) – is composed of 45% Allaton component and 35% Rutledge component. This soil type is found in depressions on marine terraces of the coastal plain and consists of sandy marine deposits. Natural drainage is very poor and is frequently ponded. A seasonal zone of water saturation is present at the surface year-round.

Pamlico muck (27) - is composed of 80% Pamlico component. This soil type is found in depressions on marine terraces of the coastal plain and consists of herbaceous organic material over sandy marine deposits. Natural drainage is very poor and is frequently ponded. A seasonal zone of water saturation is present at the surface from February to October.

Pottsburg fine sand (31) – is composed of 70% non-hydric Pottsburg component, and 10% hydric Pottsburg component. The non-hydric component is found in flatwoods on marine terrace of the coastal plain and consists of sandy marine deposits. Natural drainage is poor, and the soil type is typically associated with North Florida Flatwoods ecological communities. The hydric component is found on flats on marine terrace of the coastal plain and has a seasonal zone of water saturation at 4 inches from June to September. Similar to the non-hydric component it is associated with North Florida Flatwoods ecological communities.

Allanton fine sand, frequently flooded (58) – is composed of 80% Allaton component. This soil type is found in depressions on marine terraces of the coastal plain and consists of sandy marine deposits. Natural drainage is very poor and is frequently ponded. A seasonal zone of water saturation is at 6 inches from June to October. The soil meets hydric criteria.

Neillhurst fine sand, undulating (62) - is composed of 90% Neillhurst component. This soil type is found on spoil piles or rises on marine terrace of the coastal plain. Natural drainage is excessively drained.

Solite fine sand (63) - is composed of 85% non-hydric Solite component, and 5% hydric Solite component. The non-hydric component is found on marine terraces of the coastal plain and consists of sandy mine spoil or earthy fill. Natural drainage is poor, and a seasonal zone of water saturation is at 10 inches from June to October. The hydric component is similar to the non-hydric component; however, a seasonal zone of water saturation is at 4 inches from June to October.

## **2.3 Land Use**

Pre-Mining land uses and vegetative communities within the Project Area were classified and mapped in accordance with the Florida Land Use, Cover and Forms Classification System

[(FLUCFCS) FDOT, State Topographic Bureau, Thematic Mapping Section, 1999], (**Figure 7**). Proposed Post-Mining land uses have been mapped in accordance with the FLUCFCS system as well and are enclosed as **Figure 13** and **Table 1**.

### **2.3.1 Florida Land Use, Cover and Form Classification System (FLUCFCS)**

#### **Uplands**

Extractive (FLUCFCS 160) – These are areas that were mined prior to 1975 and such were not subject to reclamation requirements. These areas have revegetated naturally.

Military Use (FLUCFCS 173) - These areas of the Project Area include landing zones, and miscellaneous buildings and grounds that compose these facilities.

Xeric Oak (FLUCFCS 421) - This area is a mixed forest upland community of pine and oak species with sandy soils associated with the eastern portion of the Project Area. Vegetation is composed of turkey oak (*Quercus laevis*), sand live oak (*Q. geminata*), sand post oak (*Q. margarettae*), longleaf pine (*Pinus palustris*) and sand pine (*P. clausa*). Understory and groundcover species are sparse and include rusty lyonia (*Lyonia ferruginea*), wiregrass (*Aristida stricta*), prickly-pear cactus (*Opuntia stricta*), gopher apple (*Licania michauxii*) and bracken fern (*Pteridium aquilinum*).

Hardwood, Coniferous Mixed (FLUCFCS 434) - Forested areas in which neither upland conifers nor hardwoods achieve a 66 percent crown canopy dominance. Typical species include slash pine (*P. elliotti*), longleaf pine, live oak (*Q. virginiana*), laurel oak (*Q. laurifolia*), Sumard oak (*Q. shumardii*), pignut hickory (*Carya glabra*), post oak (*Q. stellata*), persimmon (*Diospyros virginiana*), and southern magnolia (*Magnolia grandifolia*).

Coniferous Plantations (FLUCFCS 441) - This upland vegetative community is the dominant land use within the Project Area. The pine plantation areas primarily contain slash pine of varying age class depending on rotation cycle. The logging rotation for these areas averages twenty (20) to twenty-five (25) years. Review of historical aerial imagery identify several rotations of pine have been harvested and replanted throughout the Project Area from 2002 to 2014.

Understory and ground cover species associated with the pine plantations vary according to the past and current management practices, and the existing topography, soils, and hydrology of the Project Area. In the drier, sandier areas of planted pine, understory vegetation often mimics xeric oak communities, with species including turkey oak, sand live oak, saw palmetto (*Serenoa repens*), gallberry (*Ilex glabra*), wiregrass, shiny blueberry (*Vaccinium myrsinites*), wax myrtle (*Myrica cerifera*), and bracken fern. Throughout the lower elevations and areas with higher groundwater soil conditions, the groundcover is often characterized by various combinations of saw palmetto, gallberry, bracken fern, wax myrtle, water oak (*Q. nigra*), loblolly bay (*Gordonia lasianthus*), and red maple (*Acer rubrum*). Ground cover is variable depending upon density of pines and age class of trees which shade shrub and ground cover.

#### **Wetlands**

Coniferous Plantations Wetland (FLUCFCS 441W) - These areas are wetland areas that have been cleared and are managed for silviculture. These communities are identified by the mixed wetland hardwood and conifer species intermixed with the planted pine. This wetland vegetative community has a canopy of planted slash pine with a sparse (2-3% vegetative cover) understory and groundcover vegetation consisting of scattered dahoon holly (*I. cassine*), loblolly bay, myrtle-

leaf holly (*I. myrtifolia*), swamp bay (*Persea palustris*), sweet bay (*Magnolia virginiana*), fetterbush (*L. lucida*), highbush blueberry (*V. corymbosum*), sweet gallberry (*I. coriacea*), Carolina redroot (*Lachnanthes caroliniana*), Virginia chain fern (*Woodwardia virginica*), cinnamon fern (*Osmunda cinnamomea*), bog button (*Lachnocaulon* spp.) and pipewort (*Eriocaulon* spp.).

Ditches (FLUCFCS 510d) - These areas include roadside ditches and ditched flow ways within wetland systems created during historical silvicultural practices. Ditches typically have defined banks that are steeply cut, and open water environments with some vegetation component.

Lakes Greater than 10 Acres (FLUCFCS 523) – One lake larger than 10 acres but less than 100 acres occurs within the Project Area. This open water habitat is associated with historic mining activities.

Lakes Less than 10 Acres (FLUCFCS 524) – Two lakes less than 10 acres occur within the Project Area. These open water features are associated with historic mining activities.

Bay Swamp (FLUCFCS 611) - The bay swamp forested communities are dominated by bay species such as loblolly bay, swamp bay, and sweet bay. Slash pine, pond pine (*P. serotina*), and loblolly pine (*P. taeda*) are often components of the tree stratum and understory vegetation includes gallberry, wax myrtle, and fetterbush.

Gum Swamp (FLUCFCS 613) - The gum swamp forested communities are dominated by blackgum (*Nyssa sylvatica* var. *biflora*). Associated species include bald cypress (*Taxodium distichum*), slash pine, swamp bay, and sweet bay.

Cypress (FLUCFCS 621) - Onsite cypress communities are pre-dominantly composed of either pond cypress (*T. ascendens*) or bald cypress and are associated with depressional and floodplain wetland systems. Associated species include blackgum, slash pine, titi (*Cyrilla racemiflora*), red maple, and water hickory (*Carya aquatica*).

Wetland Forested Mixed (FLUCFCS 630) - The wetland forested mixed land use is the most prevalent wetland land use within the Project Area. These areas are typically lower in elevation than the adjacent upland pine plantation and as such have deeper and longer hydroperiods.

These areas are co-dominated by a mixed canopy of slash pine, bald cypress, pond cypress, blackgum, red maple, loblolly bay, swamp bay, and sweet bay. Typical understory species include dahoon holly, myrtle-leaved holly, fetterbush, sweet gallberry, wax myrtle, St. John's wort (*Hypericum* spp.), Virginia chain fern, and cinnamon fern.

Wetland Scrub (FLUCFCS 631) - The wetland scrub communities are associated with species such as pond cypress, blackgum, coastal plain willow (*Salix caroliniana*), and other low shrubs with no dominant species. They are typically found in topographical depressions and have poorly drained soils.

Freshwater Marsh (FLUCFCS 641) - The freshwater marsh communities are non-forested areas of emergent wetland vegetation. Several areas consist of formerly forested systems that had their canopies destroyed during previous wildfires and no regeneration of canopy species has occurred. Vegetation within these areas includes cattail (*Typha* spp.), sand cordgrass (*Spartina bakerii*), maidencane (*Panicum hemitomon*), Carolina redroot, yellow-eyed grass (*Xyris* spp.), arrowheads (*Sagittaria* spp.), soft rush (*Juncus effusus*), and St. John's wort.

Primitive Road/Trails (FLUCFCS 8146) - There are several unpaved trails/roads within the Project Area used for silviculture purposes.

### **2.3.2 Wetland Descriptions**

A total of 1418.74-acres of wetlands, 6.28-acres of wetland cut ditches, 25.47-acres of upland cut ditches, and 15.92-acres of surface water are located within the Project Area (**Table 2**).

Wetland 1 is a 132.40-acre wetland located at the northwest corner of the Project Area. The wetland consists of two community types. The central component classifies as a wetland forested mixed (FLUCFCS 630) (84.21 ac) community consisting of loblolly bay, red maple, bald cypress, myrtle leafed holly, wax myrtle, Virginia chain fern, blackberry (*Rubus* spp.), dwarf palmetto (*Sabal minor*), and sphagnum moss (*Sphagnum* spp.). The exterior portion classifies as a coniferous plantation wetland (FLUCFCS 441W) (48.19 ac). This area has a canopy of predominately planted slash pine, with wax myrtle, red maple, dahoon holly, and very sparse (2-3% vegetative cover) groundcover vegetation consisting of netted chain fern (*W. areolata*), Virginia chain fern, and sphagnum moss. There are several ditches (FLUCFCS 510d) located along the eastern and southern portions of Wetland 1. It is surrounded by coniferous pine plantation (FLUCFCS 441) and flows offsite.

Wetland 2 is a 0.10-acre isolated wetland located in the northwest portion Project Area adjacent to a trail road. It classifies as a freshwater marsh (FLUCFCS 641) community consisting of Carolina redroot, yellow-eyed grass, and gallberry. It is surrounded by coniferous pine plantation (FLUCFCS 441) on three sides and a trail road on the fourth.

Wetland 3 is a 22.99-acre wetland located in the northwest portion of the Project Area. It is connected hydrologically to Wetland 1 by surface flow across a trail road. It is comprised of three community types. A wetland forested mixed (FLUCFCS 630) (1.25 ac) community with a canopy and subcanopy of blackgum, bald cypress, wax myrtle, red maple, dahoon holly, coastal plain willow, with groundcover consisting of Virginia chain fern, cattail, pickerelweed (*Pontederia cordata*), smartweed (*Polygonum* spp.), blackberry, Carolina redroot, beakrush (*Rhynchospora* spp.), bushy broom grass (*Andropogon glomeratus*), woolgrass (*Scirpus cyperinus*), sphagnum moss, pipewort, and camphor weed (*Pluchea camphorata*) is located in the northern portion of the wetland. The central portion of the wetland classifies as a freshwater marsh (FLUCFCS 641) (8.89 ac) community of bald cypress, wax myrtle, coastal plain willow, blackgum, woolgrass, Virginia chain fern, smartweed, camphor weed, soft rush, pickerelweed, Carolina redroot, cattail, beakrush, and sphagnum moss. The exterior portion consists of coniferous plantation wetland (FLUCFCS 441W) (12.85 ac). This area has a canopy of planted slash pine, with a subcanopy of highbush blueberry, wax myrtle, dahoon holly, and loblolly bay, and very sparse (2-3% vegetative cover) groundcover vegetation of Virginia chain fern, goldenrod (*Solidago* spp.), St. John's wort, pipewort, Carolina redroot, and sphagnum moss.

Wetland 4 is a 0.04-acre isolated wetland classifying as a freshwater marsh (FLUCFCS 641) community consisting of Carolina redroot, Virginia chain fern, yellow-eyed grass, and gallberry. This wetland is located adjacent to a trail road in the northwest portion of the Project Area.

Wetland 5 is a 119.27-acre wetland forested mixed community (FLUCFCS 630) located in the northeastern portion of the Project Area. The plant community includes pond-cypress, bald-cypress, slash pine, dahoon holly, red maple, sweet gum (*Liquidambar styraciflua*), coastal plain willow, sweet bay, titi, wax myrtle, saltbush (*Baccharis halimifolia*), blackberry, wild grape (*Vitis* spp.), cinnamon fern, royal fern (*O. regalis*), Virginia chain fern, beakrush, greenbriar (*Smilax*

*laurifolia*), camphorweed, and St. John's wort. Some climbing fern (*Lygodium* spp.) and cogongrass (*Imperata cylindrica*) were observed. This wetland is hydrologically connected to Wetland 1 via a long, upland cut ditch.

Wetland 6 is a 41.37-acre wetland located along the western boundary of the Project Area. It is comprised of two community types. The central component classifies as a wetland forested mixed (FLUCFCS 630) (28.08 ac) community consisting of sparse sweet bay in the canopy with a subcanopy of myrtle leafed holly, wax myrtle, loblolly bay, red bay (*P. borbonia*), and groundcover consisting of Virginia chain fern, yellow-eyed grass, Carolina redroot, St. John's wort, club moss (*Lycopodium* spp.), pipewort, orange milkwort (*Polygala lutea*), sundew (*Drosera* spp.), beakrush, netted chain fern, meadow beauty (*Rhexia* spp.), red maple saplings, bushy broom grass, blackberry, sphagnum moss, and maidencane. The exterior portion classifies as a coniferous plantation wetland (FLUCFCS 441W) (13.29 ac). This area has a canopy of predominately planted slash pine, and subcanopy vegetation of gallberry, and saw palmetto. Sparse (2-3% vegetative cover) groundcover species such as Virginia chain fern, bushy broom grass, Carolina redroot, and beakrush populate this area. Water flows from this wetland north through a ditch into Wetland 1.

Wetland 7 is a 9.89-acre wetland located in the northwest portion of the Project Area. It is comprised of two community types. The central component classifies as a wetland forested mixed (FLUCFCS 630) (4.90 ac) community consisting of myrtle leafed holly, red maple, dahoon holly, sweet bay, blackgum, coastal plain willow, Virginia chain fern, wax myrtle, bushy broom grass, beakrush, bull rush (*S. validus*), and Carolina redroot. The exterior portion classifies as a coniferous plantation wetland (FLUCFCS 441W) (4.99 ac). This area has a canopy of predominately planted slash pine, and very sparse (2-3% vegetative cover) understory/groundcover vegetation consisting of Virginia chain fern, Carolina redroot, sweet gallberry, and saw palmetto. Water flows from this wetland east through a ditch into Wetland 6.

Wetland 8 is an 11.43-acre wetland located in the northwestern portion of the Project Area. It is comprised of two community types. The central component classifies as a wetland forested mixed (FLUCFCS 630) (11.02 ac) community consisting of wax myrtle, loblolly bay, sweet bay, red maple, slash pine, bushy broom grass, Virginia chain fern, sphagnum moss, club moss, beakrush, Carolina redroot, blackberry, and bracken fern. The exterior portion classifies as a coniferous plantation wetland (FLUCFCS 441W) (0.41 ac). This area has a canopy of predominately planted slash pine, and a very sparse (2-3% vegetative cover) understory/groundcover vegetation consisting of gallberry, loblolly bay, saw palmetto, beakrush, shiny blueberry, pipewort, bushy broom grass, Carolina redroot, and fetterbush. Water flows from this wetland west into Wetland 7.

Wetland 9 is a 3.77-acre isolated wetland located in the northwestern portion of the Project Area. It is comprised of two community types. The central component classifies as a freshwater marsh (FLUCFCS 641) (2.88 ac) community of scattered pond cypress, red maple, woolgrass, wax myrtle, St. John's wort, bushy broom grass, Virginia chain fern, yellow-eyed grass, pickerel weed, Carolina redroot, beakrush, soft rush, fetterbush, dog fennel (*Eupatorium capillifolium*), highbush blueberry, sphagnum moss and algal mats. The exterior portion classifies as a coniferous plantation wetland (FLUCFCS 441W) (0.89 ac). This area has a canopy of predominately planted slash pine, and a very sparse (2-3% vegetative cover) understory/groundcover vegetation consisting of gallberry, netted chain fern, cinnamon fern, and Virginia chain fern.

Wetland 10 is a 1.87-acre isolated wetland located in the central portion of the Project Area. It classifies as a freshwater marsh (FLUCFCS 641) community consisting of woolgrass, Virginia chain fern, Carolina redroot, smartweed, soft rush, camphorweed, beakrush, club moss, sphagnum moss, with red maple, pond cypress, sweet bay, loblolly bay, Carolina willow, slash pine, fetterbush, and highbush blueberry around the edges of the system.

Wetland 11 is a 0.40-acre isolated wetland located in the central portion of the Project Area. It classifies as a wetland forested mixed (FLUCFCS 630) community consisting of slash pine, loblolly bay, red maple, clubmoss, yellow-eyed grass, Virginia chain fern and bog button.

Wetland 12 is a 4.44-acre wetland located in the northeast portion of the Project Area. It classifies as a wetland scrub (FLUCFCS 631) community consisting of broom grass (*A. virginicus*), soft rush, Carolina redroot, St. John's wort, sphagnum moss, camphorweed, Carolina willow, yellow-eyed grass, dog fennel, and scattered pines (slash pine, longleaf pine and sand pine). This wetland is located within an area of historically mined tailings and drains into a rim ditch that is a remnant of previous mining activity.

Wetland 13 is a 0.02-acre isolated wetland located in the northeast portion of the Project Area. It classifies as a wetland scrub (FLUCFCS 631) community. This area has an understory and groundcover vegetation consisting of St. John's wort, Virginia chain fern and cinnamon fern. This wetland is located within an area of historically mined tailings and drains into a rim ditch that is a remnant of previous mining activity.

Wetland 14 is a 0.36-acre wetland located in the northeast portion of the Project Area. It classifies as a wetland scrub (FLUCFCS 631) community. The vegetation consists of water lilies (*Nymphaea* spp.), spike rush (*Eleocharis palustris*), Carolina redroot, umbrella grass (*Fuirena* spp.), coinwort (*Centella asiatica*), water pennywort (*Hydrocotyle* spp.), St. John's wort, and sphagnum moss. This wetland is located within an area of historically mined tailings and drains into a rim ditch that is remnant of previous mining activity.

Wetland 15 is a 0.08-acre wetland located in the northeast portion of the Project Area. It classifies as a wetland scrub (FLUCFCS 631) community populated with wax myrtle, pine, sweet bay, sweet gallberry, St. John's wort, dahoon holly, and Virginia chain fern. This wetland is located within an area of historically mined tailings and drains into a rim ditch that is remnant of previous mining activity.

Wetland 16 is an 18.18-acre wetland located in the northeastern portion of the Project Area and consisting of two community types. The exterior classifies as a wetland scrub (FLUCFCS 631) (12.57 ac) community. Vegetation includes red bay, loblolly bay, sweet bay, red maple, dahoon holly, myrtle-leaved holly, wax myrtle, saltbush, highbush blueberry, slash pine, cedar (*Juniperus virginiana*), wild grape, royal fern, poison ivy (*Toxicodendron radicans*), spike rush, cattail, Virginia chain fern, yellow-eyed grass, and St. John's wort. The central portion of the wetland is a freshwater marsh (FLUCFCS 641) (5.61 ac) community consisting of spatterdock (*Nuphar* spp.), sundew, St. John's wort, club moss, water pennywort, sphagnum moss, cattail, torpedo grass (*Panicum repens*), spike rush, Carolina redroot, and umbrella grass. This wetland is located within an area of historically mined tailings and drains into a rim ditch that is remnant of previous mining activity.



Wetland 17 is a 4.08-acre wetland located near the western edge of the Project Area. The vegetative community consists of coniferous plantation wetland (FLUCFCS 441W). This area has a canopy of predominately planted slash pine, with scattered (2-3% vegetative cover) Virginia chain fern, Carolina redroot, gallberry, and saw palmetto located in the understory/groundcover. This wetland is connected hydrologically through roadside ditches that flow to the west and offsite.

Wetland 18 is a 11.36-acre wetland located along the western boundary of the Project Area. It is comprised of three community types. The central component classifies as a wetland forested mixed (FLUCFCS 630) (0.29 ac) community of slash pine, loblolly bay, red maple, bald cypress, clubmoss, yellow-eyed grass, and bog button. A cypress (FLUCFCS 621) (0.84 ac) community consisting of pond cypress, blackgum, slash pine, titi, and red maple is located in the southwestern portion of the wetland. The exterior portion classifies as a coniferous plantation wetland (FLUCFCS 441W) (10.23 ac) community. This area has a canopy of predominately planted slash pine, with widely scattered (2-3% vegetative cover) Virginia chain fern, gallberry, blackberry, and nut-rush (*Scleria baldwinii*) in the understory/groundcover.

Wetland 19 is a 181.56-acre wetland located in the central portion of the Project Area. The wetland is comprised of three community types. The central component classifies as a wetland forested mixed (FLUCFCS 630) (92.11 ac) community consisting of immature slash pine, loblolly bay, wax myrtle, fetterbush, Virginia chain fern, beakrush, Carolina redroot, blackberry, and clubmoss. The northern portion of the wetland classifies as a freshwater marsh (FLUCFCS 641) (26.42 ac) community consisting of scattered blackgum, wax myrtle, soft rush, cattail, netted chain fern, Virginia chain fern, yellow-eyed grass, beakrush, bushy broom grass, woolgrass, and pipewort. The exterior portion classifies as a coniferous plantation wetland (FLUCFCS 441W) (63.03 ac). This area has a canopy of predominately planted slash pine, and very scattered (2-3% vegetative cover) understory/groundcover vegetation consisting of red bay, gallberry, highbush blueberry, saw palmetto, yellow-eyed grass, blackberry, coinwort, Carolina redroot, pipewort, reindeer moss (*Cladonia* sp.), cinnamon fern, St. John's wort, netted chain fern, sphagnum moss, and algal mats. A large slough flows through the center of the wetland from east to west and offsite.

Wetland 20 is a 1.29-acre wetland located in the northeast portion of the Project Area. The wetland community classifies as a bay swamp (FLUCFCS 611). The plant community consists of loblolly bay, slash pine, wax myrtle, dahoon holly, gallberry, pipewort, yellow-eyed grass, Carolina redroot, club moss, and sundew. This wetland is located within an area of historically mined tailings and drains into a rim ditch that is remnant of previous mining activity.

Wetland 21 is a 123.89-acre wetland located in the central portion of the Project Area. The wetland is comprised of two community types. Most of the wetland classifies as a wetland forested mixed (FLUCFCS 630) (98.32 ac) community populated with loblolly bay, slash pine, wax myrtle, and pond cypress. Scattered throughout the wetland are areas of freshwater marsh (FLUCFCS 641) (25.57 ac) consisting of Virginia chain fern, Carolina redroot, sphagnum moss, bull rush, pickerelweed, soft rush, yellow-eyed grass, arrowhead, primrose willow (*Ludwigia peruviana*) and beakrush. A large slough flows through the center of this wetland and flows from east to west and into Wetland 19 before going offsite.

Wetland 22 is a 15.18-acre wetland located along the western boundary of the Project Area. The wetland is comprised of two community types. The central component classifies as a wetland forested mixed (FLUCFCS 630) (8.48 ac) community consisting of slash pine, loblolly bay, wax myrtle, fetterbush, Virginia chain fern, beakrush, Carolina redroot, blackberry, and clubmoss. The exterior portion classifies as a coniferous plantation wetland (FLUCFCS 441W) (6.70 ac) community. This area has a canopy of predominately planted slash pine, along with scattered

loblolly bay. Very scattered (2-3% vegetative cover) fetterbush, greenbriar, sphagnum moss, Carolina redroot, beakrush, and Virginia chain fern is located in the understory/groundcover. This wetland is linear and appears to be associated with a ditch which runs offsite from Wetland 19 to the west.

Wetland 23 is a 0.67-acre wetland located in the southwest portion of the Project Area. The wetland classifies as a coniferous plantation wetland (FLUCFCS 441W). This area has a canopy of predominately planted slash pine. The sparse (2-3% vegetative cover) understory/groundcover includes Virginia chain fern, yellow-eyed grass, and bushy broom grass. The wetland is connected hydrologically through roadside ditches to Wetland 24.

Wetland 24 is a 331.14-acre wetland located in the southwest portion of the Project Area. The wetland is comprised of three community types. The central component classifies a wetland forested mixed (FLUCFCS 630) (241.56 ac) community consisting of loblolly bay, water oak, sweet bay, slash pine, coastal plain willow, blackgum, red bay, red maple, huckleberry (*Gaylussacia* spp.), wild grape, blackberry, wax myrtle, saw palmetto, Virginia chain fern, netted chain fern, and cinnamon fern. The exterior portion classifies as a coniferous plantation wetland (FLUCFCS 441W) (89.37 ac) community. This area has a canopy of predominately planted slash pine, and sparse (2-3% vegetative) understory/groundcover vegetation of scattered gallberry, highbush blueberry, and saw palmetto. A small area of Gum Swamp (FLUCFCS 613) (0.21 ac) is located in the northern portion of this wetland. This area consists of a canopy of primarily blackgum with a component of bald cypress and red maple with an under story of blackgum, scattered slash pine, red maple, sweet bay, wax myrtle, dahoon holly, gallberry, sawgrass (*Cladium jamaicense*), Virginia chain fern, soft rush, bracken fern and beakrush. This wetland has a large slough running through it, flowing to the southwest and offsite.

Wetland 25 is a 0.23-acre wetland located in the southwest portion of the Project Area. The wetland classifies as a coniferous plantation wetland (FLUCFCS 441W) community. This area has a canopy of predominately planted slash pine, along with scattered loblolly bay. The understory is sparsely (2-3% vegetative cover) vegetated with fetterbush, smilax, sphagnum moss, Carolina redroot, beakrush, Virginia chain fern and umbrella grass. This wetland appears to have been cut off from Wetland 24 by a trail road in the past. It is connected hydrologically to Wetland 32 via roadside ditches.

Wetland 26 is a 10.89-acre wetland located in the central portion of the Project Area. The vegetative community classifies as a coniferous plantation wetland (FLUCFCS 441W) community consisting of a canopy of predominately planted pine. Understory/groundcover species include scattered (2-3% vegetative cover) myrtle-leaved holly, sweet bay, dahoon holly, wax myrtle, saw palmetto, St. John's wort, sphagnum moss, and Virginia chain fern. This wetland is connected hydrologically to Wetland 24 through a culvert under a trail road.

Wetland 27 is a 9.82-acre wetland located in the central portion of the Project Area. The vegetative community classifies as a coniferous plantation wetland (FLUCFCS 441W) community consisting of a canopy of predominately planted pine. Understory/groundcover species include scattered (2-3% vegetative cover) myrtle-leaved holly, sweet bay, dahoon holly, wax myrtle, saw palmetto, St. John's wort, sphagnum moss, and Virginia chain fern. Historically it appears that Wetlands 26 and 27 were a single wetland that were split by a trail road running north-south through them. Wetland 27 is still hydrologically connected to Wetland 26 via a culvert.

Wetland 28 is a 11.82-acre wetland located along the eastern boundary of the Project Area. The wetland classifies as a wetland forested mixed (FLUCFCS 630) community of blackgum, sweet bay, coastal plain willow, wax myrtle, titi, St. John's wort, camphorweed, royal fern, soft rush, saltbush and spike rush. This wetland is hydrologically connected to Wetland 27 via an upland cut ditch flowing to the west.

Wetland 29 is a 2.73-acre wetland located along the western boundary of the Project Area. The wetland classifies as a coniferous plantation wetland (FLUCFCS 441W). This area has a canopy of predominately planted slash pine, and an sparse (2-3%) understory/groundcover consisting of loblolly bay, sweet bay, Carolina redroot, Virginia chain fern, pipewort, and yellow-eyed grass. This wetland is hydrologically connected via roadside ditches with water flowing to the west and offsite.

Wetland 30 is a 1.38-acre isolated wetland located in the southwest portion of the Project Area. The wetland is made up of two community structures. The interior classifies as a cypress (FLUCFCS 621) (0.51 ac) community consisting of bald cypress, pond cypress, red maple, sweet bay, loblolly bay, blackberry, Carolina redroot, Virginia chain fern, bull rush, and soft rush. The exterior portion classifies as a coniferous plantation wetland (FLUCFCS 441W) (0.87 ac) community. This area has a canopy of predominately planted slash pine, and sparse (2-3% vegetative cover) understory/groundcover consisting of loblolly bay, sweet bay, Carolina redroot, Virginia chain fern, pipewort, and yellow-eyed grass.

Wetland 31 is a 1.67-acre isolated wetland located on the Project Area's western boundary. This wetland classifies as a cypress (FLUCFCS 621) community consisting of bald cypress, slash pine, red maple, gallberry, Virginia chain fern, Carolina redroot, and pipewort.

Wetland 32 is a 2.77-acre wetland located in the central portion of the Project Area. The wetland classifies as a wetland forested mixed (FLUCFCS 630) community consisting of slash pine, red bay, sweet bay, wax myrtle, dahoon holly, red maple, St. John's wort, Virginia chain fern, camphorweed, mermaidweed (*Proserpinaca* spp.), bog buttons and greenbriar. This wetland is hydrologically connected to Wetland 33 via a culvert under a trail road and ultimately flows offsite to the west through a series of culverts and wetlands.

Wetland 33 is a 20.41-acre wetland located in the central portion of the Project Area. The wetland is made up of two community types. The northern portion and an exterior ring about the southern section of the wetland classify as a coniferous plantation wetland (FLUCFCS 441W) (15.28 ac) community. This area has a canopy of predominately planted slash pine. The sparse (2-3% vegetative cover) understory/groundcover species include loblolly bay, red bay, gallberry, Virginia chain fern, greenbriar, wild grape, pipewort, yellow-eyed grass, wax myrtle, and Carolina redroot. The northern portion of this wetland flows to the north and west via a culvert and into Wetland 24. The southern portion, in addition to the coniferous pine plantation element also contains a freshwater marsh (FLUCFCS 641) (5.13 ac) community dominated by cattail but also containing wax myrtle, wild grape, water lily, Virginia chain fern, and sphagnum moss. The southern portion of the wetland flows south and west into a ditch and offsite.

Wetland 34 is a 103.42-acre wetland located in the southern portion of the Project Area. The wetland is comprised of three community types. The eastern component classifies as a wetland forested mixed (FLUCFCS 630) (46.42 ac) community consisting of cypress, sweet bay, red bay, titi, slash pine, Virginia chain fern, highbush blueberry, sphagnum moss, Carolina redroot, and bushy broom grass. The western portion of the wetland classifies as a freshwater marsh (FLUCFCS 641) (23.52 ac) community consisting of wax myrtle, Carolina redroot, yellow-eyed grass, St. Joh's wort, pipewort, beakrush, cattail and Virginia chain fern. An exterior "ring" portion

classifies as a coniferous plantation wetland (FLUCFCS 441W) (33.48 ac) community. This area has a canopy of predominately planted slash pine. Understory/groundcover consists of scattered (2-3% vegetative cover) loblolly bay, swamp red bay, huckleberry, shiny blueberry, Virginia chain fern, Carolina redroot, pipewort and algal matting. This wetland is connected hydrologically to Wetland 33 via a culvert under a trail road with flow being to the west.

Wetland 35 is a 24.60-acre wetland located in the southwestern portion of the Project Area. The wetland is comprised of two community types. The northern portion classifies as a cypress (FLUCFCS 621) (4.12 ac) community consisting of bald cypress, slash pine, red maple, gallberry, Virginia chain fern, Carolina redroot, and pipewort. The southern portion classifies as a coniferous plantation wetland (FLUCFCS 441W) (20.48 ac) community. This area has a canopy of predominately planted slash pine. The scattered (2-3%) understory/groundcover vegetation consists of gallberry, highbush blueberry, saw palmetto, cinnamon fern, Virginia chain fern, blackberry and Carolina redroot. This wetland is connected hydrologically to Wetland 24 during high water events by flowing over a trail road to the west of the project boundary.

Wetland 36 is a 4.33-acre isolated wetland located in the southwest portion of the Project Area. The vegetative community classifies as a coniferous plantation wetland (FLUCFCS 441W) community. This area has a canopy of predominately planted slash pine. Scattered (2-3% vegetative cover) understory/groundcover species include Virginia chain fern, Carolina redroot, bushy broom grass, and nut-rush.

Wetland 37 is a 2.34-acre isolated wetland located in the southwestern portion of the Project Area. The wetland is comprised of two community types. The majority of the wetland classifies as a freshwater marsh (FLUCFCS 641) (1.82 ac) community consisting of bull rush, Virginia chain fern, and soft rush. A thin border of coniferous plantation wetland (FLUCFCS 441W) (0.52 ac) is located around the perimeter of the wetland. This area has a canopy of predominately planted slash pine. The understory/groundcover species consist of scattered (2-3% vegetative cover) sweet bay, saw palmetto, fetterbush, wild grape, broom grass, highbush blueberry, and wax myrtle.

Wetland 38 is a 42.46-acre portion of a larger wetland located on the southwestern portion of the Project Area that continues offsite. The wetland is comprised of two community types. The majority of the wetland classifies as a coniferous plantation wetland (FLUCFCS 441W) (34.13 ac). This area has a canopy of predominately planted slash pine. The understory/groundcover is sparse (2-3% vegetative cover) consisting of wax myrtle, gallberry, red maple, sweet bay, Virginia chain fern, club moss, cinnamon fern, nut-rush, pipewort and Carolina redroot. The western portion classifies as a wetland forested mixed (FLUCFCS 630) (8.33 ac) community consisting of slash pine, loblolly bay, wax myrtle, fetterbush, Virginia chain fern, beakrush, Carolina redroot, blackberry, and clubmoss.

Wetland 39 is a 0.43-acre wetland located in the southern portion of the Project Area. This wetland classifies as a freshwater marsh (FLUCFCS 641) community consisting of Virginia chain fern, yellow-eyed grass, Carolina redroot, gallberry, pipewort, and algal mats. This wetland is connected hydrologically to Wetland 34 via roadside ditches.

Wetland 41 is a 1.72-acre portion of a larger wetland located in the southern portion of the Project Area. This wetland consists of a coniferous plantation wetland (FLUCFCS 441W) community. This area has a canopy of predominately planted slash pine. Species including loblolly bay, dahoon holly, highbush blueberry, wax myrtle, gallberry, Virginia chain fern, Carolina redroot, and beakrush locate within the sparse (2-3% vegetative cover) understory/groundcover. Wetland 41 is located between two trail roads and acts as a conveyance of water between Wetland 34 and Wetland 40.

Wetland 42 is a 0.70-acre wetland located in the southern portion of the Project Area. This wetland classifies as a freshwater marsh (FLUCFCS 641) community consisting of Virginia chain fern, broom grass, pipewort, yellow-eyed grass, gallberry, and sphagnum moss. This wetland is connected to Wetland 34 during high water events through windrows placed in the uplands to drain water.

Wetland 43 is a 1.16-acre wetland located in the southern portion of the Project Area. This wetland classifies as a freshwater marsh (FLUCFCS 641) community of scattered slash pine, wax myrtle, gallberry, St. John's wort, Virginia chain fern, Carolina redroot, beakrush, umbrella grass, wild grape, highbush blueberry, and broom grass. This wetland is connected to Wetland 34 via roadside ditches.

Wetland 45 is a 0.69-acre isolated wetland located in the southwest portion of the Project Area. The vegetative community consists of a wetland forested mixed (FLUCFCS 630) community of blackgum, slash pine, red bay, Virginia chain fern, Carolina redroot, beakrush, gallberry, and pipewort.

Wetland 46 through 55 will not be disturbed by the proposed project activities and consist of a variety of community types including wetland forested mixed (FLUCFCS 630), coniferous plantation wetland (FLUCFCS 441W), and cypress (FLUCFCS 621).

Upland cut ditches (FLUCFCS 510d UP) make up 25.47-acres of ditches throughout the Project Area. These ditches were dug to quickly and efficiently remove water from the upland portions of the site.

Wetland cut ditches (FLUCFCS 510d WET) make up 3.72-acres of ditches throughout the Project Area. These ditches were dug to more efficiently move water through wetland areas and off the site.

SW 3 (13.65 ac), FLUCFCS 523 - Lakes larger than 10 acres, is found in the northeastern portion of the Project Area and was dug during previous mining activities. Vegetation observed along the banks include sphagnum moss, St. John's wort, Carolina redroot, water lily, and wax myrtle. SW3 will remain undisturbed.

SW 1 and SW 2 classified as Lakes less than 10 acres (FLUCFCS 524). SW 1 (1.60 ac) is located in the southeastern portion of the Project Area and will remain undisturbed. SW 2 (0.67 ac) is located east of SW 3 in the northeast portion of the site.

### **3 ENVIRONMENTAL CONSIDERATION**

#### **3.1 Wetland and Surface Water Impacts**

##### **Direct Impacts**

Mining and associated activities will impact total of 740.45-acres of wetlands, ditches and surface waters within the Project Area (**Table 2**). Of this total, 692.14-acres are considered jurisdictional impacts consisting of 687.75-acres of jurisdictional wetlands, 3.72-acres of wetland cut ditches, and 0.67-acres of jurisdictional surface waters (**Figure 11**). The remaining 48.31-acres of non-jurisdictional impacts consist of 22.84-acres of isolated wetlands and 25.47-acres of upland cut ditches. Of the 687.75-acres of jurisdictional wetland impacts, approximately 216.72 acres of impacts are to low quality Coniferous Plantation Wetlands (441W) which are currently rotated in

timber cycles. Wetland impact cross section details are provided on **Attachment 2: Figures 11A-11U**. The Uniform Mitigation Assessment Methodology (UMAM) was used to assess functional loss associated with the proposed wetland impacts. Impact assessment scoring was completed during a field review with Mr. John Fellows of USACE and Kleinfelder scientists on June 4, 2019, of the jurisdictional wetland impact areas. Completion of the UMAM assessment revealed an estimated functional loss of 336.520 (**Attachment 3**). A summary of the proposed direct wetland impacts is provided in the enclosed **Table 3**.

### **Secondary Impacts**

Secondary wetland impacts associated with the proposed project activities are anticipated to be *de minimis*. Silt fencing and BMPs (as appropriate) will be installed along the limits of disturbance areas adjacent to any undisturbed wetland areas.

Additionally, no long-term adverse impacts to undisturbed or adjacent offsite wetlands are anticipated as the MMU methodology does not require sustained dewatering within a particular mining footprint for an extended period of time. A Hydrogeologic Analysis was prepared and submitted to the FDEP to demonstrate the lack of long-term impacts to the hydrology of undisturbed wetlands.

### **Cumulative Impacts**

The proposed mitigation plan is sufficient to offset (see Section 3.6) wetland impacts and will occur within the same drainage basin (St. Johns River); thus, no cumulative impacts are anticipated. A UMAM analysis of the proposed wetland impacts, and wetland mitigation is provided as **Attachment 3**.

## **3.2 Avoidance and Minimization of Impacts**

Due to the nature of mining, the location of the high-grade mineral sands and the locations of the wetlands, impacts to wetlands onsite are unavoidable. Large portions of wetland sloughs running through the Project Area were avoided in order to maintain the existing flow ways connecting onsite wetlands to downstream wetland systems, and flow ways that feed into the Santa Fe River Basin. During the mine planning process, the footprint of the mining limits was reduced to avoid large wetland areas located along the western and southwestern boundary (**Figure 11**). These efforts to reduce the impact to wetlands within the proposed Mine Permit Boundary reduced wetland impacts and leaves 725.96-acres of wetlands and other surface waters undisturbed. The proposed reclamation/mitigation will mimic the pre-mining wetland hydrology, acreage, and wetland type.

During construction, all necessary steps will be taken for the duration of the proposed project activities to ensure that no adverse impacts to water quality will occur. This may include, but is not limited to, siltation curtains, hay bales and floating turbidity screens, and other typical construction BMPs as necessary. All newly exposed surfaces will be seeded as soon as practicable. BMPs (as appropriate) will be installed along the limits of disturbance areas when adjacent to any undisturbed wetland areas.

## **3.3 Alternative Plan Analysis**

The following Alternative Analysis outlines the process by which the proposed or preferred alternative was chosen.

## **Preferred Alternative**

The preferred alternative for the Project Area is to temporarily impact 692.14-acres of onsite jurisdictional wetlands, ditches and surface waters, while avoiding 725.96 acres of wetland areas located along the western and southwestern boundary (**Figure 11**). These avoided wetlands make up large flow ways that provide hydrologic connection to the Santa Fe River Basin.

Proposed mining operations will extract titanium minerals, and other mined minerals, including zircon and staurolite, which are critical to a wide array of products ranging from paint, toothpaste, and porcelain, to bridge fabrication and metal casting for aerospace and military applications. Titanium and zirconium are also part of Executive Order 13817 which lists the federal strategy to secure domestic sources of these critical minerals. The Chemours mining operations currently sustains hundreds of local and regional jobs and benefits the health of the local and regional economy. The Project Area is anticipated to both continue and enhance these economic impacts for the near future.

As proposed, this preferred alternative represents the least impactful alternative that still provides for an economically viable project and meets the intent of the proposed action.

## **Alternative # 1 -- No Action**

This alternative represents a no action alternative which would substantially decrease the amount of “Florida Grade” zircon and other mined minerals available to domestic and international markets. The Trail Ridge geologic formation is the only source in the world for Florida Grade zircon, the highest standard of zircon on the market. Demand for Florida Grade zircon has increased in recent years. The decrease in available minerals will drive the increase of prices of available titanium, zircon, and staurolite minerals, leading to a further increase in final product prices, and hampering the viability of projects worldwide.

This proposed no action alternative does not meet the intent of the proposed action and would end up impacting the local and international economy and work force base.

## **Alternative #2 – Offsite**

Under the offsite alternative, Chemours will be forced to find a new site with comparable mineral deposits.

Mineral deposit locations on the Trail Ridge geologic formation have been excavated since 1949 and most of the areas where the necessary minerals are located have been mapped, delineated and excavated. This includes the deposits to the north and east of the Project Area, which have been sterilized. Additional areas of the Trail Ridge formation to the southeast of the proposed project area occur on a portion of the CBJTC that is currently not under a lease agreement with Chemours, and includes areas used for active military exercises, contains unexploded ordinances, and would require an Act of Congress to allow the mineral deposits to be mined. Located south of the proposed project area along the Trail Ridge geologic formation is the Keystone Airport. This site was considered but is not a viable offsite alternative as the land is currently in use as an airport. The areas of silviculture to the west of the proposed project area were considered but are not viable offsite alternatives. These areas are too far west of the main Trail Ridge geologic feature and mostly consist of large wetland systems.

### **Alternative #3 – Onsite Less Impact**

This alternative took into consideration the onsite less impact during the initial phases of project planning. The avoidance and minimization of most wetland impacts was considered; however, the reduced mining area was significant and did not make for a viable project.

### **Alternative #4 – Greater Impact than Preferred**

The greater impact than preferred alternative was also considered during the initial planning phases of the project. Under this alternative mining would occur within the entire Project Area, increasing wetland impacts. This would maximize mineral recovery which is the intent of the proposed project but does not take into account avoidance and minimization of wetland impacts. Therefore, it is not proposed.

The final preferred alternative balances Alternative #3 and Alternative #4 with a plan that provides avoidance and minimization but also provides a viable project.

## **3.4 Fish, Wildlife, Listed Species and their Habitats**

Prior to field reviews, Kleinfelder conducted a desktop review of federally protected species using the most recent lists of threatened and endangered (T/E) species for Clay and Duval Counties to determine which species had likelihood to occur within the Project Area. The lists were obtained from the following sources:

- **Florida Fish and Wildlife Conservation Commission (FWC)** Florida Natural Areas Inventory (FNAI)
- **U.S. Fish and Wildlife Service (FWS) Environmental Conservation Online System (ECOS)** Information for Planning and Conservation (IPaC) Wildlife Species Consultation Code
- **FWC Water Bird Locator** online database
- **FWC Eagle Nest Locator** online database

In addition, findings from a listed species report prepared for Camp Blanding Joint Training Center (CBJTC) by Bio-Tech in 2008 along with recent correspondence with CBJTC biological staff were considered for the potential of listed species occurrence within the Project Area. Pre-application meetings conducted June 11 and November 8, 2019, with USACE staff also identified additional listed species to review.

Biological survey work within the Project Area was conducted by Kleinfelder in 2012, 2014, 2018 and 2019. The Project Area was surveyed for the occurrence and potential for occurrence of listed species based on known habitat preference and geographical distribution. Surveys for wildlife species followed recommendations established in published wildlife survey methodologies developed by FWC and FWS. Pedestrian transects were conducted throughout the Project Area. All areas within the Project Area were reviewed.

The Project Area has limited biological diversity as a result of intensive silviculture operations and hunting activity that has been ongoing for many years. These activities limit the habitat available for protected species.



Based on habitat availability and Kleinfelder's field survey observations, the following listed T/E species were determined to have the potential to occur within the Project Area:

- Eastern Indigo Snake (*Drymarchon couperi*) – state and federal threatened
- Wood Stork (*Mycteria americana*) – state and federal endangered
- Florida Scrub Jay (*Aphelocoma coerulescens*) – state and federal threatened
- Red-Cockaded Woodpecker (*Picoides borealis*) – state and federal endangered
- Suwannee Moccasinshell (*Medionidus walker*) – federal threatened
- Oval Pigtoe (*Pleurobema pyriforme*) – federal endangered
- Bald Eagle (*Haliaeetus leucocephalus*) – protected under Bald and Golden Eagle Protection Act of 1940 and the Migratory Bird Treaty Act of 1918.

Since the project was originally reviewed and approved (pending water quality certification) by the USACE in 2020, and subsequently reviewed, approved and issued under the State 404 Program by the FDEP on June 6, 2022, the tricolored bat (*Perimyotis subflavus*) (TCB), has been proposed to be listed as federally endangered by the FWS. Following habitat observations by SWCA, it was determined that the Project Area contains suitable habitat for the TCB, and that TCB were determined to have the potential to occur within the Project Area. In the event that the TCB is listed as federally endangered by the FWS, further coordination and consultation with FWS will be pursued to discuss any regulatory requirements for the species.

### **Eastern Indigo Snake**

The eastern indigo snake (EIS) is federally listed endangered species by the FWS. EIS maintain a large home range inhabiting a mosaic of upland and wetland habitats including pine flatwoods, scrubby flatwoods, dry prairie, hardwood hammocks, and the perimeter of freshwater wetlands. In the northern part of their range, the EIS will often inhabit gopher tortoise burrows as refugia during the cooler months.

Although gopher tortoise burrows were observed within the Project Area, the majority of the Project Area consists of densely vegetated silviculture areas which have been fire suppressed for multiple decades and would provide limited suitable habitat. However, wetlands identified within the Project Area may provide potential foraging habitat for EIS.

It is likely that during land clearing activities, any EIS within the Project Area will relocate themselves to adjacent undisturbed lands. Prior to construction, all staff should be notified of the potential presence of EIS within the Project Area and should be instructed how to identify them. If an EIS is observed within a construction area, all activities should cease until the snake has moved beyond identified construction boundaries. Further coordination and consultation with FWS will be pursued to discuss any regulatory requirements for the species. As this is also a federally listed species, Chemours also plans to incorporate the Eastern Indigo Snake Standard Protection Measures. Based on the Eastern Indigo Snake Programmatic Effect Determination Key (**Exhibit C**) the project “may effect” the species. Kleinfelder has prepared a Biological Assessment seeking concurrence from FWS that onsite activities “may affect, but is not likely to adversely affect” the eastern indigo snake (**Attachment 2: Eastern Indigo Snake Biological Assessment**).

Eastern Indigo Snake Programmatic Effect Determination Key Responses: B, C, D- May Effect

## Wood Stork

The wood stork is federally listed endangered species by the FWS. Wood storks are colonial nesters and utilize suitable nesting habitat in inundated forested wetlands, cypress domes, and mixed hardwoods swamps. There are no known wood stork colonies within the Project Area, and the nearest known colony lies 28 miles to the east. The Project Area lies beyond the limits of core foraging habitat for the wood stork in North Florida, and based on the Wood Stork Effect Determination Key (**Exhibit C**) no adverse impacts to this species are anticipated.

Wood Stork Effect Determination Key Responses: B, C, D-Not Likely to Adversely Affect

## Florida Scrub Jay

The Florida scrub jay is federally listed as a threatened species by the FWS. The Florida scrub jay utilizes scrub and scrubby flatwood environments within peninsular Florida. Suitable habitat includes scrub communities with low scattered canopy cover composed of myrtle oak (*Quercus myrtifolia*), sand live oak (*Quercus geminate*), chapman oak (*Quercus chapmanii*), rusty lyonia (*Lyonia ferruginea*), and Florida rosemary (*Ceratiola ericoides*). Florida scrub jays are a non-migratory bird which breed March to June and maintain a social structure that involves cooperative breeding. Fledgling scrub jays remain with the breeding pair and form a family group until they reach breeding maturity. When breeding maturity is reached typically between 1 and 7 years, the scrub jay will seek to acquire a new territory and mate (FWS, n.d.). The Florida scrub jay was listed as a threatened species in 1987 due to loss, fragmentation, and degradation of scrub habitats throughout Florida, primarily from urbanization, agriculture, and fire suppression.

No known populations of scrub jays have been documented within the Project Area based on a review of FWC's Florida Scrub Jay Data Base, conversations with Camp Blanding staff and literature reviews of past studies done within Camp Blanding (McMillan et. al., 2010; Bio-Tech, 2008; Catlett, 2008). A known population was documented on the southeast side of Lowery Lake approximately 3.5 miles to the southeast (Bio-tech 2008). Marginal habitat for the scrub jay was observed by Kleinfelder within the Camp Blanding portions of the Project Area, primarily including xeric oak (421) habitat.

To preliminarily determine the presence or absence of scrub jays within the Project Area, Kleinfelder biologists conducted informal scrub jay surveys on the mornings of October 30 and 31, 2012. The informal survey involved an adaptation of federal survey guidelines (FWS, n.d.). On two consecutive days, scrub jay vocalizations and territorial calls were broadcast for 1 minute in each of the four cardinal directions at eight pre-established survey stations within potentially suitable habitat along the eastern side of the Camp Blanding parcel. Vegetation within the survey areas consisted of sand pine, gopher apple, winged sumac, turkey oak, saw palmetto, dog fennel, greenbrier, live oak, slash pine, wire grass, prickly pear cactus, paw-paw, love grass, crab grass, long leaf pine, reindeer moss, and persimmon.

No scrub jay individuals or calls were documented during the informal survey. Based on the literature review and lack of optimal habitat, it appears that the Project Area does not presently support a population of Florida scrub jay.

### **Red-Cockaded Woodpecker**

The red-cockaded woodpecker (RCW) is listed as endangered by the FWS. RCWs are relatively small woodpeckers distributed throughout the southeastern United States from Florida north to Virginia and west to eastern Texas. RCWs occupy only mature, open pine forests consisting of either longleaf pine from 80 to 120 years old, or loblolly pine from 70 to 100 years old. Cooperative breeding groups need about 200 acres of forest for foraging. Suitable foraging habitat includes pine forests that have a low density of small pines, no hardwood or pine mid-story, and usually have abundant native grasses and forbs as groundcover (FWS, n.d.(b)). Suitable nesting habitat for RCW consists of pine or pine/hardwood forests, woodlands or savannahs in which greater than 50% of the dominant trees are 60 years or older (FWS, n.d.(b)). No suitable nesting habitat was observed within the Project Area.

Multiple RCW populations or clusters are located within Camp Blanding; however, none of these groups occur within 2.5 miles of the Project Area and no suitable nesting trees were observed within the Project Area (Catlett, 2012). Correspondence with Camp Blanding biological staff confirmed that no new populations of RCW's have been noted on Camp Blanding (Catlett, 2012).

To determine if areas within the project area are utilized as foraging habitat for RCWs, informal foraging area surveys were conducted by Kleinfelder on November 7, 8, and 9, 2012. Kleinfelder conducted pedestrian transects through all potential foraging habitat and RCW vocalizations were played at 3 to 5-minute intervals. RCW's are territorial and will actively defend their foraging territory and the use of vocalizations facilitates observations of RCWs.

No RCW's were observed during this survey period. Further, the Project Area does not provide suitable foraging habitat for this species. It is therefore unlikely that the Project Area would have an effect on RCW populations.

### **Oval Pigtoe**

The oval pigtoe is a federally endangered species of freshwater mussel endemic to the states of Georgia, Florida and Alabama. The oval pigtoe inhabits mid-sized rivers and small creeks with a slow to moderate current and a sandy silt to gravel floor. According to the FWC's website this species can be found in the Chipola, Ochlockonee and Suwannee River systems. The Project Area is not located in the watershed of any of these river systems and as such not likely to affect the oval pigtoe.

### **Suwannee Moccasinshell**

The Suwannee moccasinshell is a small freshwater mussel that historically inhabited the Suwannee River basin, the Santa Fe River basin and lower Withlacoochee River mainstem. Currently it is found only in the Lower Santa Fe and Suwannee River basins. The Suwannee moccasinshell inhabits larger streams where it is found in muddy sand or sand with some gravel in slow to moderate current. The Suwannee moccasinshell is also associated with large woody debris and can be found near embedded logs.

While the Project Area is located within the Santa Fe River basin, it is located in an area associated with the most remote headwaters. The Suwannee moccasinshell relies on a steady, slow to moderate flow in larger streams. Extensive review of the Project Area shows that this habitat is not present. In addition, the larger flow ways and sloughs within the Project Area are not proposed to be impacted. This will have a two-fold effect. Firstly, if the Suwannee moccasinshell

were found to be located within the Project Area it would not be impacted by proposed mining activities and, secondly, by preserving and protecting these flow ways water quality for downstream habitats will be maintained.

### **Bald Eagle**

The bald eagle is protected under Bald and Golden Eagle Protection Act of 1940 and the Migratory Bird Treaty Act of 1918. Bald eagles are large raptors which utilize lakes, ponds, rivers, estuaries, and coastal areas as foraging habitat. Bald eagles typically nest in large, tall trees that provide clear views of surrounding areas. Forested areas on the Project Area were scanned for the presence of any large nests that could indicate the presence of bald eagles. The Project Area contains very few mature pine trees that would be suitable for nesting due to silvicultural activities. According to the most recent FWC and Audubon bald eagle nesting records, there are no known bald eagle nests within 660 feet of the Project Area, which is the farthest distance from the property that could limit construction activities.

## **3.5 Water Quantity and Quality Impacts**

### **Water Quantity Impacts**

Stormwater management for the Project Area was specifically designed to reduce and mitigate potential impacts to downstream waters and to restore to the greatest extent practical pre-mining surface flow conditions. The mine plan was designed to maintain downstream flow by avoiding the large central wetland flow ways.

During mining operations, the mine cells are proposed to be surrounded by a perimeter containment berm. The berm will prevent inundation of the mine cell from upstream drainage areas while also preventing unwanted discharge of stormwater from within the disturbed area in one of the four active stages of operations. Drawings depicting typical designs of the berms are enclosed as **Attachment 2: Figures 10A-10C**.

Four existing trail road wetland crossings are proposed to be widened during the mining phase of the proposed project. They will have equalization culverts installed to existing wetland topography in order to maintain proper flow through wetland systems. The proposed widening of these crossings will be constructed similar to the existing culverted wetland crossings. These wetland crossings appear to be providing adequate flow to downstream systems. It is not anticipated that the widening of these four crossings will have adverse impacts to water quantities.

### **Water Quality Preservation**

The engineered stormwater management design will ensure protection of adjacent and downstream waters and will adhere to State Water quality requirements. Discharge water will be reclaimed within the stormwater retention ponds and discharged in accordance with the IWW permit.

Within the Project Area the proposed stormwater management system and accepted BMPs will serve to reduce turbidity, erosion, and runoff to maintain water quality within adjacent offsite wetlands. Adherence to general and special permit conditions will provide for protection of water quality during the duration of permitted activities.

The proposed post-mining phase includes four elevated road crossings to provide upland access. Each culvert or set of culverts is designed to handle the 25-year, 24-hour design storm. The roads will be graded approximately 2-feet above the top of the culverts and are not expected to cause adverse flooding during large storm events or reduce discharges to adjacent downgradient wetlands. This will help to maintain downstream water quantity levels.

### **3.6 Public Interest**

In accordance with 33 CFR 320.4 general policies for evaluating permit applications each of the 20 public interest review factors are addressed separately below.

#### **Conservation**

See Section 3.1 – 3.4 above.

#### **Economics**

The proposed project would benefit one of two operating heavy mineral mines in the United States. The proposed project would provide the source material needed to support heavy minerals processing jobs in north Florida, including heavy equipment, geology, engineering, environmental consulting and surveying. The estimated investment is \$90 million with \$15 million of that contributing to local construction. It is estimated that 50-55 (some new hire, some redeployed from existing operations being phased out) will accompany the proposed project. The economic impact over 7 years estimates direct impacts of \$20-25 million in direct earnings and up to \$75 million in capital expenditures. Secondary economic impacts are estimated at \$87 million which includes spending at community business due to the workers spending in the area.

#### **Aesthetics**

The proposed project is located within access-controlled areas not assessable to the public. This will allow for a significant distance of vegetated buffer between the public and mining operations.

#### **General Environmental Concerns**

BMPs will be implemented to protect the surrounding aquatic environment from runoff and other erosional forces. During mining operations, all state and federal mitigation requirements for environmental impacts will be adhered to subsequent monitoring post-reclamation will be provided to the appropriate organizations.

#### **Wetlands**

See Section 3.1 above.

#### **Historic Properties**

A cultural resource survey was conducted, and no sites of significance were identified during the survey within the Project Area and the State Historic Preservation Office (SHPO) concurred with the results of the report submitted. SHPO's concurrence letter is provided as **Exhibit D**.

#### **Fish and Wildlife Values**

Completion of the proposed project is not anticipated to result in adverse impacts to fish and wildlife in the area as the Project Area will be reclaimed in accordance with the permitted conditions. Reclamation will restore land use and vegetative communities to mimic pre-mining conditions and will integrate the creation of naturally occurring communities in reclamation and

mitigation plans. The proposed project has been designed to ensure no adverse impacts will occur to downstream waters including turbidity, sedimentation, and erosional impacts. Following completion of the proposed project, the area will continue to provide suitable habitat for fish and wildlife species.

### **Flood Hazards/ Floodplain Hazards**

Mining will create temporary impacts that will return to pre-mining water flows after reclamation activities. The temporary impacts will occur in stages throughout the completion of the proposed project limiting the total area impacted at any one time. See Section 1.1 “Mining Methods and Operation”. The project area does contain areas designated Federal Emergency Management Agency (FEMA) flood zone (**Figure 5**).

### **Land Use**

Land uses will be restored to pre-mining conditions reducing the potential for restrictions on future land uses as a result of the proposed reclamation activities.

### **Navigation**

The activities associated with the proposed project will not occur in navigable waters and will have minimal to no impact on navigable waters located downstream.

### **Shore Erosion and Accretion**

During mining and construction BMPs will be implemented to protect the surrounding aquatic environments from erosion or accretion.

### **Recreation**

Recreational use of the land is limited only to restrictions imposed by the landowners.

### **Water Supply and Conservation**

Mining activities were designed to preserve the existing water supply resulting in no net change in downstream water supply. No changes to water supply and conservation are anticipated.

### **Water Quality**

Mining activities are not anticipated to have any adverse impacts on water quality.

### **Safety**

Mining and construction activities associated with the proposed project will strictly adhere to all Federal, state, and local safety laws and regulations.

### **Mineral Needs**

The mining occurs on land with concentrated amounts of heavy mineral sands optimal for mining. The activities associated with the proposed project would directly support the demand for the extraction of heavy mineral sands.

### **Considerations of Property Ownership**

Mining activities are confined to lands leased by Chemours and owned either by Armory Board of the State of Florida or the Suwanee River Water Management District (**Attachment 4**).

### 3.7 Mitigation

#### Mitigation Bank Credits

*A review of the Regulatory In-Lieu fee and Bank Information Tracking System (RIBITS) revealed there are no mitigation bank service areas that include the location of the proposed project.*

#### In-Lieu Fee Program Credits

A review of RIBITS revealed there are no available In-Lieu Fee (ILF) programs servicing the project area.

#### Permittee-Responsible Mitigation

Permittee-responsible mitigation is the only mitigation approach available and is also the most practical for the impacts associated with heavy mineral mining as the mining methods of mineral extraction only removes approximately 3% of material from the mined substrate and topographic features and drainage basins in the post-mining condition mimic the pre-mining condition. This method of extraction results in temporary impacts to jurisdictional wetlands, which once regraded will mimic the basin's hydrologic and aquatic benefits existing prior to mining.

Permittee responsible mitigation presents a low-risk option of mitigation. The proposed impacts are temporary in nature and Chemours maintains a history of successful mitigation projects including wetland reclamation and enhancement within the North Florida region. Furthermore, the USACE, and FDEP (under 62C-37 F.A.C), requires that at a minimum mitigation includes the re-establishment of wetlands to pre-mining conditions in-kind acre-for-acre in accordance with USACE regulations located in 33 CFR Part 332. As part of the federal reclamation requirements, financial assurances are being processed with FDEP, and upon completion, Chemours will provide to USACE a copy of the approved financial instrument that will ensure the completion of the proposed onsite mitigation.

Based on these factors, permittee-responsible mitigation is the most practical compensatory mitigation option. Chemours proposes to utilize permittee-responsible compensatory mitigation to offset the temporary impacts associated with the proposed project. This compensatory mitigation option locates wetlands within the same watershed as the proposed impacts and in approximately the same location (onsite). Additional onsite enhancement of low-quality undisturbed wetlands and offsite permittee responsible mitigation are also proposed to offset the temporal loss calculated in the UMAM scores. The restored wetlands supplement flood risk relief as well as increase in aesthetics within the area. In the northeast portion of the site where the Plant Site is proposed on historically mined area, the wetland restoration proposes to reclaim the majority of the Plant Site and in doing so will reconnect historic wetland connections that were severed by mining in the 1960s.

a. Uncertainty and Risk [Uncertainty - the element associated with whether the compensatory mitigation will successfully offset project impacts. Risk - the element associated with the potential for the proposed compensatory mitigation plan to fail]:

Permittee-responsible: This mitigation will restore the existing ecological value found within the project area and provide benefits to the remaining offsite natural areas associated with the watersheds that contribute to the Santa Fe River. Mitigation activities including wetland restoration/reclamation are based on methods that have been repeatedly and successfully implemented in similar habitats throughout Chemours mine sites, as well as other mineral sands mines and have proven high rates of survivorship, maturation and regeneration. Additionally, the mitigation is required to meet specific success criteria including annual monitoring for survivorship, and treatment for invasive and exotic species. These combined benefits should eliminate the uncertainty and risk that the mitigation will successfully offset project impacts.

b. Size and ecological value of parcel; watershed approach [how the site is ecologically suitable for providing desired functions - consider the physical characteristics, watershed scale features, size, and location; compatibility with adjacent land uses; and likely effects on important resources]:

Permittee-responsible: This mitigation will serve to compliment the larger network of wetlands and drainage features associated with the Santa Fe River. In the post-mining condition, this mitigation will return a network of wetland habitat in the floodplain and surrounding wetland strands providing functional gain and increased ecological value to water and wildlife to this important waterbody that drains to the Santa Fe River.

c. Temporal loss [the time between the initiation of the mitigation plan and the maturation of anticipated ecological functions at a compensatory mitigation site]:

Permittee-responsible: In order to offset the temporal loss calculated in the UMAM scores additional upfront onsite enhancement of undisturbed low-quality Coniferous Plantation Wetlands (441w) and offsite permittee responsible mitigation are also proposed. The proposed offsite permittee responsible mitigation is complete and functioning as mature communities.

d. Scientific/technical analysis, planning, and implementation [as commensurate with the amount and type of impact, the level of scientific/technical evaluation required to appropriately and adequately assess the likelihood for ecological success and sustainability; the location of the compensation site and the significance in the watershed; and, other factors presented in a complete mitigation plan]:

Permittee-responsible: Chemours' project team includes professional engineers, geologists, ecologists, and other appropriate fields of expertise. The proposed mitigation plan has been executed on similar habitats with success on similar Chemours mine sites, as well as other mineral sands mines and have proven high rates of survivorship, maturation and regeneration. Therefore, it is our understanding that the scientific/technical aspects of the mitigation plan have been designed, and will be implemented, successfully.

e. Long-term viability of mitigation/mitigation site [how the compensatory mitigation project will be managed after performance standards have been achieved to ensure long-term sustainability of the resource]:

Permittee-responsible: The mitigation plan is guided by a specific set of success criteria mandated by conditions of the permit and USACE. This includes specific species planted, planting density, planting configuration, plant size/height, and monitoring requirements. These conditions will ensure the success of the wetland restoration/reclamation activities. Once this mitigation achieves success it will be released from permit requirements and the long-term management of the site as a whole will be handled by CBJTC (**Exhibit E**)

f. Site Protection [aquatic habitats, riparian areas, buffers, and uplands that comprise the overall compensatory mitigation must be provided long-term protection through real estate instruments or other available mechanisms, as appropriate]:

Prior to release the reclamation/restoration mitigation areas from permit requirements it will be managed and monitored by Chemours and their environmental consultant. After the mitigation area has been released, it will be protected by the rules and statutes that protect all wetlands under Section 404 of the Clean Water Act (CWA) and placed into the long-term management plans of the CBJTC. This long-term management by the state provides reasonable protections from future disturbances.



g. Financial Assurances [description of financial assurances that will be provided and how they are sufficient to ensure a high level of confidence that the compensatory mitigation project will be successfully completed, as well as annual cost estimates for the long-term management needs of the site and the funding mechanism that will meet those needs]:

The Financial Assurance documentation has been reviewed and approved by FDEP under the issuance of ERP Permit MMR\_137482018, for wetland mitigation and additional financial assurance that were required for property interests related to reclamation protections (**Exhibit F**).

h. Other relevant factors [additional information contributing to the appropriateness, feasibility, or practicability of the mitigation project (ESA, wildlife corridor, unique habitat, etc.)]:

Permittee-responsible: As previously noted, the reclamation of wetlands will successfully promote species diversity, promote wildlife utilization, and re-establish hydrologic regimes to mimic pre-mining conditions. These combined mitigation efforts will serve to compliment the larger network of wetlands and tributaries associated the Santa Fe River. This mitigation will restore the network wetland habitat in the floodplain and surrounding wetland strands associated with existing watersheds, thus providing increased ecological value to water and wildlife to this important waterbody that drains to the Santa Fe River.

## Objective

The purpose of the proposed mitigation plan is to offset wetland impacts through a combination of onsite permittee responsible wetland restoration, onsite permittee responsible wetland enhancement and offsite permittee responsible mitigation (**Figures 15 and 17, Table 4**). Target vegetative communities for the onsite restored mitigation areas will match those of the wetlands proposed for impact at a minimum of one-to-one/type-for-type functional replacement for wetland loss in accordance with USACE regulations located in 33 CFR Part 332. Exceptions to this are the Coniferous Plantation Wetlands (441W) and Wetland Scrub (631) which will be replaced as Wetland Forested Mixed (630) to restore their historic community types. The onsite wetland enhancement and offsite permittee responsible mitigation will be additional mitigation to offset the temporal loss calculated in the UMAM analysis. The onsite wetland enhancement includes undisturbed onsite wetlands outside the limits of disturbance (Coniferous Plantation Wetlands - 441W), which will be enhanced through a conversion to a Wetland Forested Mixed (630) community type. Offsite permittee responsible mitigation areas are located at the nearby Florida Mine/Trail Ridge Mine (**Figure 17 and Exhibit G**) located in the same drainage basin as the Project Area. These wetlands had been previously constructed during reclamation activities but were not part of the Florida Mine/Trail Ridge Mine Mitigation Plan. Additional information about each mitigation type is provided in the sections below.

## Site Selection

The plan design has been completed to account for local water flow and will re-establish historic surface water flow patterns to mimic pre-mining conditions. Previous wetland connections near the Plant Site that were severed by historic mining activities in the 1960s will be re-established under the proposed reclamation/restoration plan. The re-establishment of historic drainage patterns will help to provide a practical and self-sustaining resource, while reducing the long-term impacts of historic mining activities on lands within the Project Area.

Wetland reclamation/restoration areas were designed to be located within the same drainage basin and vicinity as the impacted wetlands and restored on a type-for-type/acre-for-acre basis. Reclamation/restoration of wetland habitats in these locations will provide no net loss in wetland acreage within the Project Area, will serve to maintain water quantity and retention for

downstream environments. Reclamation/restoration of wetland areas in close proximity to impacted wetland habitats provides a practical means of successful reclamation/restoration of wetlands to mimic pre-mining conditions.

The establishment of wetland reclamation/restoration areas within the Project Area will provide a direct benefit to wildlife and other aquatic organisms by increasing habitat quality and connectivity for these species as compared to current environments.

### **Site Protection Instrument**

After the restored and enhanced onsite and offsite mitigation areas have been released from monitoring requirements, they will be protected by the rules and statutes that protect all wetlands within the state of Florida including the Regulatory Environmental Resource Permit (ERP) program under the independent state authority of Part IV of Chapter 373 of the Florida Statutes (F.S.), and under Section 404b of the Clean Water Act. As the compensatory mitigation occurs on state owned land and will be managed by CBJTC. This long-term management by the state provides reasonable protections from future disturbances.

### **Baseline Information**

See Section 2.3.2 above for existing wetland conditions.

### **Determination of Credits**

A UMAM analysis has been completed for the proposed wetland impacts and the compensatory mitigation calculations are provided as **Attachment 3**. The scoring was based on onsite field reviews conducted by Kleinfelder with USACE staff on June 4, 2019, and a pre-application meeting held at the Jacksonville USACE office on November 8, 2019 and a pre-application meeting held at the Jacksonville USACE office on November 8, 2019.

The UMAM analysis, of the proposed wetland mitigation and wetland impacts, calculates a total functional gain of 344.571 that results from the proposed 930.03-acres of wetland mitigation offsetting the total functional loss of 336.520 that results from the proposed 692.14-acres of direct jurisdictional wetland and surface water impacts within the Project Area.

Total Function Loss – 336.520	Total Functional Gain – 344.571
-------------------------------	---------------------------------

### **Mitigation Work Plan**

In order to offset the 692.14-acres of impacts to onsite wetlands, Chemours proposes the onsite restoration of 710.59-acres of wetlands impacted during mining, the enhancement of 165.48-acres of onsite wetlands which are not proposed to be impacted and 53.96-acres of offsite permittee responsible wetland mitigation (**Figures 15** and **17**). The onsite restoration will occur on an acre-for-acre, type-for-type basis with the exception of the Coniferous Plantation Wetland (441W) and Wetland Scrub (631) community types which will be restored to their historic Wetland Forested Mixed (630) community type.

The onsite reclamation/restoration plan includes the following FLUCFCS codes:

611 - Bay Swamp

613 - Gum Swamp

621 - Cypress

630 - Wetland Forested Mixed

641 - Freshwater Marsh

441W converted to 630 – Coniferous Plantation Wetland to Wetland Forested Mixed

For each mitigation area, post-mining contours have been designed to mimic pre-mining elevations. Seasonal High-Water Elevations (SHWE) provided on **Figure 11**, were established based on field biological indicators of hydrology observed by Kleinfelder and SWCA biologists during the wetland delineation and surveyed by a Licensed Professional Surveyor. Elevations of 3 individual points displaying the appropriate biological indicators (lichen lines, moss lines, adventitious root formation, rack or debris lines) were set in the wetland and surveyed by a licensed professional surveyor. The average of the 3 points was used to determine the SHWE elevation for the wetland (NAVD88). Many of the wetland canopy trees which are typically used to set elevations were felled during the last major wildfire event, limiting the number of SHWEs that could be set within the Project Area.

These elevations were utilized to determine current and proposed hydrologic regimes and in determining post-mining mitigation habitat types. The seasonal low water elevation (SLWE) is anticipated to be approximately 2 feet or less below wetland bottom. Once constructed, the proposed wetland mitigation areas will be supported by ground water and intermittent surface water input.

Following final elevation contouring, topsoil storage piles (including muck) will be graded back over the wetland reclamation/mitigation area to facilitate natural recruitment of wetland plant species. For forested wetland systems, native tree species will be planted to achieve a density of 400 trees per acre. Herbaceous systems will be monitored for the natural recruitment of wetland plant species, and if after a period of two years, no positive growth or establishment of native wetland herbaceous cover is observed a supplemental planting with native herbaceous wetland species will be completed.

Locations for each restored wetland mitigation area and enhancement area are depicted in **Figure 15**. Planting details are provided in **Table 5**, including general planting zones. Cross sections for each restored mitigation area are provided in **Attachment 2: Figures 16A – 16P**. Wetland mitigation areas are located along the western side slope of the Trail Ridge geologic feature and act as drainage features throughout the Project Area. Generally, the wetland mitigation areas gently slope to the west.

Chemours proposes the following time frames for mitigation completion for onsite reclamation/restoration with the following table.

Wetland Contouring Commencement	Planting	Release
1-year post-mining	Next winter planting season following wetland contouring completion	After a minimum of 5-years of monitoring, but not before minimum success criteria is met.

The earthwork associated with the proposed onsite enhancement would be completed within one year of initiation of mining activities, with tree planting completed during the next winter planting season. The offsite mitigation includes previously reclaimed and now fully functional wetlands located at the former Florida Mine / Trail Ridge Mine Site (IP-199300565).

Following construction, reclamation/restoration mitigation areas will be monitored in accordance with previously approved wetland vegetation and wildlife mitigation monitoring plans for similar mines sites. The monitoring methodology is detailed below.

The following wetland zones will be assigned to the land use and tree, or plant species type as shown in **Table 5**.

Three “zones” are proposed, Zone A, Zone B, and Zone C.

Elevations in Zone A will be approximately 1-foot below adjacent uplands. Zone A will consist of Wetland Forested Mixed (630) and Bay Swamp (611) systems. Zone A will make up the majority of the restored onsite wetlands. Tree species proposed to be planted within this wetland system include sweet bay, swamp bay, dahoon holly, green ash (*Fraxinus pennsylvanica*), sweet gum and red maple.

Elevations in Zone B will be approximately 2-foot below adjacent uplands. Zone B will consist of Cypress (621) and Gum Swamp (613) systems. Tree species proposed to be planted in Zone B will consist of cypress and blackgum in the central portions of the zones and a mix of sweet bay, swamp bay, green ash and sweet gum in the outer portions of the zones.

Elevations in Zone C will be approximately 3-foot below adjacent uplands. Zone C will make up the herbaceous Freshwater Marsh (641) wetland areas. Zone C is not proposed for planting. It is anticipated that natural recruitment from undisturbed wetlands as well as seed source found in the muck and topsoil replaced on the mitigation areas will be sufficient to provide adequate herbaceous coverage.

A total of 12 wetland reclamation areas will be restored throughout the site. These wetland areas are Mitigation Areas 1-12 (**Figure 15**).

Mitigation Area 1: Mitigation Area 1 is a large wetland that will provide hydrologic connection throughout the Project Area. It mimics pre-mining flow-ways and restores historic hydrologic connections severed when parts of the site were mined previously. This wetland will total 677.60 acres and will include 594.33 acres of Wetland Forested Mixed (630), 81.98 acres of Freshwater Marshes (641) and 1.29 acres of Bay Swamps (611). This wetland will be contoured to contain Planting Zones A, B and C. Because of the large size of Mitigation Area 1 it has been broken down into 19 phases (Mitigation Areas 1A-1T). This is necessary in order to allow for tracking, construction and monitoring purposes.

Mitigation Area 2 will be a 3.18-acre isolated wetland located in the northern portion of the Project Area. This wetland will consist of 1.63 acres of Wetland Forested Mixed (630) and 1.55 acres of Freshwater Marsh (641). This wetland will contain Planting Zones A and C.

Mitigation Area 3 will be a 5.67-acre Wetland Forested Mixed (630) community located on the western portion of the Project Area that will connect to offsite wetlands. This area will be made up Planting Zone A.

Mitigation Area 4 will be a 1.65-acre Wetland Forested Mixed (630) isolated wetland located on the western portion of the Project Area. This area will be made up Planting Zone A.

Mitigation Area 5 will be a 3.2-acre Wetland Forested Mixed (630) isolated wetland located on the western portion of the Project Area. This area will be made up Planting Zone A.

Mitigation Area 6 will be a 7.43-acre Wetland Forested Mixed (630) isolated wetland located on the western portion of the Project Area. This area will be made up Planting Zone A.

Mitigation Area 7 will be a 1.75-acre isolated wetland located within the central portion of the Project Area. This wetland will consist of a 0.21-acre Gum Swamp (613) surrounded by a Wetland Forested Mixed (630) component. This wetland will contain Planting Zones A and B.

Mitigation Area 8 will be a 3.72-acre isolated wetland located on the western portion of the Project Area. This wetland will consist of 0.51-acre Cypress (621) component surrounded by Wetland Forested Mixed (630) wetlands. This wetland will contain Planting Zones A and B.

Mitigation Area 9 will consist of a 0.97-acre isolated Freshwater Marsh (641) located on the southeastern portion of the Project Area. This wetland will consist of a Planting Zone C.

Mitigation Area 10 will consist of a 4.12-acre isolated Freshwater Marsh (641) located in the southern portion of the Project Area. This wetland will consist of Planting Zone C.

Mitigation 11 will consist of a 0.33-acre wetland connecting two areas of wetlands not proposed to be impacted. This is the location of one of the proposed wetland crossings. The area is proposed to be a Forested Wetland Mixed (630) system, corresponding to Planting Zone A.

Mitigation Area 12 will consist of a 0.97-acre wetland connecting two areas of wetlands not proposed to be impacted. This is the location of one of the proposed wetland crossings. The area is proposed to be a Forested Wetland Mixed (630) system, corresponding to Planting Zone A.

All wetland reclamation/ restoration mitigation areas will have a 50' Hardwood-conifer Mixed upland buffer to provide for enhanced forage and refuge for species utilizing the wetlands. The remainder of onsite uplands will be converted from its present use as a coniferous plantation (441) to Pine Flatwoods (411) which will closely mimic the land cover prior to its conversion for silvicultural uses. Land management practices will be consistent with current activities conducted by CBJTC and consist of prescribed burns every 3-5 years. Details of the planned land use following the completion of all wetland reclamation/ restoration mitigation areas and upland conversion areas are provided in **Table 6**.

After the reclamation/restoration mitigation areas have been released, they will be protected by the rules and statutes that protect all wetlands within the state of Florida including the statewide ERP program under the independent state authority of Part IV of Chapter 373 of the Florida Statutes (F.S.) and under Section 404b of the Clean Water Act. The Project Area consists of state-owned property and access is limited. State ownership and long-term management by CBJTC will provide additional benefits and protections in the post-reclamation condition. Furthermore, Project Area access to the proposed mitigation areas will be restricted by the use of signage, fencing and/or gates which will reduce the potential for adverse impacts to these areas.

Onsite enhancement mitigation will be completed within one year of initiation of mining activities and consist of thinning existing undisturbed Coniferous Plantation Wetland (441W) to a density of no more than 50 trees per acre. Once this has been accomplished the area will be graded to remove furrows, windrows, ditches, old logging decks and transition the elevation into the adjacent, existing mixed hardwood forests. Onsite enhancement mitigation areas will be planted with tree species found in Planting Zone A to restore the historical Wetland Forested Mixed (630) community type depicted as Wetland Forested Mixed, Enhanced (630E) on **Figure 15**. It is anticipated that herbaceous, shrub and additional wetland tree species will recruit from the adjacent mixed hardwood forests. Qualitative wetland monitoring for these areas is proposed prior to the enhancement work and again at one year after enhancement completion. Data will be compiled into a monitoring report and submitted to the agency.

Offsite permittee responsible mitigation areas are located at the nearby Florida Mine / Trail Ridge Mine Site (**Figure 17** and **Exhibit G**) located in the same drainage basin as the proposed project. These wetlands had been previously constructed during reclamation activities but were not part of the permitted mitigation plan (IP-199300565). These areas will be monitored and managed for one-year upon which Chemours will provide one qualitative monitoring report to the USACE before the requested release. The proposed areas of offsite mitigation consist of state-owned property and property targeted to be acquired under the Army Compatible Use Buffer (ACUB) project through ecological multi-use management of natural resources as outlined in the CBJTC's guidance document, the Integrated Natural Resource Management Plan (INRMP) (**Exhibit E**). State ownership and long-term management by CBJTC will provide additional benefits and protections in the post-reclamation condition. Furthermore, site access to the proposed mitigation areas will be restricted by the use of signage, fencing and/or gates which will reduce the potential for adverse impacts to these areas. Additional information regarding the land using and functional gain is provided in the attached UMAM analysis (**Attachment 3**).

### **Maintenance Plan**

Maintenance of exotic and nuisance species will be completed if it is determined the absolute coverage of these species exceeds 5%, in total, cover within the mitigation area. Those plants listed in the most recent Florida Exotic Pest Plant Council (FLEPPC) Invasive Plant List, as well as plants known as native nuisance species shall be considered exotic and nuisance species. Maintenance of exotic and nuisance species shall include herbicide application and hand removal as needed.

### **Monitoring Requirements**

Operation and management of the onsite reclamation/restoration mitigation areas will be completed by SWCA on behalf of Chemours.

Monitoring reclamation/restoration mitigation areas will ensure these areas are trending toward success criteria and provide time for mitigation areas to establish natural vegetative community structures. Mitigation areas will be restored and monitored until they meet success criteria outlined below and USACE issues formal release.

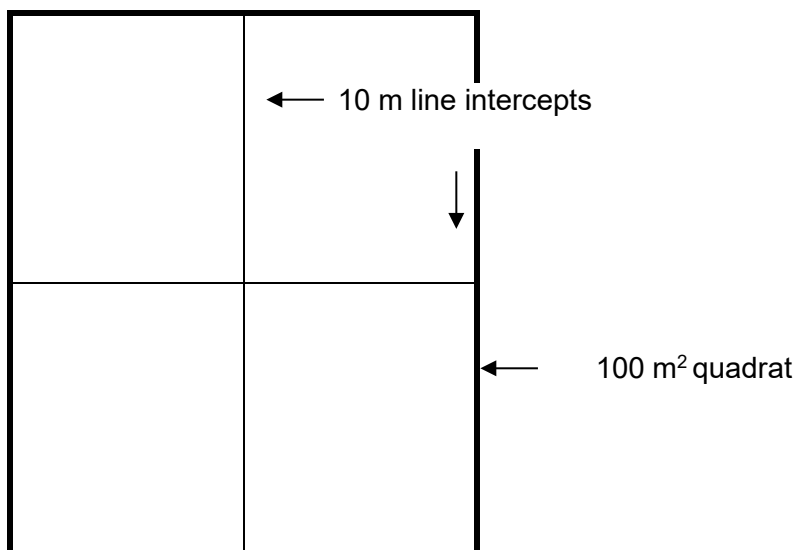
Vegetation monitoring of the mitigation and reclamation areas shall be conducted on an annual basis for five years or until such time that success criteria are met. Within six months or at the onset of the next growing season following completion of final contouring and initial planting, a baseline quantitative monitoring event shall be conducted to document the baseline conditions for the area.

Monitoring methods in each wetland mitigation area are performed quantitatively or qualitatively, depending on the timeframe in the monitoring cycle. The first year (baseline monitoring event) is monitored quantitatively. The second, third-, and fourth-year annual monitoring events are performed qualitatively. The final fifth year monitoring event, is performed quantitatively. If the wetland mitigation areas have not reached release criteria by the fifth-year monitoring event; the monitoring methods will be re-established.

Prior to baseline quantitative monitoring, base transects are placed in each wetland mitigation area across the gradient of the wetland. These base transects are utilized for the establishment of data collection points, or quadrats, at which are placed 300-cm tall PVC poles. One quadrat is established per five acres of each wetland mitigation area; 1 quadrat is placed in wetlands one acre or less. To assure a random attribute to the placement of the quadrats, a set distance ranging from 20 to 100 m (depending on shape and size of wetland) is placed between the quadrats along the length of each base transect. The PVC poles mark the corners of each quadrat, which measure 10 meters x 10 meters (100 m<sup>2</sup>) in area.

### Quantitative Monitoring

Quantitative monitoring is conducted during the first- and fifth-year annual monitoring events. Within each quadrat placed within the base transects the ground cover (mitigation areas only) and canopy components are sampled. Ground cover, defined as herbaceous and woody species less than 46 cm (18 in.) tall, is sampled using the line-intercept technique (Bonham 1989). Two 10-m line-intercept transects, as illustrated below, are utilized within each quadrat to characterize ground cover diversity, frequency, and aerial cover.



Canopy cover, defined as all woody species 46 cm (18 in.) or taller, is sampled in each quadrat for tree species, density, frequency, canopy area, height, and condition. Every tree within each 100 m<sup>2</sup> quadrat is counted and analyzed. The canopy area is calculated from x and y axial measurements of each tree's canopy.

Average canopy cover was determined with the following formula:

$$\text{Average Canopy Cover} = (\pi x^2 + \pi y^2)/2$$

Where:  $\pi = 3.14$

$x^2$  = x-axial measurement (radius) squared

$y^2$  = y-axial measurement (radius) squared

Percent canopy cover within the sampled quadrats was calculated with the following formula:

$$\text{Percent Canopy Cover} = \frac{\sum \text{Average Canopy Cover}}{\text{Total Area of Quadrats}} \times 100$$

Tree density was determined with the following formula:

$$\text{Tree Density (trees/acre)} = \frac{\text{Number of Trees in Quadrats}}{\text{Area of Quadrats}}$$

### Qualitative Monitoring

Qualitative monitoring is conducted during the second, third- and fourth-year annual monitoring events. For qualitative monitoring, vegetative cover is estimated by conducting meandering pedestrian transects through the mitigation area wetland as well as within each quadrat placed within the base transects, the ground cover (mitigation areas only), shrub, and canopy components are qualitatively sampled. Ground cover, defined as herbaceous and woody species less than 46 cm (18 in.) tall, is sampled by recording all the plant species identified and establishing a percent cover for each (Garbisch, 1986). The canopy component, defined as all woody species 46 cm (18 in.) or taller, is sampled in each quadrat for tree density and total abundance.

### Hydrologic Monitoring

Hydrologic monitoring shall be conducted within the restored wetlands. Surficial piezometers shall be installed under one of the following two options; 1) one surficial piezometer and one wetland staff gauge or 2) a surficial piezometer fitted with a combination data logger unit to monitor water elevations within the wetland. Hydrographs of the data collected for the year will be provided in the annual monitoring report.

### Wildlife Observations

Wildlife observations and evidence of use (tracks, scat, etc.) are recorded at each monitored wetland mitigation area during the monitoring events, and incidental site visits. Wildlife observations and evidence of wildlife usage for each wetland mitigation area is provided in each of the annual reports.

### Photographic Monitoring

Photographs are taken of each transect within the wetland mitigation areas at established photo points. They are included in each of the annual reports.



## **Release**

When it is determined by qualitative monitoring that success criteria have been met, a final quantitative monitoring event and release report will be completed to document the established conditions. A formal release request will be submitted to USACE, and a subsequent release inspection with USACE will be completed prior to issuance of final reclamation release.

## **Performance Standards**

Wetland mitigation areas shall be considered successful when the following criteria have been met:

- 400 trees per acre for forested systems.
- Water within all wetlands and waterbodies shall meet applicable Class III standards, pursuant to Chapter 62-302, F.A.C.
- The created wetlands shall have hydroperiods, depth of inundation, and flow regimes appropriate to the community type, which benefit the target plant community and communities downstream.
- At least 80% cover by appropriate wetland species (i.e., FAC or wetter)
- Less than 5 percent cover of both nuisance and Category I and II invasive exotic plant species pursuant to the most current list established by the Florida Exotic Pest Plant Council at <http://www.fleppc.org>.

## **Long-term Management Plan**

The reclamation/restoration mitigation areas have been designed such to create an ecologically self-sustaining habitat. These mitigation areas will be managed and monitored by Chemours until such time that the performance standards are reached. After the mitigation area has been released, it will be protected by the rules and statutes that protect all wetlands under Section 404 of the Clean Water Act (CWA) and covered by the long-term management plans of the CBJTC.

## **Adaptive Management Plan**

During the monitoring period, the following active management techniques will be conducted to address unforeseen changes in site conditions:

- Supplemental planting of native vegetation as needed to reach performance criteria;
- Maintenance of exotic, invasive or nuisance species by use of herbicide application;
- Hydrologic monitoring of groundwater to ensure establishment of wetland hydrologic conditions; and
- Re-grading as needed to achieve satisfactory wetland hydrologic conditions.

These adaptive management activities will be completed by Chemours, or their designated environmental consultants as needed. If at any time the success of the mitigation areas appears to be in jeopardy an adaptive management plan will be submitted to the USACE to ensure mitigation success.

## **Financial Assurances**

The Financial Assurance documentation has been reviewed and approved by FDEP under the issuance of ERP Permit No. MMR\_137482018, for wetland mitigation and additional financial assurance that were required for property interests related to reclamation protections (**Exhibit F**).

## 4 SUMMARY

Information and materials contained herein are submitted in request to authorize wetland impacts associated with the establishment of a new mining operation known as the Trail Ridge South Mine.

The Trail Ridge South Mine comprises  $\pm 2,884.4$  acres. Approximately 692.14 acres of jurisdictional wetlands, ditches and surface waters requiring mitigation are proposed to be disturbed and impacted by mining operations. Mitigation will be accomplished through the onsite restoration of 710.59 acres of wetlands, enhancement of 165.48 acres of onsite wetlands, and provide 53.96 acres of offsite permittee responsible wetland mitigation (**Figures 15 and 17**).

Pursuant to the conditions of permit issuance, as stated in sections 40 CFR Part 230 Section 404(b)(1), we believe the project successfully demonstrates elimination and reduction of wetland impacts to the greatest extent possible and provides suitable mitigation to offset the proposed wetland impacts.

## 5 REFERENCES

McMillan, M., R. Boughton, and R. Bowman. 2010.

Scrub Jays at Camp Blanding Joint Training Center. Venus, FL: Archbold Biological Station.

Bio-Tech, 2008

Threatened and Endangered Species Survey Report for Camp Blanding Joint Training Center. St Augustine, FL: Bio-tech Consulting, Inc.

U.S. Fish and Wildlife Service, n.d.

Florida scrub-jay

U.S. Fish and Wildlife Service, n.d. (b)

Red-cockaded Woodpecker

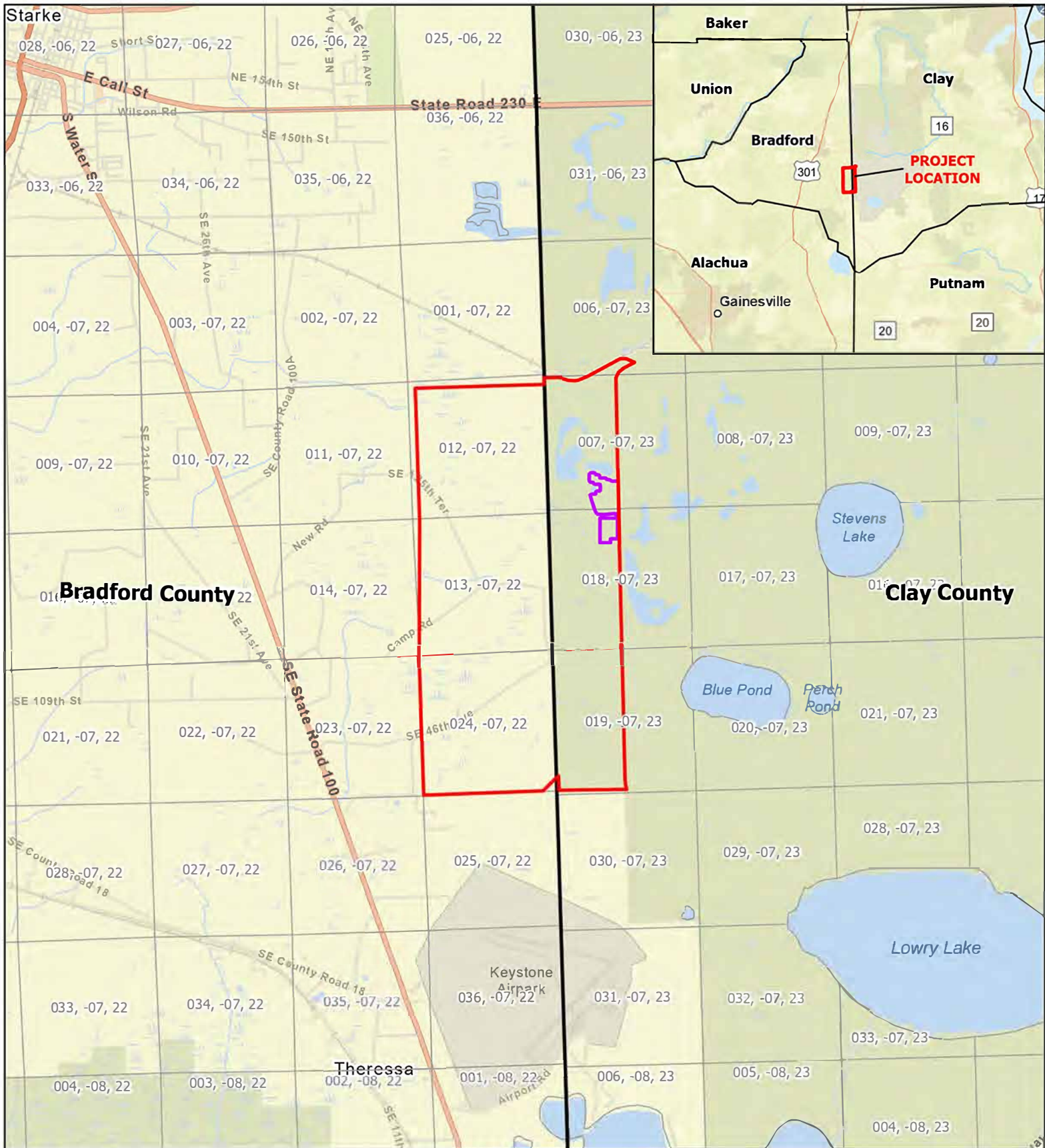
Bonham. C. D., 1989

Measurements for Terrestrial Vegetation

Garbisch, E.W., Jr., 1986,

Highways and wetlands-Compensating wetland losses: McLean, Va., Federal Highway Administration, Office of Implementation, Contract Report DOT-FH-11-9442, 60 p.

## Figures



## Legend

- Mine Permit Boundary (± 2,884.4 Ac.)
- Plant Site Boundary (± 44.1 Ac.)

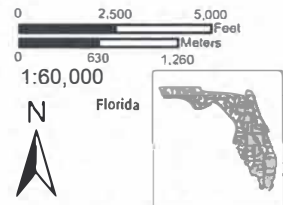
**Figure 1: Location Map**

**Trail Ridge South Mine  
SWCA Project No. 93087**

**The Chemours Company FC, LLC  
(29° 53' 7.22" N, 82° 3' 2.40" W)**

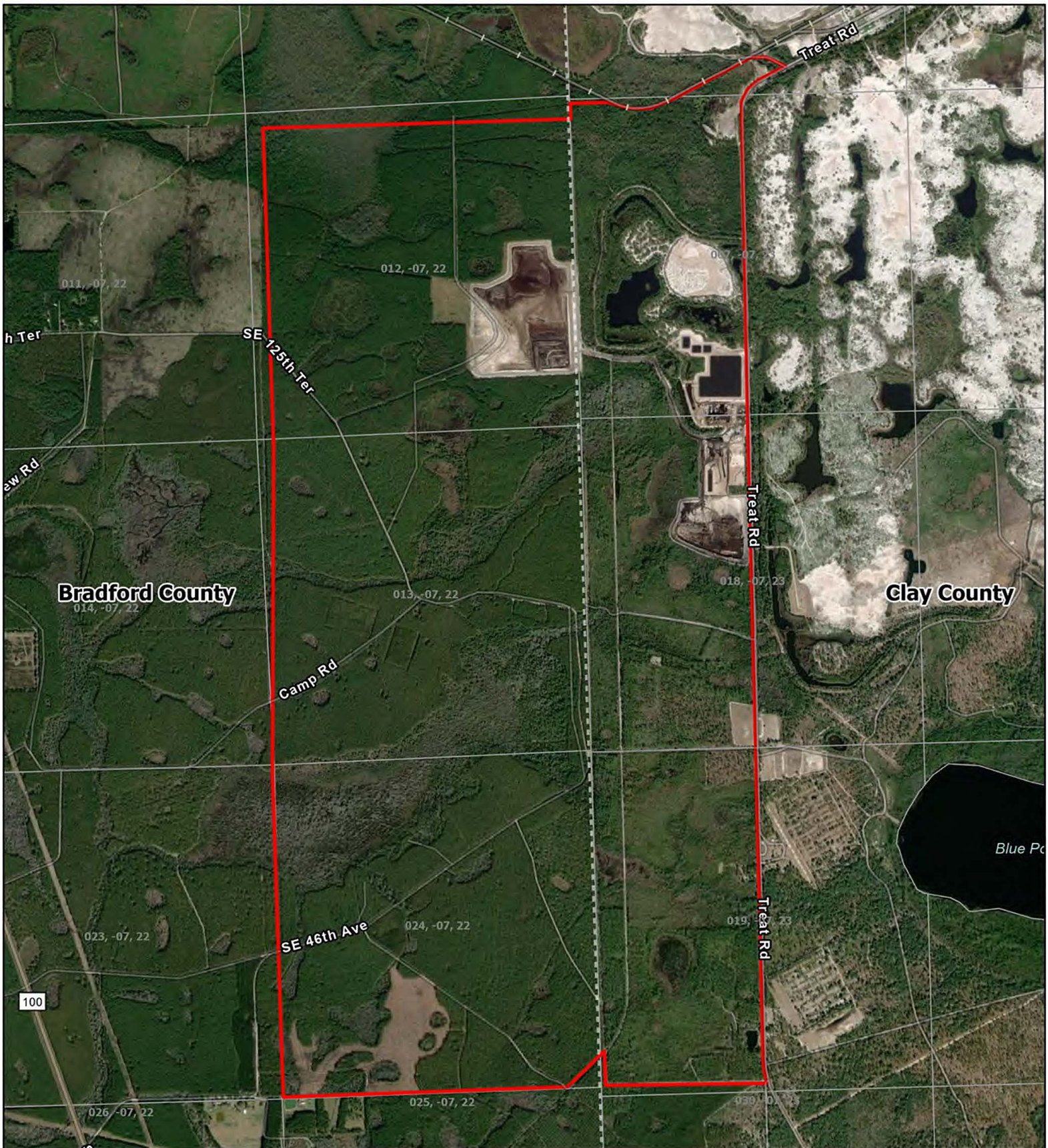
Bradford and Clay Counties, Florida

Date: September 2024  
Base map provided by  
ESRI. Property boundary  
provided by Chemours.



**SWCA**  
ENVIRONMENTAL CONSULTANTS





## Legend

Mine Permit Boundary (± 2,884.4 Ac.)

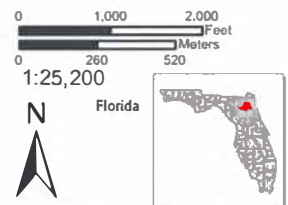
**Figure 2: Aerial Map**

**Trail Ridge South Mine  
SWCA Project No. 93087**

**The Chemours Company FC, LLC  
(29° 53' 7.22" N, 82° 3' 2.40" W)**

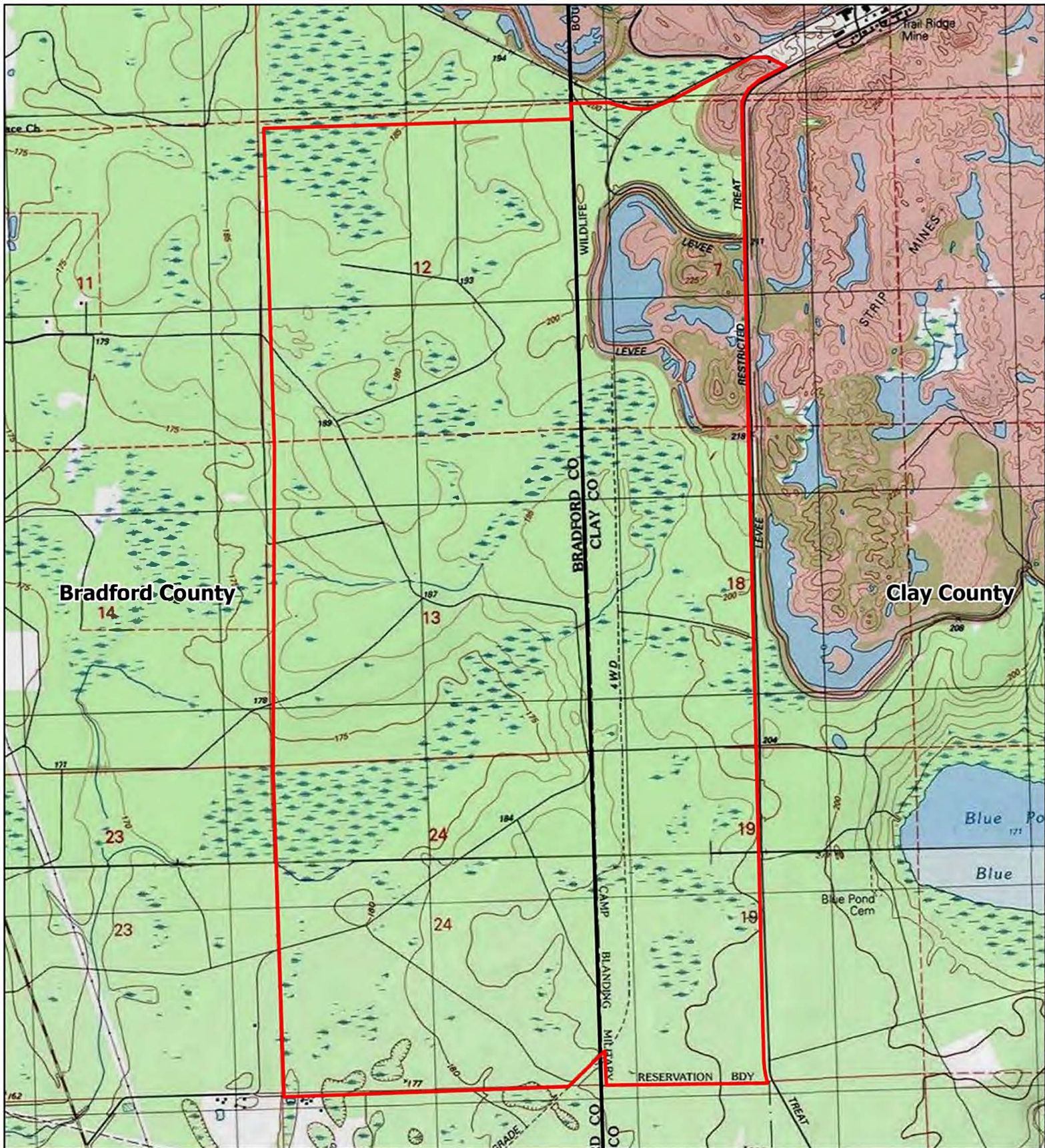
Bradford and Clay Counties, Florida

Date: September 2024  
Base map provided by  
ESRI. Property boundary  
provided by Chemours.



**SWCA**  
ENVIRONMENTAL CONSULTANTS





## Legend

Mine Permit Boundary ( $\pm$  2,884.4 Ac.)

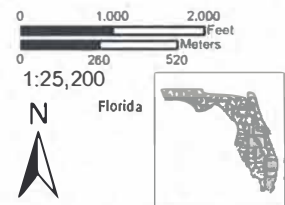
**Figure 3: USGS Topographic Map**

**Trail Ridge South Mine  
SWCA Project No. 93087**

**The Chemours Company FC, LLC  
(29° 53' 7.22" N, 82° 3' 2.40" W)**

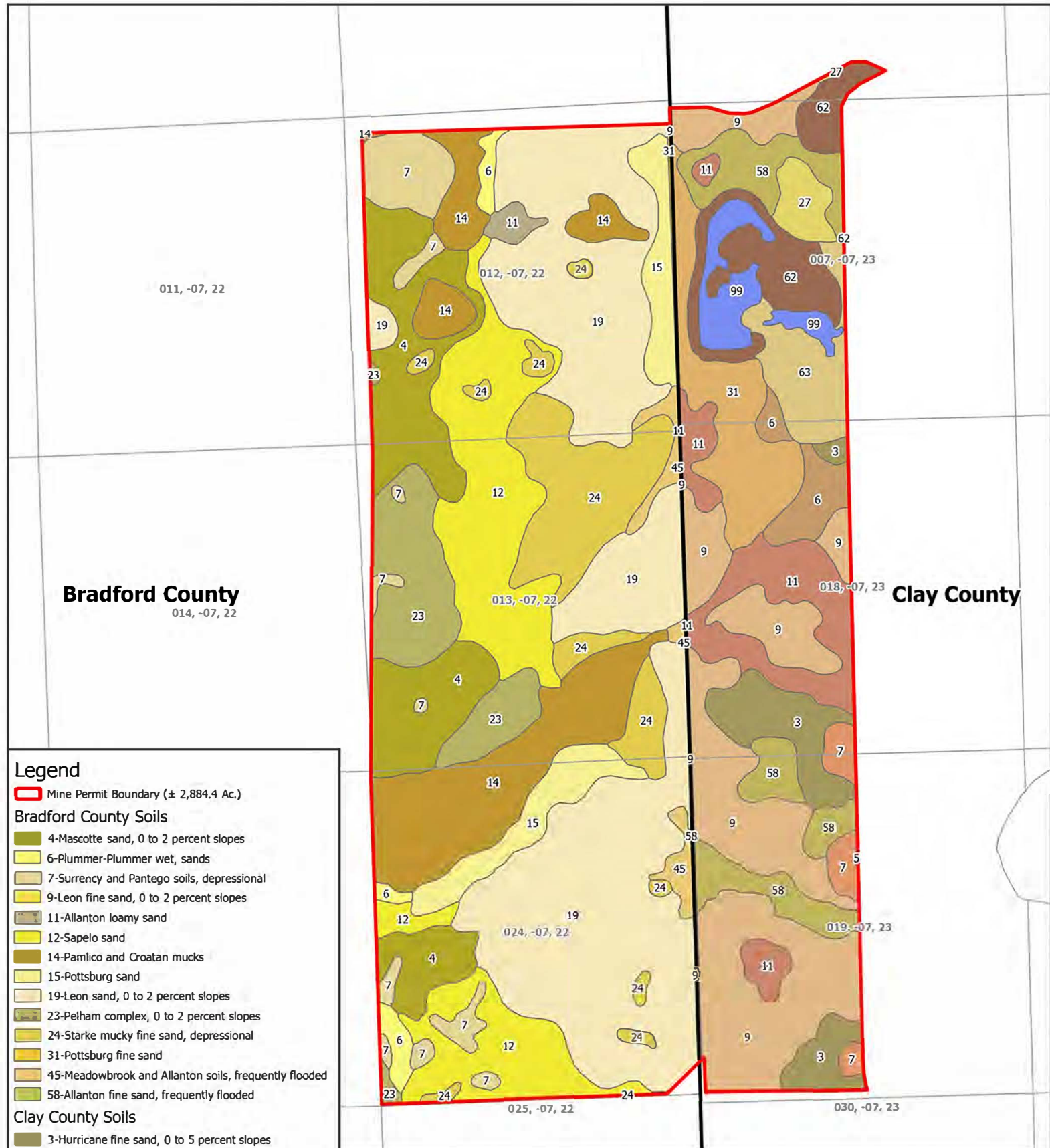
Bradford and Clay Counties, Florida

Date: September 2024  
Base map provided by  
ESRI. Property boundary  
provided by Chemours.



**SWCA**  
ENVIRONMENTAL CONSULTANTS





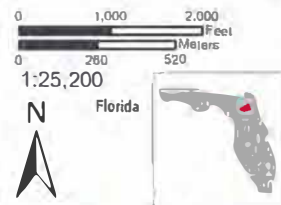
**Figure 4: Soil Map**

**Trail Ridge South Mine  
SWCA Project No. 93087**

**The Chemours Company FC, LLC  
(29° 53' 7.22" N, 82° 3' 2.40" W)**

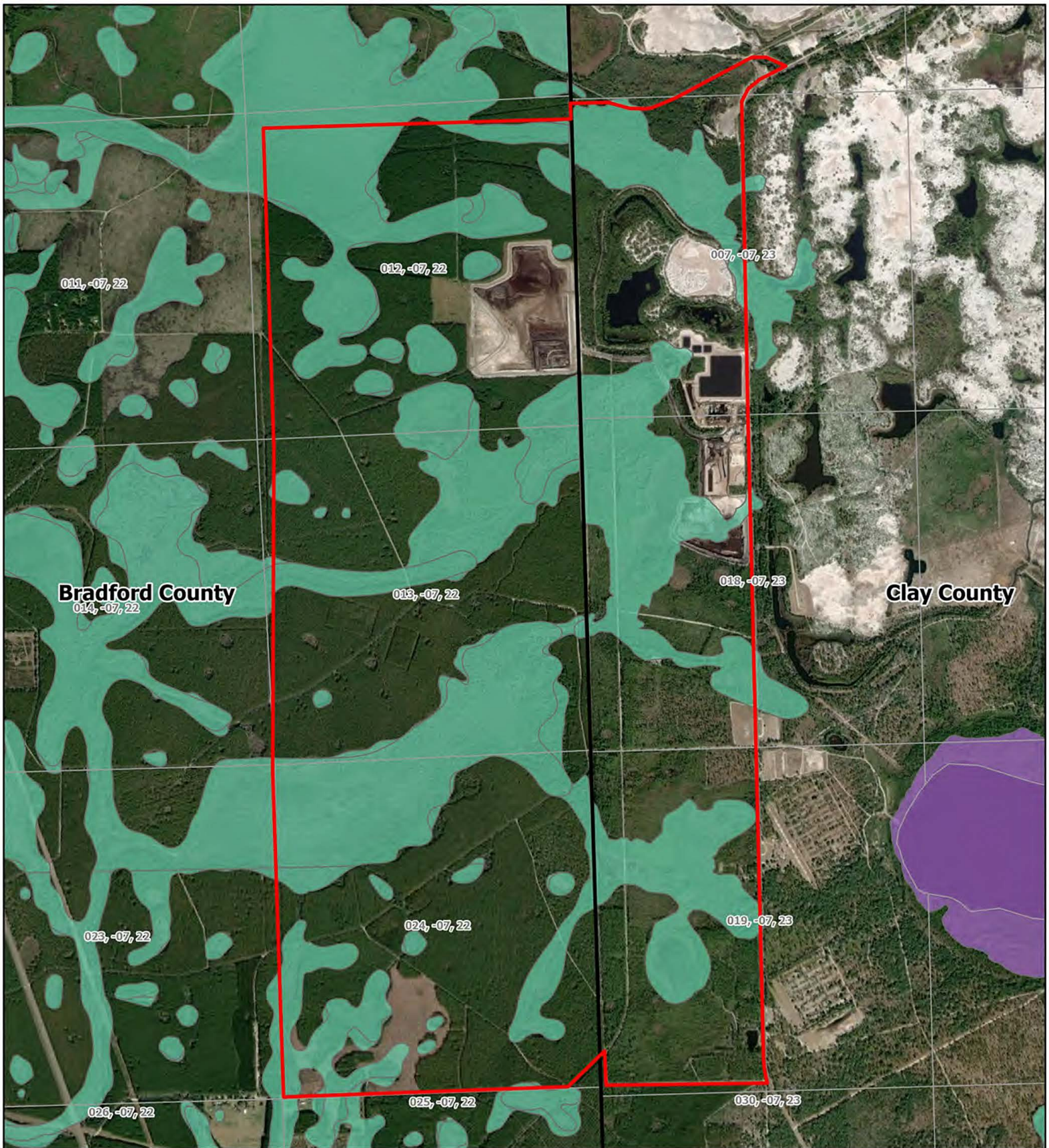
Bradford and Clay Counties, Florida

Date: September 2024  
Base map provided by ESRI. Soil layer obtained from USDA NRCS Web Soil Survey. Property boundary provided by Chemours.



**SWCA**  
ENVIRONMENTAL CONSULTANTS





## Legend

  Mine Permit Boundary ( $\pm$  2,884.4 Ac.)

## Flood Zone

- A - 1% Annual Chance of Flood Hazard
- AE - Floodway

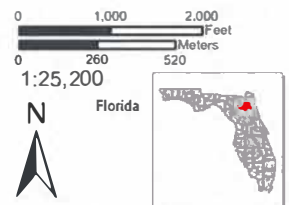
**Figure 5: FEMA Floodplain Map**

**Trail Ridge South Mine  
SWCA Project No. 93087**

**The Chemours Company FC, LLC  
(29° 53' 7.22" N, 82° 3' 2.40" W)**

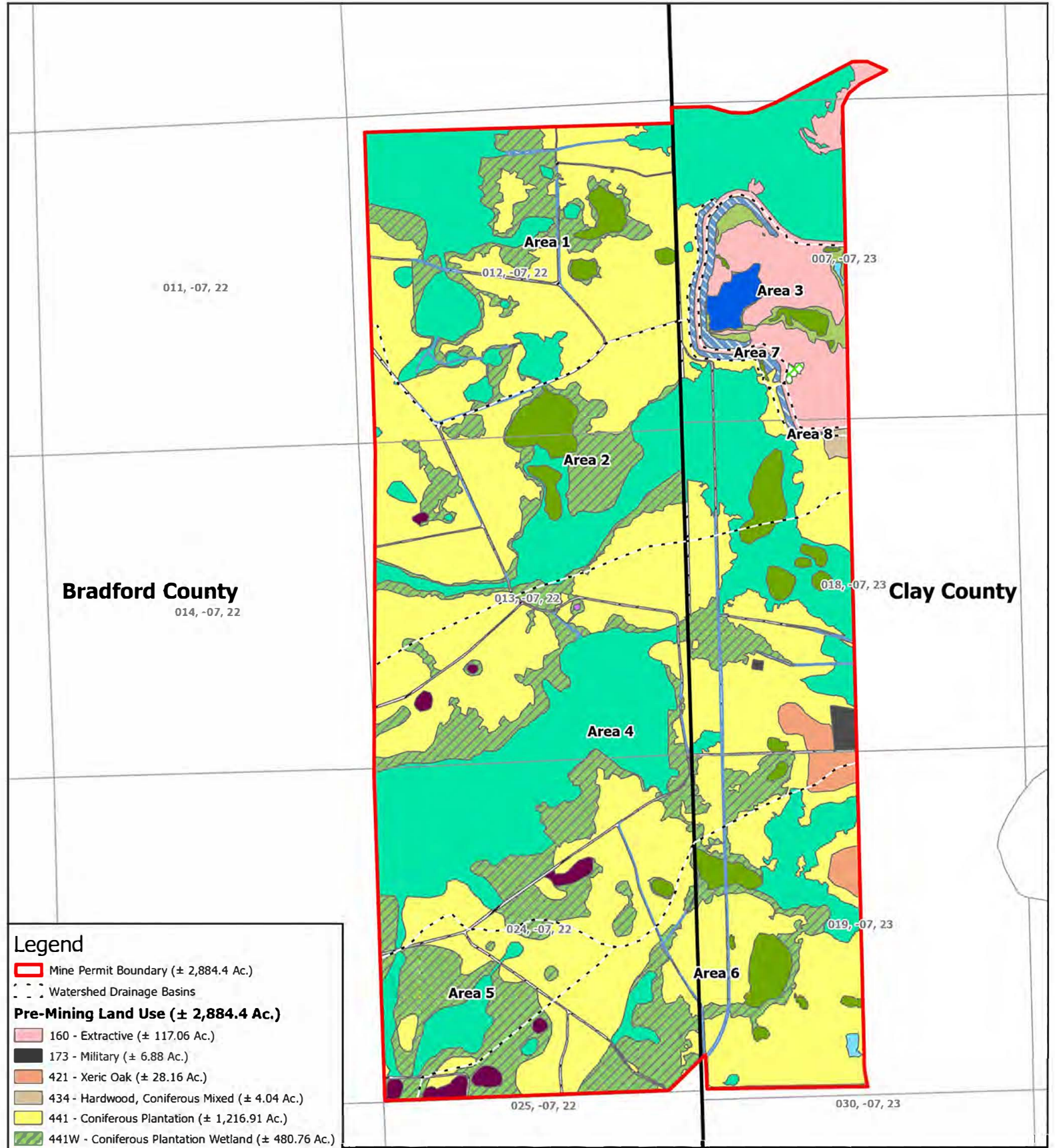
Bradford and Clay Counties, Florida

Date: September 2024  
Base map provided by ESRI. Flood zone layer obtained from FEMA - Flood Insurance Rate Map (FIRM) Panels 12007C, & 12019C. Property boundary provided by Chemours.



**SWCA**  
ENVIRONMENTAL CONSULTANTS





- Legend**
- Mine Permit Boundary (± 2,884.4 Ac.)
  - Watershed Drainage Basins
  - Pre-Mining Land Use (± 2,884.4 Ac.)**
  - 160 - Extractive (± 117.06 Ac.)
  - 173 - Military (± 6.88 Ac.)
  - 421 - Xeric Oak (± 28.16 Ac.)
  - 434 - Hardwood, Coniferous Mixed (± 4.04 Ac.)
  - 441 - Coniferous Plantation (± 1,216.91 Ac.)
  - 441W - Coniferous Plantation Wetland (± 480.76 Ac.)
  - 510d - Ditches (± 31.75 Ac.)
  - 523 - Lakes Greater than 10 Acres (± 13.65 Ac.)
  - 524 - Lakes Less than 10 Acres (± 2.27 Ac.)
  - 611 - Bay Swamp (± 1.29 Ac.)
  - 613 - Gum Swamp (± 0.21 Ac.)
  - 621 - Cypress (± 17.36 Ac.)
  - 630 - Wetland Forested Mixed (± 797.51 Ac.)
  - 631 - Wetland Scrub (± 17.11 Ac.)
  - 641 - Freshwater Marsh (± 104.50 Ac.)
  - 8146 - Primitive Roads/Trails (± 44.94 Ac.)

**Figure 7: Pre-Mining Land Use and Vegetation Map**

**Trail Ridge South Mine  
SWCA Project No. 93087**

**The Chemours Company FC, LLC**  
 (29° 53' 7.22" N, 82° 3' 2.40" W)  
 Bradford and Clay Counties, Florida

Date: September 2024  
 Base map provided by ESRI. Property boundary provided by Chemours.

0 1,000 2,000  
Feet

0 260 520  
Meters

1:25,200

N

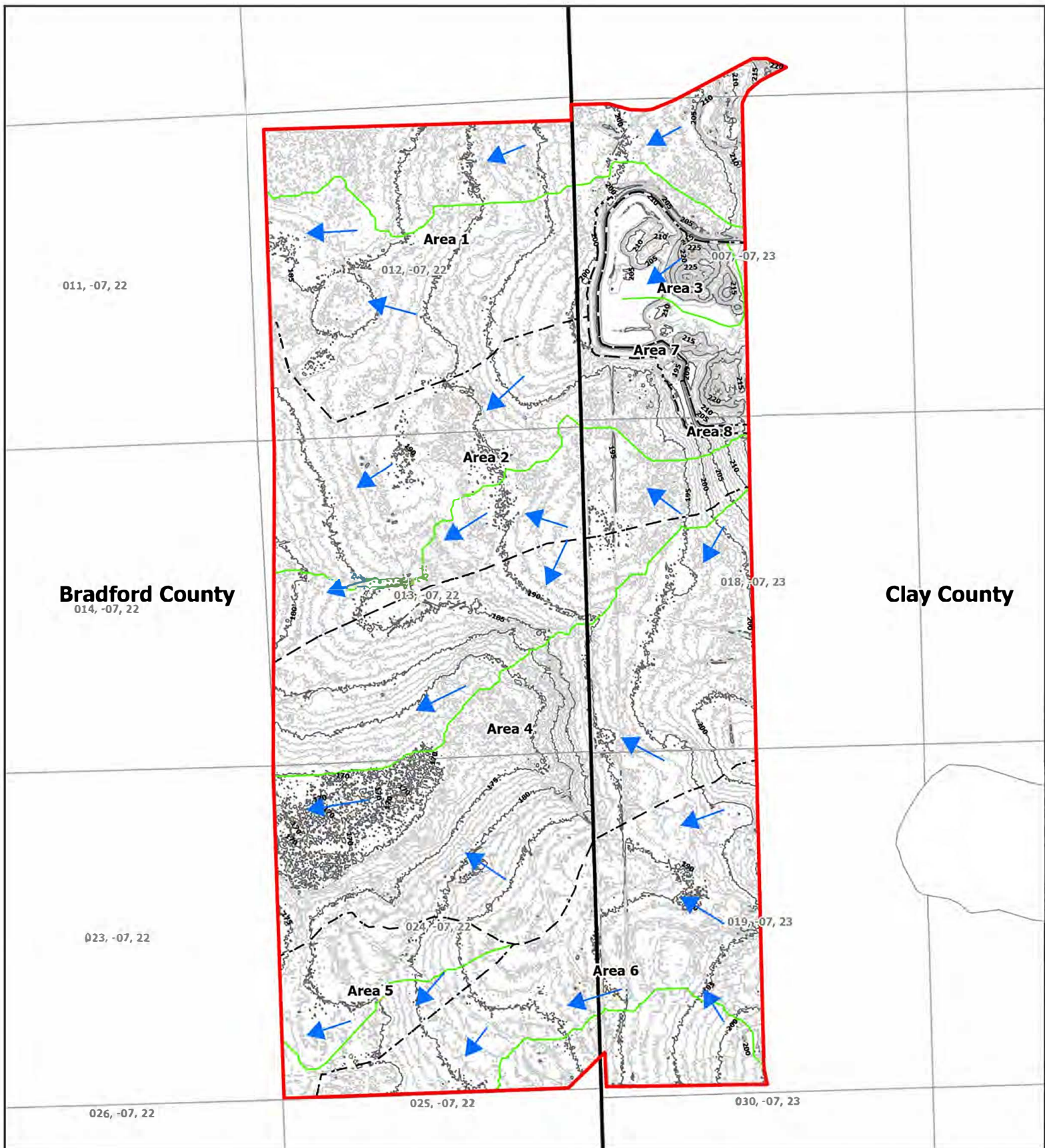
Florida

**SWCA**  
ENVIRONMENTAL CONSULTANTS









## Legend

- Mine Permit Boundary ( $\pm 2,884.4$  Ac.)
- Watershed Drainage Basins
- Time of Concentration
- 5 Ft. Elevation Contours
- 1 Ft. Elevation Contours
- Flow Directions

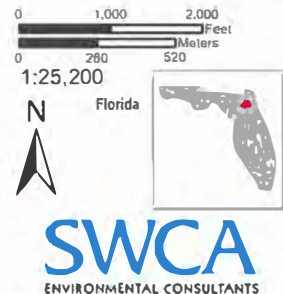
**Figure 9: Pre-Mining Topography and Drainage Basins Map**

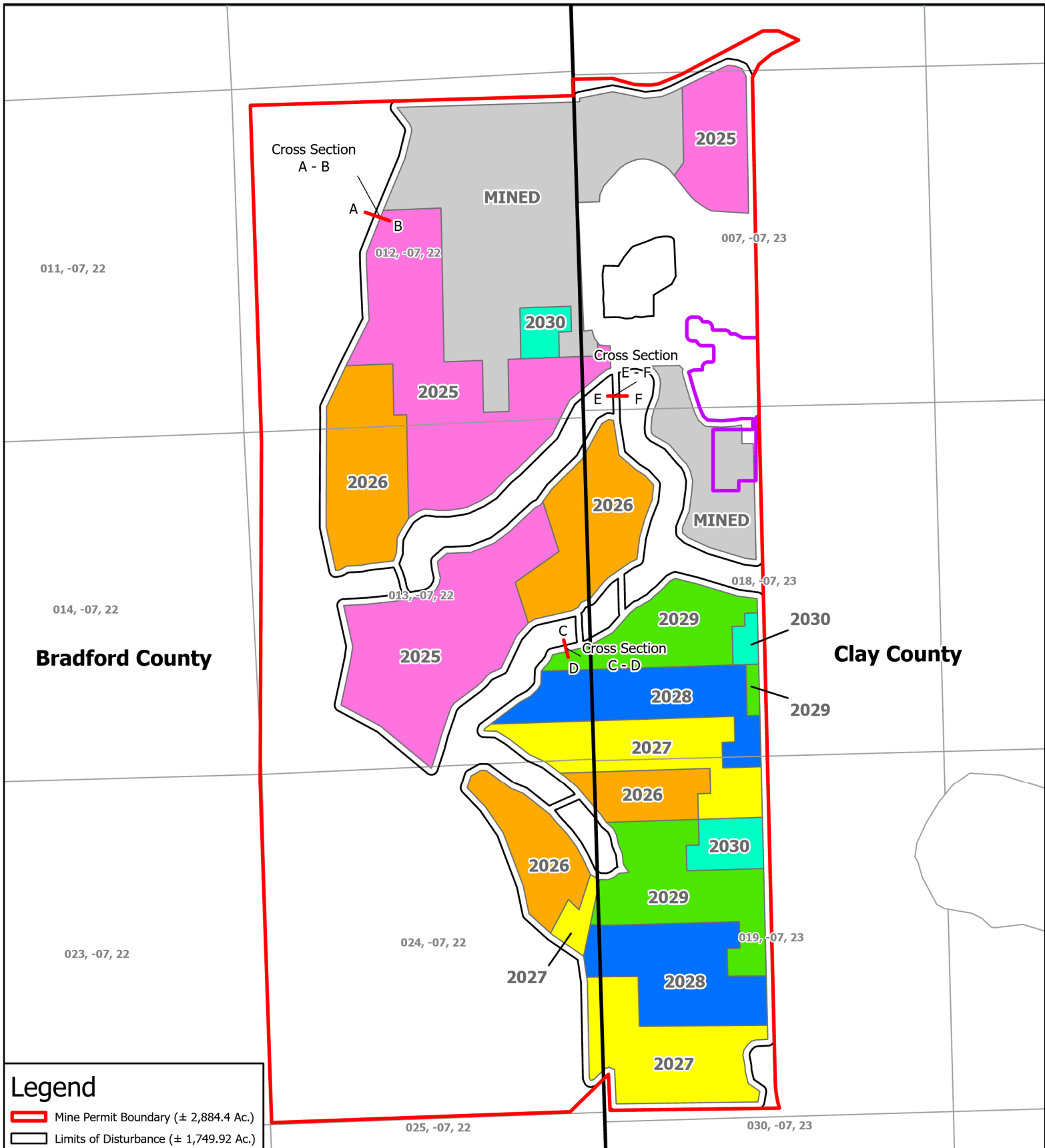
**Trail Ridge South Mine  
SWCA Project No. 93087**

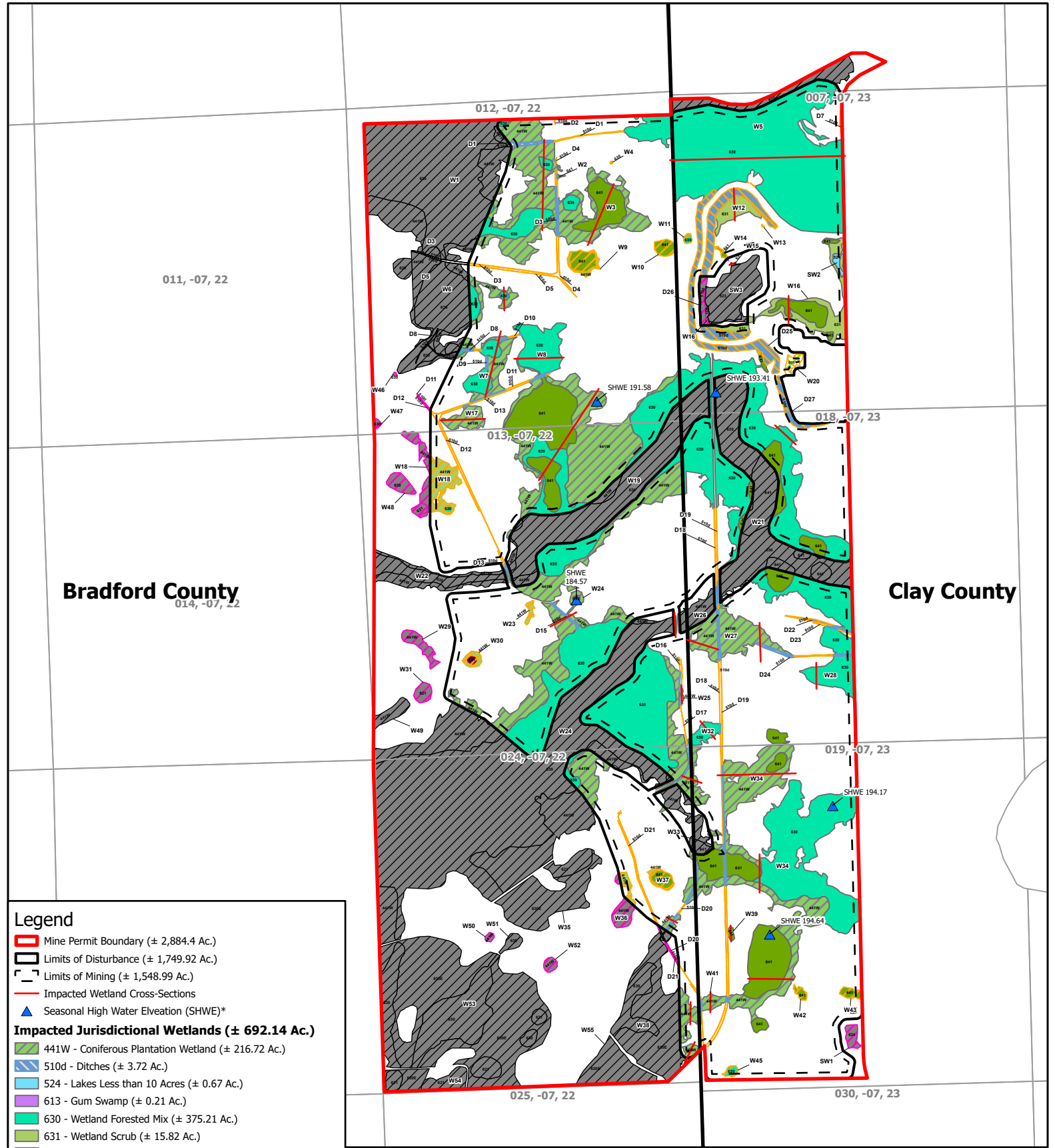
**The Chemours Company FC, LLC  
(29° 53' 7.22" N, 82° 3' 2.40" W)**

Bradford and Clay Counties, Florida

Date: September 2024  
Base map provided by ESRI. Property boundary provided by Chemours. LIDAR data obtained from Southern Resource Mapping, Inc. Date: 2011 and 2012.







- Legend**
- Mine Permit Boundary ( $\pm 2,884.4$  Ac.)
  - Limits of Disturbance ( $\pm 1,749.92$  Ac.)
  - Limits of Mining ( $\pm 1,548.99$  Ac.)
  - Impacted Wetland Cross-Sections
  - Seasonal High Water Elevation (SHWE)\*
- Impacted Jurisdictional Wetlands ( $\pm 692.14$  Ac.)**
- 441W - Coniferous Plantation Wetland ( $\pm 216.72$  Ac.)
  - 510d - Ditches ( $\pm 3.72$  Ac.)
  - 524 - Lakes Less than 10 Acres ( $\pm 0.67$  Ac.)
  - 613 - Gum Swamp ( $\pm 0.21$  Ac.)
  - 630 - Wetland Forested Mix ( $\pm 375.21$  Ac.)
  - 631 - Wetland Scrub ( $\pm 15.82$  Ac.)
  - 641 - Freshwater Marsh ( $\pm 79.79$  Ac.)
- Impacted Non-Jurisdictional Wetlands ( $\pm 48.31$  Ac.)**
- 441W - Coniferous Plantation Wetland ( $\pm 10.81$  Ac.)
  - 510d - Ditch ( $\pm 25.47$  Ac.)
  - 611 - Bay Swamp ( $\pm 1.29$  Ac.)
  - 621 - Cypress ( $\pm 0.51$  Ac.)
  - 630 - Wetland Forested Mix ( $\pm 1.39$  Ac.)
  - 631 - Wetland Scrub ( $\pm 0.02$  Ac.)
  - 641 - Freshwater Marsh ( $\pm 8.82$  Ac.)
- Undisturbed Wetlands ( $\pm 725.96$  Ac.)**
- Undisturbed Jurisdictional Wetlands ( $\pm 706.45$  Ac.)
  - Undisturbed Non-Jurisdictional Wetlands ( $\pm 19.51$  Ac.)

**Figure 11: Wetland Impact Map**

**Trail Ridge South Mine  
SWCA Project No. 93087**

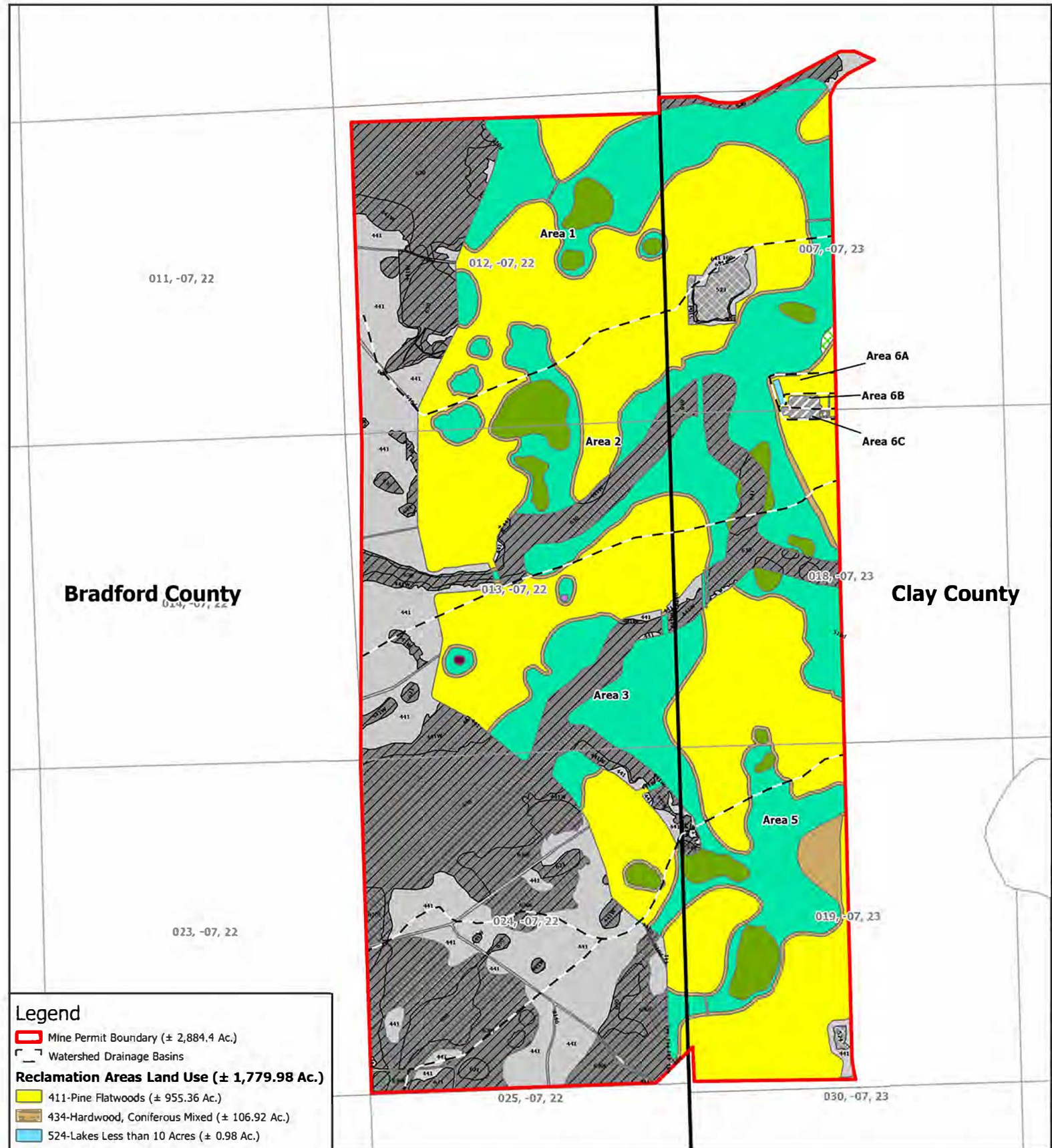
**The Chemours Company FC, LLC**  
( $29^{\circ} 53' 7.22''$  N,  $82^{\circ} 3' 2.40''$  W)

Bradford and Clay Counties, Florida

Date: November 2024  
Base map provided by ESRI. Property boundary provided by Chemours.

0 1,000 2,000 Feet  
0 260 520 Meters  
1:25,200  
N  
Florida  
SWCA  
ENVIRONMENTAL CONSULTANTS





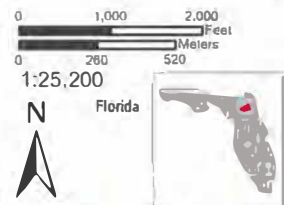
**Figure 13: Post-Mining Land Use and Vegetation Map**

**Trail Ridge South Mine  
SWCA Project No. 93087**

**The Chemours Company FC, LLC  
(29° 53' 7.22" N, 82° 3' 2.40" W)**

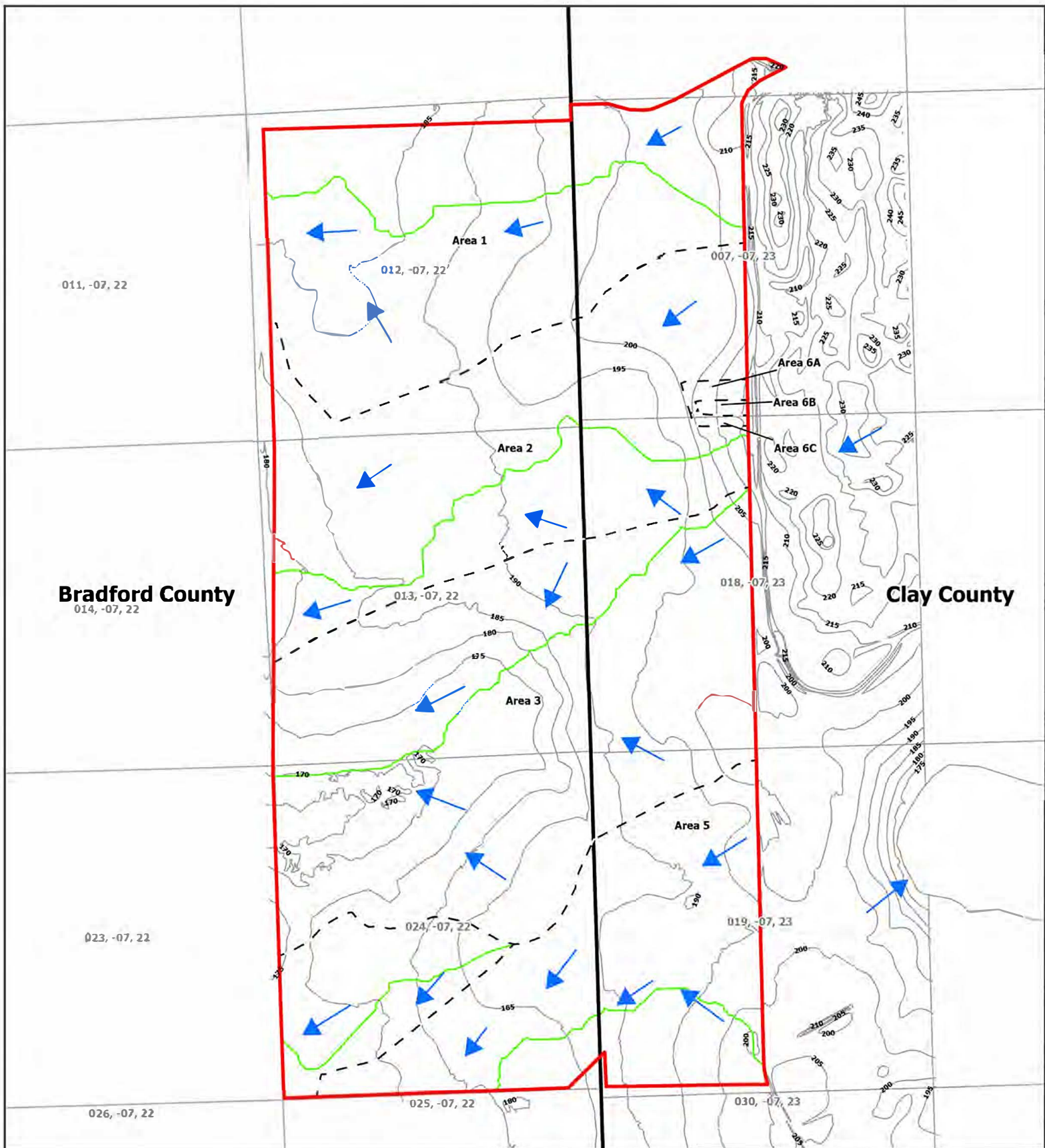
Bradford and Clay Counties, Florida

Date: September 2024  
Base map provided by  
ESRI. Property boundary  
provided by Chemours.



**SWCA**  
ENVIRONMENTAL CONSULTANTS





# Legend

- Mine Permit Boundary (± 2,884.4 Ac.)
- Watershed Drainage Basins
- Time of Concentration
- 5 Ft. Elevation Contours
- ➔ Flow Directions

**Figure 14: Post-Mining Topography and Drainage Basins Map**

**Trail Ridge South Mine  
SWCA Project No. 93087**

**The Chemours Company FC, LLC  
(29° 53' 7.22" N, 82° 3' 2.40" W)**

Bradford and Clay Counties, Florida

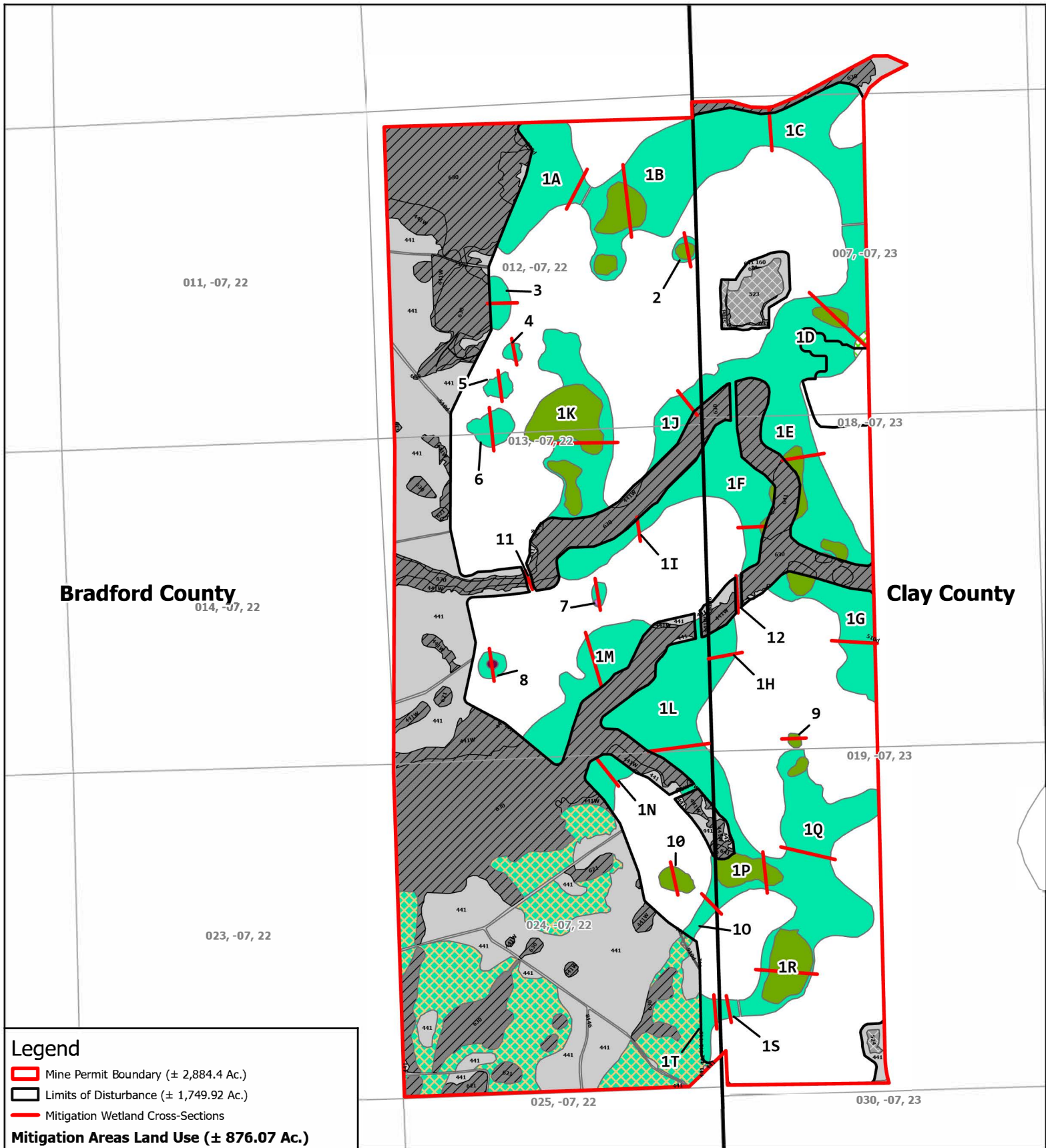
Date: September 2024  
Base map provided by ESRI. Property boundary provided by Chemours. LIDAR data obtained from Southern Resource Mapping, Inc. Date: 2011 and 2012.

0 1,000 2,000  
0 260 520  
Meters  
Feet

1:25,200

N

Florida



**Legend**

- Mine Permit Boundary (± 2,884.4 Ac.)
- Limits of Disturbance (± 1,749.92 Ac.)
- Mitigation Wetland Cross-Sections

**Mitigation Areas Land Use (± 876.07 Ac.)**

- 611-Bay Swamp (± 1.29 Ac.)
- 613-Gum Swamp (± 0.21 Ac.)
- 621-Cypress (± 0.51 Ac.)
- 630-Wetland Forested Mixed (± 619.96 Ac.)
- 630E - Wetland Forested Mixed, Enhanced (± 165.48 Ac.)
- 641-Freshwater Marsh (± 88.62 Ac.)

**Undisturbed Areas (± 938.94 Ac.)**

- Undisturbed Wetlands (± 542.67 Ac.)
- Undisturbed Surface Water (± 17.81 Ac.)
- Undisturbed Uplands (± 378.46 Ac.)

**Figure 15: Wetland Mitigation Map**

**Trail Ridge South Mine  
SWCA Project No. 93087**

**The Chemours Company FC, LLC**  
(29° 53' 7.22" N, 82° 3' 2.40" W)

Bradford and Clay Counties, Florida

Date: September 2024  
Base map provided by ESRI. Property boundary provided by Chemours.

Scale: 1:25,200

0 1,000 2,000 Feet

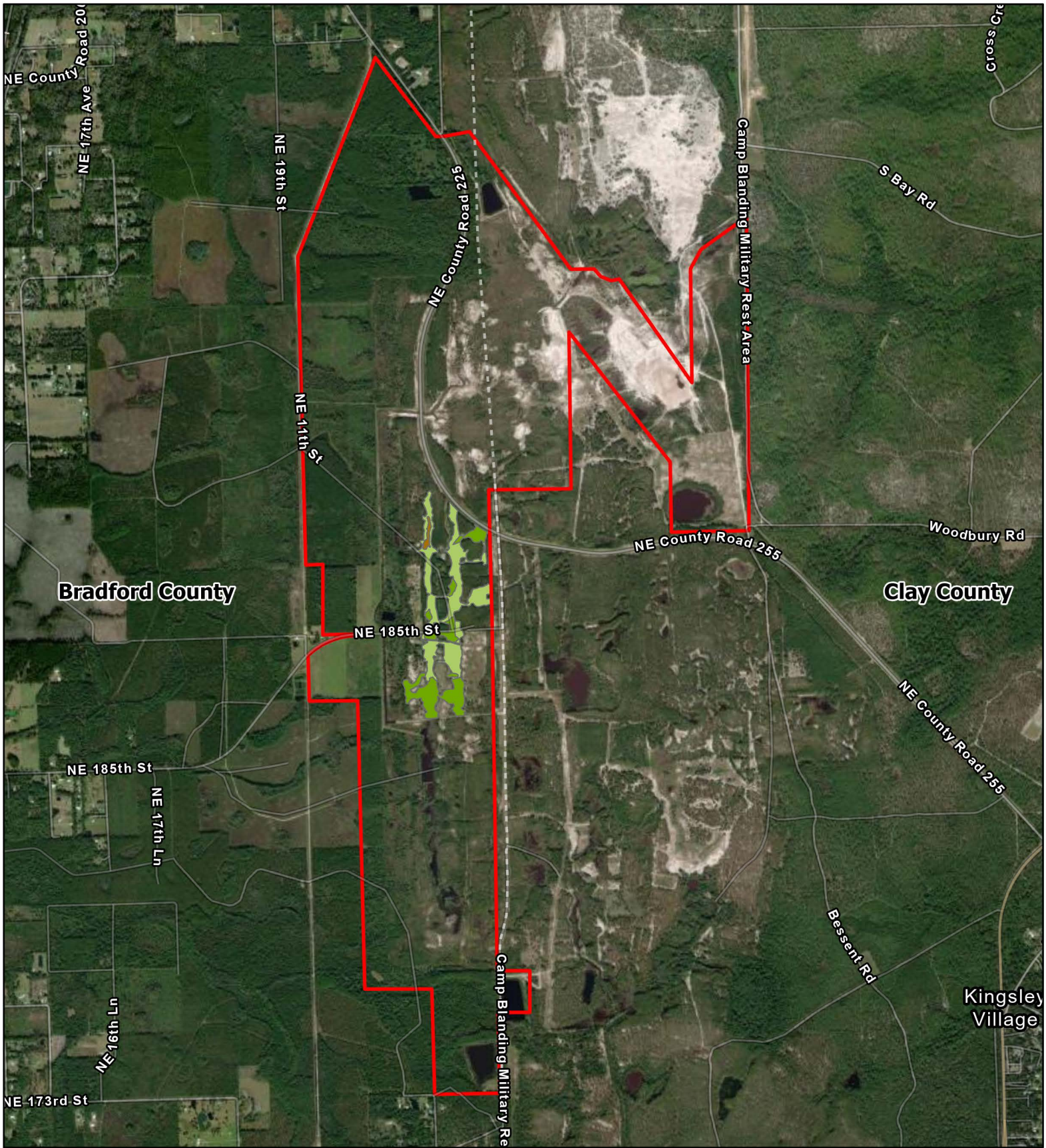
0 260 520 Meters

N

Florida

**SWCA**  
ENVIRONMENTAL CONSULTANTS





### Legend

  Florida Mine - Trail Ridge Boundary (± 1,937.0 Ac.)

#### Offsite Mitigation (± 53.96 Ac.)

- 631 - Wetland Shrub (± 33.21 Ac.)
- 641 - Freshwater Marsh (± 19.74 Ac.)
- 643 - Wet Prairie (± 1.01 Ac.)

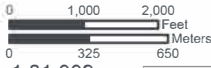
**Figure 17: Offsite Permittee Responsible Mitigation Map**

**Trail Ridge South Mine  
SWCA Project No. 93087**

**The Chemours Company FC, LLC  
(29° 53' 7.22" N, 82° 3' 2.40" W)**

Bradford and Clay Counties, Florida

Date: September 2024  
Base map provided by ESRI. Property boundary provided by Chemours.



1:31,009



Florida



**SWCA**  
ENVIRONMENTAL CONSULTANTS

## Tables

**Table 1**  
**Pre-Mining Land Use**

FLUCFCS CODE	LAND USE	TOTAL PERMITTED (Ac)
160	Extractive	117.06
173	Military	6.88
421	Xeric Oak	28.16
434	Hardwood, Coniferous Mixed	4.04
441	Coniferous Plantations	1,216.91
441W	Coniferous Plantations, Wetland	480.76
510d	Man-Made Ditches	31.75
523	Lake>10 acres but<100 acres	13.65
524	Lake<10 acres	2.27
611	Bay Swamps	1.29
613	Gum Swamps	0.21
621	Cypress	17.36
630	Wetland Forested Mixed	797.51
631	Wetland Shrub	17.11
641	Freshwater Marshes	104.50
8146	Primitive Roads/Trails	44.94
	<b>Total</b>	<b>2,884.40</b>

**Table 2**  
**Wetland and Surface Waters**

WL & SW ID	WL & SW TYPE	WL & SW SIZE	WL & SW NOT IMPACTED	TEMPORARY WL & SW IMPACTS			PERMANENT WL & SW IMPACTS			MITIGATION AREA ID
				WL & SW TYPE	IMPACT SIZE	IMPACT CODE	WL & SW TYPE	IMPACT SIZE	IMPACT CODE	
W1	441W	48.19	19.54		28.65					MA 1 / Enhancement
W1	630	84.21	76.32		7.89					MA 1 / Enhancement
W2	641	0.10	0.00		0.10					MA1 / Enhancement
W3	441W	12.85	0.00		12.85					MA 1
W3	630	1.25	0.00		1.25					MA 1
W3	641	8.89	0.00		8.89					MA 1
W4	641	0.04	0.00		0.04					Isolated / Non-Jurisdictional - No Mitigation required
W5	630	119.27	10.50		108.77					MA 1 / Enhancement
W6	441W	13.29	9.04		4.25					MA 3 / Enhancement
W6	630	28.08	25.58		2.50					MA 3 / Enhancement
W7	441W	4.99	0.00		4.99					MA 1 / Enhancement
W7	630	4.90	0.00		4.90					MA 1 / Enhancement
W8	441W	0.41	0.00		0.41					MA 1 / Enhancement
W8	630	11.02	0.00		11.02					MA 1 / Enhancement
W9	441W	0.89	0.00		0.89					Isolated / Non-Jurisdictional - No Mitigation required
W9	641	2.88	0.00		2.88					Isolated / Non-Jurisdictional - No Mitigation required
W10	641	1.87	0.00		1.87					Isolated / Non-Jurisdictional - No Mitigation required
W11	630	0.40	0.00		0.40					Isolated / Non-Jurisdictional - No Mitigation required
W12	631	4.44	0.00		4.44					MA 1 / Enhancement
W13	631	0.02	0.00		0.02					Isolated / Non-Jurisdictional - No Mitigation required
W14	641	0.36	0.00		0.36					Isolated / Non-Jurisdictional - No Mitigation required
W15	631	0.08	0.08							Undisturbed
W16	631	12.57	1.19		11.38					MA 1 / Enhancement
W16	641	5.61	0.00		5.61					MA 1 / Enhancement
W17	441W	4.08	0.00		4.08					MA 4, 5, 6 / Enhancement
W18	441W	10.23	3.66		6.57					Isolated / Non-Jurisdictional - No Mitigation required
W18	630	0.29	0.00		0.29					Isolated / Non-Jurisdictional - No Mitigation required
W18	621	0.84	0.84							Undisturbed
W19	441W	63.03	4.54		58.49					MA 1 / Enhancement
W19	630	92.11	43.60		48.51					MA 1 / Enhancement
W19	641	26.42	0.00		26.42					MA 1 / Enhancement
W20	611	1.29	0.00		1.29					Isolated / Non-Jurisdictional - No Mitigation required
W21	630	98.32	37.81		60.51					MA 1 and 12 / Enhancement
W21	641	25.57	14.77		10.80					MA 1 / Enhancement
W22	441W	6.70	6.60		0.10					MA 11 / Enhancement
W22	630	8.48	8.37		0.11					MA 11 / Enhancement
W23	441W	0.67	0.00		0.67					Isolated / Non-Jurisdictional - No Mitigation required
W24	441W	89.37	53.42		35.95					MA 1 and 7 / Enhancement
W24	613	0.21	0.00		0.21					MA 7 / Enhancement
W24	630	241.56	172.82		68.74					MA 1 and 7 / Enhancement
W25	441W	0.23	0.00		0.23					MA 1 / Enhancement
W26	441W	10.89	4.74		6.15					MA 1 / Enhancement
W27	441W	9.82	0.00		9.82					MA 1 / Enhancement
W28	630	11.82	0.00		11.82					MA 1 / Enhancement
W29	441W	2.73	2.73							Undisturbed
W30	441W	0.87	0.00		0.87					Isolated / Non-Jurisdictional - No Mitigation required
W30	621	0.51	0.00		0.51					Isolated / Non-Jurisdictional - No Mitigation required
W31	621	1.67	1.67							Undisturbed
W32	630	2.77	0.00		2.77					MA 1 / Enhancement
W33	441W	15.28	5.33		9.95					MA 1 / Enhancement
W33	641	5.13	1.11		4.02					MA 1 / Enhancement
W34	441W	33.48	0.00		33.48					MA 1 / Enhancement
W34	630	46.42	0.00		46.42					MA 1 / Enhancement
W34	641	23.52	0.00		23.52					MA 1 / Enhancement
W35	441W	20.48	20.48							Undisturbed
W35	621	4.12	4.12							Undisturbed
W36	441W	4.33	3.04		1.29					Isolated / Non-Jurisdictional - No Mitigation required
W37	441W	0.52	0.00		0.52					Isolated / Non-Jurisdictional - No Mitigation required
W37	641	1.82	0.00		1.82					Isolated / Non-Jurisdictional - No Mitigation required
W38	441W	34.13	28.53		5.60					MA 1 / Enhancement
W38	630	8.33	8.33							Undisturbed
W39	641	0.43	0.00		0.43					MA 9 / Enhancement
W41	441W	1.72	0.00		1.72					MA 1 / Enhancement
W42	641	0.70	0.00		0.70					Isolated / Non-Jurisdictional - No Mitigation required
W43	641	1.16	0.00		1.16					Isolated / Non-Jurisdictional - No Mitigation required



**Table 2**  
**Wetland and Surface Waters**

WL & SW ID	WL & SW TYPE	WL & SW SIZE	WL & SW NOT IMPACTED	TEMPORARY WL & SW IMPACTS			PERMANENT WL & SW IMPACTS			MITIGATION AREA ID
				WL & SW TYPE	IMPACT SIZE	IMPACT CODE	WL & SW TYPE	IMPACT SIZE	IMPACT CODE	
W45	630	0.69	0.00		0.69					Isolated / Non-Jurisdictional - No Mitigation required
W46	630	0.06	0.06							Undisturbed
W47	630	0.33	0.33							Undisturbed
W48	630	2.34	2.34							Undisturbed
W49	441W	2.79	2.79							Undisturbed
W50	441W	0.37	0.37							Undisturbed
W51	630	1.48	1.48							Undisturbed
W52	441W	0.94	0.94							Undisturbed
W53	441W	72.26	72.26							Undisturbed
W53	621	4.30	4.30							Undisturbed
W53	630	33.38	33.38							Undisturbed
W54	441W	3.67	3.67							Undisturbed
W54	621	5.92	5.92							Undisturbed
W55	441W	11.55	11.55							Undisturbed
SW1	524	1.60	1.60							Undisturbed
SW2	524	0.67	0.00		0.67					Enhancement
SW3	523	13.65	13.65							Undisturbed
D1	510d	0.43	0.00		0.43					Upland Cut Ditch - No Mitigation required
D1	510d	0.77	0.08		0.69					Wetland Cut Ditch - Enhancement
D2	510d	0.005	0.00		0.005					Upland Cut Ditch - No Mitigation required
D3	510d	0.34	0.00		0.34					Upland Cut Ditch - No Mitigation required
D3	510d	0.14	0.03		0.11					Wetland Cut Ditch - Enhancement
D4	510d	0.13	0.00		0.13					Upland Cut Ditch - No Mitigation required
D4	510d	0.12	0.00		0.12					Wetland Cut Ditch - Enhancement
D5	510d	0.17	0.00		0.17					Upland Cut Ditch - No Mitigation required
D5	510d	0.05	0.05							Wetland Cut Ditch - Undisturbed
D6	510d	0.01	0.00		0.01					Upland Cut Ditch - No Mitigation required
D7	510d	0.08	0.00		0.08					Upland Cut Ditch - No Mitigation required
D8	510d	0.08	0.00		0.08					Upland Cut Ditch - No Mitigation required
D8	510d	0.41	0.29		0.12					Wetland Cut Ditch - Enhancement
D9	510d	0.13	0.00		0.13					Wetland Cut Ditch - Enhancement
D10	510d	0.11	0.00		0.11					Upland Cut Ditch - No Mitigation required
D10	510d	0.07	0.00		0.07					Wetland Cut Ditch - Enhancement
D11	510d	0.11	0.02		0.09					Upland Cut Ditch - No Mitigation required
D11	510d	0.09	0.01		0.08					Wetland Cut Ditch - Enhancement
D12	510d	0.17	0.03		0.14					Upland Cut Ditch - No Mitigation required
D12	510d	0.001	0.001							Wetland Cut Ditch - Undisturbed
D13	510d	0.38	0.00		0.38					Upland Cut Ditch - No Mitigation required
D13	510d	0.05	0.00		0.05					Wetland Cut Ditch - Enhancement
D14	510d	0.01	0.00		0.01					Upland Cut Ditch - No Mitigation required
D14	510d	0.0002	0.00		0.0002					Wetland Cut Ditch - Enhancement
D15	510d	0.36	0.00		0.36					Wetland Cut Ditch - Enhancement
D16	510d	0.02	0.00		0.02					Upland Cut Ditch - No Mitigation required
D16	510d	0.01	0.00		0.01					Wetland Cut Ditch - Enhancement
D17	510d	0.04	0.00		0.04					Upland Cut Ditch - No Mitigation required
D17	510d	0.10	0.00		0.10					Wetland Cut Ditch - Enhancement
D18	510d	0.65	0.00		0.65					Upland Cut Ditch - No Mitigation required
D18	510d	0.15	0.00		0.15					Wetland Cut Ditch - Enhancement
D19	510d	0.29	0.00		0.29					Upland Cut Ditch - No Mitigation required
D19	510d	0.32	0.00		0.32					Wetland Cut Ditch - Enhancement
D20	510d	0.29	0.04		0.25					Upland Cut Ditch - No Mitigation required
D20	510d	0.68	0.14		0.54					Wetland Cut Ditch - Enhancement
D21	510d	0.09	0.03		0.06					Upland Cut Ditch - No Mitigation required
D21	510d	0.04	0.03		0.01					Wetland Cut Ditch - Enhancement
D22	510d	0.51	0.00		0.51					Upland Cut Ditch - No Mitigation required
D22	510d	0.13	0.00		0.13					Wetland Cut Ditch - Enhancement
D23	510d	0.04	0.01		0.03					Upland Cut Ditch - No Mitigation required
D23	510d	0.01	0.00		0.01					Wetland Cut Ditch - Enhancement
D24	510d	0.32	0.00		0.32					Upland Cut Ditch - No Mitigation required
D24	510d	0.72	0.00		0.72					Wetland Cut Ditch - Enhancement
D25	510d	9.32	0.00		9.32					Upland Cut Ditch - No Mitigation required
D26	510d	11.22	1.80		9.42					Upland Cut Ditch - No Mitigation required
D27	510d	2.58	0.00		2.58					Upland Cut Ditch - No Mitigation required
TOTALS		1466.41	725.96		740.45			0.00		
JURISDICTIONAL TOTALS		1398.59	706.45		692.14			0.00		
NON-JURISDICTIONAL TOTALS		67.82	19.51		48.31			0.00		

Wetland Type: from an established wetland classification system

Impact Type: D=dredge; F=Fill; H=change hydrology; S=shading; C=clearing; O=other

**Table 3**  
**Jurisdictional Wetland Impact Summary**

WETLAND ID	LAND USE	TOTAL (Ac)	TOTAL IMPACTS (Ac)
W1	441W	48.19	28.65
W1	630	84.21	7.89
W2	641	0.10	0.10
W3	441W	12.85	12.85
W3	630	1.25	1.25
W3	641	8.89	8.89
W5	630	119.27	108.77
W6	441W	13.29	4.25
W6	630	28.08	2.50
W7	441W	4.99	4.99
W7	630	4.90	4.90
W8	441W	0.41	0.41
W8	630	11.02	11.02
W12	631	4.44	4.44
W16	631	12.57	11.38
W16	641	5.61	5.61
W17	441W	4.08	4.08
W19	441W	63.03	58.49
W19	630	92.11	48.51
W19	641	26.42	26.42
W21	630	98.32	60.51
W21	641	25.57	10.80
W22	441W	6.70	0.10
W22	630	8.48	0.11
W24	441W	89.37	35.95
W24	613	0.21	0.21
W24	630	241.56	68.74
W25	441W	0.23	0.23
W26	441W	10.89	6.15
W27	441W	9.82	9.82
W28	630	11.82	11.82
W32	630	2.77	2.77
W33	441W	15.28	9.95
W33	641	5.13	4.02
W34	441W	33.48	33.48
W34	630	46.42	46.42
W34	641	23.52	23.52
W38	441W	34.13	5.60
W39	641	0.43	0.43
W41	441W	1.72	1.72
SW2	524	0.67	0.67
D1	510d	0.77	0.69
D3	510d	0.14	0.11
D4	510d	0.12	0.12
D8	510d	0.41	0.12
D9	510d	0.13	0.13
D10	510d	0.07	0.07
D11	510d	0.09	0.08
D13	510d	0.05	0.05
D14	510d	0.0002	0.0002
D15	510d	0.36	0.36
D16	510d	0.01	0.01
D17	510d	0.10	0.10
D18	510d	0.15	0.15
D19	510d	0.32	0.32
D20	510d	0.68	0.54
D21	510d	0.04	0.01
D22	510d	0.13	0.13
D23	510d	0.01	0.01
D24	510d	0.72	0.72
<b>JURISDICTIONAL WETLAND IMPACTS TOTAL</b>		<b>1216.53</b>	<b>692.14</b>

**Table 4**  
**Mitigation Summary**

MITIGATION AREA ID	LAND USE	MITIGATION TYPE	RESTORATION (Ac)	ENHANCEMENT (Ac)
1A	630	Permittee Responsible Onsite	36.21	
1B	630	Permittee Responsible Onsite	46.78	
1B	641	Permittee Responsible Onsite	13.18	
1C	630	Permittee Responsible Onsite	65.40	
1D	630	Permittee Responsible Onsite	48.25	
1D	641	Permittee Responsible Onsite	3.25	
1D	611	Permittee Responsible Onsite	1.29	
1E	630	Permittee Responsible Onsite	55.18	
1E	641	Permittee Responsible Onsite	6.38	
1F	630	Permittee Responsible Onsite	32.23	
1F	641	Permittee Responsible Onsite	0.94	
1G	630	Permittee Responsible Onsite	29.57	
1G	641	Permittee Responsible Onsite	2.89	
1H	630	Permittee Responsible Onsite	7.67	
1I	630	Permittee Responsible Onsite	21.94	
1J	630	Permittee Responsible Onsite	12.64	
1K	630	Permittee Responsible Onsite	34.16	
1K	641	Permittee Responsible Onsite	28.27	
1L	630	Permittee Responsible Onsite	57.52	
1M	630	Permittee Responsible Onsite	34.86	
1N	630	Permittee Responsible Onsite	8.55	
1O	630	Permittee Responsible Onsite	5.49	
1O	641	Permittee Responsible Onsite	0.29	
1P	630	Permittee Responsible Onsite	13.99	
1P	641	Permittee Responsible Onsite	9.45	
1Q	630	Permittee Responsible Onsite	65.80	
1Q	641	Permittee Responsible Onsite	1.44	
1R	630	Permittee Responsible Onsite	10.67	
1R	641	Permittee Responsible Onsite	15.89	
1S	630	Permittee Responsible Onsite	1.81	
1T	630	Permittee Responsible Onsite	5.61	
2	630	Permittee Responsible Onsite	1.63	
2	641	Permittee Responsible Onsite	1.55	
3	630	Permittee Responsible Onsite	5.67	
4	630	Permittee Responsible Onsite	1.65	
5	630	Permittee Responsible Onsite	3.20	
6	630	Permittee Responsible Onsite	7.43	
7	630	Permittee Responsible Onsite	1.54	
7	613	Permittee Responsible Onsite	0.21	
8	630	Permittee Responsible Onsite	3.21	
8	621	Permittee Responsible Onsite	0.51	
9	641	Permittee Responsible Onsite	0.97	
10	641	Permittee Responsible Onsite	4.12	
11	630	Permittee Responsible Onsite	0.33	
12	630	Permittee Responsible Onsite	0.97	
W151, W153	631	Permittee Responsible Offsite	33.21	
W151, W153	641	Permittee Responsible Offsite	19.74	
W151	643	Permittee Responsible Offsite	1.01	
ENHANCEMENT	630	Enhancement Onsite		165.48
TOTAL			764.55	165.48

**Table 5**  
**Mitigation Planting**

LAND USE	PLANTING ZONE	Elevation Relative to Adjacent Uplands	SHWE	TREE SPECIES
630/611	A	± 1' lower	≤ 1' above ground surface	Sweet bay ( <i>Magnolia virginiana</i> ) Swamp bay ( <i>Persea palustris</i> ) Dahoon holly ( <i>Ilex cassine</i> ) Green ash ( <i>Fraxinus pennsylvanica</i> ) Sweet gum ( <i>Liquidambar styraciflua</i> ) Red maple ( <i>Acer rubrum</i> )
613/621	B	± 2' lower	≤ 18" above ground surface	Bald cypress ( <i>Taxodium distichum</i> ) Pond cypress ( <i>Taxodium ascendens</i> ) Blackgum ( <i>Nyssa sylvatica</i> var. <i>biflora</i> ) Sweet bay ( <i>Magnolia virginiana</i> ) Swamp bay ( <i>Persea palustris</i> ) Green ash ( <i>Fraxinus pennsylvanica</i> ) Sweet gum ( <i>Liquidambar styraciflua</i> )
641	C	± 3' lower	≤ 2' above ground surface	Natural herbaceous recruitment through topsoil/muck replacement



**Table 6**  
**Post-Mining Land Use**

FLUCFCS CODE	LAND USE	TOTAL (Ac)	%
411	Pine Flatwoods	955.36	33.12%
434	Hardwood, Coniferous Mixed	106.92	3.707%
524	Lake <10 acres	0.98	0.03%
611	Bay Swamps	1.29	0.04%
613	Gum Swamps	0.21	0.01%
621	Cypress	0.51	0.02%
630	Wetland Forested Mixed	619.96	21.49%
641	Freshwater Marshes	88.62	3.07%
8145	Graded and Drained	5.06	0.18%
8146	Primitive Roads/Trails	1.07	0.04%
600	Undisturbed Wetlands	708.15	24.55%
500	Undisturbed Surface Water	17.81	0.62%
400	Undisturbed Uplands	378.46	13.12%
	<b>TOTAL</b>	<b>2,884.40</b>	<b>100.00%</b>

**Attachment 1:**  
**Preliminary Wetland Determination**



**DEPARTMENT OF THE ARMY**  
**JACKSONVILLE DISTRICT CORPS OF ENGINEERS**  
P.O. BOX 4970  
JACKSONVILLE, FLORIDA 32232-0019

**May 17, 2019**

REPLY TO  
ATTENTION OF

Regulatory Division  
West Permits Branch  
SAJ-2019-00480 (IP-JPF)  
PRELIMINARY JD

Connie Henderson  
The Chemours Company FC LLC  
Titanium Technologies  
P.O. Box 753  
Starke, Florida 32091

Dear Ms. Henderson:

Reference is made to the Department of Army permit application which has been assigned the number SAJ-2019-00480. The applicant, Chemours FC LLC and their consultant, Kleinfelder, participated in a pre-application meeting on March 13, 2019. At that time, Chemours requested verification of the wetlands mapped by Kleinfelder at the proposed mine, Trail Ridge South. The proposed Trail Ridge South mine is located in Sections 12, 13, and 24 in Township 7 South, Range 22 East and Sections 7, 8, and 19 in Township 7 South, Range 23 East in Bradford and Clay Counties, Florida.

The U.S. Corps of Engineers (Corps) personnel met with Noah Adams, Kleinfelder and Travis Richardson, T. Richardson Soil and Environmental LLC, to verify the accuracy of data provided. The data reviewed included maps, figures, and Wetland Determination Data Forms. Additionally, Corps personnel met onsite with Messers. Adams and Richardson on March 18 and 19, 2019, and reviewed several locations. Overall, Kleinfelder had accurately used the 1987 Corps of Engineers Wetland Delineation Manual to define the boundary of wetlands within the proposed mine site.

Electronic correspondence with Mr. Adams changed the request for verification of the wetlands map to accepting preliminary jurisdictional determination (PJD) status for the wetlands mapped. Attachment A provides Table 1 the aquatic resources and Figure 1 depicts the wetlands. Because a PJD status was requested, Attachment A also presents specific considerations pertaining to a PJD.

Please be advised a Department of the Army permit will be required for regulated work in all areas which may be waters of the United States. For purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures, a permit decision made on the basis of a preliminary JD treats all

waters and wetlands, which would be affected in any way by the permitted activity on the site, as if they are jurisdictional waters of the United States.

An approved JD represents the upland/wetland boundary for purposes of determining the Corps jurisdictional line and is based on the Corps of Engineers Wetlands Delineation Manual (1987) and the current regional supplement for jurisdictional determination. An approved JD is valid for a period no longer than 5 years from the date of issuance unless new information warrants a revision of the determination before the expiration date. If, after the 5-year period, the Corps has not specifically re-validated this jurisdictional determination, it shall automatically expire. The determination is based on information provided by you or your agent. Should you desire an official Corps determination that jurisdictional "waters of the United States," or "navigable waters of the United States," or both, are either present or absent on a particular site, the Corps will issue an approved JD when requested.

The Corps' Jacksonville District Regulatory Division is committed to improving service to our customers. We strive to perform our duty in a friendly and timely manner while working to preserve our environment. We invite you to take a few minutes to visit [http://corpsmapu.usace.army.mil/cm\\_apex/f?p=regulatory\\_survey](http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey) and complete our automated Customer Service Survey. Your input is appreciated – favorable or otherwise.

Thank you for your cooperation with our regulatory program. If you have any questions or concerns regarding this matter, please contact Eve Huggins at the letterhead address, by telephone at 904-232-2076, or email: [eve.m.huggins@usace.army.mil](mailto:eve.m.huggins@usace.army.mil).

Sincerely,

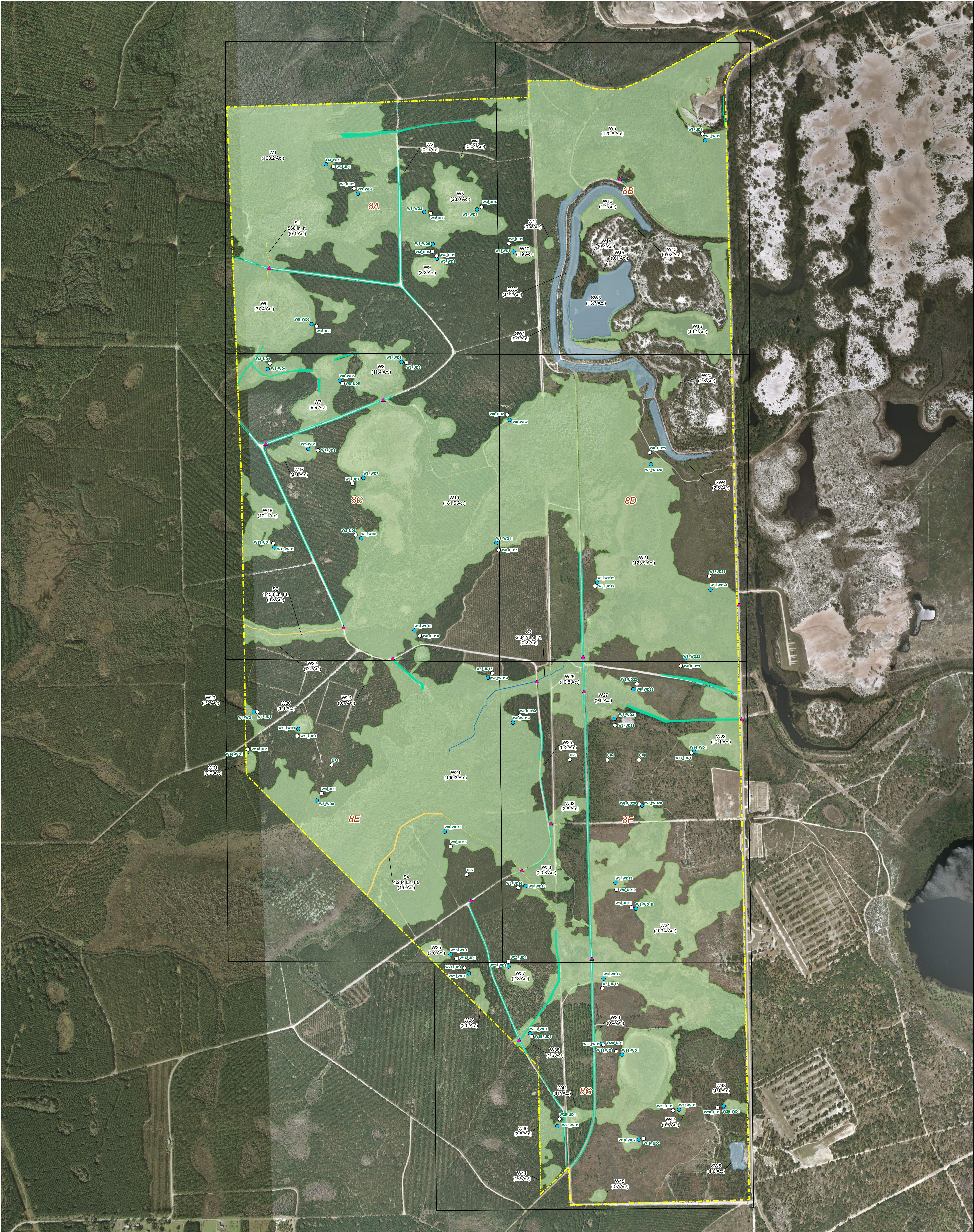


Kelly E. Unger  
Chief, West Branch

Enclosure

cc: Daniel LeJeune, Kleinfelder  
Noah Adams, Kleinfelder







**Table 1: Waters Upload Table**

Wetland	Cowardin Code	Acres	Linear Ft.	HGM Code	Abuts TNW (Y/N)	Water Types	Class of Aquatic Resources
SW1	L1OW	9.30	-	DEPRESS	N	IMPNDMNT	non-section 10 - nonwetland
SW2	L1OW	11.22	-	DEPRESS	N	IMPNDMNT	non-section 10 - nonwetland
SW3	L1OW	13.70	-	DEPRESS	N	IMPNDMNT	non-section 10 - nonwetland
SW4	L1OW	2.58	-	DEPRESS	N	IMPNDMNT	non-section 10 - nonwetland
SW5	L1OW	1.60	-	DEPRESS	N	RPW	non-section 10 - nonwetland
S1	R4	0.10	560	RIVERINE	N	RPW	non-section 10 - nonwetland
S2	R4	0.30	1458	RIVERINE	N	RPW	non-section 10 - nonwetland
S3	R4	0.20	2347	RIVERINE	N	RPW	non-section 10 - nonwetland
S4	R4	1.00	4244	RIVERINE	N	RPW	non-section 10 - nonwetland
W1	PFO	108.19	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W2	PFO	0.10	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W3	PFO	22.99	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W4	PFO	0.04	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W5	PFO	120.76	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W6	PFO	37.40	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W7	PFO	9.90	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W8	PFO	11.43	-	DEPRESS	N	RPWWN	non-section 10 - wetland
W9	PFO	3.78	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W10	PFO	1.87	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W11	PFO	0.40	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W12	PFO	4.44	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W13	PFO	0.02	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W14	PFO	0.36	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W15	PFO	0.08	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W16	PFO	19.09	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W17	PFO	4.08	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W18	PFO	10.07	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W19	PFO	181.56	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W20	PFO	1.29	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W21	PFO	123.95	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W22	PFO	7.22	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W23	PFO	0.67	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W24	PFO	190.30	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W25	PFO	0.23	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W26	PFO	10.86	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W27	PFO	9.82	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W28	PFO	12.10	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W29	PFO	1.22	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W30	PFO	1.38	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W31	PFO	0.88	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W32	PFO	2.77	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W33	PFO	20.35	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W34	PFO	103.40	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W35	PFO	1.99	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W36	PFO	2.03	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W37	PFO	2.34	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W38	PFO	1.59	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W39	PFO	0.43	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W40	PFO	3.83	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W41	PFO	1.72	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W42	PFO	0.70	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W43	PFO	1.12	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W44	PFO	1.18	-	DEPRESS	N	NRPWW	non-section 10 - wetland
W45	PFO	0.69	-	DEPRESS	N	NRPWW	non-section 10 - wetland

## **PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) CONSIDERATIONS**

In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring “pre-construction notification” (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that:

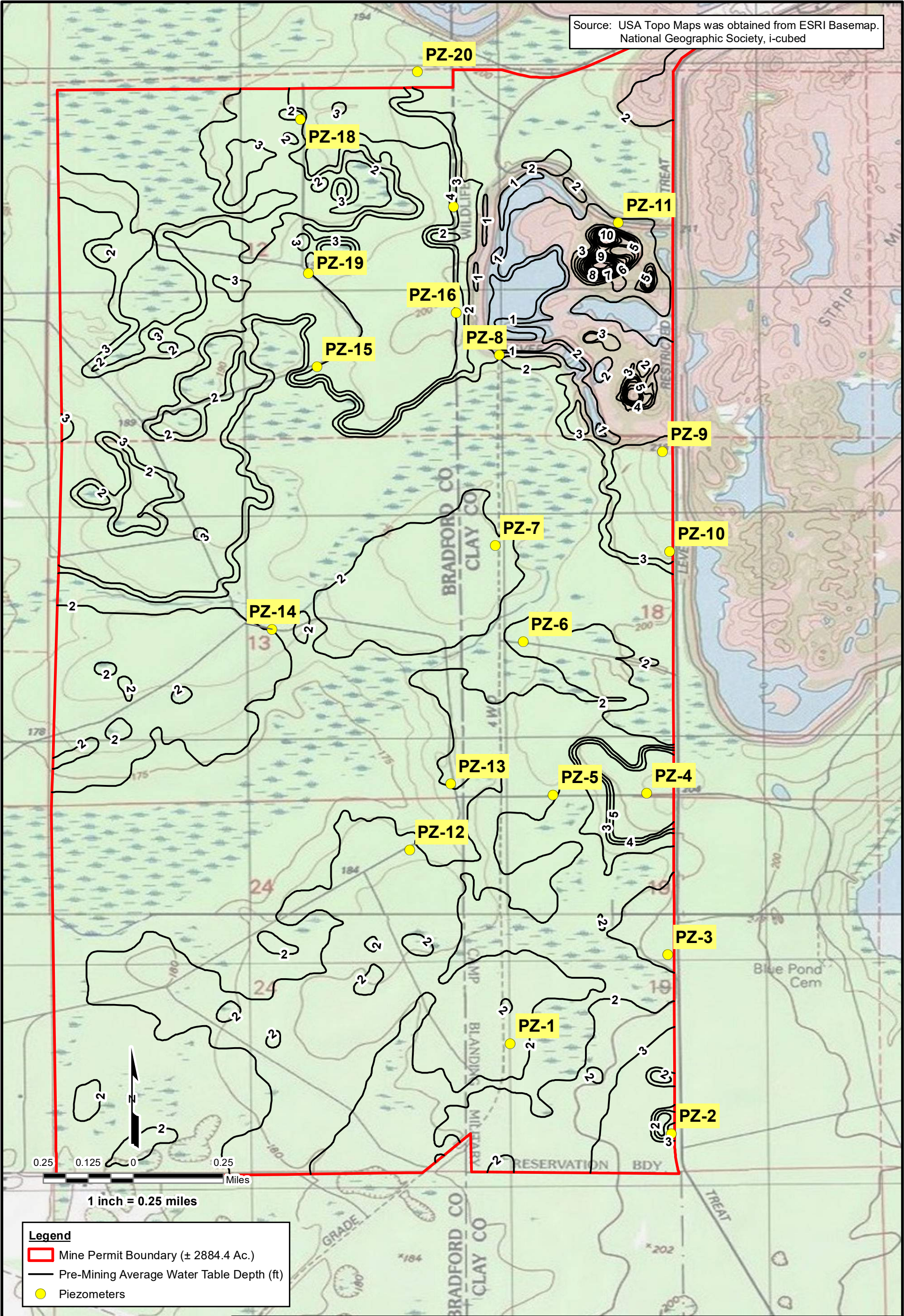
- (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources;
- (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions;
- (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization;
- (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary;
- (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant’s acceptance of the use of the PJD;
- (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and
- (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there “may be” waters of the U.S. and/or that there “may be” navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity.

**Attachment 2:**  
**Documents Previously Submitted to USACE and FDEP**



## Figures





The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

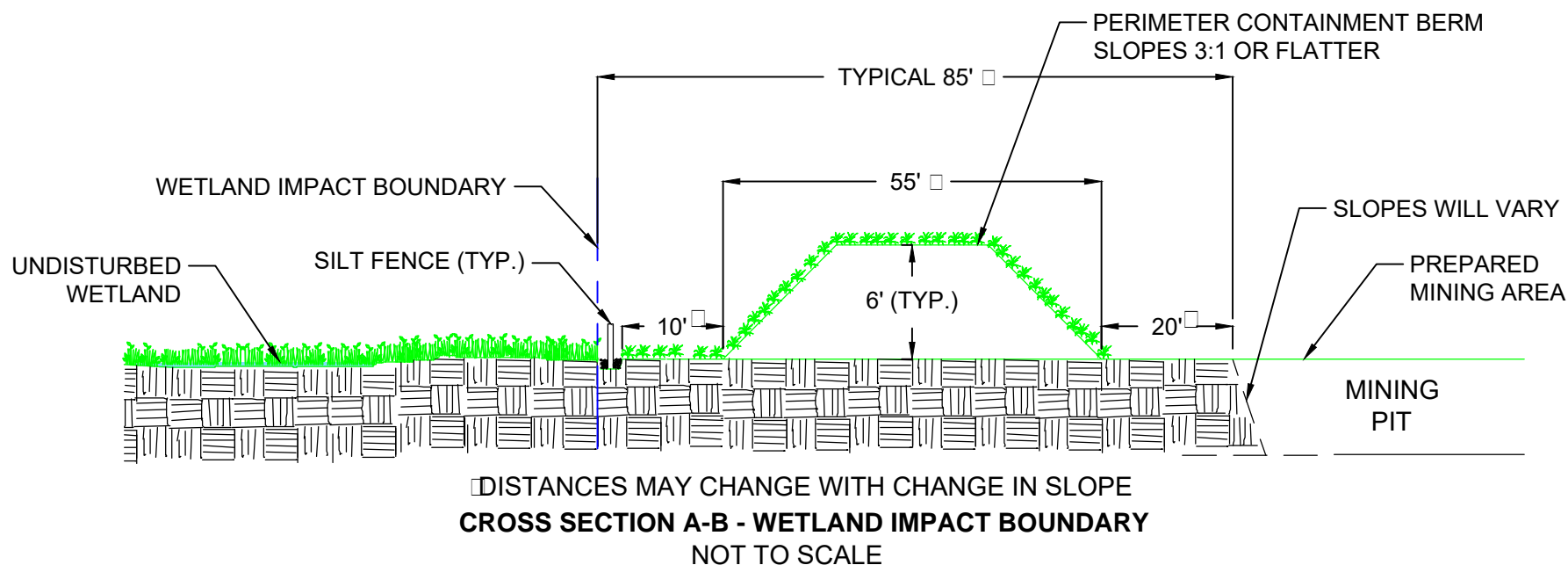


**KLEINFELDER**  
Bright People. Right Solutions.  
www.kleinfelder.com

PROJECT NO.	129491.003
DRAWN:	11/8/2019
DRAWN BY:	TRD
CHECKED BY:	DJH
FILE NAME:	See File Path

<b>Pre-Mining Average Depth to Water</b>
Trail Ridge South The Chemours Company FC, LLC. Bradford and Clay Counties, FL





The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.



PROJECT NO. 129491.003

DRAWN BY: TD

CHECKED BY: DL

DATE 11-08-2019

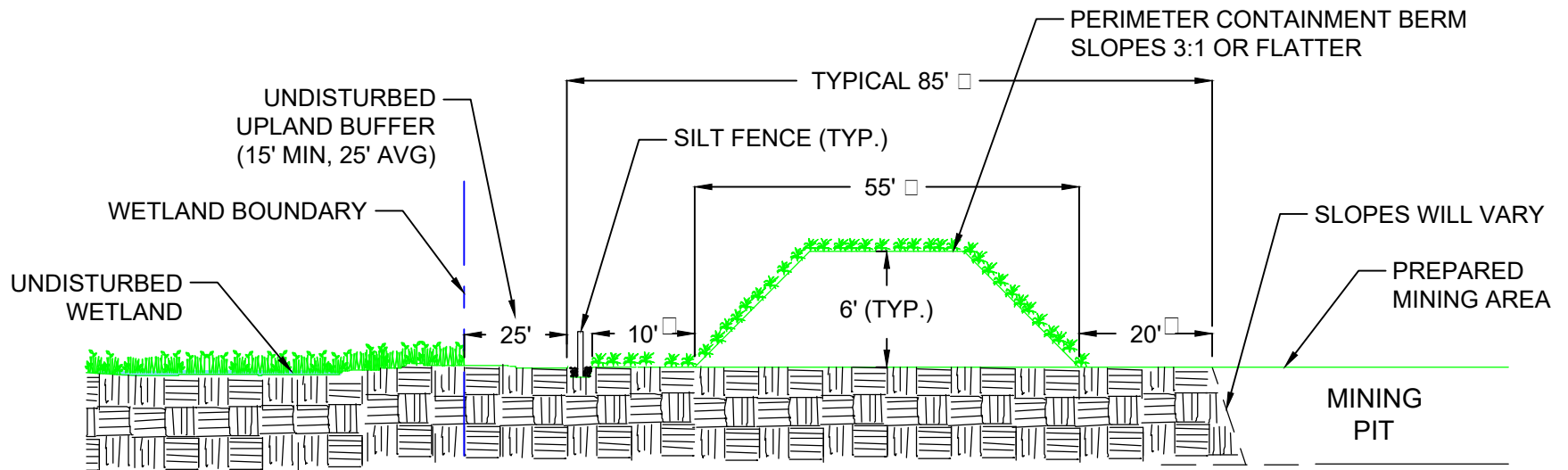
FILENAME: See file path

CROSS SECTION A - B

TRAIL RIDGE SOUTH  
THE CHEMOURS COMPANY FC, LLC.  
BRADFORD AND CLAY COUNTIES, FL

FIGURE

10A



□ DISTANCES MAY CHANGE WITH CHANGE IN SLOPE

**CROSS SECTION C-D - UNDISTURBED WETLAND BOUNDARY**  
NOT TO SCALE

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.



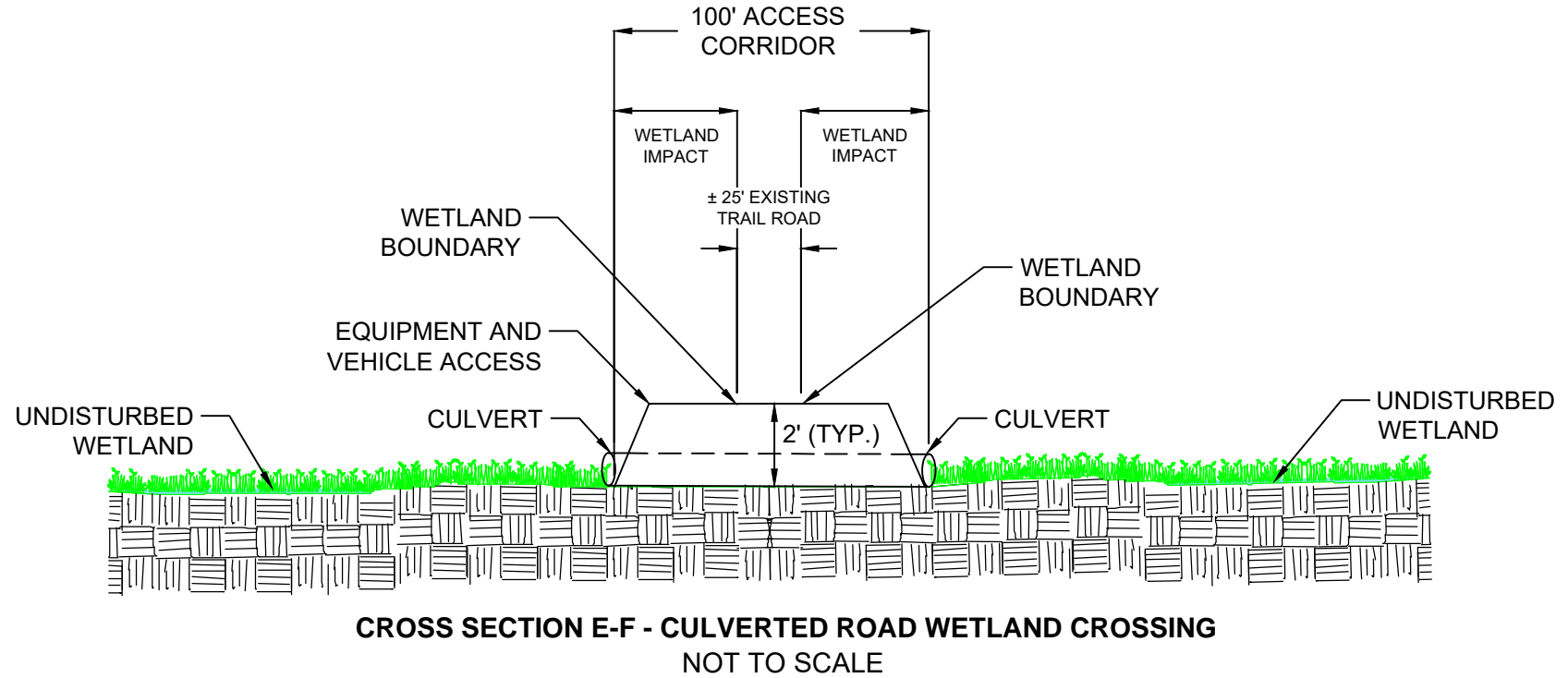
PROJECT NO.	129491.003
DRAWN BY:	TD
CHECKED BY:	DL
DATE	11-08-2019
FILENAME:	See file path

### CROSS SECTION C - D

TRAIL RIDGE SOUTH  
THE CHEMOURS COMPANY FC, LLC.  
BRADFORD AND CLAY COUNTIES, FL

FIGURE

10B



The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.



PROJECT NO. 129491.003

DRAWN BY: TD

CHECKED BY: DL

DATE 11-08-2019

FILENAME: See file path

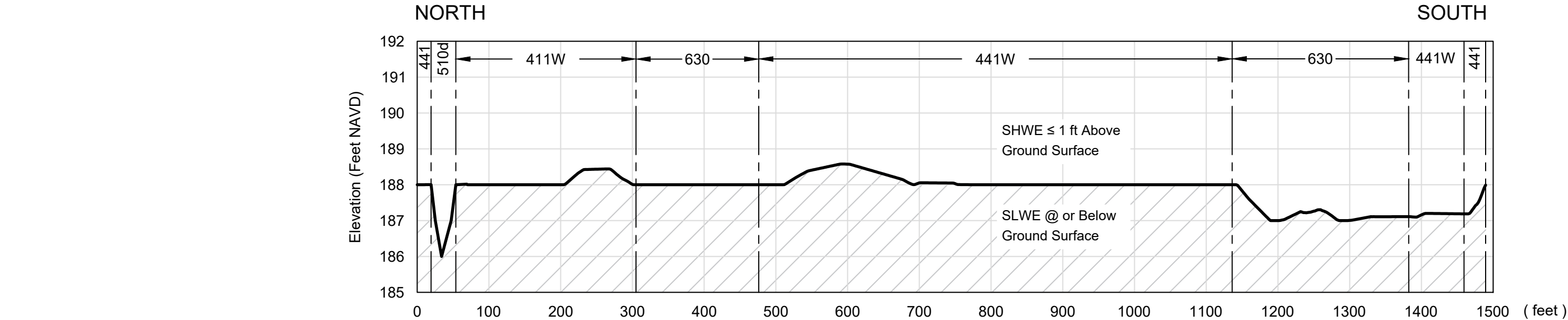
CROSS SECTION E - F

TRAIL RIDGE SOUTH  
THE CHEMOURS COMPANY FC, LLC.  
BRADFORD AND CLAY COUNTIES, FL

FIGURE

10C

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_WetlandImpact\_XS.dwg LAYOUT: Wetland Impact 1 & 3 PLOTTED: 11/8/2019 12:36 PM BY: tim desmarais



Wetland 1

**LEGEND**

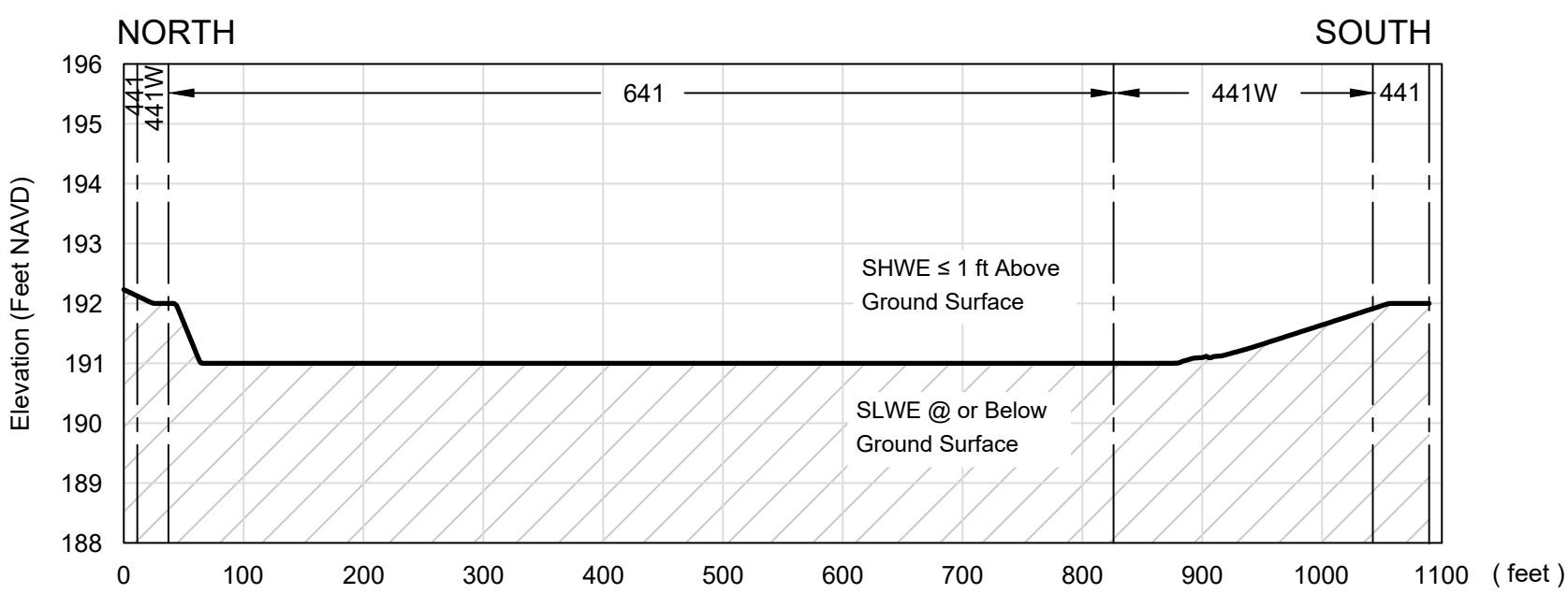
IMPACT

UNDISTURBED

EXISTING GROUND

LAND USE CODE

160 - Extractive  
173 - Military  
441 - Coniferous Plantation  
441W- Coniferous Plantation Wetland  
510d - Ditch/Canal  
611 - Bay Swamps  
630 - Wetland Forested Mixed  
631 - Wetland Scrub  
641 - Freshwater Marsh  
8146- Primitive Roads/Trails



Wetland 3

Source: Topography - Southern Resources Mapping, Inc. 2012.

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



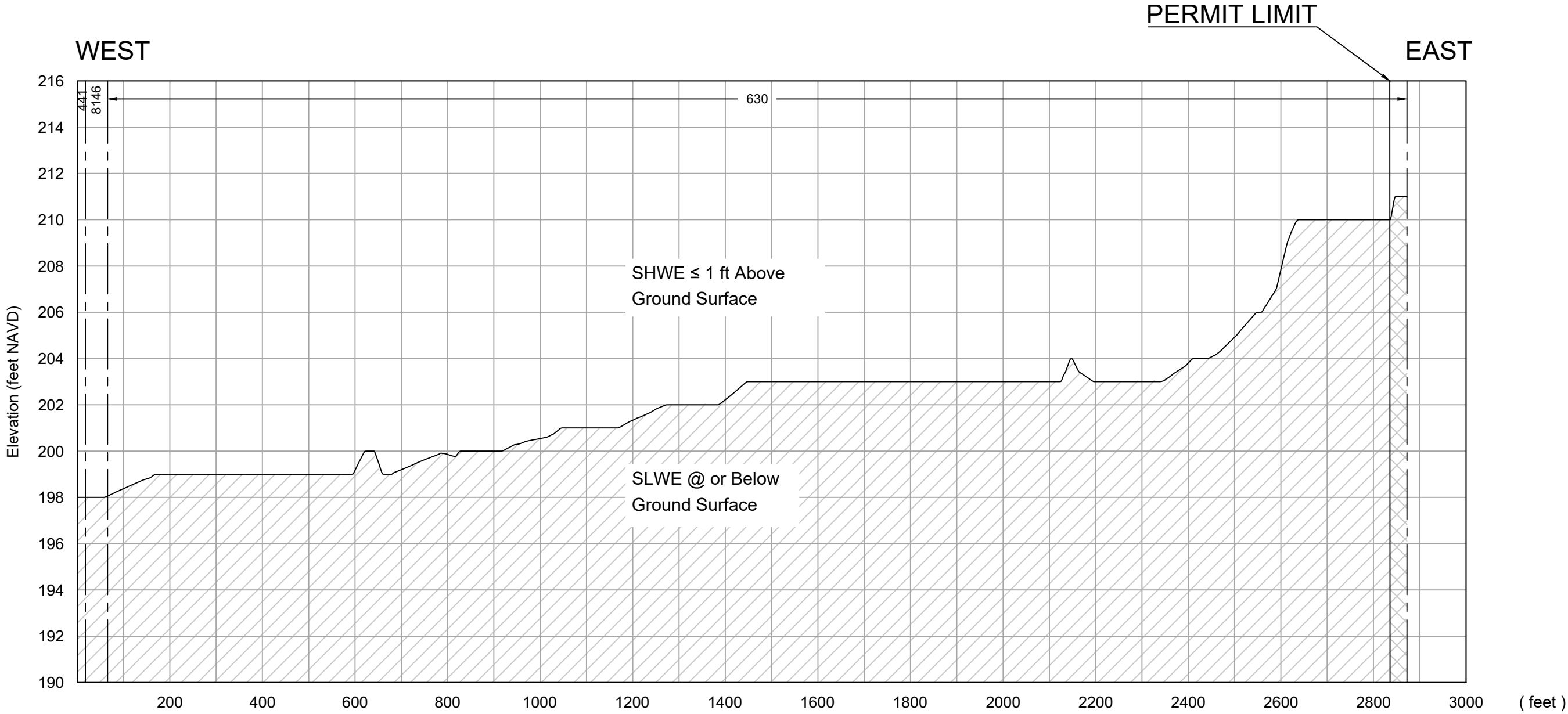
PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-08-2019  
REVISED:

WETLAND IMPACT CROSS-SECTION  
WETLAND 1 & 3

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE  
**11A**  
PAGE: 1 of 18

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_WetlandImpact\_XS.dwg PLOTTED: 11/8/2019 12:36 PM BY: tim desmarais LAYOUT: Wetland Impact 5



Wetland 5

LEGEND

IMPACT

UNDISTURBED

EXISTING GROUND

LAND USE CODE

- 160 - Extractive
- 173 - Military
- 441 - Coniferous Plantation
- 441W- Coniferous Plantation Wetland
- 510d - Ditch/Canal
- 611 - Bay Swamps
- 630 - Wetland Forested Mixed
- 631 - Wetland Scrub
- 641 - Freshwater Marsh
- 8146- Primitive Roads/Trails

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

Source: Topography - Southern Resources Mapping, Inc. 2012.

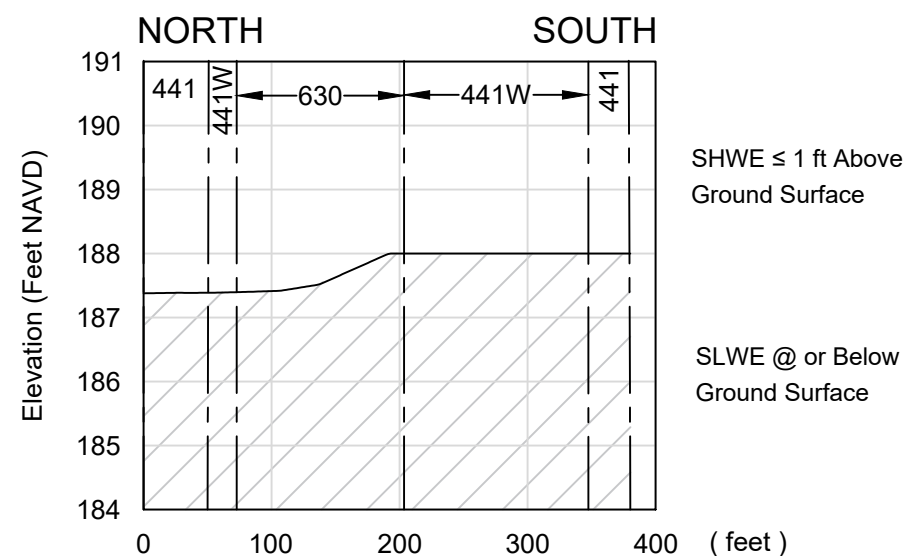
SCALE:  
HORIZ. 1"= 100'  
VERT. 1"=5'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-08-2019  
REVISED:

WETLAND IMPACT CROSS-SECTION  
WETLAND 5  
Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE  
11B  
PAGE: 2 of 18



## Wetland 6

## LEGEND

 IMPACT

 **UNDISTURBED**

—— EXISTING GROUND

----- LAND USE CODE

## 160 - Extractive

173 - Military

## 441 - Coniferous Plantation

## 441W- Coniferous Plantation Wetland

510d - Ditch/Canal

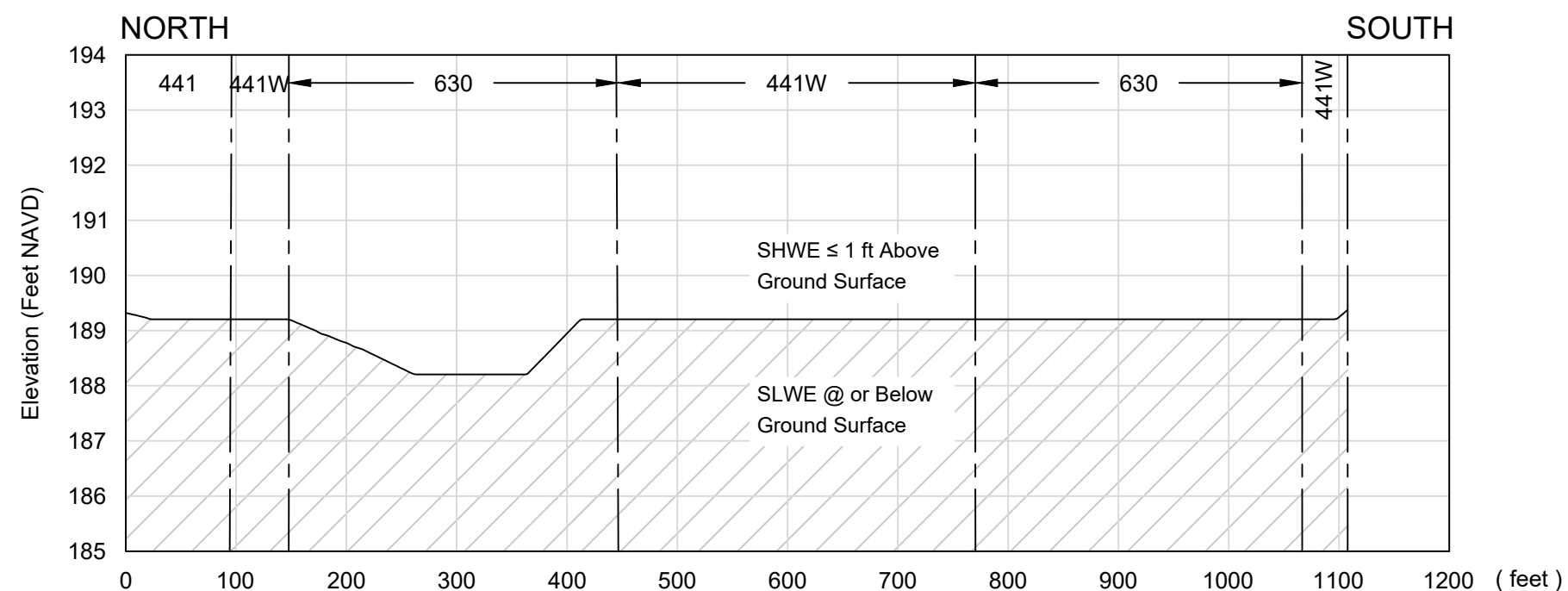
## 611 - Bay Swamps

630 - Wetland Forested Mixed

## 631 - Wetland Scrub

641 - Freshwater Marsh

## 8146- Primitive Roads/Trails



## Wetland 7

Source: Topography - Southern Resources Mapping, Inc. 2012.

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A
---------------------------

DRAWN BY YQ

CHECKED BY TRD

DATE: 11-08-2019

REVISÉ:

WETLAND IMPACT CROSS-SECTION  
WETLAND 6 & 7

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

11C





PAGE: 3 of 18

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.



CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491\003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_WetlandImpact\_XS.dwg PLOTTED: 11/8/2019 12:36 PM BY: tim desmarais LAYOUT: Wetland Impact 8 & 9

LEGEND

-  IMPACT
-  UNDISTURBED
-  EXISTING GROUND
-  LAND USE CODE

- 160 - Extractive  
173 - Military  
441 - Coniferous Plantation  
441W- Coniferous Plantation Wetland  
510d - Ditch/Canal  
611 - Bay Swamps  
630 - Wetland Forested Mixed  
631 - Wetland Scrub  
641 - Freshwater Marsh  
8146- Primitive Roads/Trails

Source: Topography - Southern Resources Mapping, Inc. 2012.

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-08-2019  
REVISED:

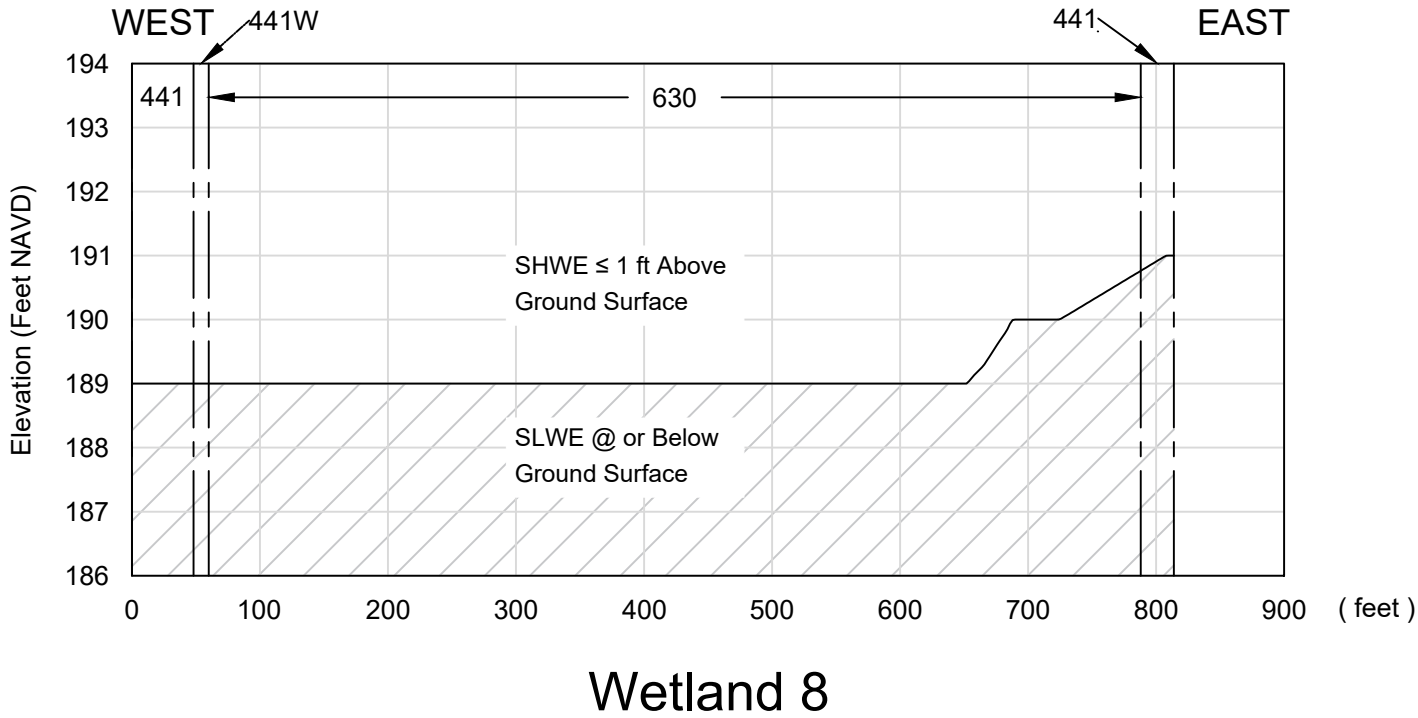
WETLAND IMPACT CROSS-SECTION  
WETLAND 8

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

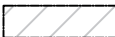



11D

PAGE: 4 of 18



CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491\003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_WetlandImpact\_XS.dwg PLOTTED: 11/8/2019 12:36 PM BY: tim desmarais LAYOUT: Wetland Impact 12 & 14

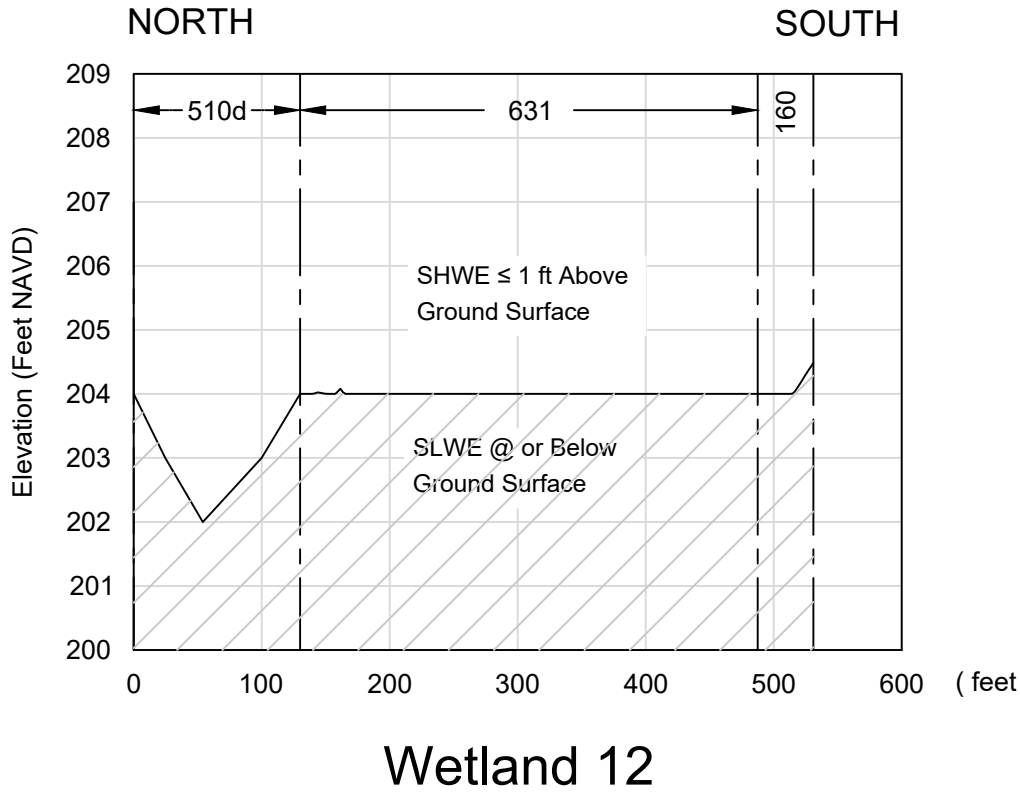
LEGEND

-  IMPACT
-  UNDISTURBED
-  EXISTING GROUND
-  LAND USE CODE

- 160 - Extractive  
173 - Military  
441 - Coniferous Plantation  
441W- Coniferous Plantation Wetland  
510d - Ditch/Canal  
611 - Bay Swamps  
630 - Wetland Forested Mixed  
631 - Wetland Scrub  
641 - Freshwater Marsh  
8146- Primitive Roads/Trails

Source: Topography - Southern Resources Mapping, Inc. 2012.

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressd or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.



SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A	WETLAND IMPACT CROSS-SECTION WETLAND 12	FIGURE
DRAWN BY YQ		
CHECKED BY TRD		
DATE: 11-08-2019	Trail Ridge South The Chemours Company FC LLC Bradford and Clay Counties, FL	11E
REVISED:		PAGE: 5 of 18

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\_2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_WetlandImpact\_XS.dwg PLOTTED: 11/8/2019 12:36 PM BY: tim desmarais LAYOUT: Wetland Impact 15 & 16

LEGEND

IMPACT

UNDISTURBED

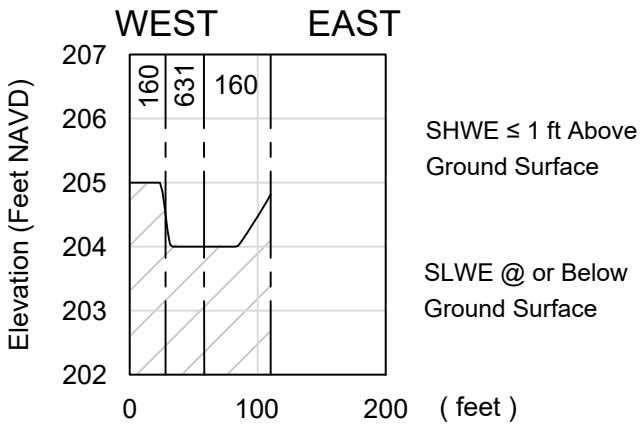
EXISTING GROUND

LAND USE CODE

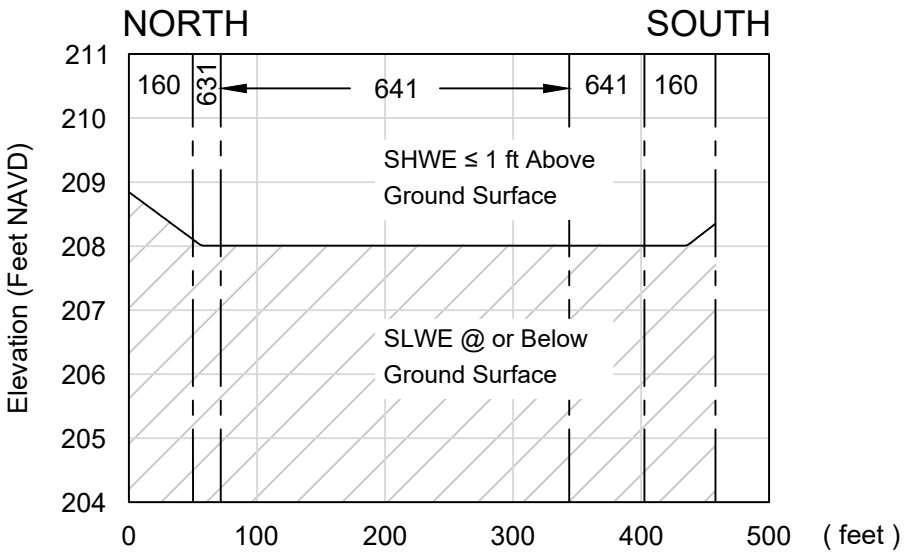
- 160 - Extractive
- 173 - Military
- 441 - Coniferous Plantation
- 441W- Coniferous Plantation Wetland
- 510d - Ditch/Canal
- 611 - Bay Swamps
- 630 - Wetland Forested Mixed
- 631 - Wetland Scrub
- 641 - Freshwater Marsh
- 8146- Primitive Roads/Trails

Source: Topography - Southern Resources Mapping, Inc. 2012.

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressd or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.



Wetland 15



Wetland 16

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A	
DRAWN BY	YQ
CHECKED BY	TRD
DATE:	11-08-2019
REVISED:	

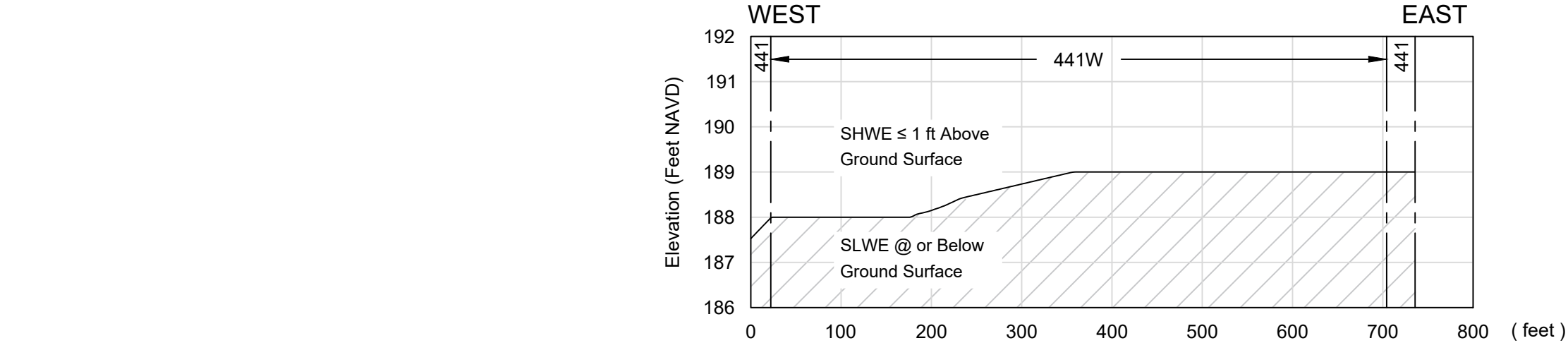
WETLAND IMPACT CROSS-SECTION  
WETLAND 15 & 16

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

11F

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491\003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_WetlandImpact\_XS.dwg PLOTTED: 11/8/2019 12:36 PM BY: tim desmarais LAYOUT: Wetland Impact 17 & 18



LEGEND

- IMPACT
- UNDISTURBED
- EXISTING GROUND
- LAND USE CODE

- 160 - Extractive
- 173 - Military
- 441 - Coniferous Plantation
- 441W- Coniferous Plantation Wetland
- 510d - Ditch/Canal
- 611 - Bay Swamps
- 630 - Wetland Forested Mixed
- 631 - Wetland Scrub
- 641 - Freshwater Marsh
- 8146- Primitive Roads/Trails

Source: Topography - Southern Resources Mapping, Inc. 2012.

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A	
DRAWN BY	YQ
CHECKED BY	TRD
DATE:	11-08-2019
REVISED:	

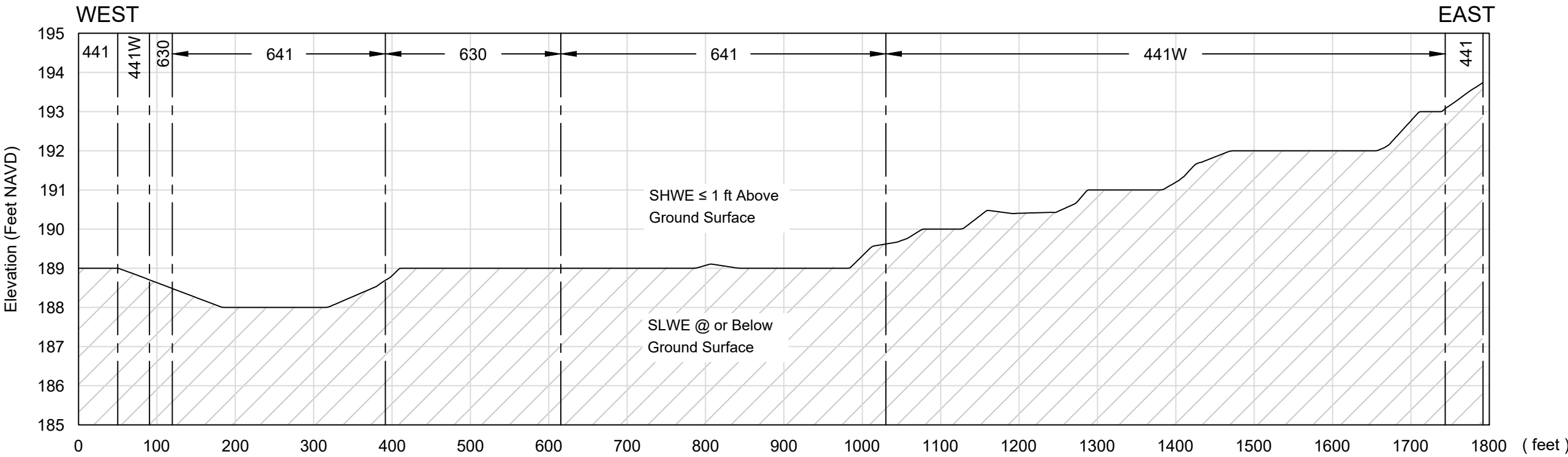
WETLAND IMPACT CROSS-SECTION  
WETLAND 17

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

11G

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_WetlandImpact\_XS.dwg LAYOUT: Wetland Impact 19 & 20 PLOTTED: 11/8/2019 12:36 PM BY: jim desmarais



Wetland 19

LEGEND

IMPACT

UNDISTURBED

EXISTING GROUND

LAND USE CODE

- 160 - Extractive
- 173 - Military
- 441 - Coniferous Plantation
- 441W- Coniferous Plantation Wetland
- 510d - Ditch/Canal
- 611 - Bay Swamps
- 630 - Wetland Forested Mixed
- 631 - Wetland Scrub
- 641 - Freshwater Marsh
- 8146- Primitive Roads/Trails

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'

Source: Topography - Southern Resources  
Mapping, Inc. 2012.

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressd or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-08-2019  
REVISED:

WETLAND IMPACT CROSS-SECTION  
WETLAND 19

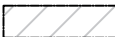



Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

11H

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_WetlandImpact\_XS.dwg PLOTTED: 11/8/2019 12:36 PM BY: tim desmarais LAYOUT: Wetland Impact 21 & 23

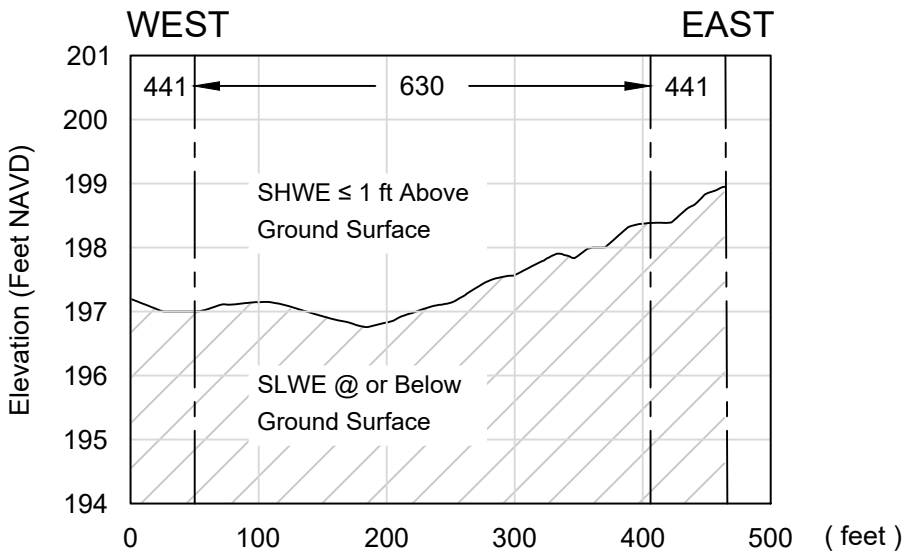
LEGEND

-  IMPACT
-  UNDISTURBED
-  EXISTING GROUND
-  LAND USE CODE

- 160 - Extractive  
173 - Military  
441 - Coniferous Plantation  
441W- Coniferous Plantation Wetland  
510d - Ditch/Canal  
611 - Bay Swamps  
630 - Wetland Forested Mixed  
631 - Wetland Scrub  
641 - Freshwater Marsh  
8146- Primitive Roads/Trails

Source: Topography - Southern Resources Mapping, Inc. 2012.

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.



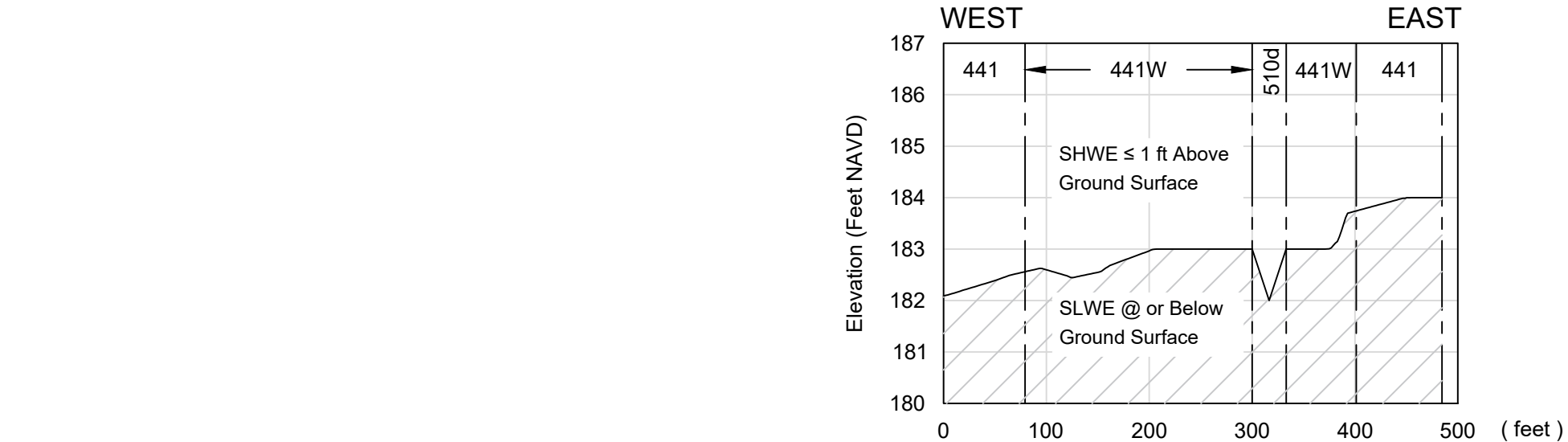
Wetland 21

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A	WETLAND IMPACT CROSS-SECTION WETLAND 21	FIGURE  111
DRAWN BY YQ		
CHECKED BY TRD	Trail Ridge South The Chemours Company FC LLC Bradford and Clay Counties, FL	PAGE: 9 of 18
DATE: 11-08-2019		
REVISED:		

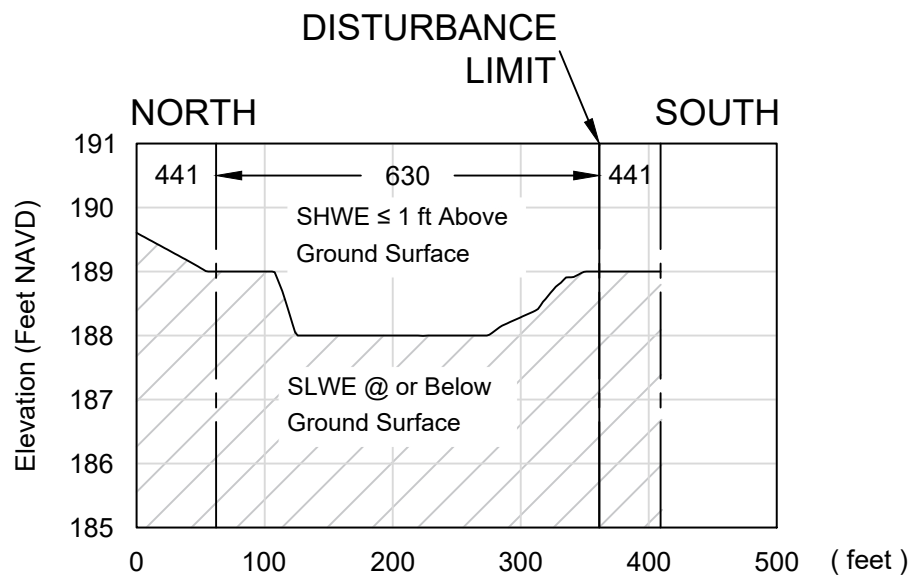
CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_WetlandImpact\_XS.dwg PLOTTED: 11/8/2019 12:36 PM BY: tim desmarais LAYOUT: Wetland Impact 24



Wetland 24-1

- LEGEND
- IMPACT
  - UNDISTURBED
  - EXISTING GROUND
  - LAND USE CODE

- 160 - Extractive
- 173 - Military
- 441 - Coniferous Plantation
- 441W- Coniferous Plantation Wetland
- 510d - Ditch/Canal
- 611 - Bay Swamps
- 630 - Wetland Forested Mixed
- 631 - Wetland Scrub
- 641 - Freshwater Marsh
- 8146- Primitive Roads/Trails



Wetland 24-2

Source: Topography - Southern Resources Mapping, Inc. 2012.

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-08-2019  
REVISED:

WETLAND IMPACT CROSS-SECTION  
WETLAND 24

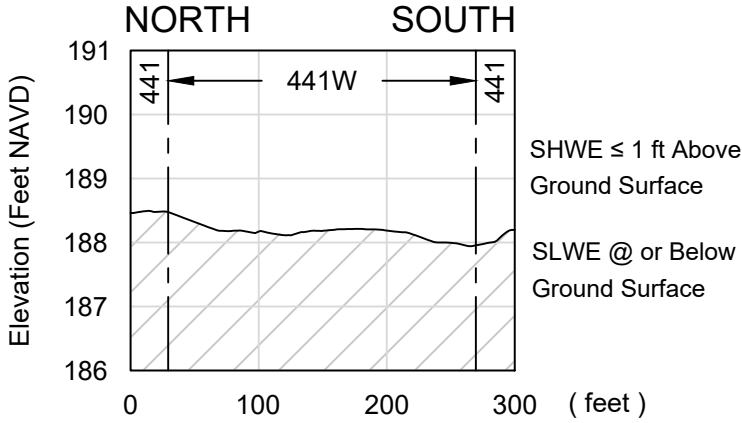
Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

11J



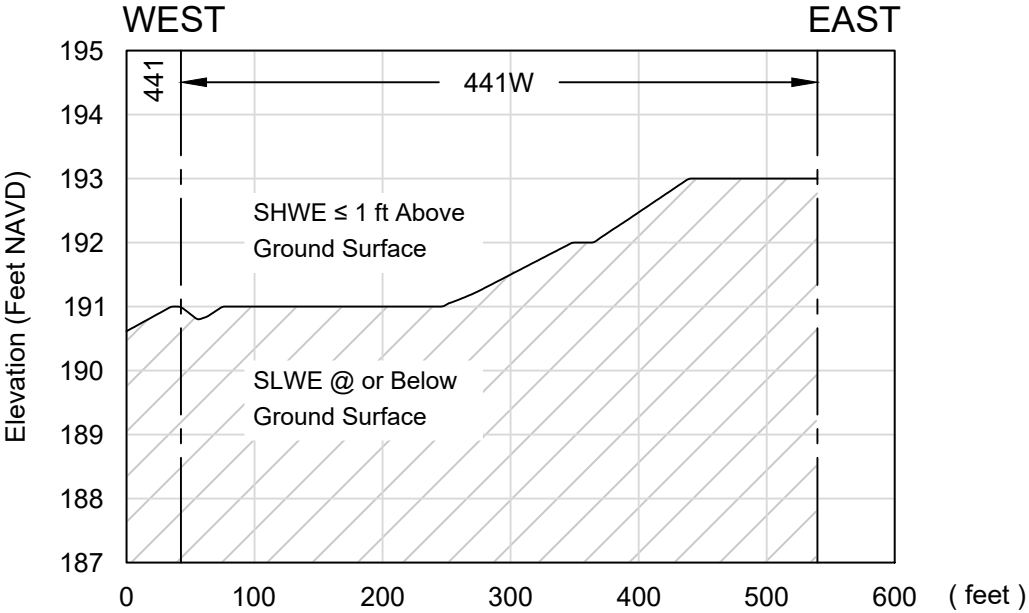
CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_WetlandImpact\_XS.dwg PLOTTED: 11/8/2019 12:36 PM BY: tim desmarais LAYOUT: Wetland Impact 25 & 26



Wetland 25

- LEGEND**
- IMPACT
  - UNDISTURBED
  - EXISTING GROUND
  - LAND USE CODE

- 160 - Extractive
- 173 - Military
- 441 - Coniferous Plantation
- 441W- Coniferous Plantation Wetland
- 510d - Ditch/Canal
- 611 - Bay Swamps
- 630 - Wetland Forested Mixed
- 631 - Wetland Scrub
- 641 - Freshwater Marsh
- 8146- Primitive Roads/Trails



Wetland 26

Source: Topography - Southern Resources Mapping, Inc. 2012.

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-08-2019  
REVISED:

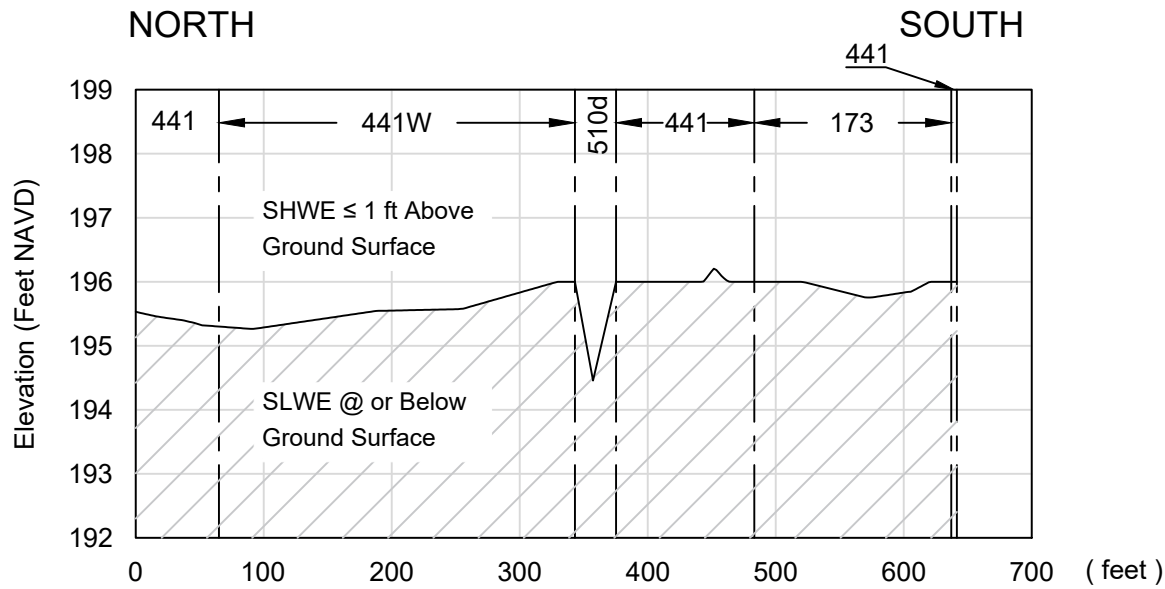
WETLAND IMPACT CROSS-SECTION  
WETLAND 25 & 26

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

11K

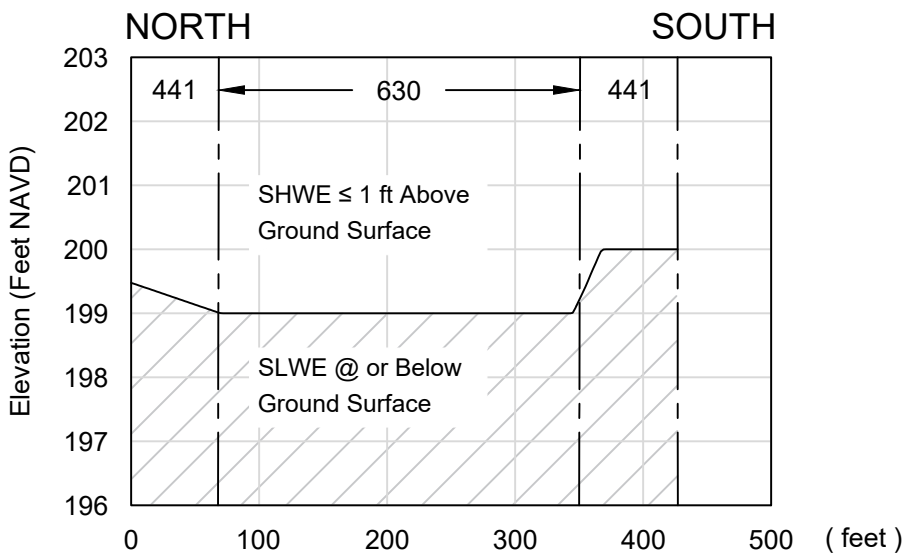
CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491\_003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_WetlandImpact\_XS.dwg PLOTTED: 11/8/2019 12:36 PM BY: tim desmarais LAYOUT: Wetland Impact 27 & 28



Wetland 27

LEGEND

- IMPACT
  - UNDISTURBED
  - EXISTING GROUND
  - LAND USE CODE
- 160 - Extractive  
173 - Military  
441 - Coniferous Plantation  
441W- Coniferous Plantation Wetland  
510d - Ditch/Canal  
611 - Bay Swamps  
630 - Wetland Forested Mixed  
631 - Wetland Scrub  
641 - Freshwater Marsh  
8146- Primitive Roads/Trails



Wetland 28

Source: Topography - Southern Resources Mapping, Inc. 2012.

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-08-2019  
REVISED:

WETLAND IMPACT CROSS-SECTION  
WETLAND 27 & 28

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

11L

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_WetlandImpact\_XS.dwg      PLOTTED: 11/8/2019 12:36 PM BY: tim desmarais

LEGEND

IMPACT

UNDISTURBED

EXISTING GROUND

LAND USE CODE

160 - Extractive

173 - Military

441 - Coniferous Plantation

441W- Coniferous Plantation Wetland

510d - Ditch/Canal

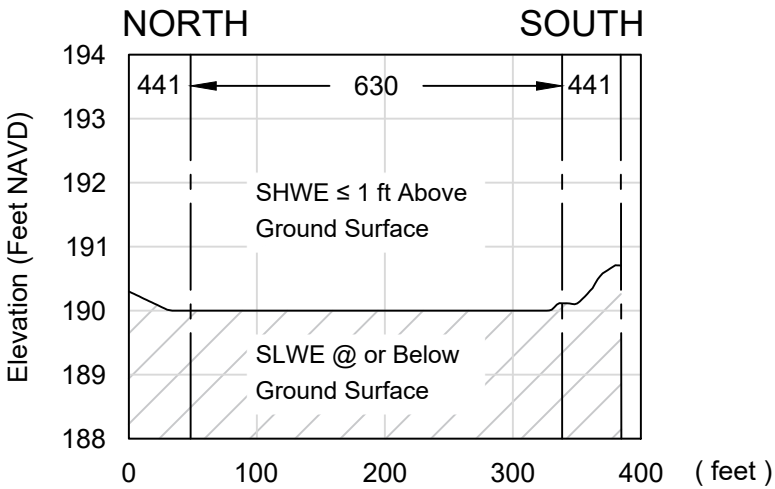
611 - Bay Swamps

630 - Wetland Forested Mixed

631 - Wetland Scrub

641 - Freshwater Marsh

8146- Primitive Roads/Trails



Wetland 32

Source: Topography - Southern Resources Mapping, Inc. 2012.

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A	
DRAWN BY	YQ
CHECKED BY	TRD
DATE:	11-08-2019
REVISED:	

WETLAND IMPACT CROSS-SECTION  
WETLAND 32

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

11M

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_WetlandImpact\_XS.dwg PLOTTED: 11/8/2019 12:36 PM BY: tim desmarais LAYOUT: Wetland Impact 33 & 34

LEGEND

IMPACT

UNDISTURBED

EXISTING GROUND

LAND USE CODE

160 - Extractive

173 - Military

441 - Coniferous Plantation

441W- Coniferous Plantation Wetland

510d - Ditch/Canal

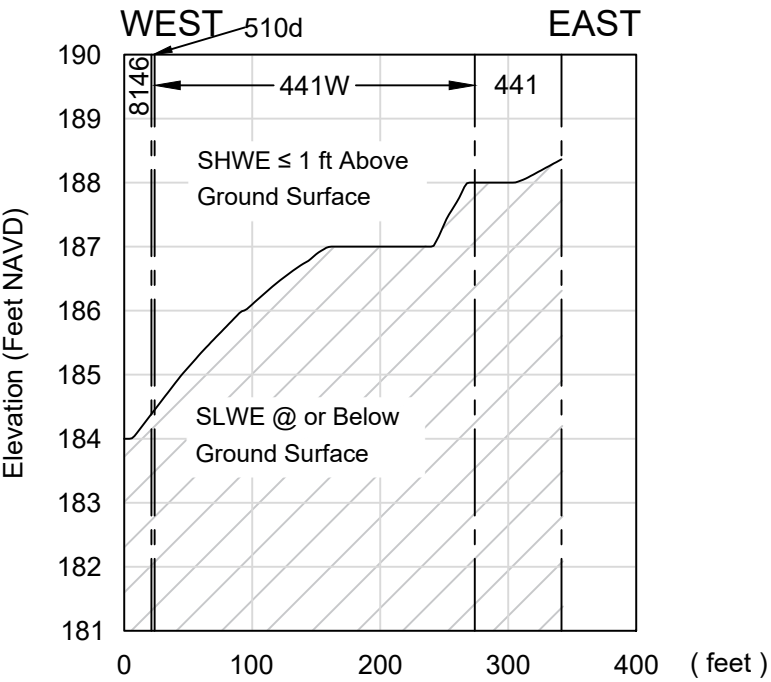
611 - Bay Swamps

630 - Wetland Forested Mixed

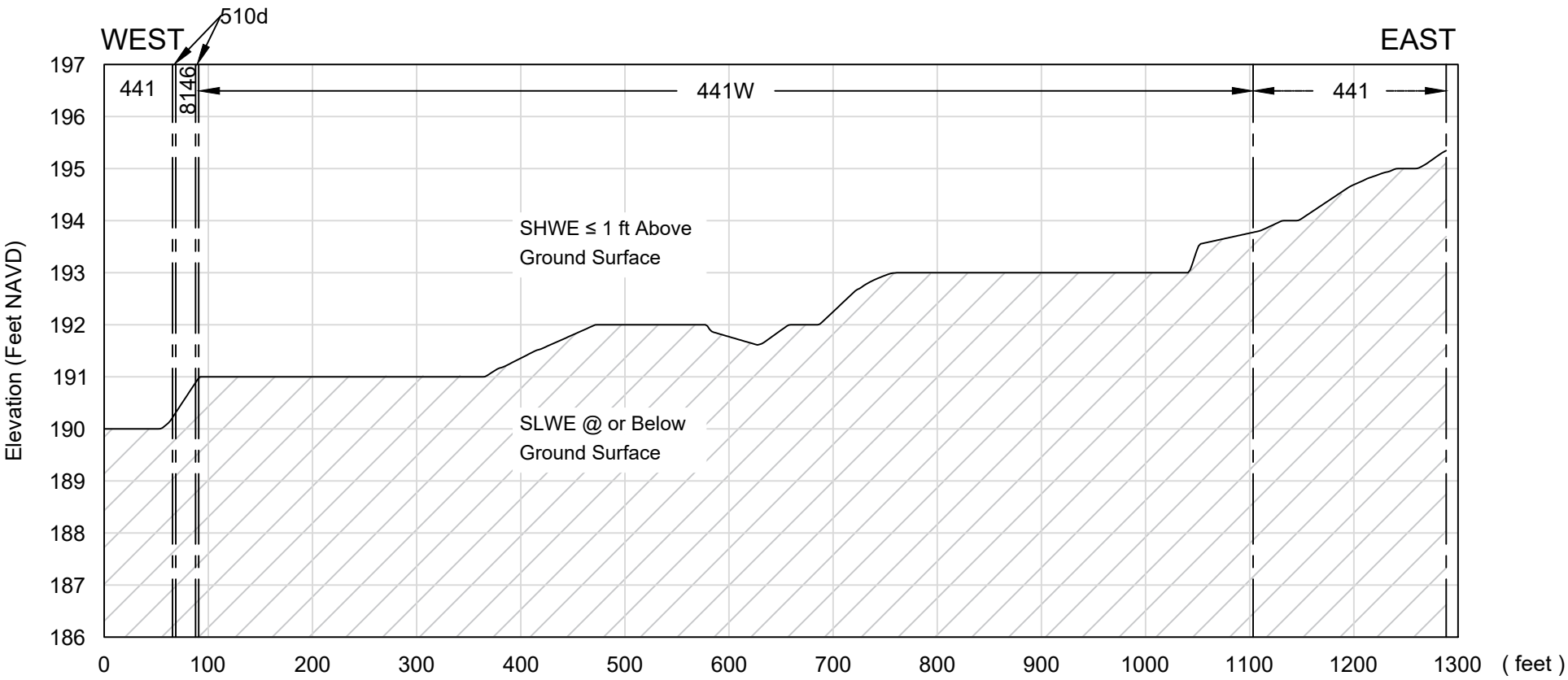
631 - Wetland Scrub

641 - Freshwater Marsh

8146- Primitive Roads/Trails



Wetland 33



Wetland 34-1

Source: Topography - Southern Resources Mapping, Inc. 2012.

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-08-2019  
REVISED:

WETLAND IMPACT CROSS-SECTION  
WETLAND 33 & 34

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

11N

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GISCAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_WetlandImpact\_XS.dwg PLOTTED: 11/8/2019 12:36 PM BY: tim desmarais LAYOUT: Wetland Impact 34

LEGEND

IMPACT

UNDISTURBED

EXISTING GROUND

LAND USE CODE

160 - Extractive

173 - Military

441 - Coniferous Plantation

441W- Coniferous Plantation Wetland

510d - Ditch/Canal

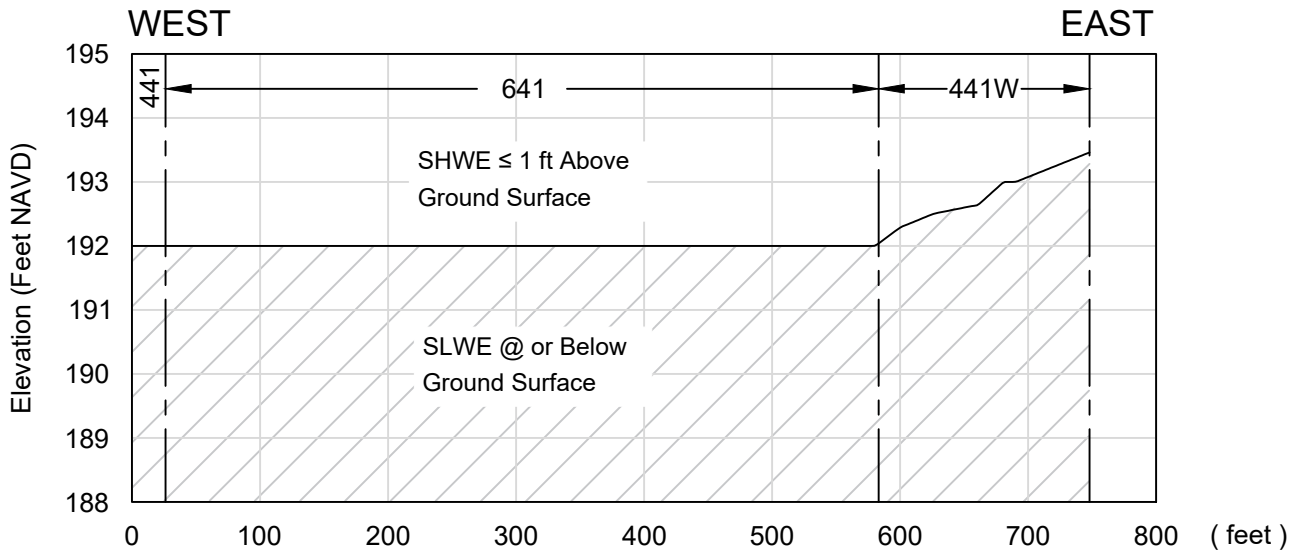
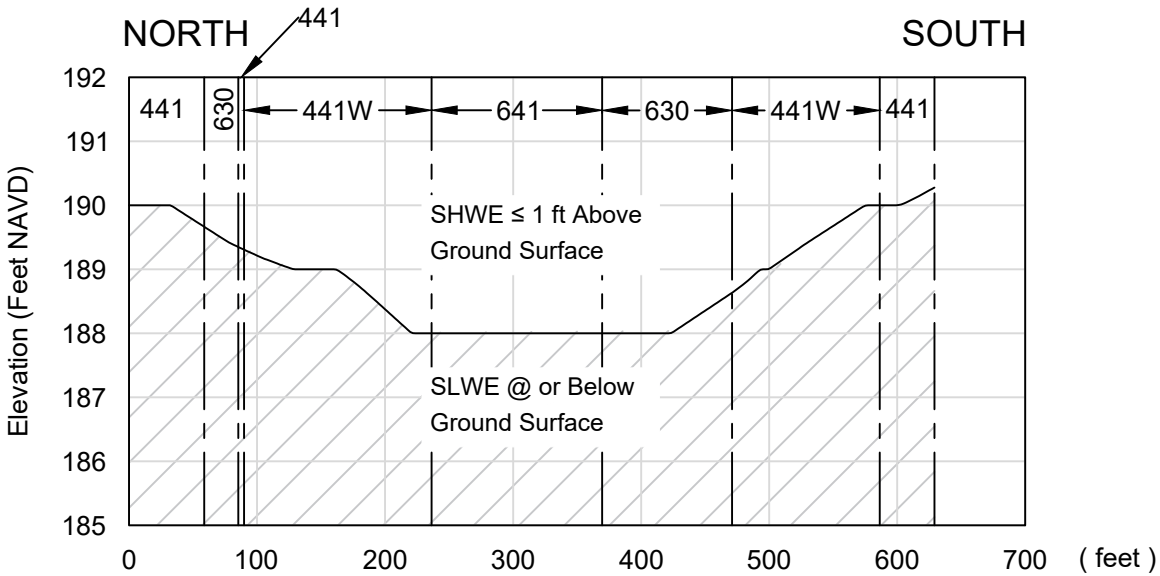
611 - Bay Swamps

630 - Wetland Forested Mixed

631 - Wetland Scrub

641 - Freshwater Marsh

8146- Primitive Roads/Trails



Source: Topography - Southern Resources Mapping, Inc. 2012.

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-08-2019  
REVISED:

WETLAND IMPACT CROSS-SECTION  
WETLAND 34

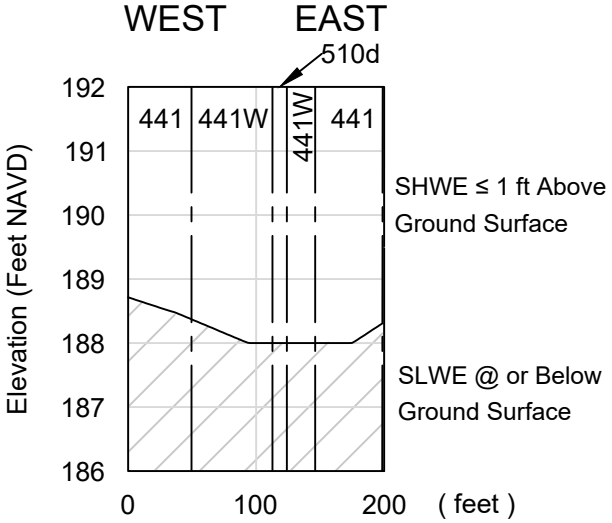
Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

110



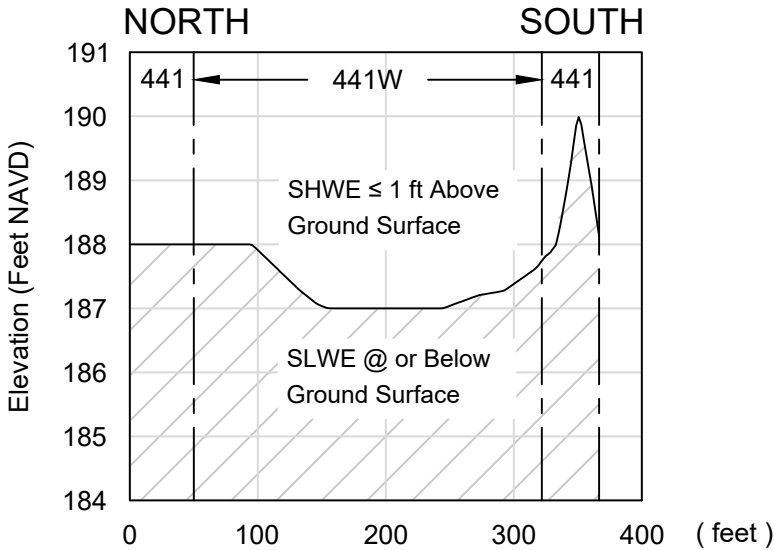
CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_WetlandImpact\_XS.dwg PLOTTED: 11/8/2019 12:36 PM BY: tim desmarais LAYOUT: Wetland Impact 38



Wetland 38 -1

- LEGEND
- IMPACT
  - UNDISTURBED
  - EXISTING GROUND
  - LAND USE CODE

- 160 - Extractive
- 173 - Military
- 441 - Coniferous Plantation
- 441W- Coniferous Plantation Wetland
- 510d - Ditch/Canal
- 611 - Bay Swamps
- 630 - Wetland Forested Mixed
- 631 - Wetland Scrub
- 641 - Freshwater Marsh
- 8146- Primitive Roads/Trails



Wetland 38-2

Source: Topography - Southern Resources Mapping, Inc. 2012.

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-08-2019  
REVISED:

WETLAND IMPACT CROSS-SECTION  
WETLAND 38

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

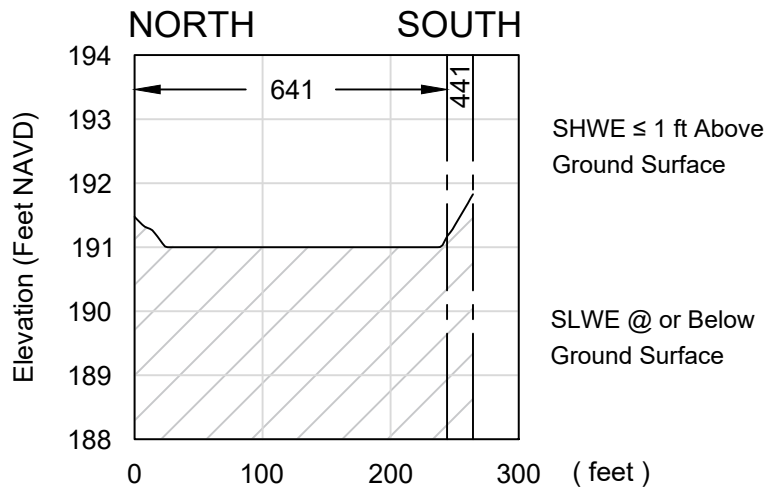
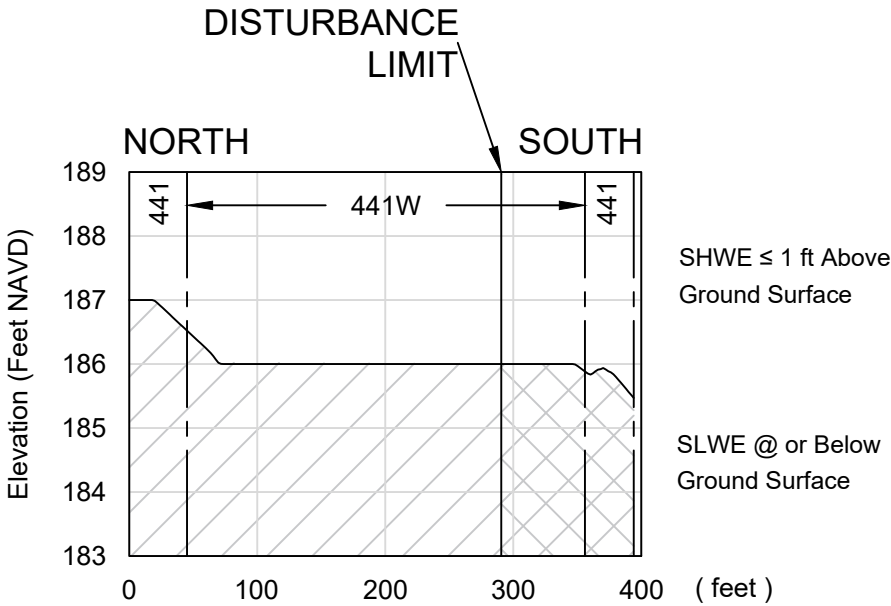
FIGURE

11P

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_WetlandImpact\_XS.dwg PLOTTED: 11/8/2019 12:36 PM BY: tim desmarais LAYOUT: Wetland Impact 38 & 39

LEGEND

- IMPACT
- UNDISTURBED
- EXISTING GROUND
- LAND USE CODE
- 160 - Extractive
- 173 - Military
- 441 - Coniferous Plantation
- 441W- Coniferous Plantation Wetland
- 510d - Ditch/Canal
- 611 - Bay Swamps
- 630 - Wetland Forested Mixed
- 631 - Wetland Scrub
- 641 - Freshwater Marsh
- 8146- Primitive Roads/Trails



Source: Topography - Southern Resources Mapping, Inc. 2012.

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressd or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-08-2019  
REVISED:

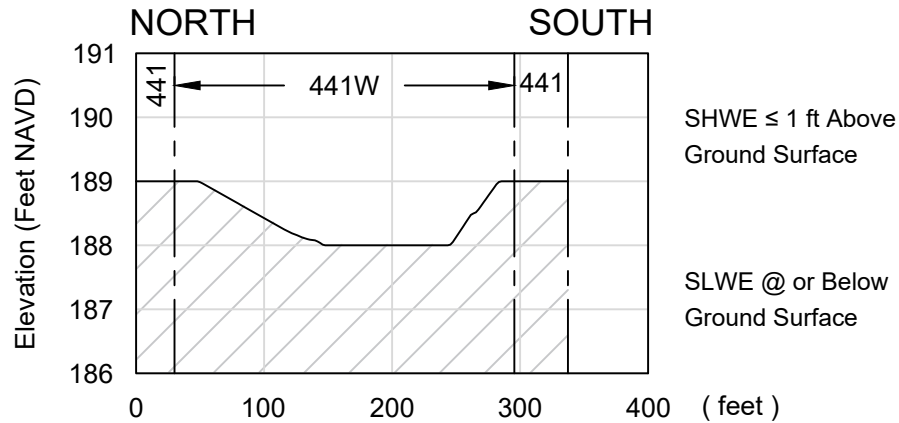
WETLAND IMPACT CROSS-SECTION  
WETLAND 38 & 39

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

11Q

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491\003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_WetlandImpact\_XS.dwg PLOTTED: 11/8/2019 12:36 PM BY: tim desmarais LAYOUT: Wetland Impact 41 & 42



Wetland 41

- LEGEND
- IMPACT
  - UNDISTURBED
  - EXISTING GROUND
  - LAND USE CODE

- 160 - Extractive
- 173 - Military
- 441 - Coniferous Plantation
- 441W- Coniferous Plantation Wetland
- 510d - Ditch/Canal
- 611 - Bay Swamps
- 630 - Wetland Forested Mixed
- 631 - Wetland Scrub
- 641 - Freshwater Marsh
- 8146- Primitive Roads/Trails

Source: Topography - Southern Resources Mapping, Inc. 2012.

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressd or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'

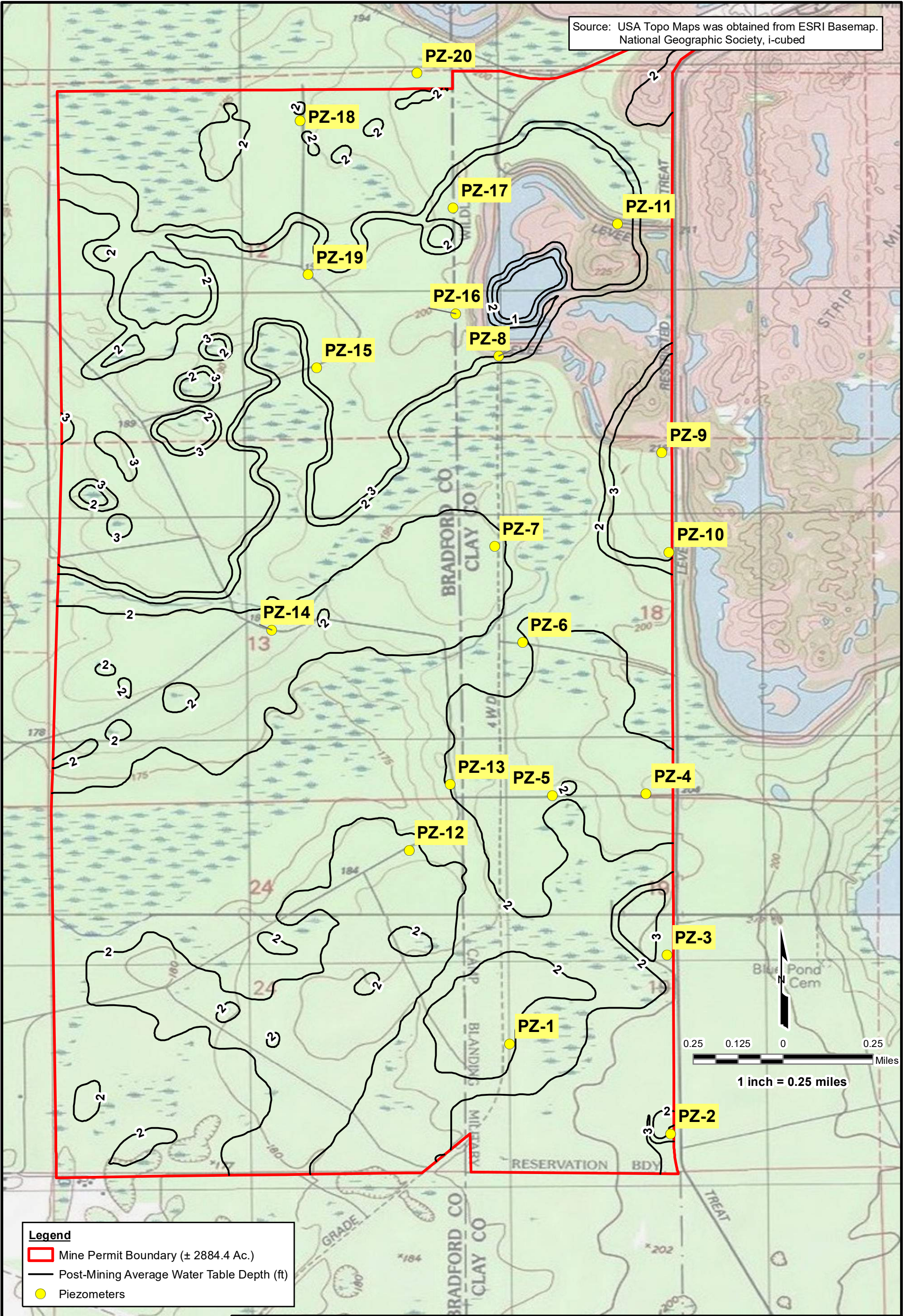


PROJECT NO. 00129491.003A	
DRAWN BY	YQ
CHECKED BY	TRD
DATE:	11-08-2019
REVISED:	

WETLAND IMPACT CROSS-SECTION WETLAND 41	
Trail Ridge South The Chemours Company FC LLC Bradford and Clay Counties, FL	

FIGURE
11R
PAGE: 18 of 18





The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

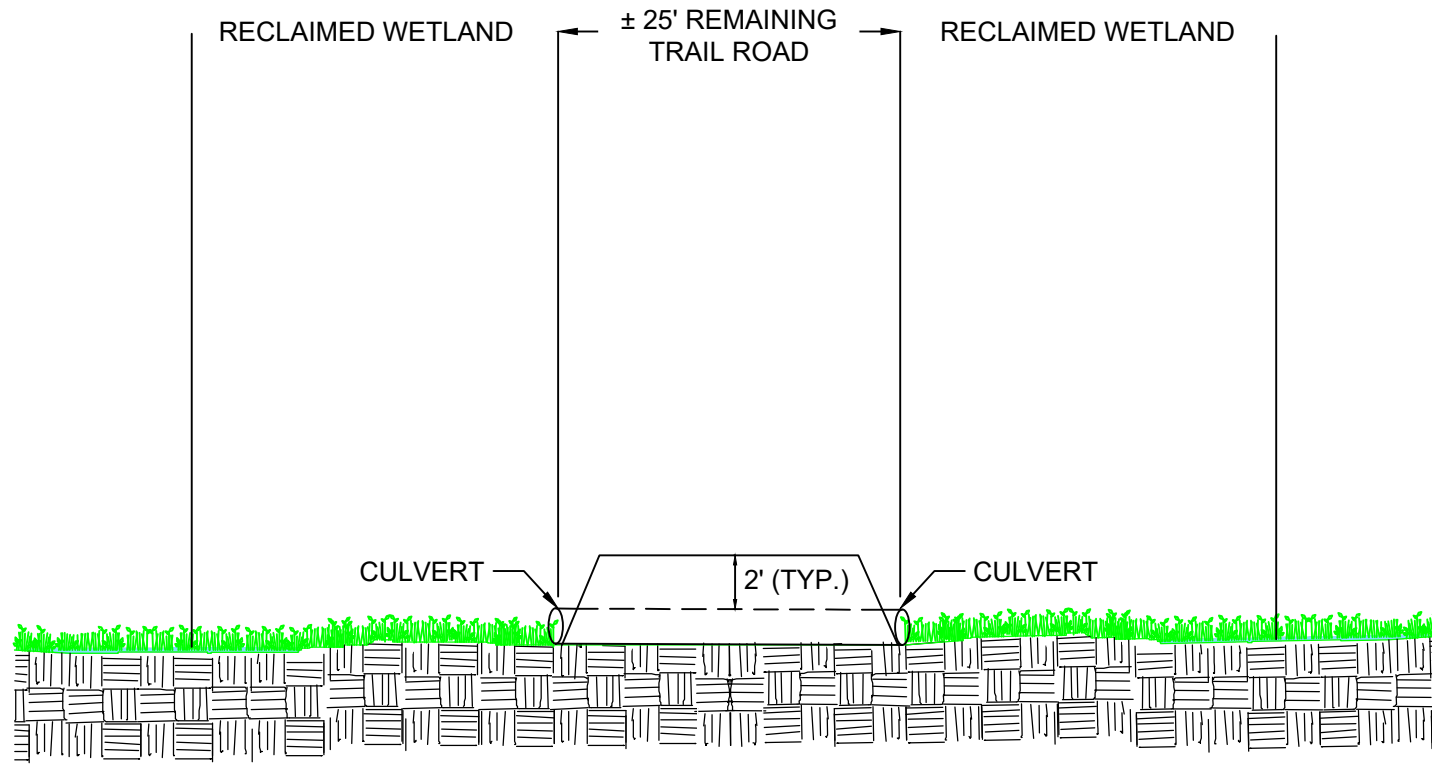


**KLEINFELDER**  
Bright People. Right Solutions.  
www.kleinfelder.com

PROJECT NO.	129491.003
DRAWN:	11/8/2019
DRAWN BY:	TRD
CHECKED BY:	DJH
FILE NAME:	See File Path

<b>Post-Mining Average Depth to Water</b>	<b>FIGURE 12</b>
Trail Ridge South The Chemours Company FC, LLC. Bradford and Clay Counties, FL	





**CROSS SECTION G-H - CULVERTED ROAD WETLAND CROSSING**  
NOT TO SCALE

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.



PROJECT NO.	129491.003
DRAWN BY:	YQ
CHECKED BY:	TRD
DATE	11-08-2019
FILENAME:	See file path

CROSS SECTION G - H

TRAIL RIDGE SOUTH  
THE CHEMOURS COMPANY FC, LLC.  
BRADFORD AND CLAY COUNTIES, FL

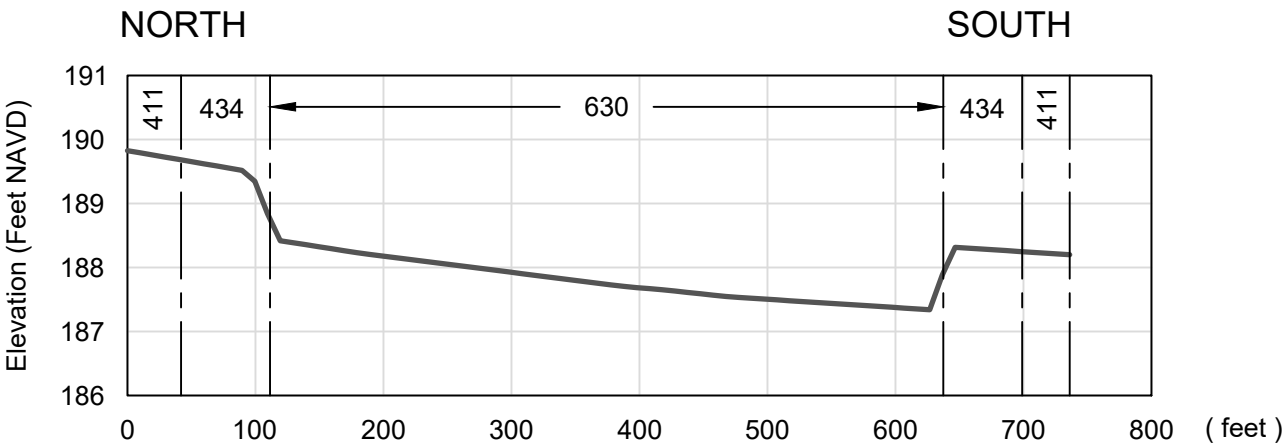
FIGURE

16

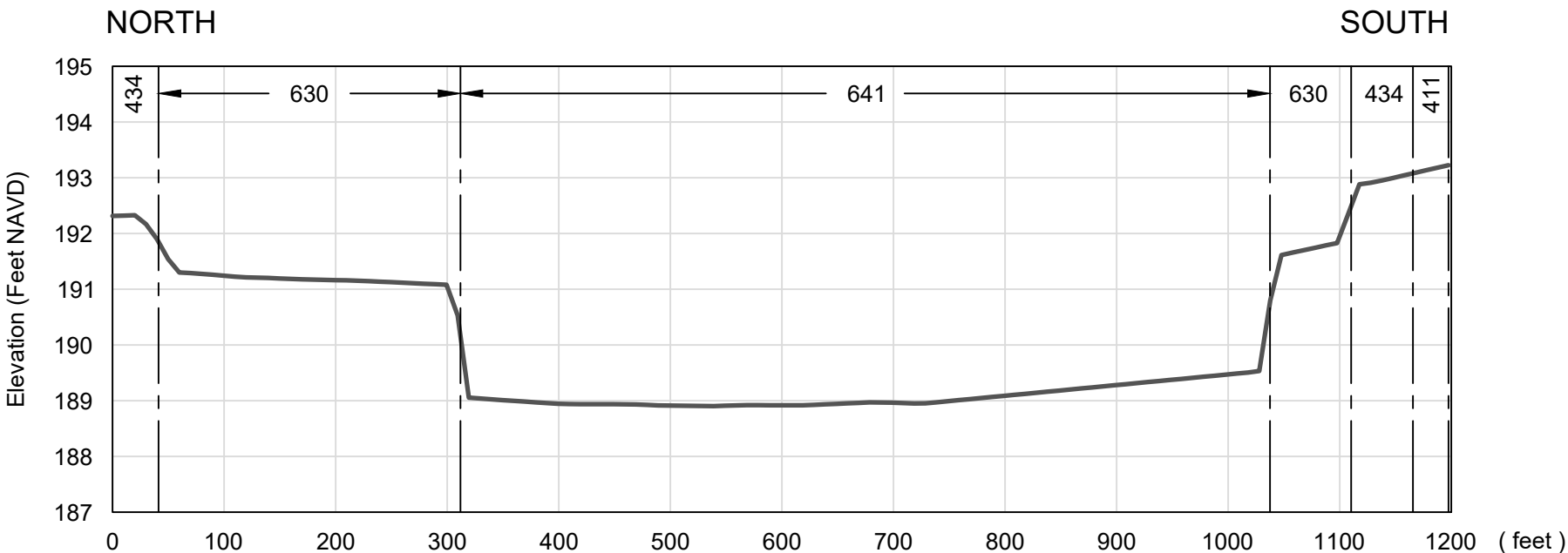


CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_Post\_LU\_CrossSections.dwg PLOTTED: 11/12/2019 10:29 AM BY: tim desmarais LAYOUT: Wetland Mitigation1A & 1B

Note:  
611, 630 : SHWE ≤ 1' Above Ground Surface  
621, 613 : SHWE ≤ 18" Above Ground Surface  
641 : SHWE ≤ 2' Above Ground Surface  
  
SLWE @ Or Below Ground Surface



Cross-Section 1A



Cross-Section 1B

LEGEND

- POST-RECLAMATION GROUND ELEVATION
- LAND USE BOUNDARY

- 411 - Pine Flatwoods
- 434 - Hardwood-Coniferous Mixed
- 611 - Bay Swamps
- 613 - Gum Swamp
- 621 - Cypress
- 641 - Freshwater Marsh

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



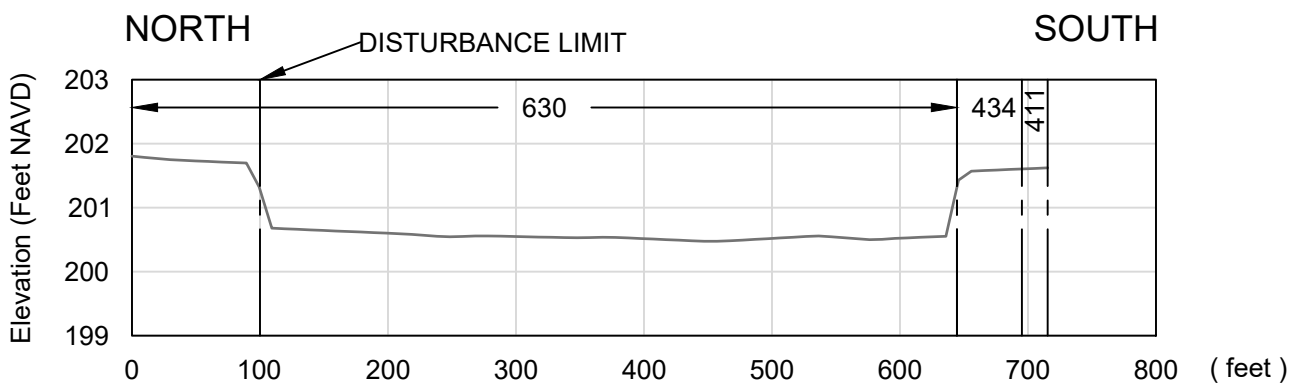
PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-12-2019  
REVISED:

WETLAND MITIGATION  
CROSS-SECTION 1A & 1B  
  
Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

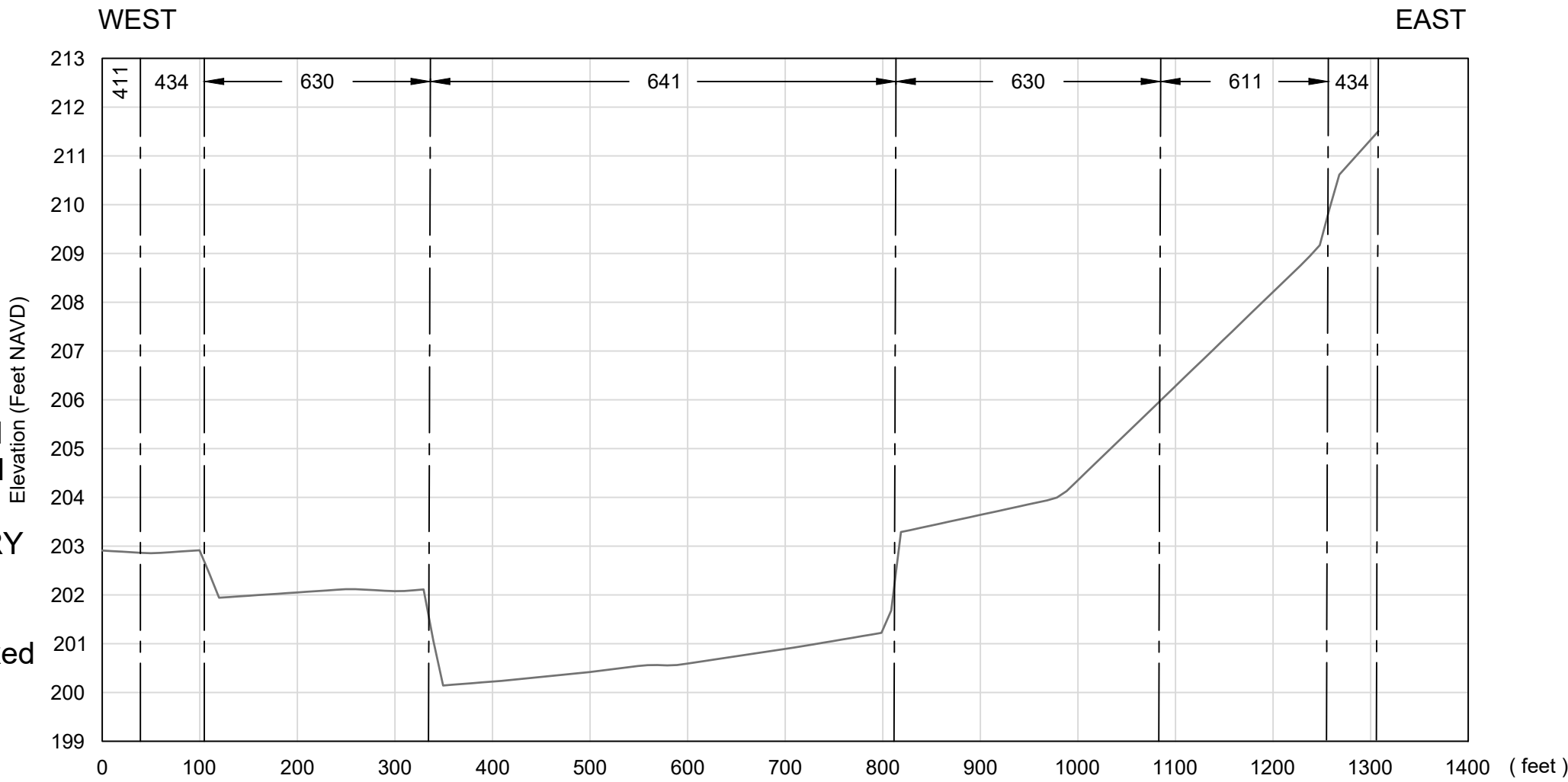
FIGURE  
  
16A  
  
PAGE: 1 of 16

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_Post\_LU\_CrossSections.dwg PLOTTED: 11/12/2019 10:29 AM BY: tim desmarais LAYOUT: Wetland Mitigation1C & 1D

Note:  
611, 630 : SHWE ≤ 1' Above Ground Surface  
621, 613 : SHWE ≤ 18" Above Ground Surface  
641 : SHWE ≤ 2' Above Ground Surface  
  
SLWE @ Or Below Ground Surface



Cross-Section 1C



Cross-Section 1D

LEGEND

POST-RECLAMATION  
GROUND ELEVATION

LAND USE BOUNDARY

411 - Pine Flatwoods  
434 - Hardwood-Coniferous Mixed  
611 - Bay Swamps  
613 - Gum Swamp  
621 - Cypress  
641 - Freshwater Marsh

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-12-2019  
REVISED:

WETLAND MITIGATION  
CROSS-SECTION 1C & 1D

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

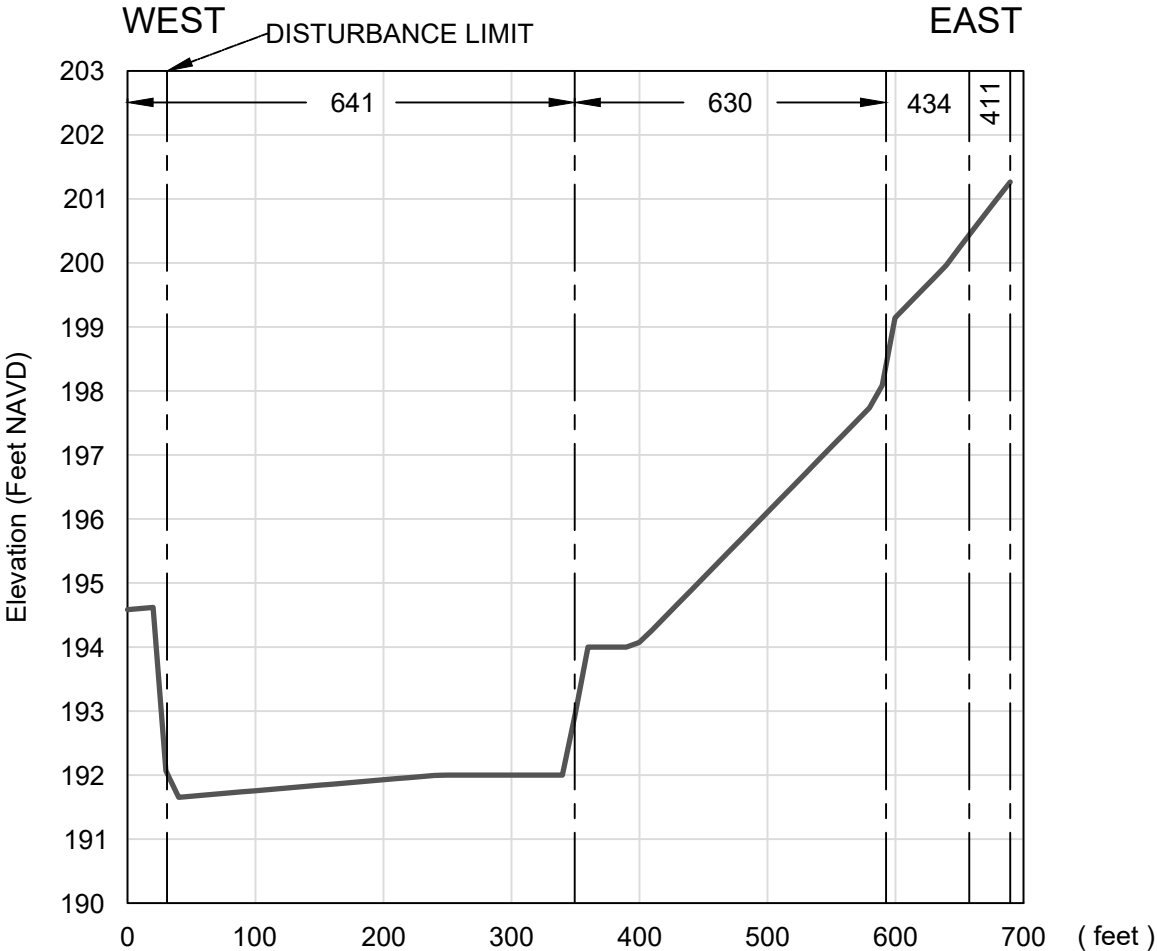
16B

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.



CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_Post\_LU\_CrossSections.dwg PLOTTED: 11/12/2019 10:29 AM BY: tim desmarais LAYOUT: Wetland Mitigation 1E & 1F

Note:  
611, 630 : SHWE ≤ 1' Above Ground Surface  
621, 613 : SHWE ≤ 18" Above Ground Surface  
641 : SHWE ≤ 2' Above Ground Surface  
  
SLWE @ Or Below Ground Surface



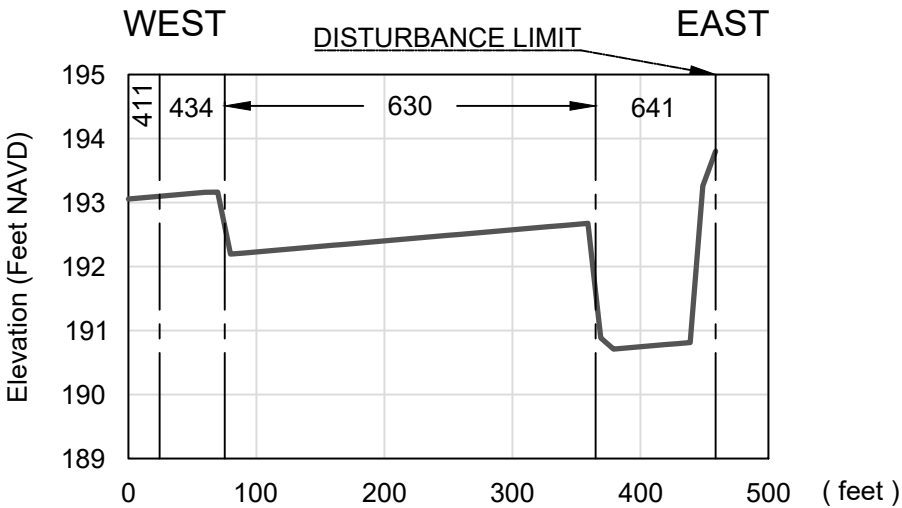
Cross-Section 1E

LEGEND

—— POST-RECLAMATION  
GROUND ELEVATION

----- LAND USE BOUNDARY

411 - Pine Flatwoods  
434 - Hardwood-Coniferous Mixed  
611 - Bay Swamps  
613 - Gum Swamp  
621 - Cypress  
641 - Freshwater Marsh



Cross-Section 1F

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-12-2019  
REVISED:

WETLAND MITIGATION  
CROSS-SECTION 1E &1F

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

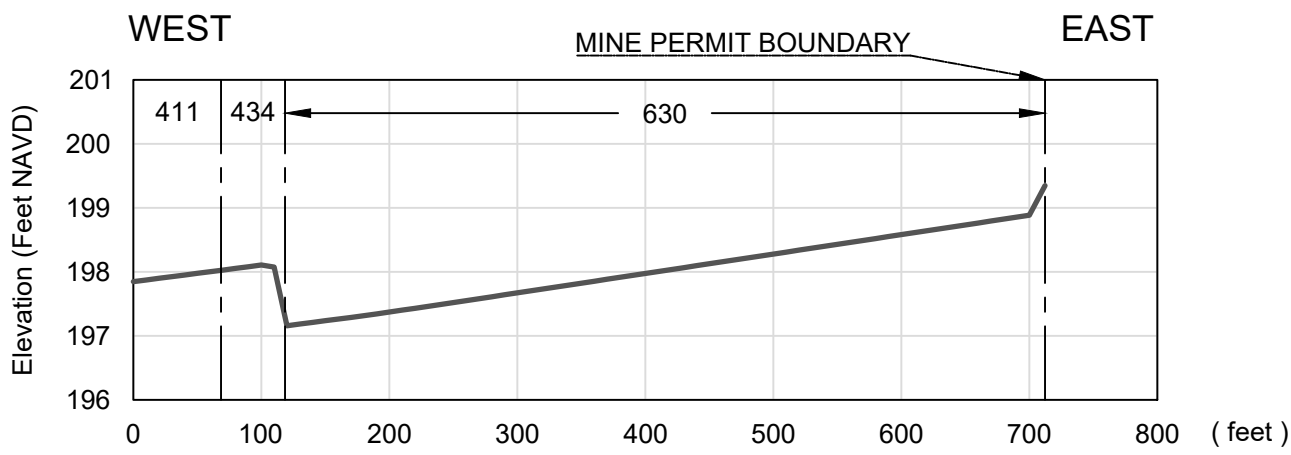
FIGURE

16C

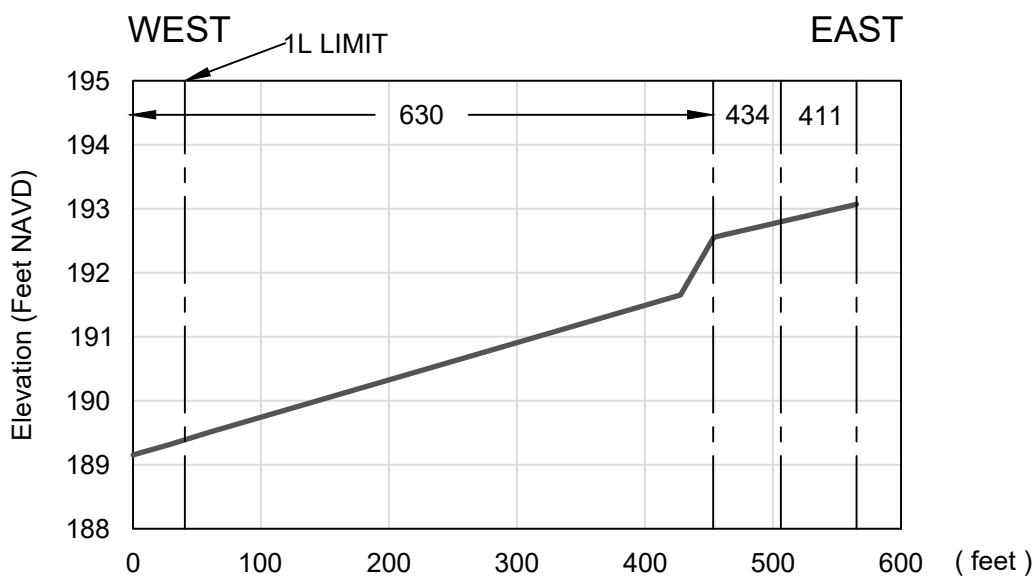
The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_Post\_LU\_CrossSections.dwg PLOTTED: 11/12/2019 10:29 AM BY: tim desmarais LAYOUT: Wetland Mitigation1G & 1H

Note:  
611, 630 : SHWE ≤ 1' Above Ground Surface  
621, 613 : SHWE ≤ 18" Above Ground Surface  
641 : SHWE ≤ 2' Above Ground Surface  
  
SLWE @ Or Below Ground Surface



Cross-Section 1G



Cross-Section 1H

- LEGEND
- POST-RECLAMATION GROUND ELEVATION
  - LAND USE BOUNDARY

- 411 - Pine Flatwoods
- 434 - Hardwood-Coniferous Mixed
- 611 - Bay Swamps
- 613 - Gum Swamp
- 621 - Cypress
- 641 - Freshwater Marsh

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-12-2019  
REVISED:

WETLAND MITIGATION  
CROSS-SECTION 1G & 1H  
  
Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

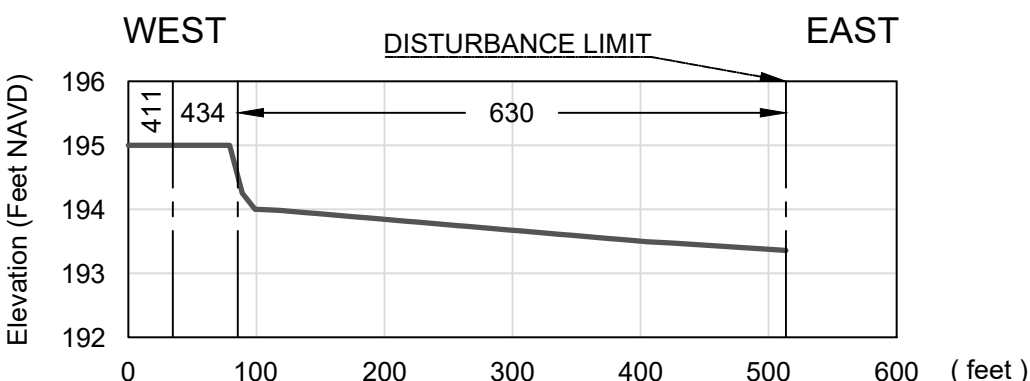
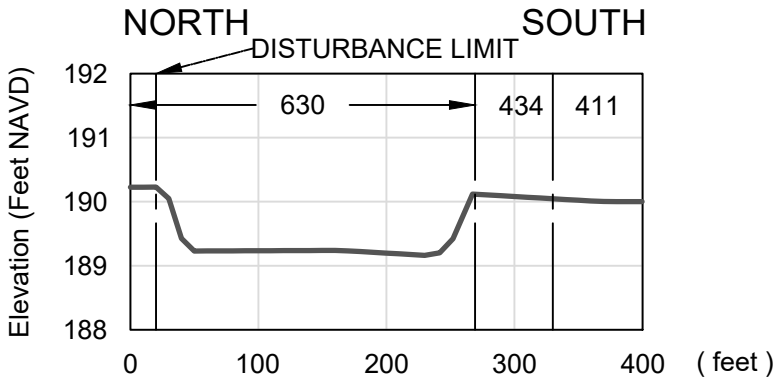
FIGURE  
  
16D  
  
PAGE: 4 of 16

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.



CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\_2019\00129491\_003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_Post\_LU\_CrossSections.dwg PLOTTED: 11/12/2019 10:29 AM BY: tim desmarais LAYOUT: Wetland Mitigation11 & 1J

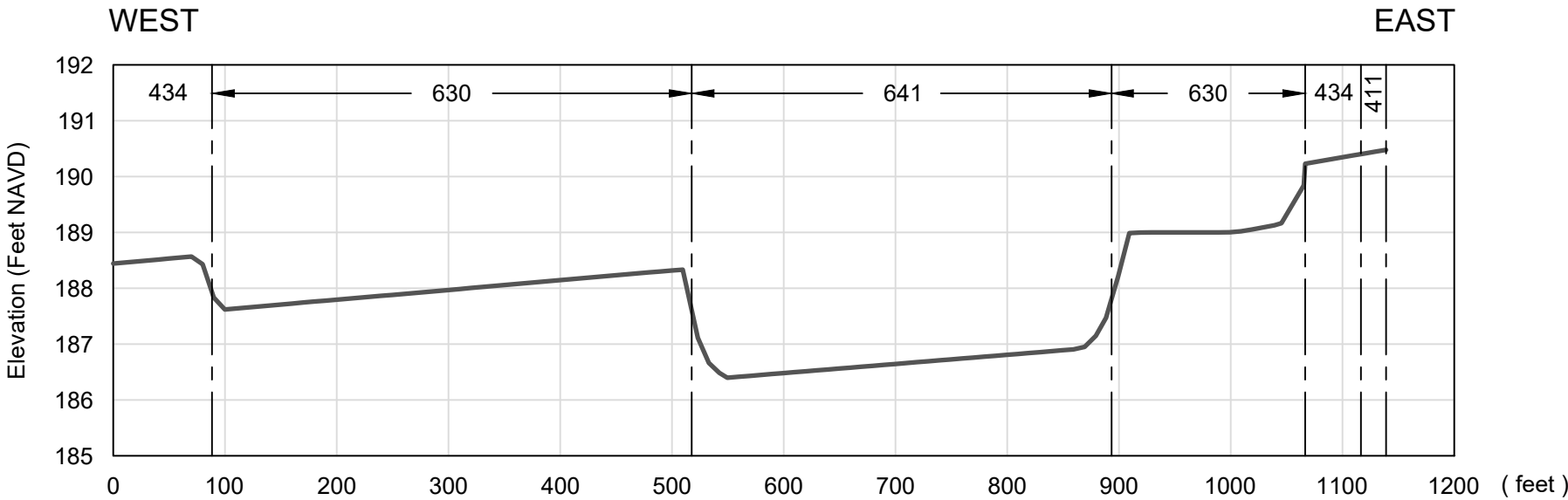
Note:  
611, 630 : SHWE ≤ 1' Above Ground Surface  
621, 613 : SHWE ≤ 18" Above Ground Surface  
641 : SHWE ≤ 2' Above Ground Surface  
  
SLWE @ Or Below Ground Surface



LEGEND

- POST-RECLAMATION GROUND ELEVATION
- LAND USE BOUNDARY

- 411 - Pine Flatwoods
- 434 - Hardwood-Coniferous Mixed
- 611 - Bay Swamps
- 613 - Gum Swamp
- 621 - Cypress
- 641 - Freshwater Marsh



SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-12-2019  
REVISED:

WETLAND MITIGATION  
CROSS-SECTION 1I, 1J, 1K  
  
Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE  
  
16E  
  
PAGE: 5 of 16

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491\003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_Post\_LU\_CrossSections.dwg PLOTTED: 11/12/2019 10:29 AM BY: tim desmarais LAYOUT: Wetland Mitigation1K & 1L

Note:  
611, 630 : SHWE ≤ 1' Above Ground Surface  
621, 613 : SHWE ≤ 18" Above Ground Surface  
641 : SHWE ≤ 2' Above Ground Surface  
  
SLWE @ Or Below Ground Surface

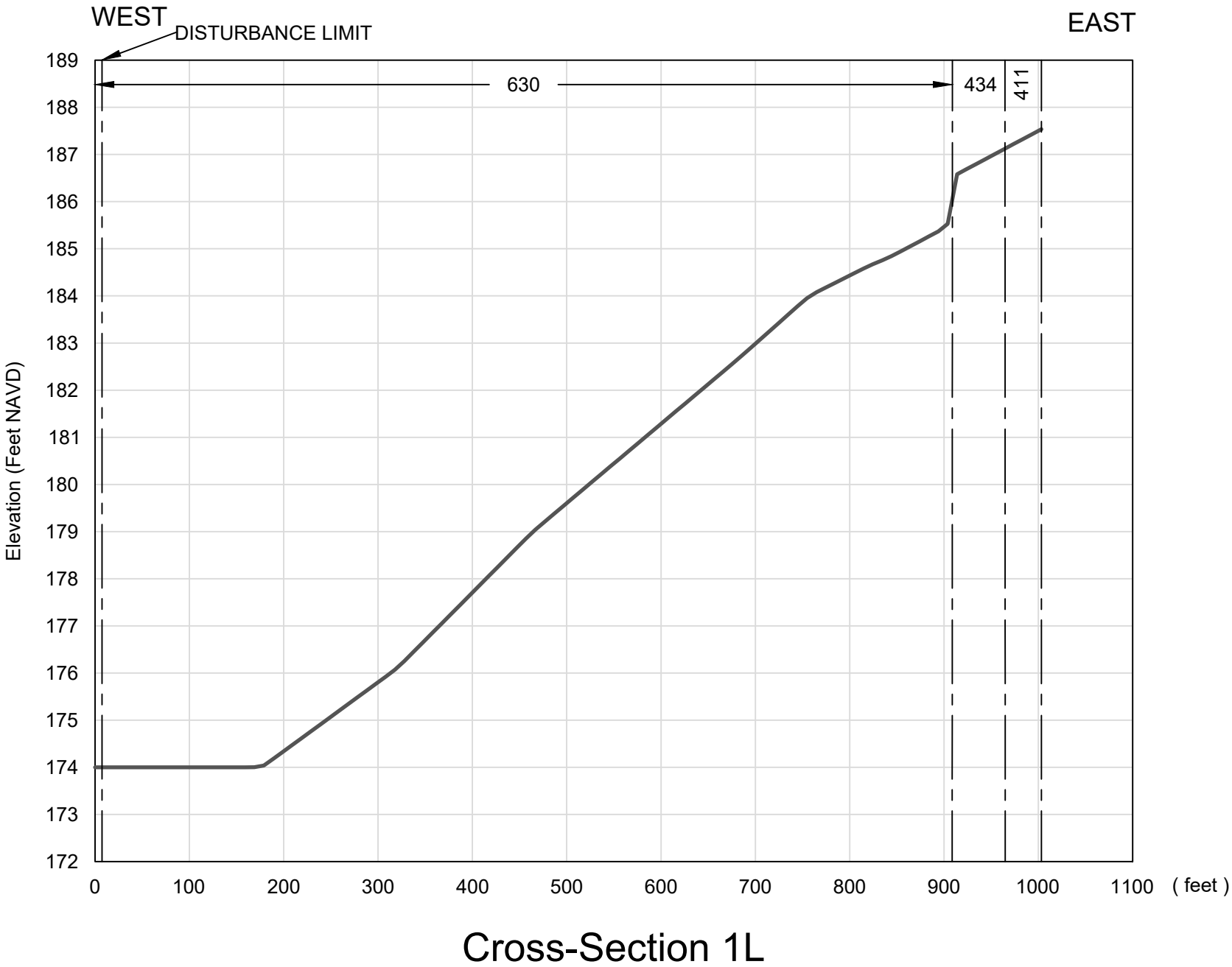
LEGEND

———— POST-RECLAMATION  
GROUND ELEVATION

----- LAND USE BOUNDARY

411 - Pine Flatwoods  
434 - Hardwood-Coniferous Mixed  
611 - Bay Swamps  
613 - Gum Swamp  
621 - Cypress  
641 - Freshwater Marsh

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.



SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-12-2019  
REVISED:

WETLAND MITIGATION  
CROSS-SECTION 1L

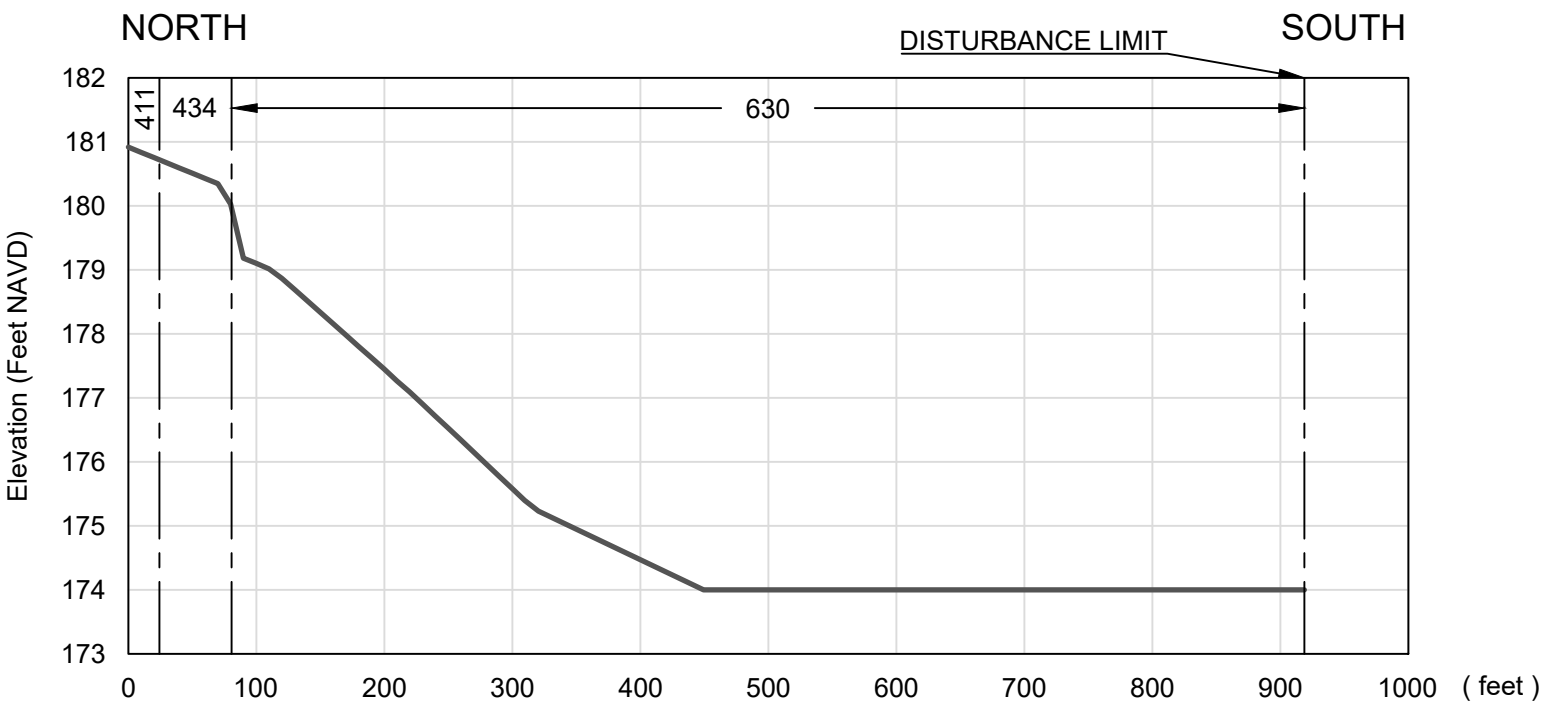
Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE  
  
16F  
  
PAGE: 6 of 16

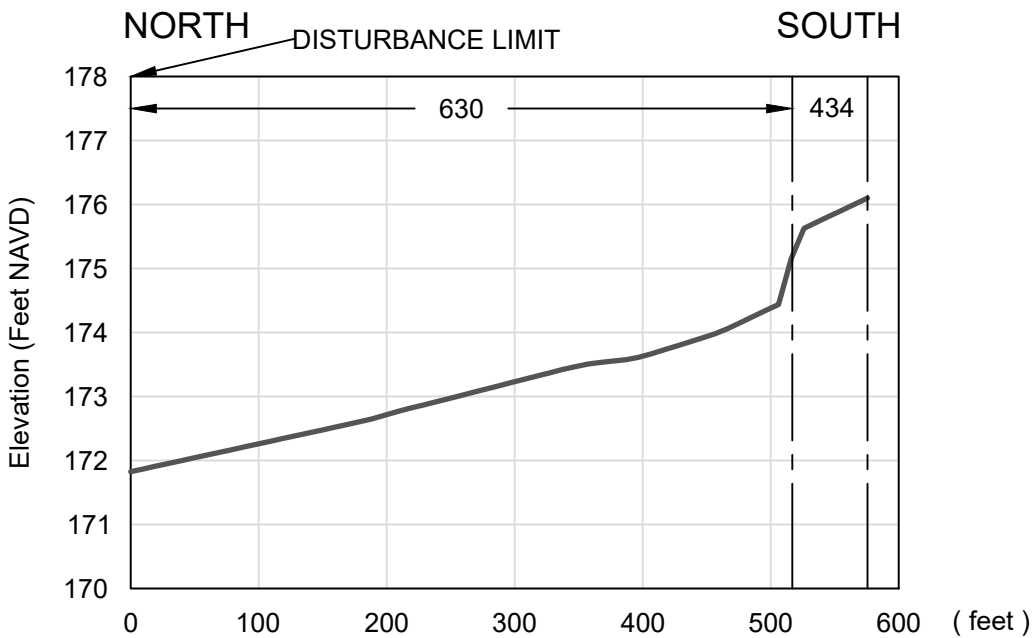


CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_Post\_LU\_CrossSections.dwg PLOTTED: 11/12/2019 10:29 AM BY: tim desmarais LAYOUT: Wetland Mitigation1M & 1N

Note:  
611, 630 : SHWE ≤ 1' Above Ground Surface  
621, 613 : SHWE ≤ 18" Above Ground Surface  
641 : SHWE ≤ 2' Above Ground Surface  
  
SLWE @ Or Below Ground Surface



Cross-Section 1M



Cross-Section 1N

LEGEND

- POST-RECLAMATION GROUND ELEVATION
- LAND USE BOUNDARY

- 411 - Pine Flatwoods
- 434 - Hardwood-Coniferous Mixed
- 611 - Bay Swamps
- 613 - Gum Swamp
- 621 - Cypress
- 641 - Freshwater Marsh

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-12-2019  
REVISED:

WETLAND MITIGATION  
CROSS-SECTION 1M & 1N

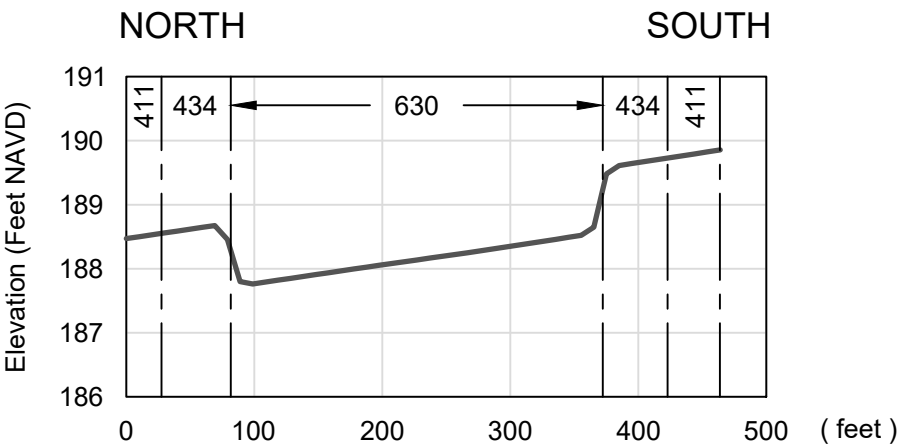
Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

16G

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_Post\_LU\_CrossSections.dwg PLOTTED: 11/12/2019 10:29 AM BY: tim desmarais LAYOUT: Wetland Mitigation10 & 1P

Note:  
611, 630 : SHWE ≤ 1' Above Ground Surface  
621, 613 : SHWE ≤ 18" Above Ground Surface  
641 : SHWE ≤ 2' Above Ground Surface  
  
SLWE @ Or Below Ground Surface

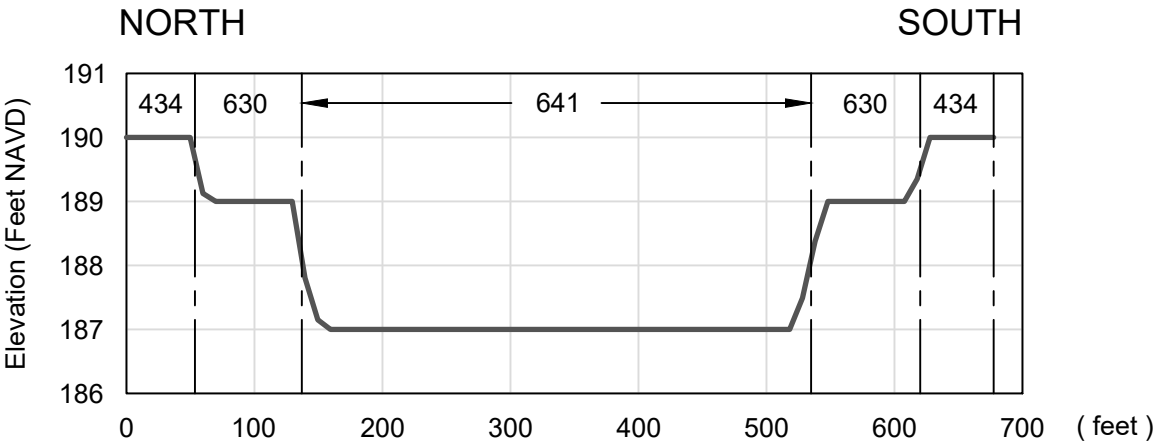


LEGEND

—— POST-RECLAMATION  
GROUND ELEVATION

----- LAND USE BOUNDARY

411 - Pine Flatwoods  
434 - Hardwood-Coniferous Mixed  
611 - Bay Swamps  
613 - Gum Swamp  
621 - Cypress  
641 - Freshwater Marsh



SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-12-2019  
REVISED:

WETLAND MITIGATION  
CROSS-SECTION 10 & 1P

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

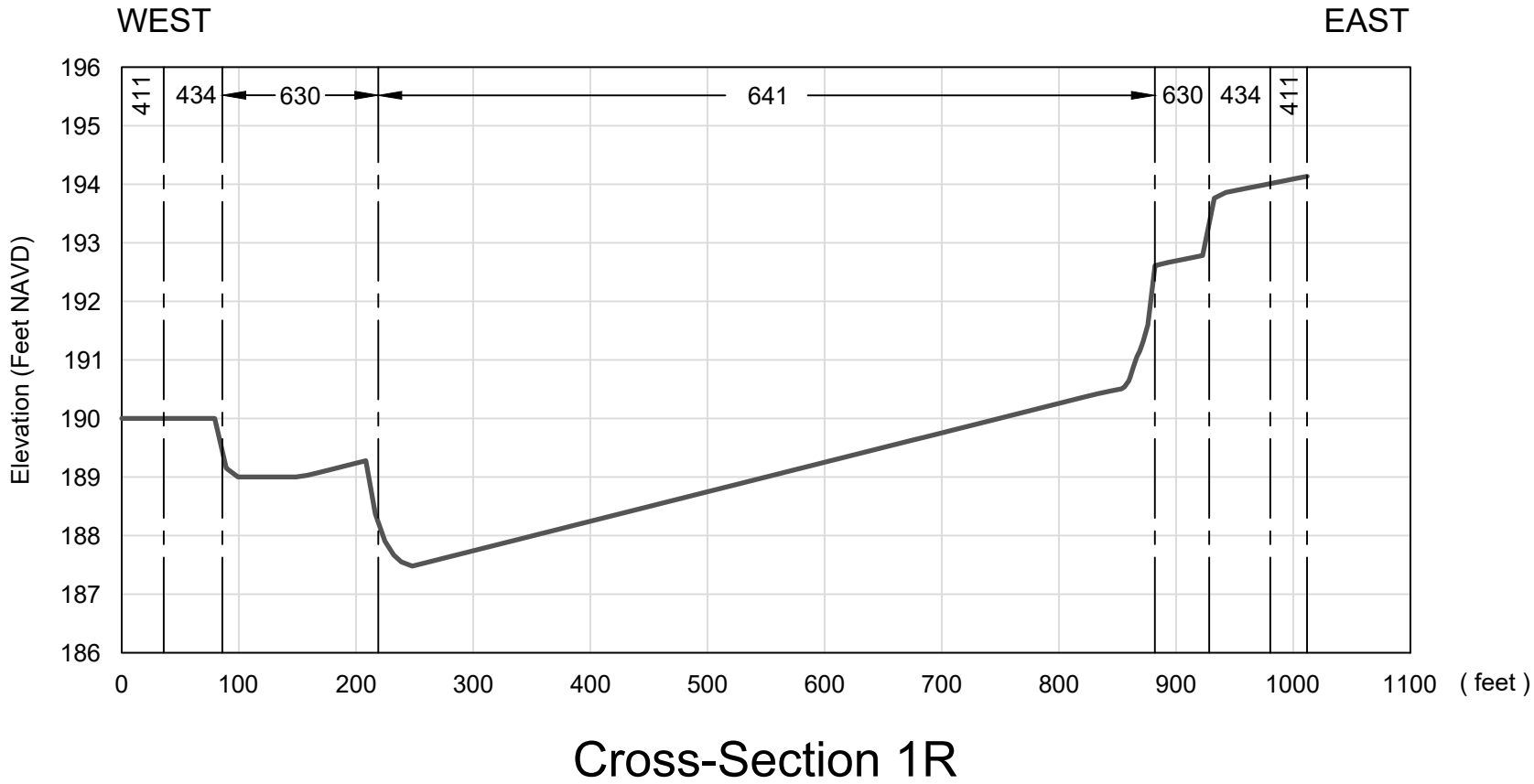
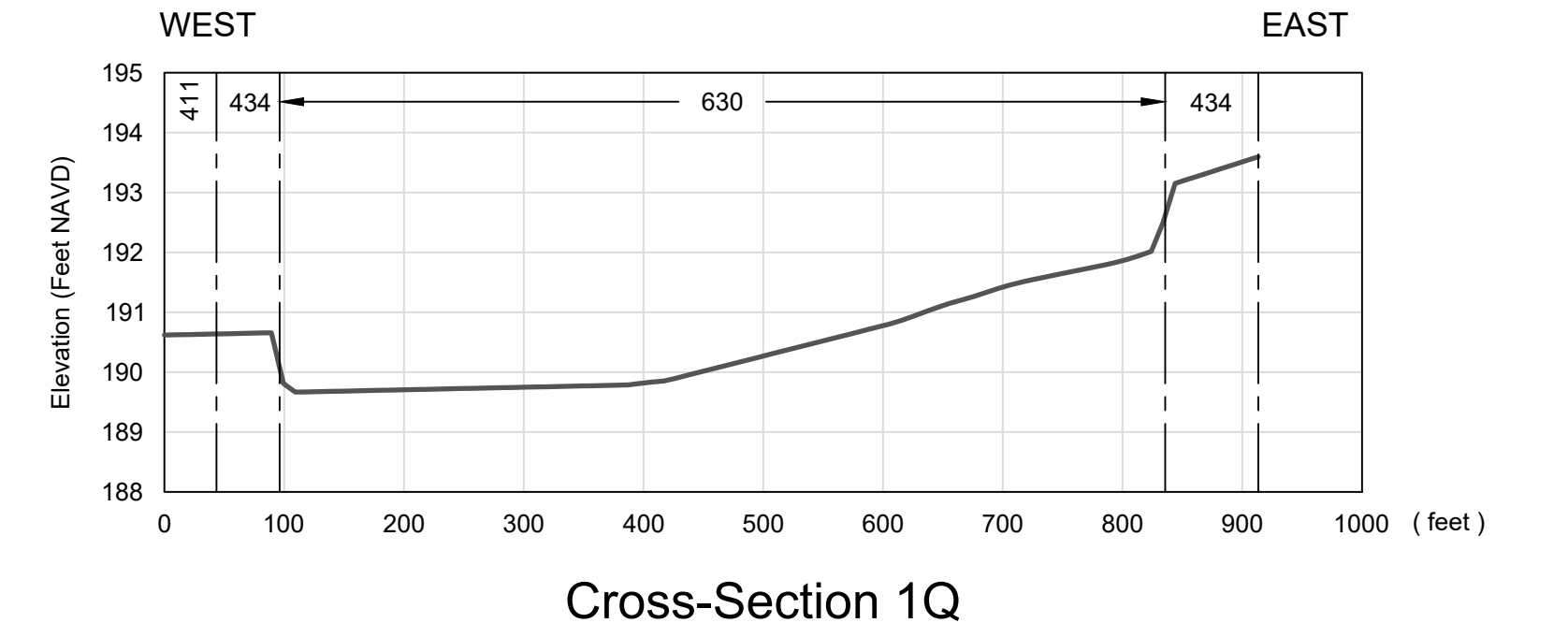
16H

PAGE: 8 of 16

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_Post\_LU\_CrossSections.dwg PLOTTED: 11/12/2019 10:29 AM BY: tim desmarais LAYOUT: Wetland Mitigation1Q & 1R

Note:  
611, 630 : SHWE ≤ 1' Above Ground Surface  
621, 613 : SHWE ≤ 18" Above Ground Surface  
641 : SHWE ≤ 2' Above Ground Surface  
  
SLWE @ Or Below Ground Surface



LEGEND

—— POST-RECLAMATION  
GROUND ELEVATION

----- LAND USE BOUNDARY

411 - Pine Flatwoods  
434 - Hardwood-Coniferous Mixed  
611 - Bay Swamps  
613 - Gum Swamp  
621 - Cypress  
641 - Freshwater Marsh

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-12-2019  
REVISED:

WETLAND MITIGATION  
CROSS-SECTION 1Q & 1R

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

16I

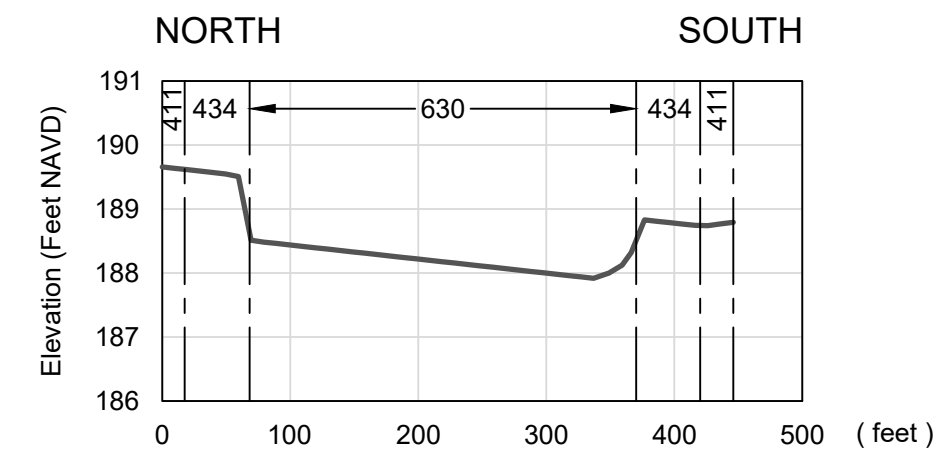
PAGE: 9 of 16

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

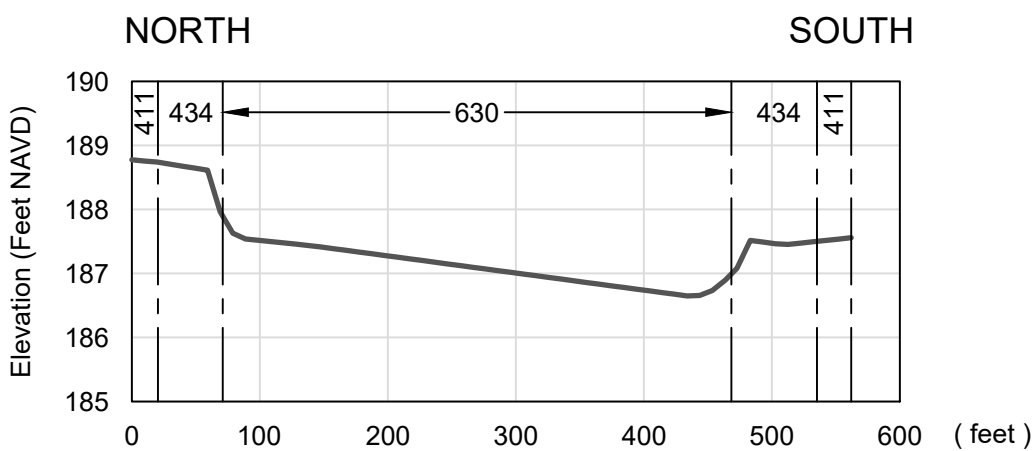


CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_Post\_LU\_CrossSections.dwg PLOTTED: 11/12/2019 10:29 AM BY: tim desmarais LAYOUT: Wetland Mitigation 1S & 1T

Note:  
611, 630 : SHWE ≤ 1' Above Ground Surface  
621, 613 : SHWE ≤ 18" Above Ground Surface  
641 : SHWE ≤ 2' Above Ground Surface  
  
SLWE @ Or Below Ground Surface



Cross-Section 1S



Cross-Section 1T

- LEGEND
- POST-RECLAMATION GROUND ELEVATION
  - LAND USE BOUNDARY

- 411 - Pine Flatwoods
- 434 - Hardwood-Coniferous Mixed
- 611 - Bay Swamps
- 613 - Gum Swamp
- 621 - Cypress
- 641 - Freshwater Marsh

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-12-2019  
REVISED:

WETLAND MITIGATION  
CROSS-SECTION 1S & 1T

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

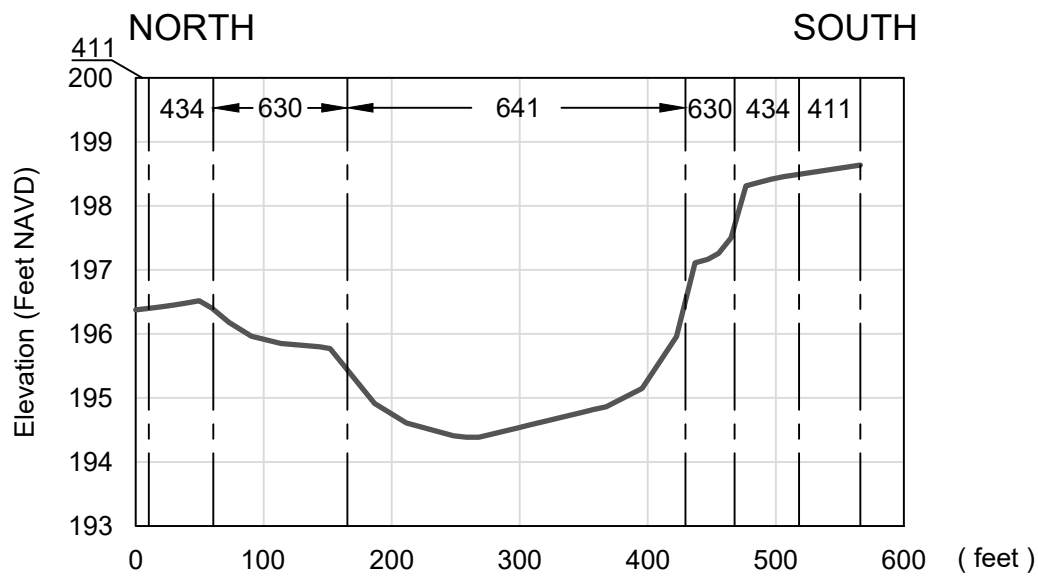
FIGURE

16J

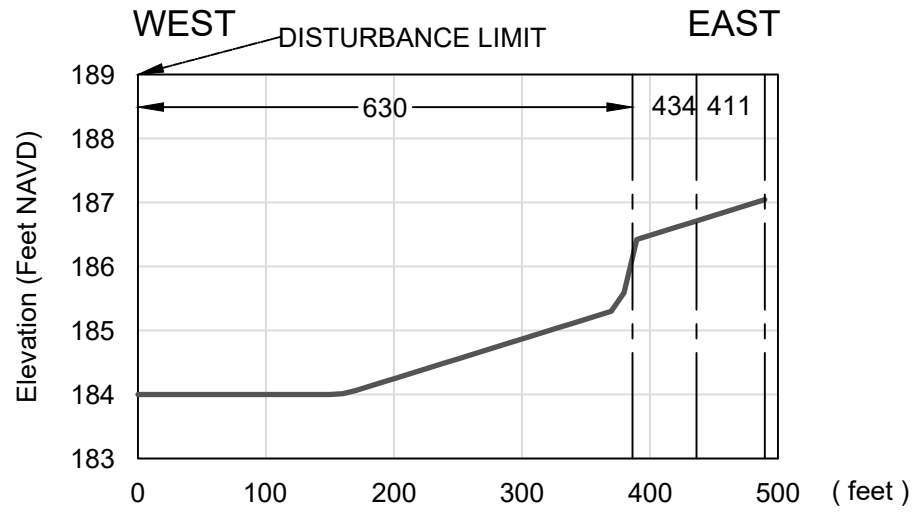
The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_Post\_LU\_CrossSections.dwg PLOTTED: 11/12/2019 10:29 AM BY: tim desmarais LAYOUT: Wetland Mitigation2 & 3

Note:  
611, 630 : SHWE ≤ 1' Above Ground Surface  
621, 613 : SHWE ≤ 18" Above Ground Surface  
641 : SHWE ≤ 2' Above Ground Surface  
  
SLWE @ Or Below Ground Surface



Cross-Section 2



Cross-Section 3

- LEGEND
- POST-RECLAMATION GROUND ELEVATION
  - LAND USE BOUNDARY

- 411 - Pine Flatwoods
- 434 - Hardwood-Coniferous Mixed
- 611 - Bay Swamps
- 613 - Gum Swamp
- 621 - Cypress
- 641 - Freshwater Marsh

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-12-2019  
REVISED:

WETLAND MITIGATION  
CROSS-SECTION 2 & 3

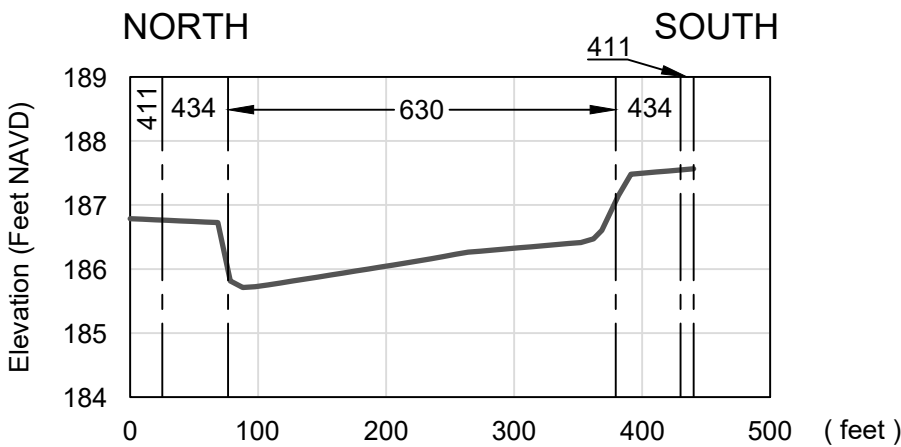
Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

16K

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_Post\_LU\_CrossSections.dwg PLOTTED: 11/12/2019 10:29 AM BY: tim desmarais LAYOUT: Wetland Mitigation 4 & 5

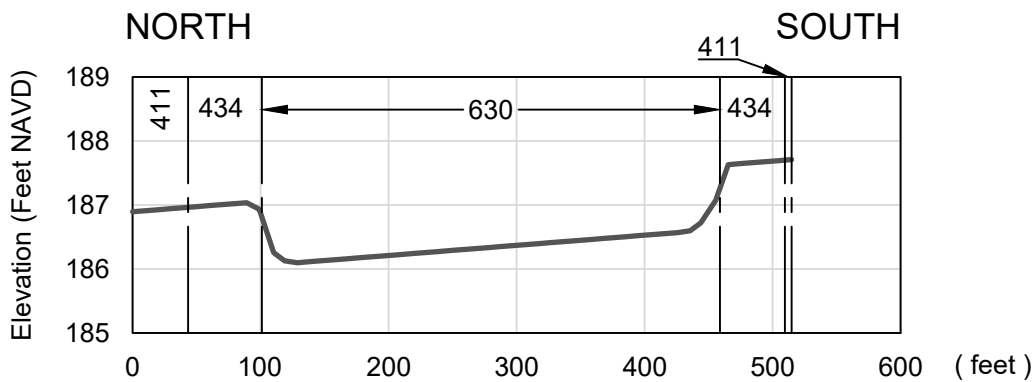
Note:  
611, 630 : SHWE ≤ 1' Above Ground Surface  
621, 613 : SHWE ≤ 18" Above Ground Surface  
641 : SHWE ≤ 2' Above Ground Surface  
  
SLWE @ Or Below Ground Surface



Cross-Section 4

- LEGEND
- POST-RECLAMATION GROUND ELEVATION
  - LAND USE BOUNDARY

- 411 - Pine Flatwoods
- 434 - Hardwood-Coniferous Mixed
- 611 - Bay Swamps
- 613 - Gum Swamp
- 621 - Cypress
- 641 - Freshwater Marsh



Cross-Section 5

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-12-2019  
REVISED:

WETLAND MITIGATION  
CROSS-SECTION 4 & 5

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

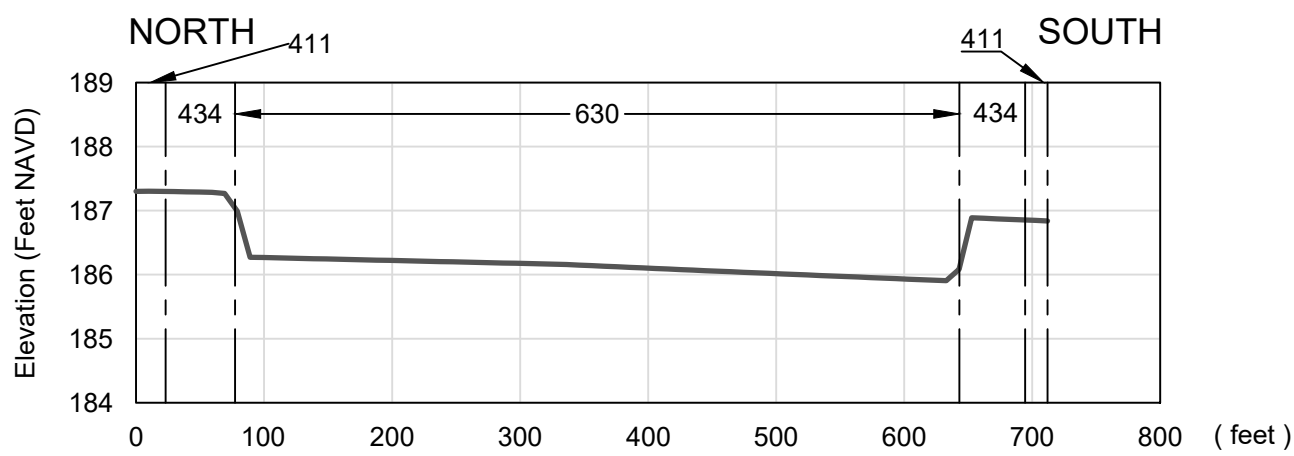
16L

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressd or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.



CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_Post\_LU\_CrossSections.dwg PLOTTED: 11/12/2019 10:29 AM BY: tim desmarais LAYOUT: Wetland Mitigation 6 & 7

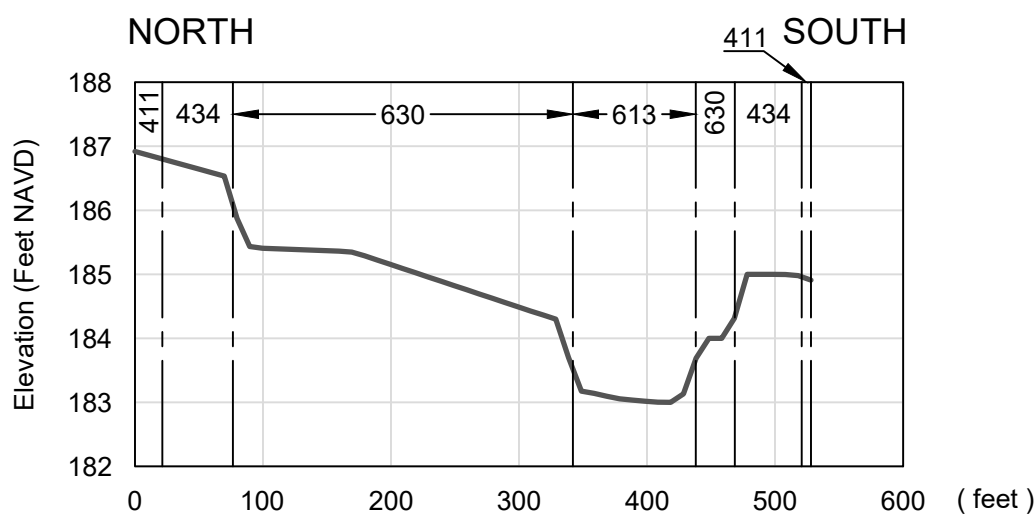
Note:  
611, 630 : SHWE ≤ 1' Above Ground Surface  
621, 613 : SHWE ≤ 18" Above Ground Surface  
641 : SHWE ≤ 2' Above Ground Surface  
  
SLWE @ Or Below Ground Surface



Cross-Section 6

- LEGEND
- POST-RECLAMATION GROUND ELEVATION
  - LAND USE BOUNDARY

- 411 - Pine Flatwoods
- 434 - Hardwood-Coniferous Mixed
- 611 - Bay Swamps
- 613 - Gum Swamp
- 621 - Cypress
- 641 - Freshwater Marsh



Cross-Section 7

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-12-2019  
REVISED:

WETLAND MITIGATION  
CROSS-SECTION 6 & 7

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

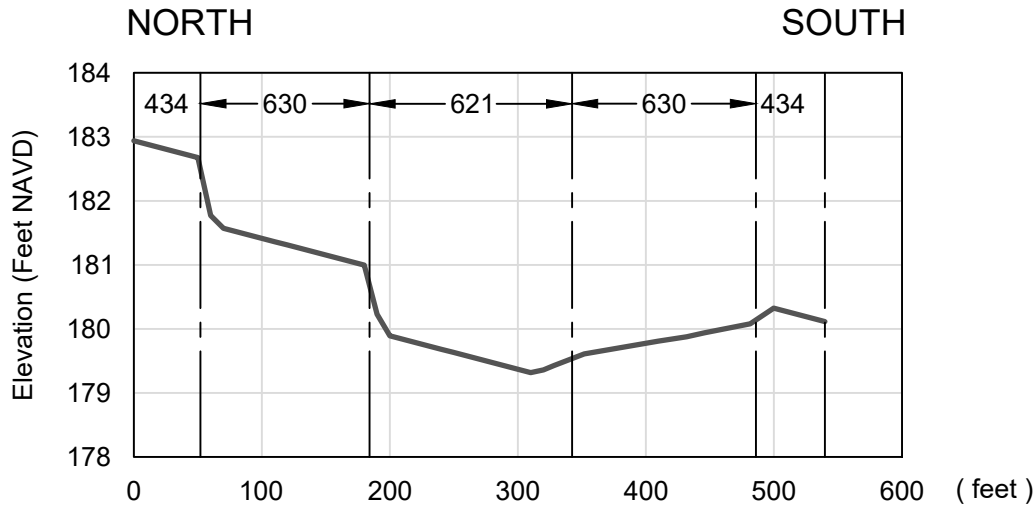
FIGURE

16M

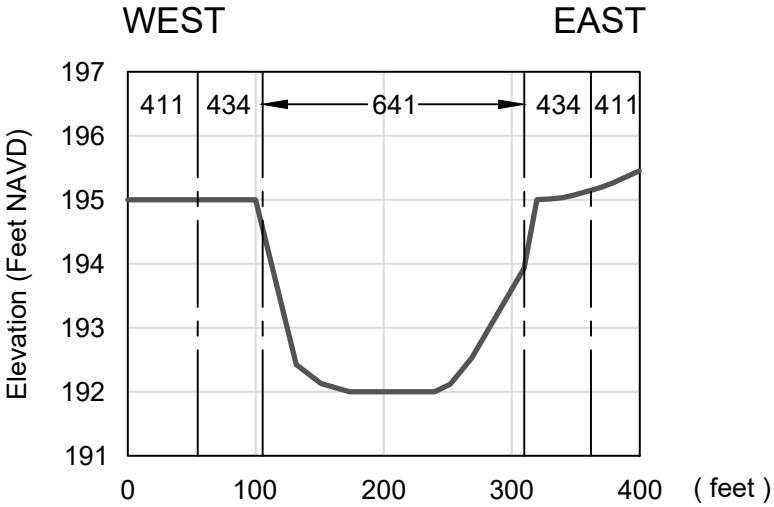
The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_Post\_LU\_CrossSections.dwg PLOTTED: 11/12/2019 10:29 AM BY: tim desmarais LAYOUT: Wetland Mitigation 8 & 9

Note:  
611, 630 : SHWE ≤ 1' Above Ground Surface  
621, 613 : SHWE ≤ 18" Above Ground Surface  
641 : SHWE ≤ 2' Above Ground Surface  
  
SLWE @ Or Below Ground Surface



Cross-Section 8



Cross-Section 9

- LEGEND
- POST-RECLAMATION GROUND ELEVATION
  - LAND USE BOUNDARY

- 411 - Pine Flatwoods
- 434 - Hardwood-Coniferous Mixed
- 611 - Bay Swamps
- 613 - Gum Swamp
- 621 - Cypress
- 641 - Freshwater Marsh

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



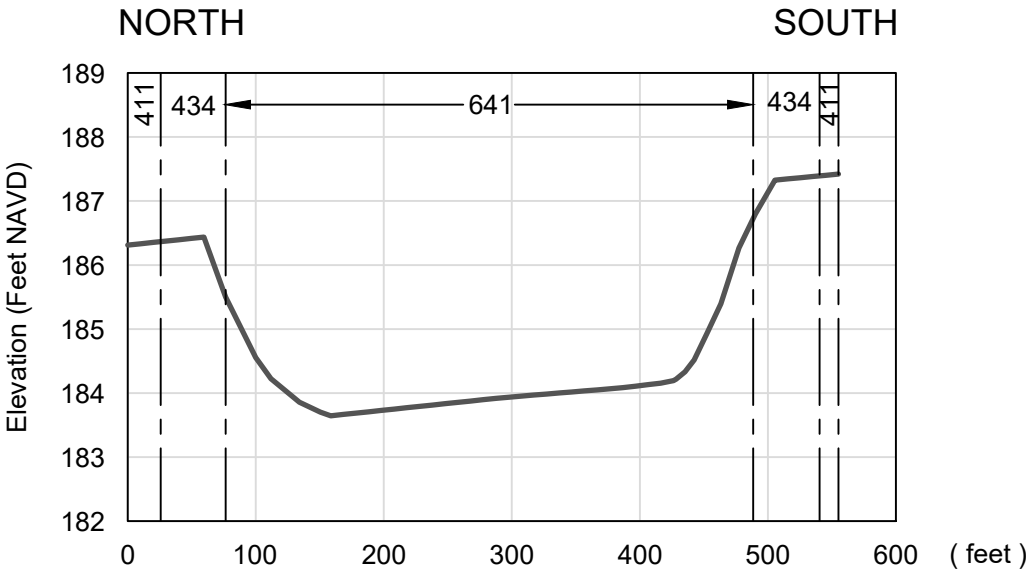
PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-12-2019  
REVISED:

WETLAND MITIGATION  
CROSS-SECTION 8 & 9  
  
Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

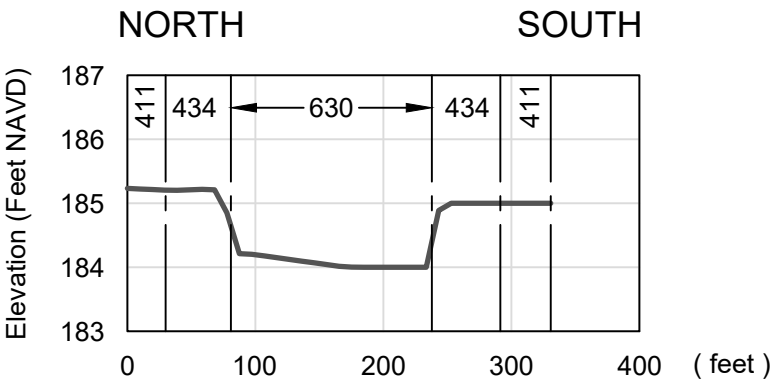
The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressd or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_Post\_LU\_CrossSections.dwg PLOTTED: 11/12/2019 10:29 AM BY: tim desmarais LAYOUT: Wetland Mitigation 10 & 11

Note:  
611, 630 : SHWE ≤ 1' Above Ground Surface  
621, 613 : SHWE ≤ 18" Above Ground Surface  
641 : SHWE ≤ 2' Above Ground Surface  
  
SLWE @ Or Below Ground Surface



Cross-Section 10



Cross-Section 11

LEGEND

- POST-RECLAMATION GROUND ELEVATION
- LAND USE BOUNDARY

- 411 - Pine Flatwoods
- 434 - Hardwood-Coniferous Mixed
- 611 - Bay Swamps
- 613 - Gum Swamp
- 621 - Cypress
- 641 - Freshwater Marsh

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-12-2019  
REVISED:

WETLAND MITIGATION  
CROSS-SECTION 10 & 11

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

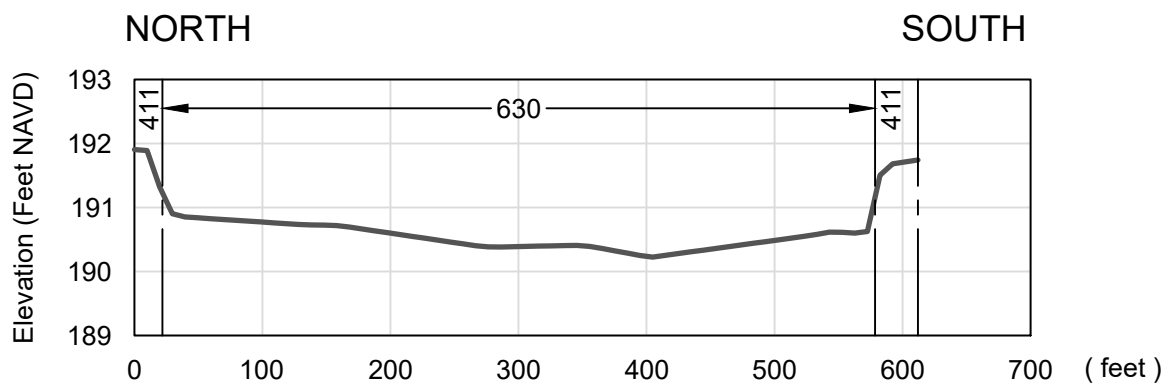
160

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressd or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.



CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\TRS\_ACOE\_Post\_LU\_CrossSections.dwg PLOTTED: 11/12/2019 10:29 AM BY: tim desmarais LAYOUT: Wetland Mitigation 12

Note:  
611, 630 : SHWE ≤ 1' Above Ground Surface  
621, 613 : SHWE ≤ 18" Above Ground Surface  
641 : SHWE ≤ 2' Above Ground Surface  
  
SLWE @ Or Below Ground Surface



Cross-Section 12

LEGEND

- POST-RECLAMATION GROUND ELEVATION
- LAND USE BOUNDARY

- 411 - Pine Flatwoods
- 434 - Hardwood-Coniferous Mixed
- 611 - Bay Swamps
- 613 - Gum Swamp
- 621 - Cypress
- 641 - Freshwater Marsh

SCALE:  
HORIZ. 1"= 150'  
VERT. 1"=3'



PROJECT NO. 00129491.003A  
DRAWN BY YQ  
CHECKED BY TRD  
DATE: 11-12-2019  
REVISED:

WETLAND MITIGATION  
CROSS-SECTION 12

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

16P

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressd or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

# **Eastern Indigo Snake Biological Assessment**



**BIOLOGICAL ASSESSMENT  
EASTERN INDIGO SNAKE  
(*DRYMARCHON COUPERI*)**

**TRAIL RIDGE SOUTH MINE  
BRADFORD AND CLAY COUNTIES, FLORIDA  
KLEINFELDER PROJECT #00129491.003**

**DECEMBER 2019**



## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION .....</b>	<b>1</b>
<b>2.0</b>	<b>PROJECT DESCRIPTION .....</b>	<b>2</b>
<b>3.0</b>	<b>EFFECTS ANALYSIS AND DETERMINATION OF EFFECTS .....</b>	<b>5</b>
<b>4.0</b>	<b>SUMMARY .....</b>	<b>8</b>
<b>5.0</b>	<b>REFERENCES .....</b>	<b>9</b>

## **FIGURES**

Figure 1	Location Map
Figure 2	Aerial Map
Figure 3	USGS Topographic Map
Figure 7	Pre-Mining Land Use and Vegetation Map
Figure 10D	Typical Mining Footprint
Figure 11	Wetland Impact Map
Figure 13	Post-Mining Land Use and Vegetation Map

## **ATTACHMENTS**

Attachment 1	Species Status Assessment (SSA) Report for the Eastern Indigo Snake USFWS (2018)
Attachment 2	Standard Protection Measures for the Eastern Indigo Snake (2013)

---

## 1.0 INTRODUCTION

---

The Chemours Company FC, LLC (Chemours), is currently seeking to obtain a Standard Permit (SP) to begin heavy mineral mining operations on a ±2,884.4-acre parcel known as the Trail Ridge South Mine in Bradford and Clay Counties, Florida (Figure 1).

A Special Use Permit was granted from the Bradford County Board of County Commissioners to allow mining operations in October 2019. No approval was necessary from Clay County as they do not regulate activities that occur on property included within the Camp Blanding Joint Training Center (CBJTC) Installation.

In support of the SP application, a biological assessment of the federally listed eastern indigo snake (*Drymarchon couperi*) is provided herein. Based on the proposed action, the applicant is seeking concurrence from the U.S. Fish and Wildlife Service (USFWS) that onsite activities “**may affect, but is not likely to adversely affect**” the eastern indigo snake. This biological assessment is prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act (16 U.S.C. 1536 (c)).

## 2.0 PROJECT DESCRIPTION

---

The project area is  $\pm 2,884.4$ -acres in total size. The project area is located in Sections 6, 7, 12, 13, 18, 19, and 24, Township 7 South, Range 22 and 23 East on the border between Bradford and Clay Counties, along a narrow sand ridge known as the Trail Ridge (Figure 2).

Land use throughout the project area generally consist of thickly vegetated upland areas managed for silviculture, drainage features, and wetlands associated with the Santa Fe River Drainage Basin. The project area lies under the jurisdictions of the Suwannee River Water Management District (SRWMD) and St. Johns River Water Management District (SJRWMD). Wetlands occur throughout the project area and flow southwest and downstream to wetlands and tributaries of the Santa Fe Swamp and River system. Current drainage patterns within the proposed project area have been somewhat altered from historic conditions due to water management practices associated with silviculture (rows, furrows, ditching) and historic mining activities that took place prior to 1975. Adjacent properties consist of land owned by the Armory Board of the State of Florida, Rayonier Inc., the City of Keystone Heights, the North Florida Land Trust (NFLT), the Suwannee River Water Management District (SRWMD), and private citizens.

Prior to extraction of the mineral sands, all merchantable timber will be harvested in a manner consistent with silviculture best management practices (BMPs) and applicable regulations by the timber owner. Upon completion of timber harvesting, silt fencing and other applicable erosion control measures will be installed around the proposed mine cells.

Areas to be mined will be “root raked” and all wooden material will be burned per appropriate State/County regulations. The top 12 inches of topsoil will be removed and used to form the perimeter containment berms around the mining area for control of storm water runoff. All stormwater will be captured in the excavated pit. Perimeter containment berms are to be stabilized with slopes at a minimum of 3H:1V or flatter and seeded as needed to prevent erosion. Silt fencing will be utilized along the exterior edges of perimeter containment berms adjacent to wetlands to control erosion and sedimentation

In an effort to minimize adverse effects to the eastern indigo snake, the removal of tree stumps and brush is only conducted immediately prior to the advance of mining operations and completed in small blocks 10 to 20 acres, limiting the amount of new land disturbed by mining activities at any one time. The applicant will also implement the *Standard Protection Measures for the Eastern Indigo Snake* (2013) (Attachment 2).



Over the past few years Chemours has looked at ways to improve the efficiency for the strategic recovery of the existing smaller ore resources while reducing the environmental footprint. Benefits are the elimination of multiple haul trucks from the mining process, since the Mobile Mining Unit (MMU) receives the feed material from an excavator and as the MMU is mounted on tracks, it can progress with the advance of the mine. Elimination of the haul trucks from the mining area reduces dust, noise and light impacts. The MMU operates on electric power.

The Trail Ridge South mining footprint will consist of two (2) MMUs and a land-based separation plant site, Mobile Concentrator (MC). The MMUs move as mining progresses. The MMUs consist of a feed hopper and shredder to break apart oversize (roots, rocks and hardpan) from the excavated material prior to being slurried and pumped via high-density polyethylene (HDPE) pipeline to a single deck vibrating screen which also moves around the ore body as mining progresses to remove oversize. The oversize material from the screen will be used as backfill in the mined-out cells.

The screen undersize is re-slurried and pumped to the MC. The MC will separate the heavy minerals from the quartz sand based upon differences in specific gravity and may remain at one fixed location for the duration of the mining operation (Figure 1).

The excavation process will be conducted within mining cells designed at approximately 10 to 20 acres in size and will be in various stages from clearing to reclamation. The excavation process will occur in the "Active Mining Cell". The excavation will progress through the cells using multiple excavators to feed an MMU. This unit will process the feed and slurry the ore to the near-by MC. The mine cells will be dewatered as excavation progresses and the water incorporated into the process water for reuse. Mining depth will average approximately 22 feet with a maximum depth of 40 feet.

Once the ore has been separated from the quartz at the MC, the lighter specific gravity (SG) quartz sands (approximately 98% by volume) will become tailings and will be pumped to mined-out cells via HDPE pipeline where they are dewatered and utilized for reclamation activities. Once the tailings are sufficiently dewatered, reclamation activities, including recontouring of the site (mined area) so the topography is similar to pre-mining conditions, topsoil placement, and revegetation will be conducted. Native herbaceous vegetation will be reestablished from the replaced topsoil. Temporary groundcover may be seeded/planted (millet or rye) to assist with erosion control, as needed.

Excess water from tailings will be decanted, collected, and recycled back to the MMU to be used to slurry the new feed in the mining process.

Approximately 160 acres ( $\pm$  80 acres per MMU, Figure 10D) may be in various stages of the mining process at the active mining areas at one time including:

1. Site Preparation
2. Active Mining

### 3. Tailings

### 4. Contouring/Reclamation

Approximately  $\pm 1,749.92$  acres within the  $\pm 2884.4$ -acre project area is proposed for impact associated with mining and another 30.06 acres associated with the construction of a plant site. A total of  $\pm 1,104.42$  acres are to remain undisturbed (Figure 11 and 13). Proposed wetland impacts associated with mining activities are considered temporary in nature. Mitigation measures include on-site/in-kind restoration of the pre-mining wetland habitat types and the enhancement of undisturbed wetlands within the project area. The uplands will be restored to the historic natural Pine Flatwoods (411) community type. Typical silvicultural features that currently exist within the project area (rows, furrows, ditching) will not be returned in the reclamation process. Due to the small amount of mineral extracted (approximately 2%), topographic features and drainage basins in the post-mining condition will mimic the pre-mining condition. Areas slated for wetland reclamation will also be graded and topsoil (muck) will be returned for planting purposes. Planting of the mined area is conducted based upon the land use designated for the area (either upland or wetland) to mimic pre-mining land use and vegetative communities. This “block type” mining minimizes environmental impacts as actively disturbed areas are kept to a minimum.

The proposed mitigation plan is sufficient to offset wetland impacts and will be implemented on an acre-for-acre/type-for-type basis (where applicable) and through the enhancement of undisturbed wetlands within the project area.

No long-term draw down impacts to undisturbed or adjacent offsite wetlands are anticipated as modeled by Kleinfelder engineers. The short term drawn down impacts will be *de minimis* in affect and will resemble seasonal drought conditions.

The mine plan design has been completed to account for site specific water flow and will re-establish historic surface water flow patterns to mimic pre-mining conditions. The re-establishment of historic drainage patterns will help to provide a practical and self-sustaining resource, while reducing the duration of impact activities on lands within the project area.

### 3.0 EFFECTS ANALYSIS AND DETERMINATION OF EFFECTS

---

The eastern indigo snake was federally listed as threatened in 1978 under the Endangered Species Act (ESA) of 1973. The eastern indigo snake was historically found throughout the southeastern U.S. coastal plain, however due to increased population declines resulting from habitat loss the species current estimated range extends from southern Georgia to most of peninsular Florida.

Critical habitat has not been designated for the eastern indigo snake (USFWS 2018).

#### Status of the Species

Please see Attachment 1 for the November 5, 2018 Species Status Assessment (SSA) Report for the Eastern Indigo Snake.

#### Environmental Baseline

The existing land use for the proposed project site is dominated by silviculture practices (Coniferous Plantations – 441). The coniferous plantation areas primarily contain slash pine (*Pinus elliottii*) of varying age class depending on rotation cycle. The logging rotation for these areas averages twenty (20) to twenty-five (25) years. Review of historical aerial imagery identify several rotations of pine have been harvested and replanted throughout the site from 2002 to 2014.

Understory and ground cover species associated with the pine plantations vary according to the past and current management practices, and the existing topography, soils, and hydrology of the area. In the drier, sandier areas of planted pine, understory vegetation often mimics xeric oak communities, with species including turkey oak (*Quercus laevis*), sand live oak (*Q. geminata*), saw palmetto (*Serenoa repens*), gallberry (*Ilex glabra*), wiregrass (*Aristida stricta*), shiny blueberry (*Vaccinium myrsinites*), wax myrtle (*Myrica cerifera*), and bracken fern (*Pteridium aquilinum*). Throughout the lower elevations and areas with higher groundwater soil conditions, the groundcover is often characterized by various combinations of saw palmetto, gallberry, bracken fern, wax myrtle, water oak (*Q. nigra*), loblolly bay (*Gordonia lasianthus*), and red maple (*Acer rubrum*). Ground cover is variable depending upon density of pines and age class of trees which shade shrub and ground cover.

On November 6, 2019 , Kleinfelder biologists consulted the Information for Planning and Conservation (IPaC) search through U.S. Fish and Wildlife's <https://ecos.fws.gov/ipac/> website which identified the potential for the federally listed eastern indigo and/or its habitat to be located within the project area.

During numerous site visits conducted between November 2015 and October 2019, pedestrian surveys were completed by Kleinfelder biologists to look for the presence of



or potential utilization by the eastern indigo snake within the project area. No eastern indigo snakes were observed during the field reviews. Several small upland areas were observed to have and may provide suitable winter habitat for the eastern indigo snake. However, a majority of the upland areas within the project area consist of densely vegetated silviculture areas which have been fire suppressed for multiple decades. Observations of off-site habitats consisted of similar community types as those found within the project area.

### Effects of the Action

Completion of the proposed project is not anticipated to result in adverse impacts to the eastern indigo snake as the project area provides limited suitable habitat and temporary mining impacts will be reclaimed to restore land use and vegetative communities to mimic pre-mining conditions.

Restoration of the pre-mining conditions will integrate the creation of naturally occurring communities as outlined in the reclamation and mitigation plans. The proposed project has been designed to ensure no adverse impacts will occur to downstream waters including turbidity, sedimentation, and erosional impacts. Permittee-responsible mitigation in compliance with the federal regulations for wetland impacts will restore and improve the existing ecological value found within the project area and provide benefits to the remaining off-site natural areas. Reclamation of these areas will enhance wildlife utilization within the project area and increase habitat connectivity for wildlife movement.

Gopher tortoise burrows (approximately 122) were observed in several upland areas within the proposed project boundary. The applicant will perform 100% survey of all suitable gopher tortoise habitat prior to site disturbance activities and a relocation permit will be acquired from the Florida Fish and Wildlife Conservation Commission (FWC) to excavate any tortoises that reside within or adjacent to the proposed disturbance footprint. The survey and relocation activities will be conducted in small blocks in front of the immediate path of mining operations. It is likely that during land clearing activities, any eastern indigo snake within the project area will relocate themselves to adjacent undisturbed lands. Any eastern indigo snakes found during the gopher tortoise excavations will be allowed to safely escape the project area to adjacent suitable habitat in accordance with FWC relocation protocols for commensal species.

Prior to site disturbance, all staff will be notified of the potential presence of eastern indigo snakes within the project area and instructed on the identification, protected status, what to do if a snake is observed within the project area, and applicable penalties that may be imposed if state and/or federal regulations regarding the species are violated.

The applicant agrees to implement the *Standard Protection Measures for the Eastern Indigo Snake* (2013) (Attachment 2)

### Cumulative Effects

Cumulative effects are not expected to occur from the project as reclamation/mitigation activities will occur within the same drainage basin as the impacts.

## 4.0 SUMMARY

---

A thorough review of potential suitable habitat for the eastern indigo snake occurring within the project area returned an effect determination of “***may affect, but is not likely to adversely affect***”.

The project proposes permittee-responsible on-site/in-kind restoration implemented on an acre-for-acre and type-for-type basis (where applicable) and through the enhancement of undisturbed wetlands within the project area. The uplands will be restored to the historic natural Pine Flatwoods (411) community type. Typical silvicultural features that currently exist within the project area (rows, furrows, ditching) will not be returned in the reclamation process. Any eastern indigo snakes found during permitted gopher tortoise relocations shall be allowed to move to undisturbed adjacent habitats.

To additionally ensure the protection of eastern indigo snakes during construction and mining activities, the *Standard Protection Measures for the Eastern Indigo Snake* (Attachment 2) will be included in the permit documents and implemented throughout the project area during construction and mining activities.



## 5.0 REFERENCES

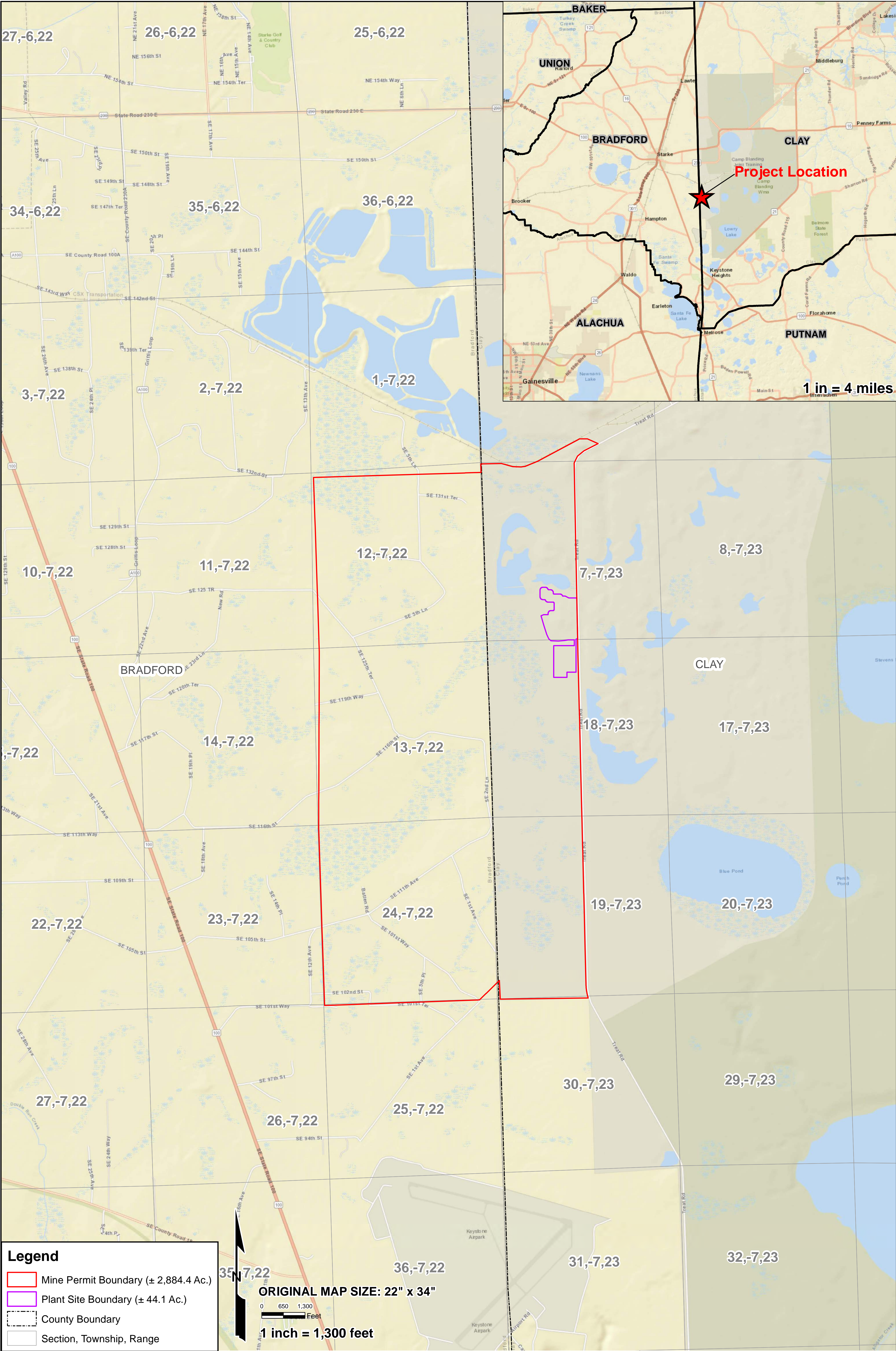
---

U.S. Fish and Wildlife Service. 2018. Baker County Federally Listed Species. Eastern Indigo Snake (*Drymarchon couperi*).

<https://www.fws.gov/northflorida/IndigoSnakes/indigo-snakes.htm>

U.S. Fish and Wildlife Service. August 2013. Standard Protection Measures for the Eastern Indigo Snake.





Legend

- Mine Permit Boundary (± 2,884.4 Ac.)
- Plant Site Boundary (± 44.1 Ac.)
- County Boundary
- Section, Township, Range

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfielder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the user relying or misusing the information.

Source: Imagery was obtained from ESRI Baseemap, Streets Map, Stark and Keystone Heights Quadrangles.

NO.	REVISION	BY	DATE
△			
△			
△			
△			
△			



**KLEINFELDER**  
Bright People. Right Solutions.

www.kleinfielder.com

PROJECT NO.	129491.003
DRAWN:	11/6/2019
DRAWN BY:	LS
CHECKED BY:	NA
FILE NAME:	See File Path

Location Map

Trail Ridge South  
The Chemours Company FC, LLC.  
Bradford & Clay Counties, FL





Legend

Mine Permit Boundary (± 2,884.4 Ac.)

County Boundary

Section, Township, Range

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.

Source: Imagery was obtained from ESRI Basemap, Aerial Imagery.  
Image Date: 1/28/2019 & 3/15/2017.

NO.	REVISION	BY	DATE
△			
△			
△			
△			
△			
△			



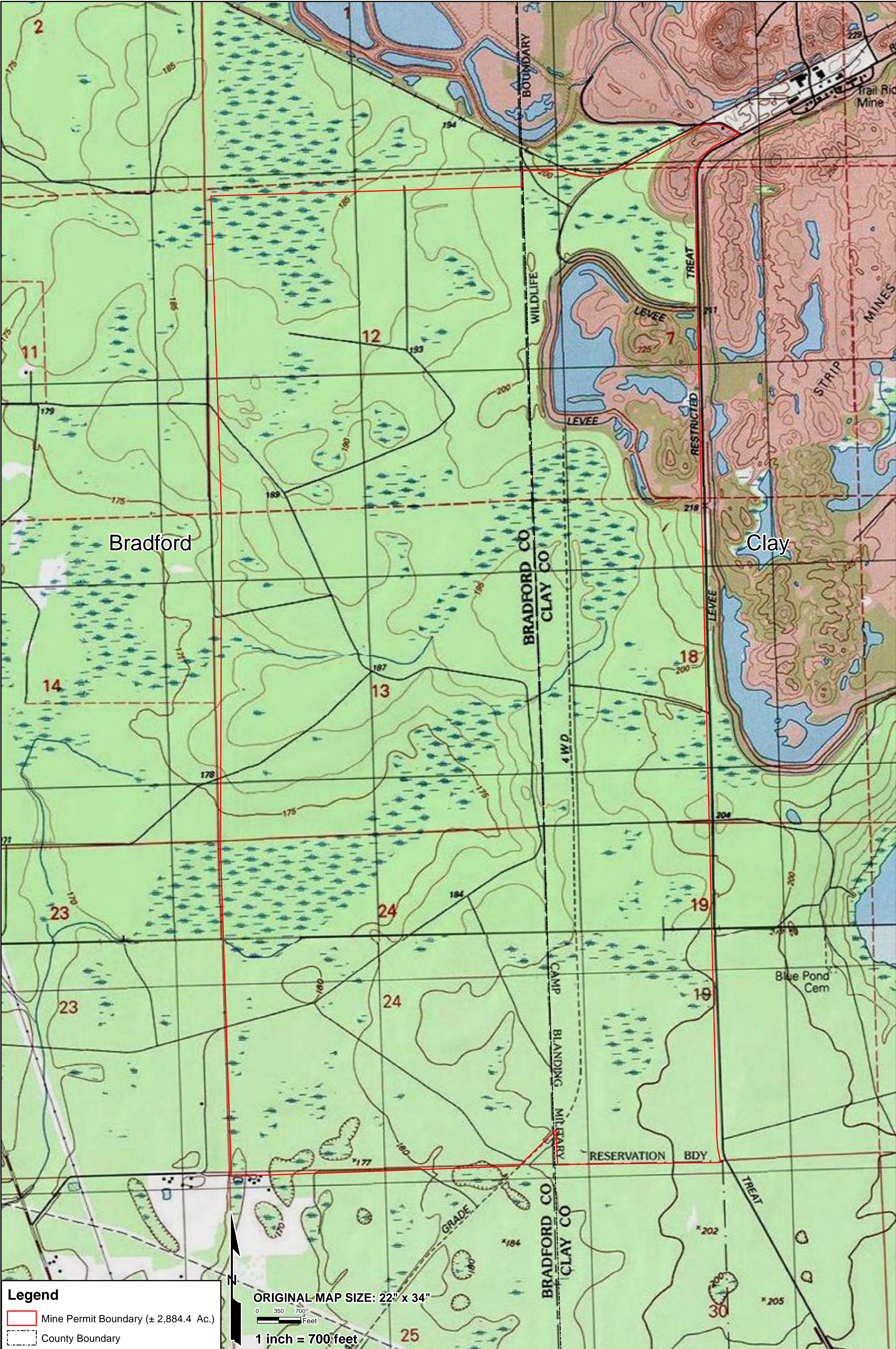
**KLEINFELDER**  
Bright People. Right Solutions.

[www.kleinfelder.com](http://www.kleinfelder.com)

PROJECT NO.	129491.003
DRAWN:	11/6/2019
DRAWN BY:	LS
CHECKED BY:	NA
FILE NAME:	See File Path

Aerial Map
Trail Ridge South The Chemours Company FC, LLC. Bradford & Clay Counties, FL





**Legend**

Mine Permit Boundary (± 2,884.4 Ac.)

County Boundary

N

0

350

700

Feet

1 inch = 700 feet

ORIGINAL MAP SIZE: 22" x 34"

<div><div>The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product and is not a designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.</div><div>Source: Imagery was obtained from USGS Topographic Map, Starke and Keystone Heights Quadrangles.</div></div>	NO.	REVISION	BY	DATE	<div><div><div>Bright People. Right Solutions.</div><div>www.kleinfelder.com</div></div></div>	PROJECT NO.	129491.003	USGS Topographic Map	Trail Ridge South The Chemours Company FC, LLC. Bradford & Clay Counties, FL	Figure  3
	△					DRAWN:	11/6/2019			
	△					DRAWN BY:	LS			
	△					CHECKED BY:	NA			
	△					FILE NAME:	See File Path			





# Clay

0411 Freshwater Marsh (± 104.50 Ac.)

**1 inch = 700 feet**

**Pre-Mining Land Use  
and Vegetation Map**

---

Trail Ridge South  
The Chemours Company FC, LLC.  
Bradford and Clay Counties, FL

CAD FILE: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GIS\CAD\Chemours\2019\00129491.003A\_Chemours-FL-CY2019 Trail Ridge South\CAD\ITRS\_ACOE\_MineFootprint.dwg LAYOUT: 10D-MINE FOOTPRINT

# Typical Mining Footprint

±80 acres per Mobile Mining Unit (MMU)

Perimeter Containment Berm

### Contouring and Reclamation

Once the tailings are sufficiently dewatered, reclamation activities, including recontouring of the site (mined area) so the topography is similar to pre-mining conditions, topsoil placement, and revegetation will be conducted. Native herbaceous vegetation will be reestablished from the replaced topsoil. Temporary groundcover may be seeded/planted (millet or rye) to assist with erosion control, if needed.

### Active Mining

The removal of the ore will be in 7- to 10-foot lifts or benches. The excavation will progress through the cells using multiple excavators to feed an MMU. This unit will process the feed and slurry the ore to the near-by MC. The mine cells will be dewatered as excavation progresses and the water incorporated into the process water for reuse. Mining depth will average approximately 22 feet with a maximum depth of 40 feet.

±20 Ac Contouring and Reclamation

±20 Ac Sand Tailings

±20 Ac Active Mining Cell with MMU

±20 Ac Site Preparation

Progression

### Sand Tailings Return

Once the ore has been separated from the quartz at the MC, the lighter SG quartz sands (approximately 98% by volume) will become tailings and will be pumped to mined-out cells via HDPE pipeline where they are dewatered and utilized for reclamation activities.

### Site Preparation

All merchantable timber is harvested in a manner consistent with silviculture best management practices (BMPs) and area is “root raked” with all wooden material burned per appropriate State/County regulations. Silt fencing and other applicable erosion control measures will be installed around the proposed mine cells. The top 12 inches of topsoil will be removed and used to form the perimeter or containment berms around the mining area for control of storm water runoff.

The Trail Ridge South mining footprint will consist of two (2) MMUs and a land-based separation plant site, Mobile Concentrator (MC). The MMUs move as mining progresses. The MMUs consist of a feed hopper and shredder to break apart oversize (roots, rocks and hardpan) from the excavated material prior to being slurried and pumped via High-density polyethylene (HDPE) pipeline to a single deck vibrating screen which also moves around the ore body as mining progresses to remove oversize. The oversize material from the screen will be used as backfill in the mined-out cells.

The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressd or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.



PROJECT NO. 00129491.003A  
DRAWN BY NCD  
CHECKED BY TRD  
DATE: 11-08-2019  
REVISED:

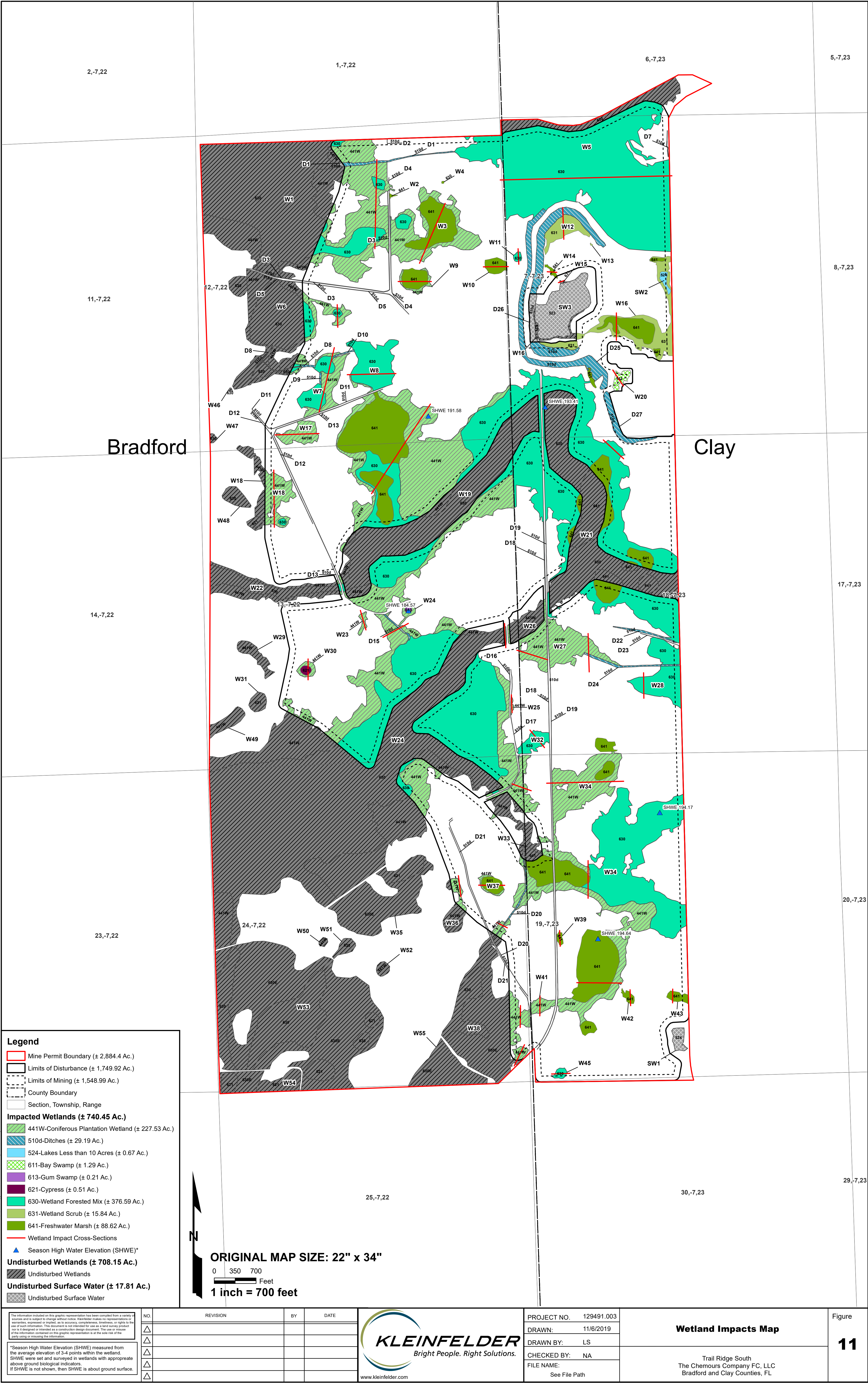
### TYPICAL MINING FOOTPRINT

Trail Ridge South  
The Chemours Company FC LLC  
Bradford and Clay Counties, FL

FIGURE

10D







Mine Permit Boundary (± 2,884.4 Ac.)

Watershed Drainage Basins

County Boundary

Section, Township, Range

Reclamation Areas Land Use (± 1,779.98 Ac.)

411-Pine Flatwoods (± 955.36 Ac.)

434-Hardwood, Coniferous Mixed (± 106.92 Ac.)

524-Lakes Less than 10 Acres (± 0.98 Ac.)

611-Bay Swamp (± 1.29 Ac.)

613-Gum Swamp (± 0.21 Ac.)

621-Cypress (± 0.51 Ac.)

630-Wetland Forested Mixed (± 619.96 Ac.)

641-Freshwater Marsh (± 88.62 Ac.)

8145-Graded and Drained (± 5.06 Ac.)

8146-Primitive Roads/Trails (± 1.07 Ac.)

Undisturbed Wetlands (± 708.15 Ac.)

Undisturbed Wetlands

Undisturbed Surface Water (± 17.81 Ac.)

Undisturbed Surface Water

Undisturbed Uplands (± 378.46 Ac.)

Undisturbed Uplands

ORIGINAL MAP SIZE: 22" x 34"

0 350 700

Feet

1 inch = 700 feet

Document Path: G:\DPT-CHWFM\11.MXD\129491 TRS ACOE\Fig 13 Post-Mining Land Use and Veg Map.mxd

<div><div>The information included on this graphic representation has been compiled from a variety of sources and is subject to change without notice. Kleinfelder makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a land survey product nor is it designed or intended as a construction design document. The use or misuse of the information contained on this graphic representation is at the sole risk of the party using or misusing the information.</div></div>	NO.	REVISION	BY	DATE	<div><div><div><div></div><div>PROJECT NO. 129491.003</div></div><div><div></div><div>DRAWN: 11/6/2019</div></div><div><div></div><div>DRAWN BY: LS</div></div><div><div></div><div>CHECKED BY: NA</div></div><div><div></div><div>FILE NAME: See File Path</div></div></div></div>	<div><div><div>Post-Mining Land Use and Vegetation Map</div><div>Trail Ridge South The Chemours Company FC, LLC. Bradford and Clay Counties, FL</div></div></div>	<div>Figure</div> <div>13</div>
	△						
	△						
	△						
	△						

KLEINFELDER

Bright People. Right Solutions.

www.kleinfelder.com



# **Species Status Assessment (SSA) Report**

**for the**

**Eastern Indigo Snake**

**(*Drymarchon couperi*)**

**Version 1.0**

**November 5, 2018**



**Photo Credit: Dirk J. Stevenson**

U.S. Fish and Wildlife Service  
Southeast Region  
Atlanta, GA





## ACKNOWLEDGEMENTS

The research for this document was prepared by Michele Elmore (U.S. Fish and Wildlife Service (USFWS) – Georgia Ecological Services), Linda LaClaire (USFWS – Mississippi Ecological Services), Mark Endries (USFWS - Asheville, North Carolina, Ecological Services), Michael Marshall (USFWS Region 4 Office), Stephanie DeMay (Texas A&M Natural Resources Institute), with technical assistance from Drew Becker and Erin Rivenbark (USFWS Region 4 Office)

Valuable peer reviews of a draft of this report were provided by: Dr. David Breininger (Kennedy Space Center), Dr. Natalie Hyslop (North Georgia University), Dr. Chris Jenkins (The Orianne Society), Dirk Stevenson (Altamaha Environmental Consulting, LLC), John Jensen and Matt Elliot (Georgia Department of Natural Resources) and multiple reviewers from the Florida Fish and Wildlife Conservation Commission.

### Suggested reference:

U.S. Fish and Wildlife Service. 2018. Species status assessment report for the eastern indigo snake (*Drymarchon couperi*). Version 1.0 November, 2018. Atlanta, GA.

## Table of Contents

<b>EXECUTIVE SUMMARY .....</b>	<b>5</b>
<b>CHAPTER 1 – INTRODUCTION .....</b>	<b>9</b>
<b>CHAPTER 2 – SPECIES INFORMATION AND INDIVIDUAL NEEDS .....</b>	<b>11</b>
<b>2.1 Species Description .....</b>	<b>11</b>
<b>2.2 Taxonomy and Genetics .....</b>	<b>12</b>
<b>2.3 Historical Range and Distribution.....</b>	<b>15</b>
<b>2.4 Current Range and Distribution .....</b>	<b>16</b>
2.4.1 <i>Panhandle .....</i>	18
Alabama .....	18
Mississippi .....	19
Florida Panhandle .....	20
2.4.2 <i>North Florida .....</i>	22
2.4.3 <i>Peninsular Florida.....</i>	24
2.4.4 <i>Southeast Georgia.....</i>	26
<b>2.5 Individual Needs.....</b>	<b>28</b>
2.5.1 <i>Life History .....</i>	28
2.5.2 <i>Habitat .....</i>	31
<b>CHAPTER 3 – POPULATION AND SPECIES NEEDS .....</b>	<b>34</b>
<b>3.1 Population Resiliency.....</b>	<b>34</b>
<b>3.2 Species Representation .....</b>	<b>37</b>
<b>3.3 Species Redundancy.....</b>	<b>38</b>
<b>CHAPTER 4 – FACTORS INFLUENCING VIABILITY .....</b>	<b>38</b>
<b>4.1 Habitat Modification and Destruction .....</b>	<b>39</b>
<b>4.2 Direct Mortality .....</b>	<b>42</b>
<b>4.3 Climate Conditions .....</b>	<b>44</b>
<b>4.4 Disease.....</b>	<b>44</b>
<b>4.5 Gopher Tortoise Populations .....</b>	<b>47</b>
<b>4.6 Collection .....</b>	<b>47</b>
<b>4.7 Other .....</b>	<b>48</b>
<b>4.8 Conservation Efforts.....</b>	<b>49</b>
<b>4.9 Summary of Factors Influencing the Eastern Indigo Snake.....</b>	<b>56</b>

CHAPTER 5 – CURRENT CONDITIONS .....	56
<b>5.1 Methodology - Analytical Units .....</b>	<b>56</b>
<b>5.2 Resiliency .....</b>	<b>61</b>
5.2.1 <i>Population Factors that Influence Resiliency</i> .....	61
5.2.2 <i>Habitat Factors that Influence Resiliency</i> .....	62
5.2.3 <i>Overall Resiliency Calculations</i> .....	67
<b>5.3 Representation.....</b>	<b>69</b>
<b>5.4 Redundancy .....</b>	<b>70</b>
<b>5.5 Conservation Status .....</b>	<b>72</b>
<b>5.6 Current Condition Summary.....</b>	<b>74</b>
CHAPTER 6 – FUTURE CONDITIONS .....	75
<b>6.1 Future Considerations .....</b>	<b>75</b>
<b>6.2 Future Scenarios .....</b>	<b>79</b>
<b>6.3 Resiliency .....</b>	<b>81</b>
6.3.1 <i>Scenario A (Low Development)</i> .....	84
6.3.2 <i>Scenario B (Moderate Development)</i> .....	85
6.3.3 <i>Scenario C (High Development)</i> .....	87
6.3.4 <i>Scenario D (Targeted Conservation)</i> .....	88
<b>6.4 Representation and Redundancy.....</b>	<b>90</b>
<b>6.5 Future Condition Summary.....</b>	<b>92</b>
<b>6.6 Status Assessment Summary.....</b>	<b>95</b>
REFERENCES .....	97
APPENDIX A – Home Range Comparison Data and Habitat .....	113
APPENDIX B – Current Conditions Methods .....	116
APPENDIX C – Eastern Indigo Snake Rangewide Potential Habitat Model.....	131
APPENDIX D – Future Condition Methods.....	139
APPENDIX E – Conservation Focus Areas .....	149



## EXECUTIVE SUMMARY

This Species Status Assessment (SSA) reports the results of a comprehensive review for the eastern indigo snake (*Drymarchon corais couperi*, hereafter recognized by its currently accepted name, *Drymarchon couperi*). The species was listed as threatened on March 3, 1978 (USFWS 1978) under the Endangered Species Act (ESA) due to threats from habitat modification, collections for the pet trade and gassing while in gopher tortoise (*Gopherus polyphemus*) burrows (USFWS 1978). This SSA provides a thorough assessment of the species' biology, its biological status and influencing factors, and assesses the species' resource needs in the context of determining the species' viability and risk of extinction. Using the SSA framework, we consider what the species needs to maintain viability by characterizing the status of the species in terms of its resiliency, representation and redundancy (together the 3Rs). This process used the best available information to characterize viability as the ability of the eastern indigo snake to sustain populations in its natural systems over time.

The eastern indigo snake is a large, non-venomous snake with populations occurring in portions of Florida and southeastern Georgia. Historically, the eastern indigo snake occurred throughout Florida and in the coastal plain of Georgia, Alabama and Mississippi. Although the eastern indigo snake is difficult to consistently locate in the field, important life history characteristics and species needs have been learned from numerous studies. The eastern indigo snake is a diurnal species. The species prefers upland habitat types (e.g. longleaf pine sandhills, scrub, pine flatwoods, tropical hardwood hammocks, and coastal dunes), but also uses a variety of lowland and human-altered habitats. They may move seasonally between upland and lowland habitats, especially in northern portions of their range. Throughout their range, eastern indigo snakes use below-ground shelter sites for refuge, breeding, feeding and nesting. They depend on gopher tortoise burrows in xeric sandhill habitats throughout the northern portion of the species' range for overwintering shelter sites. Adult eastern indigo snakes move long distances and have very large home ranges; from several hundred to several thousand acres (tens to over a thousand hectares). On average home range sizes are larger for males, and also vary by season and latitude. Home ranges in the northern portion of the range are larger than in the southern portion. Eastern indigo snakes may live for 8 to 12 years in the wild, become sexually mature around 3.5 years of age and breed October through January. They consume a wide variety of animals, including other snakes.

The primary negative factors influencing the viability of the species are from habitat fragmentation and loss due to land use changes, especially urbanization. Urbanization includes a variety of impacts which remove or alter available habitat or impact snakes directly including: residential and commercial development, road construction and expansion, direct mortality (e.g. road mortality, human persecution), invasive species, predation and inadequate fire management. Habitat loss for coastal populations due to sea level rise is also an increasing risk.

The cooperation of many partners to implement conservation efforts can help mitigate the negative factors and positively influence long-term viability of the species. To accelerate recovery, repatriation of eastern indigo snake populations in areas of extirpation is underway. Since listing under the ESA, wild collection of eastern indigo snakes for the pet trade is no longer believed to be a significant threat. Land conservation has increased in some areas, especially where there are on-going efforts to conserve gopher tortoise populations. These conservation efforts have diminished the threat of gassing gopher tortoise burrows, and will have lasting conservation benefits for the eastern indigo snake across much of its range.

Biological populations of eastern indigo snakes are unknown; thus, for this assessment we defined populations using species' movement and home range data from the literature (i.e. buffered occurrence data by 5 miles (8 kilometers)). To maintain species viability, resilient eastern indigo snake populations need large habitat patches (>10,000 acres (> 4,046 hectares)) of good quality habitat (diverse, unfragmented, few roads), with adequate shelter sites (e.g. gopher tortoise burrows), and connectivity among one or more populations for genetic exchange. The species needs genetic and ecological diversity (representation) to maintain adaptive potential and, multiple populations (redundancy) across representative units to withstand catastrophic events. To assess current condition we measured population and habitat factors and assigned resiliency classes to populations based on the best available information on the species' biology. We then considered the representation and redundancy of populations across the species' range. To assess future conditions, we used models to forecast habitat fragmentation and loss due to urbanization and sea level rise at two future times, at years 2050 and 2070. We also considered the potential of targeted conservation action (i.e. habitat conservation and population repatriation) to improve species viability.

The current distribution for the eastern indigo snake has contracted from its historical distribution. Some of the range contraction has occurred since listing under the ESA, particularly in the Florida Panhandle (currently no resilient populations) due to the decline of gopher tortoise populations (Enge *et al.* 2013); however conservation efforts are underway to repatriate gopher tortoise and eastern indigo snake populations in this region. The overall current population resiliency is medium to low and is predicted to be low to very low in the future without targeted conservation efforts. The eastern indigo snake faces a variety of negative influencing factors from habitat fragmentation and loss, and direct mortality that are predicted to be exacerbated by urbanization and sea level rise. At least seven island populations are predicted to be extirpated due to sea level rise and many decline in resiliency as a result of urbanization. Future ecological and genetic representation decreases due to loss of resilient populations in the North Florida region, lowering the species' potential to adapt to changing environmental conditions. Low (in Southeast Georgia and Peninsular Florida) to no (in Panhandle and North Florida) redundancy in representative areas increases the species' risk to catastrophic events. One population is predicted to remain highly resilient without targeted conservation efforts aimed to protect and repatriate populations. On-going conservation efforts (e.g. gopher tortoise

conservation, habitat conservation and repatriation) are positively influencing the eastern indigo snake and are key to mitigating negative factors and ensuring long-term viability of the species. The following table provides a summary of the current and future conditions of the eastern indigo snake organized by the 3Rs.

The 3Rs Population and Species Needs	Current Condition	Future Condition (Viability): Projections based on future urbanization and sea level rise scenarios at years 2050 and 2070:
<b>Resiliency (population level):</b> <ul style="list-style-type: none"> <li>Large populations able to withstand stochastic events</li> </ul> <b>Needs</b> <ul style="list-style-type: none"> <li>High habitat quantity</li> <li>Habitat diversity</li> <li>Low habitat fragmentation</li> <li>Adequate shelter</li> <li>Population connectivity</li> </ul>	<ul style="list-style-type: none"> <li>53 (of 83) extant populations</li> <li>Population resiliency:               <ul style="list-style-type: none"> <li>4 High</li> <li>13 Medium</li> <li>28 Low</li> <li>8 Very Low</li> <li>30 Extirpated</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>46 (of 83) extant populations. Seven lost to sea level rise, and 44 to 47 very low or extirpated.</li> <li>Low urbanization rates: One highly resilient population and 6 to 10 medium resilient populations at 2050 and 2070, respectively.</li> <li>Moderate urbanization rates: One highly resilient population and 5 to 6 medium resilient populations at 2050 and 2070, respectively.</li> <li>High urbanization rates: One highly resilient population and 4 to 5 medium resilient populations at 2050 and 2070, respectively.</li> <li>Targeted Conservation: Moderate urbanization rates are mitigated via habitat conservation &amp; repatriation. By 2070, 6 highly resilient populations, 16 medium resilient and 2-4 populations repatriated.</li> </ul>
<b>Representation (species level):</b> <ul style="list-style-type: none"> <li>Genetic and ecological diversity to maintain species adaptive potential</li> </ul> <b>Needs</b> <ul style="list-style-type: none"> <li>Genetic variation exists between populations</li> <li>Ecological variation exists across geographic gradient</li> </ul>	<p>Compared to historical distribution:</p> <ul style="list-style-type: none"> <li>3 of 4 regions represented, but considerable declines in occupancy across the regions (Panhandle* 97% loss, North Florida 56% loss, Southeast Georgia 32% loss and Peninsular Florida 42% loss)</li> <li>Genetic and ecological variation retained but with losses in key areas needed for connectivity</li> </ul>	<ul style="list-style-type: none"> <li>3 of 4 regions continue to be represented but with declines across all scenarios.</li> <li>All scenarios exhibit declines in representation due to population declines across genetic and ecological gradients.</li> <li>Low, Moderate and High Urbanization scenarios: No highly resilient and 2-7 medium resilient populations remain in Peninsular Florida; no high or medium resilient populations remain in the North Florida (by 2070) or occur in the Panhandle and one highly resilient and 2 medium resilient populations in Southeast Georgia.</li> <li>Island populations are mostly lost across all scenarios due to sea level rise.</li> <li>Targeted Conservation: Number of highly resilient populations increase in Southeast Georgia (3), and are maintained in Peninsular Florida (3). North Florida populations are maintained at medium levels and 2-4 Panhandle populations are repatriated.</li> </ul>



The 3Rs Population and Species Needs	Current Condition	Future Condition (Viability): Projections based on future urbanization and sea level rise scenarios at years 2050 and 2070:
<p><b>Redundancy (species level):</b></p> <ul style="list-style-type: none"> <li>• Number and distribution of populations to withstand catastrophic events</li> </ul> <p><b>Needs</b></p> <ul style="list-style-type: none"> <li>• Multiple resilient populations in each area of representation</li> </ul>	<ul style="list-style-type: none"> <li>• 30 of 83 historical populations extirpated</li> <li>• Overall 48% decline in population extent</li> <li>• 4 highly resilient populations: Panhandle*: 0 North Florida: 0 Southeast Georgia: 1 Peninsular Florida: 3</li> </ul>	<ul style="list-style-type: none"> <li>• Low, Moderate and High Urbanization: Low (Southeast Georgia 2, Peninsular Florida 2-7) to no redundancy (North Florida, Panhandle) of medium resilient populations. No redundancy of highly resilient populations, only one remains in Southeast Georgia.</li> <li>• Targeted Conservation: 6 highly resilient populations, 16 medium resilient populations retained in key areas and some populations restored (but at medium to low levels) Panhandle: 0 High, 2-4 repatriated North Florida: 0 High, 2 Medium Southeast Georgia: 3 High, 6 Medium Peninsular Florida: 3 High, 6 Medium</li> </ul>

\* Panhandle Region includes portions of Alabama, Florida, Mississippi and Georgia. See report for detail.

**STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE**  
**U.S. Fish and Wildlife Service**  
**August 12, 2013**

The eastern indigo snake protection/education plan (Plan) below has been developed by the U.S. Fish and Wildlife Service (USFWS) in Florida for use by applicants and their construction personnel. At least **30 days prior** to any clearing/land alteration activities, the applicant shall notify the appropriate USFWS Field Office via e-mail that the Plan will be implemented as described below (North Florida Field Office: [jaxregs@fws.gov](mailto:jaxregs@fws.gov); South Florida Field Office: [verobeach@fws.gov](mailto:verobeach@fws.gov); Panama City Field Office: [panamacity@fws.gov](mailto:panamacity@fws.gov)). As long as the signatory of the e-mail certifies compliance with the below Plan (including use of the attached poster and brochure), no further written confirmation or “approval” from the USFWS is needed and the applicant may move forward with the project.

If the applicant decides to use an eastern indigo snake protection/education plan other than the approved Plan below, written confirmation or “approval” from the USFWS that the plan is adequate must be obtained. At least 30 days prior to any clearing/land alteration activities, the applicant shall submit their unique plan for review and approval. The USFWS will respond via e-mail, typically within 30 days of receiving the plan, either concurring that the plan is adequate or requesting additional information. A concurrence e-mail from the appropriate USFWS Field Office will fulfill approval requirements.

The Plan materials should consist of: 1) a combination of posters and pamphlets (see **Poster Information** section below); and 2) verbal educational instructions to construction personnel by supervisory or management personnel before any clearing/land alteration activities are initiated (see **Pre-Construction Activities** and **During Construction Activities** sections below).

### **POSTER INFORMATION**

Posters with the following information shall be placed at strategic locations on the construction site and along any proposed access roads (a final poster for Plan compliance, to be printed on 11” x 17” or larger paper and laminated, is attached):

**DESCRIPTION:** The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet in length. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. Frequently, they have orange to coral reddish coloration in the throat area, yet some specimens have been reported to only have cream coloration on the throat. These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.

**SIMILAR SNAKES:** The black racer is the only other solid black snake resembling the eastern indigo snake. However, black racers have a white or cream chin, thinner bodies, and WILL BITE if handled.

**LIFE HISTORY:** The eastern indigo snake occurs in a wide variety of terrestrial habitat types throughout Florida. Although they have a preference for uplands, they also utilize some wetlands

and agricultural areas. Eastern indigo snakes will often seek shelter inside gopher tortoise burrows and other below- and above-ground refugia, such as other animal burrows, stumps, roots, and debris piles. Females may lay from 4 - 12 white eggs as early as April through June, with young hatching in late July through October.

**PROTECTION UNDER FEDERAL AND STATE LAW:** The eastern indigo snake is classified as a Threatened species by both the USFWS and the Florida Fish and Wildlife Conservation Commission. “Taking” of eastern indigo snakes is prohibited by the Endangered Species Act without a permit. “Take” is defined by the USFWS as an attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage in any such conduct. Penalties include a maximum fine of \$25,000 for civil violations and up to \$50,000 and/or imprisonment for criminal offenses, if convicted.

Only individuals currently authorized through an issued Incidental Take Statement in association with a USFWS Biological Opinion, or by a Section 10(a)(1)(A) permit issued by the USFWS, to handle an eastern indigo snake are allowed to do so.

**IF YOU SEE A LIVE EASTERN INDIGO SNAKE ON THE SITE:**

- Cease clearing activities and allow the live eastern indigo snake sufficient time to move away from the site without interference;
- Personnel must NOT attempt to touch or handle snake due to protected status.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Immediately notify supervisor or the applicant’s designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- If the snake is located in a vicinity where continuation of the clearing or construction activities will cause harm to the snake, the activities must halt until such time that a representative of the USFWS returns the call (within one day) with further guidance as to when activities may resume.

**IF YOU SEE A DEAD EASTERN INDIGO SNAKE ON THE SITE:**

- Cease clearing activities and immediately notify supervisor or the applicant’s designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Thoroughly soak the dead snake in water and then freeze the specimen. The appropriate wildlife agency will retrieve the dead snake.

**Telephone numbers of USFWS Florida Field Offices to be contacted if a live or dead eastern indigo snake is encountered:**

**North Florida Field Office – (904) 731-3336**

**Panama City Field Office – (850) 769-0552**

**South Florida Field Office – (772) 562-3909**



## **PRE-CONSTRUCTION ACTIVITIES**

1. The applicant or designated agent will post educational posters in the construction office and throughout the construction site, including any access roads. The posters must be clearly visible to all construction staff. A sample poster is attached.
2. Prior to the onset of construction activities, the applicant/designated agent will conduct a meeting with all construction staff (annually for multi-year projects) to discuss identification of the snake, its protected status, what to do if a snake is observed within the project area, and applicable penalties that may be imposed if state and/or federal regulations are violated. An educational brochure including color photographs of the snake will be given to each staff member in attendance and additional copies will be provided to the construction superintendent to make available in the onsite construction office (a final brochure for Plan compliance, to be printed double-sided on 8.5" x 11" paper and then properly folded, is attached). Photos of eastern indigo snakes may be accessed on USFWS and/or FWC websites.
3. Construction staff will be informed that in the event that an eastern indigo snake (live or dead) is observed on the project site during construction activities, all such activities are to cease until the established procedures are implemented according to the Plan, which includes notification of the appropriate USFWS Field Office. The contact information for the USFWS is provided on the referenced posters and brochures.

## **DURING CONSTRUCTION ACTIVITIES**

1. During initial site clearing activities, an onsite observer may be utilized to determine whether habitat conditions suggest a reasonable probability of an eastern indigo snake sighting (example: discovery of snake sheds, tracks, lots of refugia and cavities present in the area of clearing activities, and presence of gopher tortoises and burrows).
2. If an eastern indigo snake is discovered during gopher tortoise relocation activities (i.e. burrow excavation), the USFWS shall be contacted within one business day to obtain further guidance which may result in further project consultation.
3. Periodically during construction activities, the applicant's designated agent should visit the project area to observe the condition of the posters and Plan materials, and replace them as needed. Construction personnel should be reminded of the instructions (above) as to what is expected if any eastern indigo snakes are seen.

## **POST CONSTRUCTION ACTIVITIES**

Whether or not eastern indigo snakes are observed during construction activities, a monitoring report should be submitted to the appropriate USFWS Field Office within 60 days of project completion. The report can be sent electronically to the appropriate USFWS e-mail address listed on page one of this Plan.

**Attachment 3:**  
**UMAM Analysis**

## **Impact UMAM Analysis**



**PART I – Qualitative Description**  
**(See Section 62-345.400, F.A.C.)**

Site/Project Name		Application Number		Assessment Area Name or Number	
Trail Ridge South				W1, W3, W6-8, W17, W19, W22, W24-27, W33, W34, W38, W41	
FLUCCs code		Further classification (optional)		Impact or Mitigation Site?	Assessment Area Size
Hydric Coniferous Plantation (441W)				Impact	216.72
Basin/Watershed Name/Number	Affected Waterbody (Class)		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)		
Santa Fe River Basin	Class III		None		
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands					
Surficial water for the site flows from the northeast to the southwest generally following the surficial topography. On-site wetlands continue off-site into a series of large contiguous systems that connect to the Santa Fe River Basin.					
Assessment area description					
These areas are wetland areas that have been cleared and are managed for silviculture. These communities are identified by the mixed wetland hardwood and conifer species intermixed with the planted pine. This wetland vegetative community has a canopy of planted slash pine with understory and groundcover vegetation consisting of scattered dahoon holly, loblolly bay, myrtle-leaf holly, swamp bay, sweet bay, fetterbush, highbush blueberry, sweet galberry, Carolina redbud, Virginia chain fern, cinnamon fern, bog button and pipewort.					
Significant nearby features			Uniqueness (considering the relative rarity in relation to the regional landscape.)		
Santa Fe Swamp			Not unique, community is common in the area		
Functions			Mitigation for previous permit/other historic use		
Provide cover, substrate, or refuge; breeding; nesting; denning; nursery area; wildlife corridor; food chain support; natural water storage; natural flow attenuation; water quality improvement			None		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found )			Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)		
Frogs (southern cricket, American green tree, southern spring peeper, southern chorus, American bullfrog, etc.), Snakes (black racer, crayfish, peninsula ribbon, Florida banded water, mud, water moccasin), Turtles (common snapping, Florida softshell, common musk, mud, Florida redbelly), Birds (swallow-tailed kite, red-tailed hawk, owl [great horned/screech], anhinga, black-crowned night-heron, blue heron, songbirds, wood duck, woodpecker, turkey, turkey vultures), Carolina anole, raccoon, bat, opossum, bobcat, deer, marsh rabbit, weasel, wild boar			Eastern indigo snake - T (state & fed), Florida pine snake - T (state), gopher tortoise - T (state); Florida sandhill crane - T (state), little blue heron - T (state), tricolored heron - T (state), wood stork - E (state & fed), bald eagle - protected under Bald and Golden Eagle Protection Act (1940) and Migratory Bird Treaty Act (1914) Amphibians\Reptiles\ Birds - feeding, roosting, brooding, nesting		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):					
Mammal species observed utilizing the site include deer, wild boar, racoon and bobcat. Bird species include red-tailed hawk, blue heron, woodpecker, songbirds and turkey vultures. Reptiles observed on the site include the Carolina anole, water moccasin, black racer and gopher tortoise. Amphibians observed include frogs.					
Additional relevant factors:					
Assessment conducted by:			Assessment date(s):		
Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)			June 4, 2019		

**PART II – Quantification of Assessment Area (impact or mitigation)**  
**(See Sections 62-345.500 and .600, F.A.C.)**

Site/Project Name	Application Number	Assessment Area Name or Number
Trail Ridge South		W1, W3, W6-8, W17, W19, W22, W24-27, W33, W34, W38, W41
Impact or Mitigation	Assessment conducted by:	Assessment date:
Impact	Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)	6/4/19

Scoring Guidance
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed

Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

<p>.500(6)(a) Location and Landscape Support</p> <p>w/o pres or current      with</p> <p>5      0</p>	<p>The assessment area is scored a 5 throughout the site based on several factors such as the site's proximity to Camp Blanding and Starke on the east and west respectively. The site is also bordered to the north by the Trail Ridge Mine site. Military exercises and maneuvers such as ordnance detonation, rifle and pistol firing ranges and tank and humvee training coupled with security measures in the form of multiple fences severely hamper wildlife movement from the east of the site. The City of Starke to the west along with residential housing to the north present issues such as multiple county roads, vehicular and pedestrian traffic, fencing and human activities that either impact or prevent wildlife movement. The tracts to the south are all currently being used as pine plantation. This land use severely hampers use by wildlife by removing forage and nesting/roosting areas through land management practices and timber cultivation.</p>
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>w/o pres or current      with</p> <p>5      0</p>	<p>The water environment for the site is similar to what is observed in most northeastern Florida pine plantations. Extensive windrows and ditching serve to move water quickly and efficiently, not only from uplands, but between wetlands and off the site. In 2007 a severe fire burned the site so severely that seed stock in several wetlands were wiped out indicating a reduced function of wetlands as a storage area for water. Water flow is generally to the west and southwest across the site and into Sampson Creek, Prevatt Creek, Double Run Creek and Theresa Slough. Ultimately these drainage basins flow to the Santa Fe River watershed.</p>
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>w/o pres or current      with</p> <p>4      0</p>	<p>This assessment area is dominated by an immature, planted slash pine (<i>Pinus elliotti</i>) overstory. Land management practices such as periodic burning, timbering and bedding have virtually eliminated other canopy and subcanopy species. The dominant herbaceous plants observed consist mostly of cinnamon fern (<i>Osmunda cinnomomea</i>) and blackstem fern (<i>Woodwardia virginica</i>) growing in the windrow beds. Aquatic animal species were not observed using this area as the windrows and associated ditching remove water from the assessment area making it unsuitable habitat.</p>

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0.46666667	0

Impact Acres =	216.72
----------------	--------

For impact assessment areas	
Functional Loss (FL) = delta x acres =	101.136

Delta = [with-current]
0.46666667



**PART I – Qualitative Description**  
**(See Section 62-345.400, F.A.C.)**

Site/Project Name		Application Number		Assessment Area Name or Number	
Trail Ridge South				D1, D3, D4, D8-D11, D13-D24	
FLUCCs code		Further classification (optional)		Impact or Mitigation Site?	
510/Ditch				Impact	
Assessment Area Size		3.72			
Basin/Watershed Name/Number		Affected Waterbody (Class)		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)	
Santa Fe River Basin		Class III		None	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands					
Surficial water for the site flows from the northeast to the southwest generally following the surficial topography. On-site wetlands continue off-site into a series of large contiguous systems that connect to the Santa Fe River Basin.					
Assessment area description					
These areas include roadside ditches and ditched flowways within wetland systems created during historical silvicultural practices. Ditches typically have defined banks that are steeply cut, and open water environments with some vegetation component.					
Significant nearby features				Uniqueness (considering the relative rarity in relation to the regional landscape.)	
Santa Fe Swamp				Not unique, community is common in the area	
Functions				Mitigation for previous permit/other historic use	
Provide cover, substrate, or refuge; breeding; nesting; denning; nursery area; wildlife corridor; food chain support; natural water storage; natural flow attenuation; water quality improvement, fire buffer				None	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found )				Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)	
Frogs (southern cricket, American green tree, southern spring peeper, southern chorus, American bullfrog, etc.), Snakes (black racer, crayfish, peninsula ribbon, Florida banded water, mud, water moccasin), Turtles (common snapping, Florida softshell, common musk, mud, Florida redbelly), Birds (swallow-tailed kite, red-tailed hawk, owl [great horned/screech], anhinga, black-crowned night-heron, blue heron, songbirds, wood duck, woodpecker, turkey, turkey vultures), Carolina anole, raccoon, bat, opossum, bobcat, deer, marsh rabbit, weasel, wild boar				Eastern indigo snake - T (state & fed), Florida pine snake - T (state), gopher tortoise - T (state); Florida sandhill crane - T (state), little blue heron - T (state), tricolored heron - T (state), wood stork - E (state & fed), bald eagle - protected under Bald and Golden Eagle Protection Act (1940) and Migratory Bird Treaty Act (1914) Amphibians\Reptiles\ Birds - feeding, roosting, brooding, nesting	
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):					
Mammal species observed utilizing the site include deer, wild boar, racoon and bobcat. Bird species include red-tailed hawk, blue heron, woodpecker, songbirds and turkey vultures. Reptiles observed on the site include the Carolina anole, water moccasin, black racer and gopher tortoise. Amphibians observed include frogs.					
Additional relevant factors:					
Assessment conducted by:				Assessment date(s):	
Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)				June 4, 2019	

**PART II – Quantification of Assessment Area (impact or mitigation)**  
**(See Sections 62-345.500 and .600, F.A.C.)**

Site/Project Name	Application Number	Assessment Area Name or Number
Trail Ridge South		D1, D3, D4, D8-D11, D13-D24
Impact or Mitigation	Assessment conducted by:	Assessment date:
Impact	Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)	6/4/19

Scoring Guidance
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed

Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

<p>.500(6)(a) Location and Landscape Support</p> <p>w/o pres or current      with</p> <p>5      0</p>	<p>The assessment area is scored a 5 throughout the site based on several factors such as the site's proximity to Camp Blanding and Starke on the east and west respectively. The site is also bordered to the north by the Trail Ridge Mine site and residential housing. Military exercises and maneuvers such as ordnance detonation, rifle and pistol firing ranges and tank and humvee training coupled with security measures in the form of multiple fences severely hamper wildlife movement from the east of the site. The City of Starke to the west along with residential housing to the north present issues such as multiple county roads, vehicular and pedestrian traffic, fencing and human activities that either impact or prevent wildlife movement. The tracts to the south are all currently being used as pine plantation. This land use severely hampers use by wildlife by removing forage and nesting/roosting areas through land management practices and timber cultivation.</p>
<p>.500(6)(b) Water Environment (n/a for uplands)</p> <p>w/o pres or current      with</p> <p>2      0</p>	<p>While streams are defined as having bed and bank systems, ditches are channelized with steep banks. In contrast to streams, ditches do not have the meandering flowways with extensive root systems, riffle-run areas and pools to provide refugia for aquatic insects and other animals such as frogs and small fish. Land management practices consistent with silvicultural activities have channelized many of the historic stream systems in order to facilitate easier removal of water from the site. Water flow is generally to the west and southwest across the site and into Sampson Creek, Prevatt Creek, Double Run Creek and Theresa Slough. Ultimately these drainage basins flow to the Sante Fe River watershed.</p>
<p>.500(6)(c) Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>w/o pres or current      with</p> <p>2      0</p>	<p>Land management practices have reduced or eliminated refugia for aquatic animals and plant species either completely or to very short durations. Typically vegetation is sprayed in order to facilitate off-site water flow. Some maidencane (<i>Panicum hemitotum</i>) and torpedo grass (<i>Panicum repens</i>) was observed.</p>

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres      with
0.3      0

Impact Acres =	3.72
----------------	------

For impact assessment areas	
Functional Loss (FL) = delta x acres =	1.116

Delta = [with-current]
0.3

**PART I – Qualitative Description**  
**(See Section 62-345.400, F.A.C.)**

Site/Project Name		Application Number		Assessment Area Name or Number	
Trail Ridge South				SW2	
FLUCCs code		Further classification (optional)		Impact or Mitigation Site?	
Lake <10 acres (524)				Impact	
Assessment Area Size		0.67			
Basin/Watershed Name/Number		Affected Waterbody (Class)		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)	
Santa Fe River Basin		Class III		None	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands					
Surficial water for the site flows from the northeast to the southwest generally following the surficial topography. On-site wetlands continue off-site into a series of large contiguous systems that connect to the Santa Fe River Basin.					
Assessment area description					
Onsite lake communities are associated with species such as water lily, american lotus, maidencane, soft rush, duckweed, duck potato, and cattails.					
Significant nearby features				Uniqueness (considering the relative rarity in relation to the regional landscape.)	
Santa Fe Swamp				Not unique, community is common in the area	
Functions				Mitigation for previous permit/other historic use	
Provide cover, substrate, or refuge; breeding; nesting; denning; nursery area; wildlife corridor; food chain support; natural water storage; natural flow attenuation; water quality improvement, fire buffer				None	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found )				Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)	
Frogs (southern cricket, American green tree, southern spring peeper, southern chorus, American bullfrog, etc.), Snakes (black racer, crayfish, peninsula ribbon, Florida banded water, mud, water moccasin), Turtles (common snapping, Florida softshell, common musk, mud, Florida redbelly), Birds (swallow-tailed kite, red-tailed hawk, owl [great horned/screech], anhinga, black-crowned night-heron, blue heron, songbirds, wood duck, woodpecker, turkey, turkey vultures), Carolina anole, raccoon, bat, opossum, bobcat, deer, marsh rabbit, weasel, wild boar				Eastern indigo snake - T (state & fed), Florida pine snake - T (state), gopher tortoise - T (state); Florida sandhill crane - T (state), little blue heron - T (state), tricolored heron - T (state), wood stork - E (state & fed), bald eagle - protected under Bald and Golden Eagle Protection Act (1940) and Migratory Bird Treaty Act (1914) Amphibians\Reptiles\ Birds - feeding, roosting, brooding, nesting	
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):					
Mammal species observed utilizing the site include deer, wild boar, racoon and bobcat. Bird species include red-tailed hawk, blue heron, woodpecker, songbirds and turkey vultures. Reptiles observed on the site include the Carolina anole, water moccasin, black racer and gopher tortoise. Amphibians observed include frogs.					
Additional relevant factors:					
Assessment conducted by:				Assessment date(s):	
Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)				June 4, 2019	



**PART II – Quantification of Assessment Area (impact or mitigation)**  
**(See Sections 62-345.500 and .600, F.A.C.)**

Site/Project Name	Application Number	Assessment Area Name or Number
Trail Ridge South		SW2
Impact or Mitigation	Assessment conducted by:	Assessment date:
Impact	Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)	6/4/19

Scoring Guidance
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed

Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

<p>.500(6)(a) Location and Landscape Support</p> <p>w/o pres or current      with</p> <p>5      0</p>	<p>The assessment area is scored a 5 throughout the site based on several factors such as the site's proximity to Camp Blanding and Starke on the east and west respectively. The site is also bordered to the north by the Trail Ridge Mine site and residential housing. Military exercises and maneuvers such as ordnance detonation, rifle and pistol firing ranges and tank and humvee training coupled with security measures in the form of multiple fences severely hamper wildlife movement from the east of the site. The City of Starke to the west along with residential housing to the north present issues such as multiple county roads, vehicular and pedestrian traffic, fencing and human activities that either impact or prevent wildlife movement. The tracts to the south are all currently being used as pine plantation. This land use severely hampers use by wildlife by removing forage and nesting/roosting areas through land management practices and timber cultivation.</p>
<p>.500(6)(b) Water Environment (n/a for uplands)</p> <p>w/o pres or current      with</p> <p>5      0</p>	<p>Lakes are non-flowing areas filled with water, localized in a basin surrounded by land apart from any river or other outlet and can have extensive root systems, and other sufficient habitat to provide refugia for aquatic insects and other animals such as frogs and small fish. Water flow is generally to the west and southwest across the site and into Sampson Creek, Prevatt Creek, Double Run Creek and Theresa Slough. Ultimately these drainage basins flow to the Santa Fe River watershed.</p>
<p>.500(6)(c) Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>w/o pres or current      with</p> <p>5      0</p>	<p>Land management practices have reduced or eliminated refugia for aquatic animals and plant species either completely or to very short durations. Typically vegetation is sprayed in order to facilitate off-site water flow. Some maidencane (<i>Panicum hemitomum</i>) and torpedo grass (<i>Panicum repens</i>) was observed.</p>

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres      with
0.5      0

Impact Acres =	0.67
----------------	------

For impact assessment areas	
Functional Loss (FL) = delta x acres =	0.335

Delta = [with-current]
0.5

**PART I – Qualitative Description**  
**(See Section 62-345.400, F.A.C.)**

Site/Project Name		Application Number		Assessment Area Name or Number	
Trail Ridge South				W24	
FLUCCs code		Further classification (optional)		Impact or Mitigation Site?	
Gum Swamp (613)				Impact	
				0.21	
Basin/Watershed Name/Number		Affected Waterbody (Class)		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)	
Santa Fe River Basin		Class III		None	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands					
Surficial water for the site flows from the northeast to the southwest generally following the surficial topography. On-site wetlands continue off-site into a series of large contiguous systems that connect to the Santa Fe River Basin.					
Assessment area description					
The gum swamp forested communities are dominated by blackgum. Associated species include bald cypress, slash pine, swamp bay, and sweet bay.					
Significant nearby features				Uniqueness (considering the relative rarity in relation to the regional landscape.)	
Santa Fe Swamp				Not unique, community is common in the area	
Functions				Mitigation for previous permit/other historic use	
Provide cover, substrate, or refuge; breeding; nesting; denning; nursery area; wildlife corridor; food chain support; natural water storage; natural flow attenuation; water quality improvement, fire buffer				None	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found )				Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)	
Frogs (southern cricket, American green tree, southern spring peeper, southern chorus, American bullfrog, etc.), Snakes (black racer, crayfish, peninsula ribbon, Florida banded water, mud, water moccasin), Turtles (common snapping, Florida softshell, common musk, mud, Florida redbelly), Birds (swallow-tailed kite, red-tailed hawk, owl [great horned/screech], anhinga, black-crowned night-heron, blue heron, songbirds, wood duck, woodpecker, turkey, turkey vultures), Carolina anole, raccoon, bat, opossum, bobcat, deer, marsh rabbit, weasel, wild boar				Eastern indigo snake - T (state & fed), Florida pine snake - T (state), gopher tortoise - T (state); Florida sandhill crane - T (state), little blue heron - T (state), tricolored heron - T (state), wood stork - E (state & fed), bald eagle - protected under Bald and Golden Eagle Protection Act (1940) and Migratory Bird Treaty Act (1914) Amphibians\Reptiles\ Birds - feeding, roosting, brooding, nesting	
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):					
Mammal species observed utilizing the site include deer, wild boar, racoon and bobcat. Bird species include red-tailed hawk, blue heron, woodpecker, songbirds and turkey vultures. Reptiles observed on the site include the Carolina anole, water moccasin, black racer and gopher tortoise. Amphibians observed include frogs.					
Additional relevant factors:					
Assessment conducted by:				Assessment date(s):	
Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)				June 4, 2019	

**PART II – Quantification of Assessment Area (impact or mitigation)**  
**(See Sections 62-345.500 and .600, F.A.C.)**

Site/Project Name	Application Number	Assessment Area Name or Number
Trail Ridge South		W24
Impact or Mitigation	Assessment conducted by:	Assessment date:
Impact	Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)	6/4/19

Scoring Guidance
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed

Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

<p>.500(6)(a) Location and Landscape Support</p> <p>w/o pres or current      with</p> <p>5      0</p>	<p>The assessment area is scored a 5 throughout the site based on several factors such as the site's proximity to Camp Blanding and Starke on the east and west respectively. The site is also bordered to the north by the Trail Ridge Mine site and residential housing. Military exercises and maneuvers such as ordinance detonation, rifle and pistol firing ranges and tank and humvee training coupled with security measures in the form of multiple fences severely hamper wildlife movement from the east of the site. The City of Starke to the west along with residential housing to the north present issues such as multiple county roads, vehicular and pedestrian traffic, fencing and human activities that either impact or prevent wildlife movement. The tracts to the south are all currently being used as pine plantation. This land use severely hampers use by wildlife by removing forage and nesting/roosting areas through land management practices and timber cultivation.</p>
<p>.500(6)(b) Water Environment (n/a for uplands)</p> <p>w/o pres or current      with</p> <p>5      0</p>	<p>Ditching and draining throughout the site have resulted in a deficient water regime within this wetland. Extensive windrows and ditching serve to remove water quickly and efficiently, not only from uplands, but between wetlands and off the site. In 2007 a severe fire burned the site so severely that seed stock in several wetlands were wiped out indicating a reduced function of wetlands as a storage area for water. Water level indicators, such as moss rings on the trees, indicate a lower than expected water table throughout the wetland. Water flow is generally to the west and southwest across the site and into Sampson Creek, Prevatt Creek, Double Run Creek and Theresa Slough. Ultimately these drainage basins flow to the Santa Fe River watershed.</p>
<p>.500(6)(c) Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>w/o pres or current      with</p> <p>5      0</p>	<p>This assessment area is dominated by immature swamp tupelo (<i>Nyssa sylvatica</i> var. <i>biflora</i>). An abnormally thick subcanopy consisting of wax myrtle (<i>Myrica cerifera</i>), loblolly bay (<i>Gordonia lasianthus</i>), and sweet bay (<i>Magnolia virginiana</i>) with an understory of blackstem fern (<i>Woodwardia virginica</i>), cinnamon fern (<i>Osmunda cinnomomea</i>), red root (<i>Lachnanthes caroliniana</i>) and greenbriar (<i>Smilax laurifolia</i>) is evident. At first glance the species appear to be appropriate, however the age distribution indicates an impacted system. There are very few mature trees to provide new seed stock and no standing snags to provide roosting and nesting opportunities. Land management practices have reduced or eliminated refugia for aquatic animals either completely or to very short durations.</p>

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0.5	0

Impact Acres =	0.21
----------------	------

For impact assessment areas	
Functional Loss (FL) = delta x acres =	0.105

Delta = [with-current]
0.5



**PART I – Qualitative Description  
(See Section 62-345.400, F.A.C.)**

Site/Project Name		Application Number		Assessment Area Name or Number	
Trail Ridge South				W1, W3, W5-W8, W19, W21, W22, W24, W28, W32, W34	
FLUCCs code		Further classification (optional)		Impact or Mitigation Site?	
Wetland Forested Mixed (630)				Impact	
Assessment Area Size		375.21			
Basin/Watershed Name/Number		Affected Waterbody (Class)		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)	
Santa Fe River Basin		Class III		None	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands					
Surficial water for the site flows from the northeast to the southwest generally following the surficial topography. On-site wetlands continue off-site into a series of large contiguous systems that connect to the Santa Fe River Basin.					
Assessment area description					
The wetland forested mixed land use is the most prevalent wetland land use within the project area. These areas are typically lower in elevation than the adjacent upland pine plantation and as such have deeper and longer hydroperiods. These areas are co-dominated by a mixed canopy of slash pine, bald cypress, pond cypress, blackgum, red maple, loblolly bay, swamp bay, and sweet bay. Typical understory species include dahoon holly, myrtle-leaved holly, fetterbush, sweet gallberry, wax myrtle, St. John's wort, Virginia chain fern, and cinnamon fern.					
Significant nearby features				Uniqueness (considering the relative rarity in relation to the regional landscape.)	
Santa Fe Swamp				Not unique, community is common in the area	
Functions				Mitigation for previous permit/other historic use	
Provide cover, substrate, or refuge; breeding; nesting; denning; nursery area; wildlife corridor; food chain support; natural water storage; natural flow attenuation; water quality improvement				None	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found )				Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)	
Frogs (southern cricket, American green tree, southern spring peeper, southern chorus, American bullfrog, etc.), Snakes (black racer, crayfish, peninsula ribbon, Florida banded water, mud, water moccasin), Turtles (common snapping, Florida softshell, common musk, mud, Florida redbelly), Birds (swallow-tailed kite, red-tailed hawk, owl [great horned/screech], anhinga, black-crowned night-heron, blue heron, songbirds, wood duck, woodpecker, turkey, turkey vultures), Carolina anole, raccoon, bat, opossum, bobcat, deer, marsh rabbit, weasel, wild boar				Eastern indigo snake - T (state & fed), Florida pine snake - T (state), gopher tortoise - T (state); Florida sandhill crane - T (state), little blue heron - T (state), tricolored heron - T (state), wood stork - E (state & fed), bald eagle - protected under Bald and Golden Eagle Protection Act (1940) and Migratory Bird Treaty Act (1914) Amphibians\Reptiles\ Birds - feeding, roosting, brooding, nesting	
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):					
Mammal species observed utilizing the site include deer, wild boar, racoon and bobcat. Bird species include red-tailed hawk, blue heron, woodpecker, songbirds and turkey vultures. Reptiles observed on the site include the Carolina anole, water moccasin, black racer and gopher tortoise. Amphibians observed include frogs.					
Additional relevant factors:					
Assessment conducted by:				Assessment date(s):	
Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)				June 4, 2019	

**PART II – Quantification of Assessment Area (impact or mitigation)**  
**(See Sections 62-345.500 and .600, F.A.C.)**

Site/Project Name	Application Number	Assessment Area Name or Number
Trail Ridge South		W1, W3, W5-W8, W19, W21, W22, W24, W28, W32, W34
Impact or Mitigation	Assessment conducted by:	Assessment date:
Impact	Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)	6/4/19

Scoring Guidance
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed

Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

<p>.500(6)(a) Location and Landscape Support</p> <p>w/o pres or current      with</p> <p>5      0</p>	<p>The assessment area is scored a 5 throughout the site based on several factors such as the site's proximity to Camp Blanding and Starke on the east and west respectively. The site is also bordered to the north by the Trail Ridge Mine site and residential housing. Military exercises and maneuvers such as ordinance detonation, rifle and pistol firing ranges and tank and humvee training coupled with security measures in the form of multiple fences severely hamper wildlife movement from the east of the site. The City of Starke to the west along with residential housing to the north present issues such as multiple county roads, vehicular and pedestrian traffic, fencing and human activities that either impact or prevent wildlife movement. The tracts to the south are all currently being used as pine plantation. This land use severely hampers use by wildlife by removing forage and nesting/roosting areas through land management practices and timber cultivation.</p>
<p>.500(6)(b)Water Environment for uplands) (n/a)</p> <p>w/o pres or current      with</p> <p>5      0</p>	<p>Ditching and draining throughout the site have resulted in a deficient water regime within this wetland. Extensive windrows and ditching serve to remove water quickly and efficiently, not only from uplands, but between wetlands and off the site. In 2007 a severe fire burned the site so severely that seed stock in several wetlands were wiped out indicating a reduced function of wetlands as a storage area for water. Water level indicators, such as moss rings on the trees, indicate a lower than expected water table throughout the wetland. Water flow is generally to the west and southwest across the site and into Sampson Creek, Prevatt Creek, Double Run Creek and Theresa Slough. Ultimately these drainage basins flow to the Sante Fe River watershed.</p>
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>w/o pres or current      with</p> <p>5      0</p>	<p>The canopy within this assessment area is a mixture of slash pine (<i>Pinus elliotii</i>), red maple (<i>Acer rubrum</i>), loblolly bay (<i>Gordonia lasianthus</i>), sweet bay (<i>Magnolia virginiana</i>), bald cypress (<i>Taxodium distichum</i>) and pond cypress (<i>Taxodium ascendens</i>) canopy. A subcanopy consisting of red maple (<i>Acer rubrum</i>), wax myrtle (<i>Myrica cerifera</i>), fetterbush (<i>Lyonia lucida</i>) and gallberry (<i>Ilex glabra</i>) with an understory of blackstem fern (<i>Woodwardia virginica</i>), cinnamon fern (<i>Osmunda cinnomomea</i>), red root (<i>Lachnanthes caroliniana</i>) and greenbriar (<i>Smilax laurifolia</i>) is evident. At first glance the species appear to be appropriate, however the age distribution indicates an impacted system. There are very few mature trees to provide new seed stock and no standing snags to provide roosting and nesting opportunities. Land management practices have reduced or eliminated refugia for aquatic animals either completely or to very short durations.</p>

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres      with
0.5      0

Impact Acres =	375.21
----------------	--------

For impact assessment areas
Functional Loss (FL) = delta x acres = <b>187.605</b>

Delta = [with-current]
0.5

**PART I – Qualitative Description**  
**(See Section 62-345.400, F.A.C.)**

Site/Project Name		Application Number		Assessment Area Name or Number	
Trail Ridge South				W12, W16	
FLUCCs code		Further classification (optional)		Impact or Mitigation Site?	Assessment Area Size
Wetland Scrub (631)				Impact	15.82
Basin/Watershed Name/Number	Affected Waterbody (Class)		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)		
Santa Fe River Basin	Class III		None		
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands					
Surficial water for the site flows from the northeast to the southwest generally following the surficial topography. On-site wetlands continue off-site into a series of large contiguous systems that connect to the Santa Fe River Basin.					
Assessment area description					
The wetland scrub communities are associated with species such as pond cypress, blackgum, coastal plain willow, and other low shrubs with no dominant species. They are typically found in topographical depressions and have poorly drained soils.					
Significant nearby features			Uniqueness (considering the relative rarity in relation to the regional landscape.)		
Sante Fe Swamp			Not unique, community is common in the area		
Functions			Mitigation for previous permit/other historic use		
Provide cover, substrate, or refuge; breeding; nesting; denning; nursery area; wildlife corridor; food chain support; natural water storage; natural flow attenuation; water quality improvement			None		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found )			Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)		
Frogs (southern cricket, American green tree, southern spring peeper, southern chorus, American bullfrog, etc.), Snakes (black racer, crayfish, peninsula ribbon, Florida banded water, mud, water moccasin), Turtles (common snapping, Florida softshell, common musk, mud, Florida redbelly), Birds (swallow-tailed kite, red-tailed hawk, owl [great horned/screech], anhinga, black-crowned night-heron, blue heron, songbirds, wood duck, woodpecker, turkey, turkey vultures), Carolina anole, raccoon, bat, opossum, bobcat, deer, marsh rabbit, weasel, wild boar			Eastern indigo snake - T (state & fed), Florida pine snake - T (state), gopher tortoise - T (state); Florida sandhill crane - T (state), little blue heron - T (state), tricolored heron - T (state), wood stork - E (state & fed), bald eagle - protected under Bald and Golden Eagle Protection Act (1940) and Migratory Bird Treaty Act (1914) Amphibians\Reptiles\ Birds - feeding, roosting, brooding, nesting		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):					
Mammal species observed utilizing the site include deer, wild boar, racoon and bobcat. Bird species include red-tailed hawk, blue heron, woodpecker, songbirds and turkey vultures. Reptiles observed on the site include the Carolina anole, water moccasin, black racer and gopher tortoise. Amphibians observed include frogs.					
Additional relevant factors:					
Assessment conducted by:			Assessment date(s):		
Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)			June 4, 2019		



**PART II – Quantification of Assessment Area (impact or mitigation)**  
**(See Sections 62-345.500 and .600, F.A.C.)**

Site/Project Name	Application Number	Assessment Area Name or Number
Trail Ridge South		W12, W16
Impact or Mitigation	Assessment conducted by:	Assessment date:
Impact	Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)	6/4/19

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

<p>.500(6)(a) Location and Landscape Support</p> <p>w/o pres or current      with</p> <p>5      0</p>	<p>The assessment area is scored a 5 throughout the site based on several factors such as the site's proximity to Camp Blanding and Starke on the east and west respectively. The site is also bordered to the north by the Trail Ridge Mine site and residential housing. Military exercises and maneuvers such as ordinance detonation, rifle and pistol firing ranges and tank and humvee training coupled with security measures in the form of multiple fences severely hamper wildlife movement from the east of the site. The City of Starke to the west along with residential housing to the north present issues such as multiple county roads, vehicular and pedestrian traffic, fencing and human activities that either impact or prevent wildlife movement. The tracts to the south are all currently being used as pine plantation. This land use severely hampers use by wildlife by removing forage and nesting/roosting areas through land management practices and timber cultivation.</p>
<p>.500(6)(b)Water Environment for uplands) (n/a)</p> <p>w/o pres or current      with</p> <p>4      0</p>	<p>Ditching and draining throughout the site have resulted in a deficient water regime within this wetland. Extensive windrows and ditching serve to remove water quickly and efficiently, not only from uplands, but between wetlands and off the site. In 2007 a severe fire burned the site so severely that seed stock in several wetlands were wiped out indicating a reduced function of wetlands as a storage area for water. Water level indicators, such as moss rings on the trees, indicate a lower than expected water table throughout the wetland. Water flow is generally to the west and southwest across the site and into Sampson Creek, Prevatt Creek, Double Run Creek and Theresa Slough. Ultimately these drainage basins flow to the Sante Fe River watershed.</p>
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>w/o pres or current      with</p> <p>3      0</p>	<p>No canopy species occur within the assesment area. The dense subcanopy consists of red maple (<i>Acer rubrum</i>), wax myrtle (<i>Myrica cerifera</i>), fetterbush (<i>Lyonia lucida</i>) and gallberry (<i>Ilex glabra</i>) with an sparse understory of blackstem fern (<i>Woodwardia virginica</i>), cinnamon fern (<i>Osmunda cinnomomea</i>), red root (<i>Lachnanthes caroliniana</i>) and greenbriar (<i>Smilax laurifolia</i>) is evident. At first glance the species appear to be appropriate however the age distribution indicates an impacted system. There are very few mature trees to provide new seed stock and no standing snags to provide roosting and nesting opportunities. Land management practices have reduced or eliminated refugia for aquatic animals either completely or to very short durations.</p>

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0.4	0

Impact Acres =	15.82
----------------	-------

For impact assessment areas	
Functional Loss (FL) = delta x acres =	6.328

Delta = [with-current]
0.4

**PART I – Qualitative Description**  
**(See Section 62-345.400, F.A.C.)**

Site/Project Name		Application Number		Assessment Area Name or Number	
Trail Ridge South				W3, W16, W19, W21, W33, W34, W39	
FLUCCs code		Further classification (optional)		Impact or Mitigation Site?	
Freshwater Marshes (641)				Impact	
				79.79	
Basin/Watershed Name/Number		Affected Waterbody (Class)		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)	
Santa Fe River Basin		Class III		None	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands					
Surficial water for the site flows from the northeast to the southwest generally following the surficial topography. On-site wetlands continue off-site into a series of large contiguous systems that connect to the Santa Fe River Basin.					
Assessment area description					
The freshwater marsh communities are non-forested areas of emergent wetland vegetation. Several areas consist of formerly forested systems that had their canopies destroyed during previous wildfires and no regeneration of canopy species has occurred. Vegetation within these areas includes cattail, sand cordgrass, maidencane, Carolina redroot, yellow-eyed grass, arrowheads, soft rush, and St. John's wort.					
Significant nearby features				Uniqueness (considering the relative rarity in relation to the regional landscape.)	
Santa Fe Swamp				Not unique, community is common in the area	
Functions				Mitigation for previous permit/other historic use	
Provide cover, substrate, or refuge; breeding; nesting; denning; nursery area; wildlife corridor; food chain support; natural water storage; natural flow attenuation; water quality improvement				None	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found )				Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)	
Frogs (southern cricket, American green tree, southern spring peeper, southern chorus, American bullfrog, etc.), Snakes (black racer, crayfish, peninsula ribbon, Florida banded water, mud, water moccasin), Turtles (common snapping, Florida softshell, common musk, mud, Florida redbelly), Birds (swallow-tailed kite, red-tailed hawk, owl [great horned/screech], anhinga, black-crowned night-heron, blue heron, songbirds, wood duck, woodpecker, turkey, turkey vultures), Carolina anole, raccoon, bat, opossum, bobcat, deer, marsh rabbit, weasel, wild boar				Eastern indigo snake - T (state & fed), Florida pine snake - T (state), gopher tortoise - T (state); Florida sandhill crane - T (state), little blue heron - T (state), tricolored heron - T (state), wood stork - E (state & fed), bald eagle - protected under Bald and Golden Eagle Protection Act (1940) and Migratory Bird Treaty Act (1914) Amphibians\Reptiles\ Birds - feeding, roosting, brooding, nesting	
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):					
Mammal species observed utilizing the site include deer, wild boar, racoon and bobcat. Bird species include red-tailed hawk, blue heron, woodpecker, songbirds and turkey vultures. Reptiles observed on the site include the Carolina anole, water moccasin, black racer and gopher tortoise. Amphibians observed include frogs.					
Additional relevant factors:					
Assessment conducted by:				Assessment date(s):	
Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)				June 4, 2019	

**PART II – Quantification of Assessment Area (impact or mitigation)**  
**(See Sections 62-345.500 and .600, F.A.C.)**

Site/Project Name	Application Number	Assessment Area Name or Number
Trail Ridge South		W3, W16, W19, W21, W33, W34, W39
Impact or Mitigation	Assessment conducted by:	Assessment date:
Impact	Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)	6/4/19

Scoring Guidance
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed

Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support	w/o pres or current	with	<p>The assessment area is scored a 5 throughout the site based on several factors such as the site's proximity to Camp Blanding and Starke on the east and west respectively. The site is also bordered to the north by the Trail Ridge Mine site and residential housing. Military exercises and maneuvers such as ordinance detonation, rifle and pistol firing ranges and tank and humvee training coupled with security measures in the form of multiple fences severely hamper wildlife movement from the east of the site. The City of Starke to the west along with residential housing to the north present issues such as multiple county roads, vehicular and pedestrian traffic, fencing and human activities that either impact or prevent wildlife movement. The tracts to the south are all currently being used as pine plantation. This land use severely hampers use by wildlife by removing forage and nesting/roosting areas through land management practices and timber cultivation.</p>
	5	0	
.500(6)(b)Water Environment for uplands) (n/a)	w/o pres or current	with	<p>Ditching and draining throughout the site have resulted in a deficient water regime within this wetland. Extensive windrows and ditching serve to remove water quickly and efficiently, not only from uplands, but between wetlands and off the site. In 2007 a severe fire burned the site so severely that seed stock in several wetlands were wiped out indicating a reduced function of wetlands as a storage area for water. This assessment area is a direct result of the fires as the areas were previously Wetland Forested Mix (630). Water flow is generally to the west and southwest across the site and into Sampson Creek, Prevatt Creek, Double Run Creek and Theresa Slough. Ultimately these drainage basins flow to the Sante Fe River watershed.</p>
	5	0	
.500(6)(c)Community structure  1. Vegetation and/or 2. Benthic Community	w/o pres or current	with	<p>The canopy within this assessment area was destroyed in the 2007 fire. No regrowth has been observed. A subcanopy consisting of St. John's wort (<i>Hypericum</i> spp), wax myrtle (<i>Myrica cerifera</i>), fetterbush (<i>Lyonia lucida</i>) and gallberry (<i>Ilex glabra</i>) with an understory of cattails (<i>Typha</i> spp), duck potato (<i>Sagittaria latifolia</i>), pickerelweed (<i>Pontedaria cordata</i>), blackstem fern (<i>Woodwardia virginica</i>), cinnamon fern (<i>Osmunda cinnomomea</i>), Carolina red root (<i>Lachnanthes caroliniana</i>) and greenbriar (<i>Smilax laurifolia</i>) is evident. At first glance the species appear to be appropriate however this system did not exist on the site prior to 2007. All adult tree species as well as the seed stock to replenish them appear to have burned with little to no natural recruitment taking place. Land management practices have reduced or eliminated refugia for aquatic animals either completely or to very short durations.</p>
	5	0	

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0.5	0

Impact Acres =	79.79
----------------	-------

For impact assessment areas	
Functional Loss (FL) = delta x acres =	<b>39.895</b>

Delta = [with-current]
0.5



**Mitigation UMAM Analysis**

**PART I – Qualitative Description**  
**(See Section 62-345.400, F.A.C.)**

Site/Project Name		Application Number		Assessment Area Name or Number	
Trail Ridge South				1D	
FLUCCs code		Further classification (optional)		Impact or Mitigation Site?	
Bay Swamp (611)				Mitigation	
Assessment Area Size		1.29			
Basin/Watershed Name/Number		Affected Waterbody (Class)		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)	
Santa Fe River Basin		Class III		None	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands					
Surficial water for the site flows from the northeast to the southwest generally following the surficial topography. On-site wetlands continue off-site into a series of large contiguous systems that connect to the Santa Fe River Basin.					
Assessment area description					
The bay swamp forested communities are dominated by bay species such as loblolly bay, swamp bay, and sweet bay. Slash pine, pond pine, and loblolly pine are often components of the tree stratum and understory vegetation includes gallberry, wax myrtle, and fetterbush.					
Significant nearby features				Uniqueness (considering the relative rarity in relation to the regional landscape.)	
Santa Fe Swamp				Not unique, community is common in the area	
Functions				Mitigation for previous permit/other historic use	
provide cover, substrate, or refuge; breeding; nesting; denning; nursery area; wildlife corridor; food chain support; natural water storage; natural flow attenuation; water quality improvement				None	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found )				Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)	
Frogs (southern cricket, American green tree, southern spring peeper, southern chorus, American bullfrog, etc.), Snakes (black racer, crayfish, peninsula ribbon, Florida banded water, mud, water moccasin), Turtles (common snapping, Florida softshell, common musk, mud, Florida redbelly), Birds (swallow-tailed kite, red-tailed hawk, owl [great horned/screech], anhinga, black-crowned night-heron, blue heron, songbirds, wood duck, woodpecker, turkey, turkey vultures), Carolina anole, raccoon, bat, opossum, bobcat, deer, marsh rabbit, weasel, wild boar				Eastern indigo snake - T (state & fed), Florida pine snake - T (state), gopher tortoise - T (state); Florida sandhill crane - T (state), little blue heron - T (state), tricolored heron - T (state), wood stork - E (state & fed), bald eagle - protected under Bald and Golden Eagle Protection Act (1940) and Migratory Bird Treaty Act (1914) Amphibians\Reptiles\ Birds - feeding, roosting, brooding, nesting	
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):					
Mammal species observed utilizing the site include deer, wild boar, racoon and bobcat. Bird species include red-tailed hawk, blue heron, woodpecker, songbirds and turkey vultures. Reptiles observed on the site include the Carolina anole, water moccasin, black racer and gopher tortoise. Amphibians observed include frogs.					
Additional relevant factors:					
Assessment conducted by:				Assessment date(s):	
Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)				11/8/2019	

**PART II – Quantification of Assessment Area (impact or mitigation)**  
**(See Sections 62-345.500 and .600, F.A.C.)**

Site/Project Name	Application Number	Assessment Area Name or Number
Trail Ridge South		1D
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)	11/8/19

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

<p>.500(6)(a) Location and Landscape Support</p> <p>w/o pres or current      with</p> <p>0      7</p>	<p>Location and Landscape Support has a functional lift based on the efforts not only within the assessment areas but also adjacent upland buffers and surrounding uplands across the site. The site has been used for silviculture for decades reducing the benefit to wildlife and the ability to provide benefits to downstream environments because of ditching and draining. Fifty foot upland buffers planted as enhanced hardwood-conifer mixed (434) FLUCCS type will be placed around all of the wetlands, while the remaining uplands on site will be planted as pine flatwoods (411) to more closely resemble historic ecosystems prior to the present day coniferous plantation (441). The pine flatwoods community will be managed by prescribed burns every 3-5 years and be placed on a 80 year timber rotation to maintain appropriate age distribution.</p>
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>w/o pres or current      with</p> <p>0      7</p>	<p>Water Environment will be enhanced in several ways. All windrows, ditches, berms and cuts associated with silviculture will be removed. This will restore the natural sheet flow of the various systems on site, allowing the wetlands to more completely filter water prior to its continuing off-site as well as reducing high flow rates that can cause downstream erosion and flooding. In addition, several large flow-ways that had either been altered or severed during previous mining events will be restored and reconnected to historic drainage patterns and wetlands which will result in healthier wetlands on-site and downstream.</p>
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>w/o pres or current      with</p> <p>0      7</p>	<p>Vegetative target communities are based on several factors including what is currently located on site and the historic features that existed prior to impact by previous land owners. Impacted wetlands will be replaced acre for acre and type for type and planted only with appropriate wetland tree species. A 50' upland buffer of hardwood-conifer mixed (434) will be placed around each wetland providing much better forage and refuge opportunities than is provided by pine plantation (441). Removing ditches and drains and allowing for more natural sheet flow will also provide enhanced habitat for aquatic insects, amphibians and fish.</p>

Score = sum of above scores/30 (if uplands, divide by 20)
current      with
or w/o pres
0      0.70

If preservation as mitigation,
Preservation adjustment factor =      N/A
Adjusted mitigation delta =      N/A

For mitigation assessment areas
RFG=delta/(t-factor x risk)=      0.370

Delta = [with mitigation-current]
0.70

Mitigation
Time lag (t-factor) =      1.26
Risk factor (RF) =      1.5

Mitigation Area Size (acres)	1.29
Fuctional Gain (FG) (RFG x acres)	0.478



**PART I – Qualitative Description**  
**(See Section 62-345.400, F.A.C.)**

Site/Project Name		Application Number		Assessment Area Name or Number	
Trail Ridge South				7	
FLUCCs code		Further classification (optional)		Impact or Mitigation Site?	Assessment Area Size
Gum Swamp (613)				Migitation	0.21
Basin/Watershed Name/Number	Affected Waterbody (Class)		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)		
Santa Fe River Basin	Class III		None		
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands					
Surficial water for the site flows from the northeast to the southwest generally following the surficial topography. On-site wetlands continue off-site into a series of large contiguous systems that connect to the Santa Fe River Basin.					
Assessment area description					
The gum swamp forested communities are dominated by blackgum. Associated species include bald cypress, slash pine, swamp bay, and sweet bay.					
Significant nearby features			Uniqueness (considering the relative rarity in relation to the regional landscape.)		
Santa Fe Swamp			Not unique, community is common in the area		
Functions			Mitigation for previous permit/other historic use		
Provide cover, substrate, or refuge; breeding; nesting; denning; nursery area; wildlife corridor; food chain support; natural water storage; natural flow attenuation; water quality improvement			None		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found )			Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)		
Frogs (southern cricket, American green tree, southern spring peeper, southern chorus, American bullfrog, etc.), Snakes (black racer, crayfish, peninsula ribbon, Florida banded water, mud, water moccasin), Turtles (common snapping, Florida softshell, common musk, mud, Florida redbelly), Birds (swallow-tailed kite, red-tailed hawk, owl [great horned/screech], anhinga, black-crowned night-heron, blue heron, songbirds, wood duck, woodpecker, turkey, turkey vultures), Carolina anole, raccoon, bat, opossum, bobcat, deer, marsh rabbit, weasel, wild boar			Eastern indigo snake - T (state & fed), Florida pine snake - T (state), gopher tortoise - T (state); Florida sandhill crane - T (state), little blue heron - T (state), tricolored heron - T (state), wood stork - E (state & fed), bald eagle - protected under Bald and Golden Eagle Protection Act (1940) and Migratory Bird Treaty Act (1914) Amphibians\Reptiles\ Birds - feeding, roosting, brooding, nesting		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):					
Mammal species observed utilizing the site include deer, wild boar, racoon and bobcat. Bird species include red-tailed hawk, blue heron, woodpecker, songbirds and turkey vultures. Reptiles observed on the site include the Carolina anole, water moccasin, black racer and gopher tortoise. Amphibians observed include frogs.					
Additional relevant factors:					
Assessment conducted by:			Assessment date(s):		
Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)			11/8/2019		

**PART II – Quantification of Assessment Area (impact or mitigation)**  
**(See Sections 62-345.500 and .600, F.A.C.)**

Site/Project Name	Application Number	Assessment Area Name or Number
Trail Ridge South		7
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)	11/8/19

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

<p>.500(6)(a) Location and Landscape Support</p> <p>w/o pres or current      with</p> <p>0      7</p>	<p>Location and Landscape Support has a functional lift based on the efforts not only within the assessment areas but also adjacent upland buffers and surrounding uplands across the site. The site has been used for silviculture for decades reducing the benefit to wildlife and the ability to provide benefits to downstream environments because of ditching and draining. Fifty foot upland buffers planted as enhanced hardwood-conifer mixed (434) FLUCCS type will be placed around all of the wetlands, while the remaining uplands on site will be planted as pine flatwoods (411) to more closely resemble historic ecosystems prior to the present day coniferous plantation (441). The pine flatwoods community will be managed by prescribed burns every 3-5 years and be placed on a 80 year timber rotation to maintain appropriate age distribution.</p>
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>w/o pres or current      with</p> <p>0      7</p>	<p>Water Environment will be enhanced in several ways. All windrows, ditches, berms and cuts associated with silviculture will be removed. This will restore the natural sheet flow of the various systems on site, allowing the wetlands to more completely filter water prior to its continuing off-site as well as reducing high flow rates that can cause downstream erosion and flooding. In addition, several large flow-ways that had either been altered or severed during previous mining events will be restored and reconnected to historic drainage patterns and wetlands which will result in healthier wetlands on-site and downstream.</p>
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>w/o pres or current      with</p> <p>0      7</p>	<p>Vegetative target communities are based on several factors including what is currently located on site and the historic features that existed prior to impact by previous land owners. Impacted wetlands will be replaced acre for acre and type for type and planted only with appropriate wetland tree species. A 50' upland buffer of hardwood-conifer mixed (434) will be placed around each wetland providing much better forage and refuge opportunities than is provided by pine plantation (441). Removing ditches and drains and allowing for more natural sheet flow will also provide enhanced habitat for aquatic insects, amphibians and fish.</p>

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres      with
0      0.70

If preservation as mitigation,
Preservation adjustment factor = N/A
Adjusted mitigation delta = N/A

For mitigation assessment areas
RFG=delta/(t-factor x risk)= 0.370

Delta = [with mitigation-current]
0.70

Mitigation
Time lag (t-factor) = 1.26
Risk factor (RF) = 1.5

Mitigation Area Size (acres)	0.21
Fuctional Gain (FG) (RFG x acres)	0.078

**PART I – Qualitative Description  
(See Section 62-345.400, F.A.C.)**

Site/Project Name		Application Number		Assessment Area Name or Number	
Trail Ridge South				8	
FLUCCs code		Further classification (optional)		Impact or Mitigation Site?	
Cypress (621)				Mitigation	
				0.51	
Basin/Watershed Name/Number		Affected Waterbody (Class)		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)	
Santa Fe River Basin		Class III		None	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands					
Surficial water for the site flows from the northeast to the southwest generally following the surficial topography. On-site wetlands continue off-site into a series of large contiguous systems that connect to the Santa Fe River Basin.					
Assessment area description					
Onsite cypress communities are pre-dominantly composed of either pond cypress or bald cypress and are associated with depressional and floodplain wetland systems. Associated species include blackgum, slash pine, titi, red maple, and water hickory.					
Significant nearby features				Uniqueness (considering the relative rarity in relation to the regional landscape.)	
Santa Fe Swamp				Not unique, community is common in the area	
Functions				Mitigation for previous permit/other historic use	
Provide cover, substrate, or refuge; breeding; nesting; denning; nursery area; wildlife corridor; food chain support; natural water storage; natural flow attenuation; water quality improvement				None	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found )				Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)	
Frogs (southern cricket, American green tree, southern spring peeper, southern chorus, American bullfrog, etc.), Snakes (black racer, crayfish, peninsula ribbon, Florida banded water, mud, water moccasin), Turtles (common snapping, Florida softshell, common musk, mud, Florida redbelly), Birds (swallow-tailed kite, red-tailed hawk, owl [great horned/screech], anhinga, black-crowned night-heron, blue heron, songbirds, wood duck, woodpecker, turkey, turkey vultures), Carolina anole, raccoon, bat, opossum, bobcat, deer, marsh rabbit, weasel, wild boar				Eastern indigo snake - T (state & fed), Florida pine snake - T (state), gopher tortoise - T (state); Florida sandhill crane - T (state), little blue heron - T (state), tricolored heron - T (state), wood stork - E (state & fed), bald eagle - protected under Bald and Golden Eagle Protection Act (1940) and Migratory Bird Treaty Act (1914) Amphibians\Reptiles\ Birds - feeding, roosting, brooding, nesting	
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):					
Mammal species observed utilizing the site include deer, wild boar, racoon and bobcat. Bird species include red-tailed hawk, blue heron, woodpecker, songbirds and turkey vultures. Reptiles observed on the site include the Carolina anole, water moccasin, black racer and gopher tortoise. Amphibians observed include frogs.					
Additional relevant factors:					
Assessment conducted by:				Assessment date(s):	
Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)				11/8/2019	



**PART II – Quantification of Assessment Area (impact or mitigation)**  
**(See Sections 62-345.500 and .600, F.A.C.)**

Site/Project Name	Application Number	Assessment Area Name or Number
Trail Ridge South		8
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)	11/8/19

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support	Location and Landscape Support has a functional lift based on the efforts not only within the assessment areas but also adjacent upland buffers and surrounding uplands across the site. The site has been used for silviculture for decades reducing the benefit to wildlife and the ability to provide benefits to downstream environments because of ditching and draining. Fifty foot upland buffers planted as enhanced hardwood-conifer mixed (434) FLUCCS type will be placed around all of the wetlands, while the remaining uplands on site will be planted as pine flatwoods (411) to more closely resemble historic ecosystems prior to the present day coniferous plantation (441). The pine flatwoods community will be managed by prescribed burns every 3-5 years and be placed on a 80 year timber rotation to maintain appropriate age distribution.			
w/o pres or current				
0				
with				
7				
.500(6)(b)Water Environment (n/a for uplands)	Water Environment will be enhanced in several ways. All windrows, ditches, berms and cuts associated with silviculture will be removed. This will restore the natural sheet flow of the various systems on site, allowing the wetlands to more completely filter water prior to its continuing off-site as well as reducing high flow rates that can cause downstream erosion and flooding. In addition, several large flow-ways that had either been altered or severed during previous mining events will be restored and reconnected to historic drainage patterns and wetlands which will result in healthier wetlands on-site and downstream.			
w/o pres or current				
0				
with				
7				
.500(6)(c)Community structure	Vegetative target communities are based on several factors including what is currently located on site and the historic features that existed prior to impact by previous land owners. Impacted wetlands will be replaced acre for acre and type for type and planted only with appropriate wetland tree species. A 50' upland buffer of hardwood-conifer mixed (434) will be placed around each wetland providing much better forage and refuge opportunities than is provided by pine plantation (441). Removing ditches and drains and allowing for more natural sheet flow will also provide enhanced habitat for aquatic insects, amphibians and fish.			
1. Vegetation and/or 2. Benthic Community				
w/o pres or current				
0				
with				
7				

Score = sum of above scores/30 (if uplands, divide by 20)
current
w/o pres
0
with
0.70

If preservation as mitigation,	
Preservation adjustment factor =	N/A
Adjusted mitigation delta =	N/A

For mitigation assessment areas	
RFG=delta/(t-factor x risk)=	0.370

Delta = [with mitigation-current]
0.70

Mitigation	
Time lag (t-factor) =	1.26
Risk factor (RF) =	1.5

Mitigation Area Size (acres)	0.51
Fuctional Gain (FG) (RFG x acres)	0.189

**PART I – Qualitative Description  
(See Section 62-345.400, F.A.C.)**

Site/Project Name		Application Number		Assessment Area Name or Number	
Trail Ridge South				1A, 1B, 1C, 1D, 1E, 1F, 1G, 1H, 1I, 1J, 1K, 1L, 1M, 1N, 1O, 1P, 1Q, 1R, 1S, 1T, 2, 3, 4, 5, 6, 7, 8, 11, 12	
FLUCCs code		Further classification (optional)		Impact or Mitigation Site?	
Wetland Forested Mix (630)				Mitigation	
Assessment Area Size		619.96			
Basin/Watershed Name/Number		Affected Waterbody (Class)		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)	
Santa Fe River Basin		Class III		None	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands					
Surficial water for the site flows from the northeast to the southwest generally following the surficial topography. On-site wetlands continue off-site into a series of large contiguous systems that connect to the Santa Fe River Basin.					
Assessment area description					
The wetland forested mixed land use is the most prevalent wetland land use within the project area. These areas are typically lower in elevation than the adjacent upland pine plantation and as such have deeper and longer hydroperiods. These areas are co-dominated by a mixed canopy of slash pine, bald cypress, pond cypress, blackgum, red maple, loblolly bay, swamp bay, and sweet bay. Typical understory species include dahoon holly, myrtle-leaved holly, fetterbush, sweet gallberry, wax myrtle, St. John's wort, Virginia chain fern, and cinnamon fern.					
Significant nearby features				Uniqueness (considering the relative rarity in relation to the regional landscape.)	
Santa Fe Swamp				Not unique, community is common in the area	
Functions				Mitigation for previous permit/other historic use	
Provide cover, substrate, or refuge; breeding; nesting; denning; nursery area; wildlife corridor; food chain support; natural water storage; natural flow attenuation; water quality improvement				None	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found )				Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)	
Frogs (southern cricket, American green tree, southern spring peeper, southern chorus, American bullfrog, etc.), Snakes (black racer, crayfish, peninsula ribbon, Florida banded water, mud, water moccasin), Turtles (common snapping, Florida softshell, common musk, mud, Florida redbelly), Birds (swallow-tailed kite, red-tailed hawk, owl [great horned/screech], anhinga, black-crowned night-heron, blue heron, songbirds, wood duck, woodpecker, turkey, turkey vultures), Carolina anole, raccoon, bat, opossum, bobcat, deer, marsh rabbit, weasel, wild boar				Eastern indigo snake - T (state & fed), Florida pine snake - T (state), gopher tortoise - T (state); Florida sandhill crane - T (state), little blue heron - T (state), tricolored heron - T (state), wood stork - E (state & fed), bald eagle - protected under Bald and Golden Eagle Protection Act (1940) and Migratory Bird Treaty Act (1914) Amphibians\Reptiles\ Birds - feeding, roosting, brooding, nesting	
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):					
Mammal species observed utilizing the site include deer, wild boar, racoon and bobcat. Bird species include red-tailed hawk, blue heron, woodpecker, songbirds and turkey vultures. Reptiles observed on the site include the Carolina anole, water moccasin, black racer and gopher tortoise. Amphibians observed include frogs.					
Additional relevant factors:					
Assessment conducted by:				Assessment date(s):	
Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)				11/8/2019	

**PART II – Quantification of Assessment Area (impact or mitigation)**  
**(See Sections 62-345.500 and .600, F.A.C.)**

Site/Project Name	Application Number	Assessment Area Name or Number
Trail Ridge South		1A, 1B, 1C, 1D, 1E, 1F, 1G, 1H, 1I, 1J, 1K, 1L, 1M, 1N, 1O, 1P, 1Q, 1R, 1S, 1T, 2, 3, 4
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)	11/8/2019

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

<p>.500(6)(a) Location and Landscape Support</p> <p>w/o pres or current      with</p> <p>0      7</p>	<p>Location and Landscape Support has a functional lift based on the efforts not only within the assessment areas but also adjacent upland buffers and surrounding uplands across the site. The site has been used for silviculture for decades reducing the benefit to wildlife and the ability to provide benefits to downstream environments because of ditching and draining. Fifty foot upland buffers planted as enhanced hardwood-conifer mixed (434) FLUCCS type will be placed around all of the wetlands, while the remaining uplands on site will be planted as pine flatwoods (411) to more closely resemble historic ecosystems prior to the present day coniferous plantation (441). The pine flatwoods community will be managed by prescribed burns every 3-5 years and be placed on a 80 year timber rotation to maintain appropriate age distribution.</p>
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>w/o pres or current      with</p> <p>0      7</p>	<p>Water Environment will be enhanced in several ways. All windrows, ditches, berms and cuts associated with silviculture will be removed. This will restore the natural sheet flow of the various systems on site, allowing the wetlands to more completely filter water prior to its continuing off-site as well as reducing high flow rates that can cause downstream erosion and flooding. In addition, several large flow-ways that had either been altered or severed during previous mining events will be restored and reconnected to historic drainage patterns and wetlands which will result in healthier wetlands on-site and downstream.</p>
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>w/o pres or current      with</p> <p>0      7</p>	<p>Vegetative target communities are based on several factors including what is currently located on site and the historic features that existed prior to impact by previous land owners. Impacted wetlands will be replaced acre for acre and type for type and planted only with appropriate wetland tree species. A 50' upland buffer of hardwood-conifer mixed (434) will be placed around each wetland providing much better forage and refuge opportunities than is provided by pine plantation (441). Removing ditches and drains and allowing for more natural sheet flow will also provide enhanced habitat for aquatic insects, amphibians and fish.</p>

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres      with
0      0.70

If preservation as mitigation,
Preservation adjustment factor =      N/A
Adjusted mitigation delta =      N/A

For mitigation assessment areas
RFG=delta/(t-factor x risk)=      0.370

Delta = [with mitigation-current]
0.70

Mitigation
Time lag (t-factor) =      1.26
Risk factor (RF) =      1.5

Mitigation Area Size (acres)	619.96
Fuctional Gain (FG) (RFG x acres)	229.615



**PART I – Qualitative Description**  
**(See Section 62-345.400, F.A.C.)**

Site/Project Name		Application Number		Assessment Area Name or Number	
Trail Ridge South				1B, 1D, 1E, 1F, 1G, 1K, 1P, 1Q, 1R, 2, 9, 10	
FLUCCs code		Further classification (optional)		Impact or Mitigation Site?	Assessment Area Size
Freshwater Marshes (641)				Mitigation	88.62
Basin/Watershed Name/Number		Affected Waterbody (Class)		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)	
Santa Fe River Basin		Class III		None	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands					
Surficial water for the site flows from the northeast to the southwest generally following the surficial topography. On-site wetlands continue off-site into a series of large contiguous systems that connect to the Santa Fe River Basin.					
Assessment area description					
The freshwater marsh communities are non-forested areas of emergent wetland vegetation. Several areas consist of formerly forested systems that had their canopies destroyed during previous wildfires and no regeneration of canopy species has occurred. Vegetation within these areas includes cattail, sand cordgrass, maidencane, Carolina redroot, yellow-eyed grass, arrowheads, soft rush, and St. John's wort.					
Significant nearby features				Uniqueness (considering the relative rarity in relation to the regional landscape.)	
Santa Fe Swamp				Not unique, community is common in the area	
Functions				Mitigation for previous permit/other historic use	
Provide cover, substrate, or refuge; breeding; nesting; denning; nursery area; wildlife corridor; food chain support; natural water storage; natural flow attenuation; water quality improvement				None	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found )				Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)	
Frogs (southern cricket, American green tree, southern spring peeper, southern chorus, American bullfrog, etc.), Snakes (black racer, crayfish, peninsula ribbon, Florida banded water, mud, water moccasin), Turtles (common snapping, Florida softshell, common musk, mud, Florida redbelly), Birds (swallow-tailed kite, red-tailed hawk, owl [great horned/screech], anhinga, black-crowned night-heron, blue heron, songbirds, wood duck, woodpecker, turkey, turkey vultures), Carolina anole, raccoon, bat, opossum, bobcat, deer, marsh rabbit, weasel, wild boar				Eastern indigo snake - T (state & fed), Florida pine snake - T (state), gopher tortoise - T (state); Florida sandhill crane - T (state), little blue heron - T (state), tricolored heron - T (state), wood stork - E (state & fed), bald eagle - protected under Bald and Golden Eagle Protection Act (1940) and Migratory Bird Treaty Act (1914) Amphibians\Reptiles\ Birds - feeding, roosting, brooding, nesting	
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):					
Mammal species observed utilizing the site include deer, wild boar, racoon and bobcat. Bird species include red-tailed hawk, blue heron, woodpecker, songbirds and turkey vultures. Reptiles observed on the site include the Carolina anole, water moccasin, black racer and gopher tortoise. Amphibians observed include frogs.					
Additional relevant factors:					
Assessment conducted by:				Assessment date(s):	
Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)				11/8/2019	

**PART II – Quantification of Assessment Area (impact or mitigation)**  
**(See Sections 62-345.500 and .600, F.A.C.)**

Site/Project Name	Application Number	Assessment Area Name or Number
Trail Ridge South		1B, 1D, 1E, 1F, 1G, 1K, 1P, 1Q, 1R, 2, 9, 10
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)	11/8/2019

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

<p>.500(6)(a) Location and Landscape Support</p> <p>w/o pres or current      with</p> <p>0      7</p>	<p>Location and Landscape Support has a functional lift based on the efforts not only within the assessment areas but also adjacent upland buffers and surrounding uplands across the site. The site has been used for silviculture for decades reducing the benefit to wildlife and the ability to provide benefits to downstream environments because of ditching and draining. Fifty foot upland buffers planted as enhanced hardwood-conifer mixed (434) FLUCCS type will be placed around all of the wetlands, while the remaining uplands on site will be planted as pine flatwoods (411) to more closely resemble historic ecosystems prior to the present day coniferous plantation (441). The pine flatwoods community will be managed by prescribed burns every 3-5 years and be placed on a 80 year timber rotation to maintain appropriate age distribution.</p>
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>w/o pres or current      with</p> <p>0      7</p>	<p>Water Environment will be enhanced in several ways. All windrows, ditches, berms and cuts associated with silviculture will be removed. This will restore the natural sheet flow of the various systems on site, allowing the wetlands to more completely filter water prior to its continuing off-site as well as reducing high flow rates that can cause downstream erosion and flooding. In addition, several large flow-ways that had either been altered or severed during previous mining events will be restored and reconnected to historic drainage patterns and wetlands which will result in healthier wetlands on-site and downstream.</p>
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>w/o pres or current      with</p> <p>0      7</p>	<p>Vegetative target communities are based on several factors including what is currently located on site and the historic features that existed prior to impact by previous land owners. Impacted wetlands will be replaced acre for acre and type for type and planted only with appropriate wetland tree species. A 50' upland buffer of hardwood-conifer mixed (434) will be placed around each wetland providing much better forage and refuge opportunities than is provided by pine plantation (441). Removing ditches and drains and allowing for more natural sheet flow will also provide enhanced habitat for aquatic insects, amphibians and fish.</p>

Score = sum of above scores/30 (if uplands, divide by 20)
current      with
0      0.70

If preservation as mitigation,
Preservation adjustment factor =      N/A
Adjusted mitigation delta =      N/A

For mitigation assessment areas
RFG=delta/(t-factor x risk)=      0.523

Delta = [with mitigation-current]
0.70

Mitigation
Time lag (t-factor) =      1.07
Risk factor (RF) =      1.25

Mitigation Area Size (acres)	88.62
<b>Fuctional Gain (FG) (RFG x acres)</b>	<b>46.381</b>

**PART I – Qualitative Description**  
**(See Section 62-345.400, F.A.C.)**

Site/Project Name		Application Number		Assessment Area Name or Number	
Trail Ridge South (Offsite-Phase1)				W151, W153	
FLUCCs code		Further classification (optional)		Impact or Mitigation Site?	Assessment Area Size
Wetland Scrub (631)				Mitigation	33.21
Basin/Watershed Name/Number		Affected Waterbody (Class)		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)	
Santa Fe River Basin		Class III		None	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands					
Mitigation area receives surface water runoff from surrounding uplands and upstream wetland connections. Ultimately the water from the mitigation areas reports to the Santa Fe River Basin.					
Assessment area description					
The wetland scrub communities are associated with species such as pond cypress, blackgum, coastal plain willow, and other low shrubs with no dominant species. They are typically found in topographical depressions and have poorly drained soils.					
Significant nearby features				Uniqueness (considering the relative rarity in relation to the regional landscape.)	
None				Not unique, community is common in the area	
Functions				Mitigation for previous permit/other historic use	
Provide cover, substrate, or refuge; breeding; nesting; denning; nursery area; wildlife corridor; food chain support; natural water storage; natural flow attenuation; water quality improvement				None	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found )				Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)	
Frogs (southern cricket, American green tree, southern spring peeper, southern chorus, American bullfrog, etc.), Snakes (black racer, crayfish, peninsula ribbon, Florida banded water, mud, water moccasin), Turtles (common snapping, Florida softshell, common musk, mud, Florida redbelly), Birds (swallow-tailed kite, red-tailed hawk, owl [great horned/screech], anhinga, black-crowned night-heron, blue heron, songbirds, wood duck, woodpecker, turkey, turkey vultures), Carolina anole, raccoon, bat, opossum, bobcat, deer, marsh rabbit, weasel, wild boar				Eastern indigo snake - T (state & fed), Florida pine snake - T (state), gopher tortoise - T (state); Florida sandhill crane - T (state), little blue heron - T (state), tricolored heron - T (state), wood stork - E (state & fed), bald eagle - protected under Bald and Golden Eagle Protection Act (1940) and Migratory Bird Treaty Act (1914) Amphibians\Reptiles\ Birds - feeding, roosting, brooding, nesting	
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):					
Mammal species observed utilizing the site include deer, wild boar, racoon and bobcat. Bird species include red-tailed hawk, blue heron, woodpecker, songbirds and turkey vultures. Reptiles observed on the site include the Carolina anole, water moccasin, black racer and gopher tortoise. Amphibians observed include frogs.					
Additional relevant factors:					
Assessment conducted by:				Assessment date(s):	
Lawson Smith (KLF) Daniel LeJeune (Icarus)				1/18/2022	



**PART II – Quantification of Assessment Area (impact or mitigation)**  
**(See Sections 62-345.500 and .600, F.A.C.)**

Site/Project Name	Application Number	Assessment Area Name or Number
Trail Ridge South (Offsite-Phase1)		W151, W153
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	Lawson Smith (KLF) Daniel LeJeune (Icarus)	1/18/2022

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

<p>.500(6)(a) Location and Landscape Support</p> <p>w/o pres or current      with</p> <p>0      7</p>	<p>As a existing fully functioning Wetland Scrub (631) system, the offsite permittee responsible mitigation provides immediate benefits offsetting the impacts of the proposed project.</p>
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>w/o pres or current      with</p> <p>0      6</p>	<p>The existing water environment presently supports the surrounding and downstream communities that ultimately flow into the Santa Fe River Basin.</p>
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>w/o pres or current      with</p> <p>0      6</p>	<p>Existing vegetative communities include a sub canopy of wax myrtle, slash pine, and blackgum. Groundcover species include rosy camphorweed, royal fern, spikerush, and various rush species. The area displays standing water between 2-6 inches and a varying muck layer of 2-3 inches in depth.</p>

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres      with
0      0.63

If preservation as mitigation,
Preservation adjustment factor =      N/A
Adjusted mitigation delta =      N/A

For mitigation assessment areas
RFG=delta/(t-factor x risk)=      0.633

Delta = [with mitigation-current]
0.63

Mitigation
Time lag (t-factor) =      1
Risk factor (RF) =      1

Mitigation Area Size (acres)	33.21
Fuctional Gain (FG) (RFG x acres)	21.033

**PART I – Qualitative Description**  
**(See Section 62-345.400, F.A.C.)**

Site/Project Name		Application Number		Assessment Area Name or Number	
Trail Ridge South (Offsite-Phase 1)				W151, W153	
FLUCCs code		Further classification (optional)		Impact or Mitigation Site?	Assessment Area Size
Freshwater Marshes (641)				Mitigation	19.74
Basin/Watershed Name/Number		Affected Waterbody (Class)		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)	
Santa Fe River Basin		Class III		None	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands					
Mitigation area receives surface water runoff from surrounding uplands and upstream wetland connections. Ultimately the water from the mitigation areas reports to the Santa Fe River Basin.					
Assessment area description					
The freshwater marsh communities are non-forested areas of emergent wetland vegetation. Existing vegetative communities include groundcover species consisting of St. John's wort, Asian coinwort, bushy bluestem, pine-barren goldenrod, rosy camphorweed, yellow-eyed grass, and various rush species.					
Significant nearby features				Uniqueness (considering the relative rarity in relation to the regional landscape.)	
None				Not unique, community is common in the area	
Functions				Mitigation for previous permit/other historic use	
Provide cover, substrate, or refuge; breeding; nesting; denning; nursery area; wildlife corridor; food chain support; natural water storage; natural flow attenuation; water quality improvement				None	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found )				Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)	
Frogs (southern cricket, American green tree, southern spring peeper, southern chorus, American bullfrog, etc.), Snakes (black racer, crayfish, peninsula ribbon, Florida banded water, mud, water moccasin), Turtles (common snapping, Florida softshell, common musk, mud, Florida redbelly), Birds (swallow-tailed kite, red-tailed hawk, owl [great horned/screech], anhinga, black-crowned night-heron, blue heron, songbirds, wood duck, woodpecker, turkey, turkey vultures), Carolina anole, raccoon, bat, opossum, bobcat, deer, marsh rabbit, weasel, wild boar				Eastern indigo snake - T (state & fed), Florida pine snake - T (state), gopher tortoise - T (state); Florida sandhill crane - T (state), little blue heron - T (state), tricolored heron - T (state), wood stork - E (state & fed), bald eagle - protected under Bald and Golden Eagle Protection Act (1940) and Migratory Bird Treaty Act (1914) Amphibians\Reptiles\ Birds - feeding, roosting, brooding, nesting	
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):					
Mammal species observed utilizing the site include deer, wild boar, racoon and bobcat. Bird species include red-tailed hawk, blue heron, woodpecker, songbirds and turkey vultures. Reptiles observed on the site include the Carolina anole, water moccasin, black racer and gopher tortoise. Amphibians observed include frogs.					
Additional relevant factors:					
Assessment conducted by:				Assessment date(s):	
Lawson Smith (KLF) Daniel LeJeune (Icarus)				1/18/2022	

**PART II – Quantification of Assessment Area (impact or mitigation)**  
**(See Sections 62-345.500 and .600, F.A.C.)**

Site/Project Name	Application Number	Assessment Area Name or Number
Trail Ridge South (Offsite-Phase 1)		W151, W153
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	Lawson Smith (KLF) Daniel LeJeune (Icarus)	1/18/2022

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

<p>.500(6)(a) Location and Landscape Support</p> <p>w/o pres or current      with</p> <p>0      7</p>	<p>As a existing fully functioning Freshwater Marsh (641) system, the offsite permittee responsible mitigation provides immediate benefits offsetting the impacts of the proposed project.</p>
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>w/o pres or current      with</p> <p>0      8</p>	<p>The existing water environment presently supports the surrounding and downstream communities that ultimately flow into the Santa Fe River Basin.</p>
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>w/o pres or current      with</p> <p>0      8</p>	<p>Existing vegetative communities include areas with no canopy cover or sparce canopy cover. Groundcover species include St. John's wort, Asian coinwort, bushy bluestem, pine-barren goldenrod, rosy camphorweed, yellow-eyed grass, and various rush species. The area displays standing water between 2-6 inches and a varying muck layer of 2-3 inches in depth.</p>

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres      with
0      0.77

If preservation as mitigation,
Preservation adjustment factor =      N/A
Adjusted mitigation delta =      N/A

For mitigation assessment areas
RFG=delta/(t-factor x risk)=      0.767

Delta = [with mitigation-current]
0.77

Mitigation
Time lag (t-factor) =      1
Risk factor (RF) =      1

Mitigation Area Size (acres)	19.74
Fuctional Gain (FG) (RFG x acres)	15.134



**PART I – Qualitative Description**  
**(See Section 62-345.400, F.A.C.)**

Site/Project Name		Application Number		Assessment Area Name or Number	
Trail Ridge South				W151	
FLUCCs code		Further classification (optional)		Impact or Mitigation Site?	Assessment Area Size
Wet Prairie (643)				Mitigation	1.01
Basin/Watershed Name/Number		Affected Waterbody (Class)		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)	
Santa Fe River Basin		Class III		None	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands					
Mitigation area receives surface water runoff from surrounding uplands and upstream wetland connections. Ultimately the water from the mitigation areas reports to the Santa Fe River Basin.					
Assessment area description					
These areas are typically distinguished from the adjacent wetland scrub and marsh areas by having less water and shorter herbage. These areas are composed predominately of grassy vegetation consisting of wire grass, spikerush, yellow-eyed grass, whitetop sedge, and St. Johns wort.					
Significant nearby features				Uniqueness (considering the relative rarity in relation to the regional landscape.)	
None				Not unique, community is common in the area	
Functions				Mitigation for previous permit/other historic use	
Provide cover, substrate, or refuge; breeding; nesting; denning; nursery area; wildlife corridor; food chain support; natural water storage; natural flow attenuation; water quality improvement				None	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found )				Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)	
Frogs (southern cricket, American green tree, southern spring peeper, southern chorus, American bullfrog, etc.), Snakes (black racer, crayfish, peninsula ribbon, Florida banded water, mud, water moccasin), Turtles (common snapping, Florida softshell, common musk, mud, Florida redbelly), Birds (swallow-tailed kite, red-tailed hawk, owl [great horned/screech], anhinga, black-crowned night-heron, blue heron, songbirds, wood duck, woodpecker, turkey, turkey vultures), Carolina anole, raccoon, bat, opossum, bobcat, deer, marsh rabbit, weasel, wild boar				Eastern indigo snake - T (state & fed), Florida pine snake - T (state), gopher tortoise - T (state); Florida sandhill crane - T (state), little blue heron - T (state), tricolored heron - T (state), wood stork - E (state & fed), bald eagle - protected under Bald and Golden Eagle Protection Act (1940) and Migratory Bird Treaty Act (1914) Amphibians\Reptiles\ Birds - feeding, roosting, brooding, nesting	
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):					
Mammal species observed utilizing the site include deer, wild boar, racoon and bobcat. Bird species include red-tailed hawk, blue heron, woodpecker, songbirds and turkey vultures. Reptiles observed on the site include the Carolina anole, water moccasin, black racer and gopher tortoise. Amphibians observed include frogs.					
Additional relevant factors:					
Assessment conducted by:				Assessment date(s):	
Lawson Smith (KLF) Daniel LeJeune (Icarus)				1/18/2022	

**PART II – Quantification of Assessment Area (impact or mitigation)**  
**(See Sections 62-345.500 and .600, F.A.C.)**

Site/Project Name	Application Number	Assessment Area Name or Number
Trail Ridge South		W151
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	Lawson Smith (KLF) Daniel LeJeune (Icarus)	1/18/2022

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

<p>.500(6)(a) Location and Landscape Support</p> <p>w/o pres or current      with</p> <p>0      7</p>	<p>As an existing fully functioning Wet Prairie (643) system, the offsite permittee responsible mitigation provides immediate benefits offsetting the impacts of the proposed project.</p>
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>w/o pres or current      with</p> <p>0      8</p>	<p>The existing water environment presently supports the surrounding and downstream communities that ultimately flow into the Santa Fe River Basin.</p>
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>w/o pres or current      with</p> <p>0      8</p>	<p>Existing vegetative communities include groundcover consisting of wire grass, spikerush, yellow-eyed grass, whitetop sedge, and St. Johns wort. The area displays surface saturation and is surrounded by wetland scrub.</p>

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres      with
0      0.77

If preservation as mitigation,
Preservation adjustment factor =      N/A
Adjusted mitigation delta =      N/A

For mitigation assessment areas
RFG=delta/(t-factor x risk)=      0.767

Delta = [with mitigation-current]
0.77

Mitigation
Time lag (t-factor) =      1
Risk factor (RF) =      1

Mitigation Area Size (acres)	1.01
Fuctional Gain (FG) (RFG x acres)	0.774

**PART I – Qualitative Description**  
(See Section 62-345.400, F.A.C.)

Site/Project Name		Application Number		Assessment Area Name or Number	
Trail Ridge South				630 Enhancement	
FLUCCs code		Further classification (optional)		Impact or Mitigation Site?	
Wetland Forested Mixed (630)				Mitigation	
Assessment Area Size		165.48			
Basin/Watershed Name/Number		Affected Waterbody (Class)		Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)	
Santa Fe River Basin		Class III		None	
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands					
Surficial water for the site flows from the northeast to the southwest generally following the surficial topography. On-site wetlands continue off-site into a series of large contiguous systems that connect to the Santa Fe River Basin.					
Assessment area description					
The wetland forested mixed land use is the most prevalent wetland land use within the project area. These areas are typically lower in elevation than the adjacent upland pine plantation and as such have deeper and longer hydroperiods. These areas are co-dominated by a mixed canopy of slash pine, bald cypress, pond cypress, blackgum, red maple, loblolly bay, swamp bay, and sweet bay. Typical understory species include dahoon holly, myrtle-leaved holly, fetterbush, sweet gallberry, wax myrtle, St. John's wort, Virginia chain fern, and cinnamon fern.					
Significant nearby features				Uniqueness (considering the relative rarity in relation to the regional landscape.)	
Santa Fe Swamp				Not unique, community is common in the area	
Functions				Mitigation for previous permit/other historic use	
Provide cover, substrate, or refuge; breeding; nesting; denning; nursery area; wildlife corridor; food chain support; natural water storage; natural flow attenuation; water quality improvement				None	
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found )				Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)	
Frogs (southern cricket, American green tree, southern spring peeper, southern chorus, American bullfrog, etc.), Snakes (black racer, crayfish, peninsula ribbon, Florida banded water, mud, water moccasin), Turtles (common snapping, Florida softshell, common musk, mud, Florida redbelly), Birds (swallow-tailed kite, red-tailed hawk, owl [great horned/screech], anhinga, black-crowned night-heron, blue heron, songbirds, wood duck, woodpecker, turkey, turkey vultures), Carolina anole, raccoon, bat, opossum, bobcat, deer, marsh rabbit, weasel, wild boar				Eastern indigo snake - T (state & fed), Florida pine snake - T (state), gopher tortoise - T (state); Florida sandhill crane - T (state), little blue heron - T (state), tricolored heron - T (state), wood stork - E (state & fed), bald eagle - protected under Bald and Golden Eagle Protection Act (1940) and Migratory Bird Treaty Act (1914) Amphibians\Reptiles\ Birds - feeding, roosting, brooding, nesting	
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):					
Mammal species observed utilizing the site include deer, wild boar, racoon and bobcat. Bird species include red-tailed hawk, blue heron, woodpecker, songbirds and turkey vultures. Reptiles observed on the site include the Carolina anole, water moccasin, black racer and gopher tortoise. Amphibians observed include frogs.					
Additional relevant factors:					
Assessment conducted by:				Assessment date(s):	
Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)				11/8/2019	



**PART II – Quantification of Assessment Area (impact or mitigation)**  
**(See Sections 62-345.500 and .600, F.A.C.)**

Site/Project Name	Application Number	Assessment Area Name or Number
Trail Ridge South		630 Enhancement
Impact or Mitigation	Assessment conducted by:	Assessment date:
Mitigation	Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)	11/8/2019

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

<p>.500(6)(a) Location and Landscape Support</p> <p>w/o pres or current      with</p> <p>5      7</p>	<p>The enhancement activity of converting the community type from the anthropogenically altered Coniferous Plantation Wetland (441W) to the natural Wetland Forested Mixed (630) community type improves the support the area can provide to the surrounding and downstream communities. Location and Landscape Support has a functional lift based on the efforts not only within the assessment areas but also adjacent upland buffers and surrounding uplands across the site. The site has been used for silviculture for decades reducing the benefit to wildlife and the ability to provide benefits to downstream environments because of ditching and draining.</p>
<p>.500(6)(b)Water Environment (n/a for uplands)</p> <p>w/o pres or current      with</p> <p>5      7</p>	<p>Water Environment will be enhanced in several ways. All windrows, ditches, berms and cuts associated with silviculture will be removed. This will restore the natural sheet flow of the various systems on site, allowing the wetlands to more completely filter water prior to its continuing off-site as well as reducing high flow rates that can cause downstream erosion and flooding.</p>
<p>.500(6)(c)Community structure</p> <p>1. Vegetation and/or 2. Benthic Community</p> <p>w/o pres or current      with</p> <p>4      7</p>	<p>Vegetative target communities are based on several factors including what is currently located on site and the historic features that existed prior to impact by silviculture. Pines will be thinned to 50 trees per acre and then the areas will be replanted with appropriate native wetland tree species. Removing ditches and drains and allowing for more natural sheet flow will also provide enhanced habitat for aquatic insects, amphibians and fish onsite and downstream.</p>

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres      with
0.4666667      0.70

If preservation as mitigation,
Preservation adjustment factor =      N/A
Adjusted mitigation delta =      N/A

For mitigation assessment areas
RFG=delta/(t-factor x risk)=      0.187

Delta = [with mitigation-current]
0.2333333

Mitigation
Time lag (t-factor) =      1
Risk factor (RF) =      1.25

Mitigation Area Size (acres)	165.48
<b>Fuctional Gain (FG) (RFG x acres)</b>	<b>30.890</b>

**Attachment 4:**  
**Onsite and Adjacent Parcels**

**Attachment 4**  
**On-Site and Adjacent Parcels**

Parcel ID	Property Owner Name	Address	Zip Code	County	Acreage
19-07-23-000732-000-00	Armory Board State Of FL	C/O Dept Of Mil Affairs/State Camp Blanding Lands 82 Marine St Saint Augustine, FL	320845039	Clay	638.00
18-07-23-000731-017-00	Armory Board State Of FL	C/O Dept Of Mil Affairs/State Camp Blanding Lands 82 Marine St Saint Augustine, FL	320845039	Clay	638.00
07-07-23-000731-006-00	Armory Board State Of FL	C/O Dept Of Mil Affairs/State Camp Blanding Lands 82 Marine St Saint Augustine, FL	320845039	Clay	638.00
06-07-23-00731-005-00	Armory Board State Of FL	C/O Dept Of Mil Affairs/State Camp Blanding Lands 82 Marine St Saint Augustine, FL	320845039	Clay	637.00
04828-0-00000	Suwanee River Water Management District	9225 CR 49 Live Oak, FL	32060	Bradford	632.11
04829-0-00000	Suwanee River Water Management District	9225 CR 49 Live Oak, FL	32060	Bradford	835.00
04986-0-00000	Suwanee River Water Management District	9225 CR 49 Live Oak, FL	32060	Bradford	639.00
30-07-23-000741-000-00	City Of Keystone Heights	Airport 7100 Airport Rd Starke, FL	32091	Clay	14.54
30-07-23-000740-000-00	Armory Board State Of FL	C/O Dept Of Mil Affairs/State Camp Blanding Lands 82 Marine St Saint Augustine, FL	320845039	Clay	14.54
04818-0-00000	Rayonier Tax Services	PO BOX 161139 Mobile, AL	36616	Bradford	546.75
04831-0-00000	Rayonier Tax Services	PO BOX 161139 Mobile, AL	36616	Bradford	605.00
04985-0-00000	Rayonier Tax Services	PO BOX 161139 Mobile, AL	36616	Bradford	634.75
04612-0-00100 10	North Florida Land Trust	2038 GILMORE ST JACKSONVILLE, FL	32204	Bradford	227.00
04613-0-00000 10	North Florida Land Trust	2039 GILMORE ST JACKSONVILLE, FL	32204	Bradford	402.27
04993-0-00100 HX H3	Baldree, Robert & Linda	1404 SE 101ST WAY STARKE, FL	320919348	Bradford	40.00
04991-0-00200	Munen, Delano Lex	8286 SE 11th Ave Starke, FL	32091	Bradford	12.60
04991-0-00201	Munen, Delano Lex	8286 SE 11th Ave Starke, FL	32091	Bradford	5.00
04989-0-00000 05	Suwanee River Water Management District	9225 CR 49 Live Oak, FL	32060	Bradford	107.49
04987-0-00000 04	City Of Keystone Heights	Airport 7100 Airport Rd Starke, FL	32091	Bradford	250.00
	= On-site parcel				



**Exhibit A:**  
**Permit Boundary and Legal Description**



04612-0-00100  
SRWMD

SECTION 1

16-07-23-000731-000-00  
CBJTC

SECTION 6

### SKETCH OF DESCRIPTION

OF LANDS LYING IN SECTIONS 12, 13 & 24 OF TOWNSHIP 7 SOUTH, RANGE 22 EAST, BRADFORD COUNTY, FLORIDA AND IN SECTIONS 6, 7, 18 & 19 OF TOWNSHIP 7 SOUTH, RANGE 23 EAST, CLAY COUNTY, FLORIDA

#### DESCRIPTION ~ PERMIT BOUNDARY

A parcel of land lying in Sections 12, 13 & 24 of Township 7 South, Range 22 East, Bradford County, Florida and in Sections 6, 7, 18 & 19 of Township 7 South, Range 23 East, Clay County, Florida; said parcel being more particularly described as follows:

Commence at an iron rod located at the intersection of the Southerly boundary of said Section 19 with the Westerly boundary of the right of way of Treat Road (80' right of way) for the Point of Beginning and run South 89 degrees 15 minutes 32 seconds West, along said Southerly boundary, 2644.08 feet to a 1/2" iron pipe found at the Southwest corner of said Section 19; thence North 02 degrees 33 minutes 13 seconds West, along the Westerly boundary of Section 19 (the Easterly boundary of Section 24), a distance of 562.88 feet; thence South 45 degrees 37 minutes 23 seconds West, 536.50 feet to the Southerly boundary of said Section 24; thence South 87 degrees 54 minutes 44 seconds West, along said Southerly boundary, 4662.58 feet to a concrete monument found at the Southwest corner thereof; thence North 01 degree 55 minutes 08 seconds West, along the Westerly boundary of said Section 27, a distance of 5327.47 feet to a concrete monument found at the Northwest corner thereof (SW Corner of Section 13); thence North 00 degrees 13 minutes 04 seconds East, along the Northerly boundary thereof, 5042.38 feet to a concrete monument found at the Northeast corner thereof; thence North 02 degrees 05 minutes 13 seconds West, along the Westerly boundary of said Section 7 (the Easterly boundary of Section 11) a distance of 257.50 feet to the Westerly boundary of said Section 7, thence North 88 degrees 44 minutes 40 seconds East, along the Northerly boundary of said Section 7, a distance of 619.71 feet; thence South 74 degrees 10 minutes 34 seconds East, 117.95 feet; thence South 74 degrees 40 minutes 23 seconds East, 243.02 feet; thence South 88 degrees 02 minutes 29 seconds East, 245.72 feet; thence North 67 degrees 33 minutes 00 seconds East, 365.11 feet; thence North 61 degrees 55 minutes 30 seconds East, 1432.05 feet; thence North 89 degrees 30 minutes 06 seconds East, 239.59 feet; thence South 65 degrees 57 minutes 04 seconds East, 350.19 feet to the Westerly boundary of the right of way of Treat Road (80' right of way); thence Southerly along said Westerly boundary the following courses: South 62 degrees 43 minutes 36 seconds West, 477.38 feet; thence South 50 degrees 21 minutes 21 seconds West, 252.52 feet; thence South 26 degrees 52 minutes 41 seconds West, 227.34 feet; thence South 01 degree 07 minutes 17 seconds East, 5334.77 feet to an iron rod on the Southerly boundary of said Section 17; thence South 01 degree 23 minutes 41 seconds East, 4970.74 feet to an iron rod located at the beginning of a curve, concave to the East and having a radius of 1628.89 feet; thence Southerly along said westerly boundary and along the arc of said curve, 422.17 feet as measured along a chord having a bearing of South 08 degrees 50 minutes 25 seconds East, to the Point of Beginning. Containing 2884.43 acres, more or less.

#### DESCRIPTION ~ FORMAL DETERMINATION BOUNDARY

A parcel of land lying in Sections 12, 13 & 24 of Township 7 South, Range 22 East, Bradford County, Florida and in Sections 6, 7, 18 & 19 of Township 7 South, Range 23 East, Clay County, Florida; said parcel being more particularly described as follows:

Commence at an iron rod located at the intersection of the Southerly boundary of said Section 19 with the Westerly boundary of the right of way of Treat Road (80' R/W) for the Point of Beginning and run South 89 degrees 15 minutes 32 seconds West, along said Southerly boundary, 2644.08 feet to an 1/2" iron pipe found at the SW Corner of said Section 19; thence North 02 degrees 33 minutes 13 seconds West, along the Westerly boundary of Section 19 (Easterly boundary of Section 24), a distance of 562.88 feet; thence South 45 degrees 37 minutes 23 seconds West, 536.50 feet; thence North 00 degrees 55 minutes 02 seconds West, 1829.61 feet; thence North 45 degrees 04 minutes 26 seconds West, 5918.99 feet; thence North 00 degrees 55 minutes 45 seconds West, 4299.14 feet to a point on the Northerly boundary of said Section 13, said point being 727.20 feet Easterly of the Northwest corner of said section 13 on a bearing of North 87 degrees 44 minutes 28 seconds East; thence North 02 degrees 15 minutes 47 seconds West, 5235.32 feet to a point on the Northerly boundary of said Section 12, being 694.10 feet Easterly of the NW corner thereof on a bearing of North 88 degrees 17 minutes 08 seconds East; thence North 88 degrees 17 minutes 08 seconds East, along said Northerly boundary, 4348.28 feet to a concrete monument located at the NE corner of said Section 12; thence North 02 degrees 05 minutes 13 seconds West, along the Westerly boundary of said Section 7 (Easterly boundary of Section 11, Township 7 South, Range 22 East) 257.50 feet to a concrete monument located at the Northwest corner of said Section 7; thence North 88 degrees 44 minutes 40 seconds East, along the Northerly boundary of said Section 7, a distance of 619.71 feet; thence South 74 degrees 10 minutes 34 seconds East, 117.95 feet; thence South 74 degrees 40 minutes 23 seconds East, 243.02 feet; thence South 88 degrees 02 minutes 29 seconds East, 245.72 feet; thence North 67 degrees 33 minutes 00 seconds East, 365.11 feet; thence North 61 degrees 55 minutes 30 seconds East, 1432.05 feet; thence North 89 degrees 30 minutes 06 seconds East, 239.59 feet; thence South 65 degrees 57 minutes 04 seconds East, 350.19 feet to the Westerly boundary of the right of way of Treat Road (80' right of way); thence Southerly along said Westerly boundary the following courses: South 62 degrees 43 minutes 36 seconds West, 477.38 feet; thence South 50 degrees 21 minutes 21 seconds West, 252.52 feet; thence South 26 degrees 52 minutes 41 seconds West, 227.34 feet; thence South 01 degree 07 minutes 17 seconds East, 5334.77 feet to an iron rod on the Southerly boundary of said Section 17; thence South 01 degree 23 minutes 41 seconds East, 4970.74 feet to an iron rod located at the beginning of a curve, concave to the East and having a radius of 1628.89 feet; thence Southerly along said westerly boundary and along the arc of said curve, 422.17 feet as measured along a chord having a bearing of South 08 degrees 50 minutes 25 seconds East, to the Point of Beginning. Containing 2212.32 acres, more or less.

#### NOTES

This map not valid without the signature and the original raised seal of a Florida licensed surveyor and mapper.

This sketch does not represent a field survey.

Bearings based on State Plane Coordinates NAD 1983 Florida North Datum as projected using RTK network GPS.

Additions or deletions to survey maps or reports by other than the signing party is prohibited without the written consent of Patrick B. Welch & Associates, Inc.

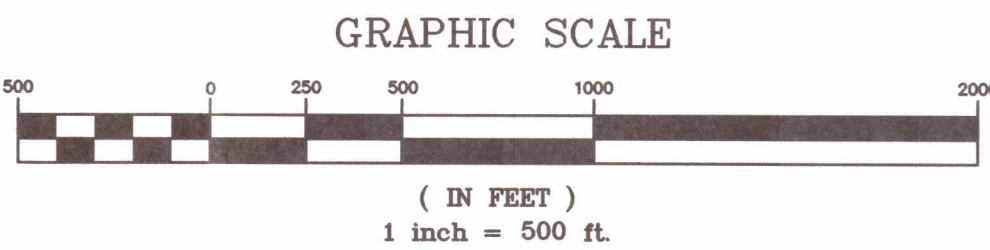
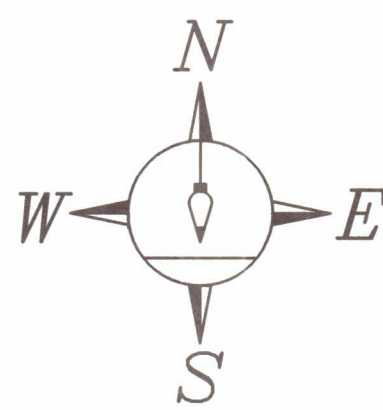
CBJTC = CAMP BLANDING JOINT TRAINING CENTER  
SRWMD = SUWANNEE RIVER WATER MANAGEMENT DISTRICT

19

20

29

30



#### SURVEYOR'S CERTIFICATION

I hereby certify that this survey meets the minimum technical standards as set forth by the Florida Board of Professional Surveyors and Mappers in Chapter 60G17-16, Florida Administrative Code, pursuant to Section 472.02(2), Florida Statutes.

By Patrick B. Welch PSW  
FLORIDA CERTIFICATE NO. 2714  
BUSINESS NO. LB 4012

DATE SIGNED

FOR : THE CHEMOURS COMPANY FC, LLC

DRAWN BY : LMB CHECKED BY : PSW FIELD BOOK : N/A  
SCALE : 1" = 500' JOB NO. : 05-14-282 MAP NO. : 1D-106

PATRICK B. WELCH & ASSOCIATES, INC.

LAND SURVEYING, PLANNING & DRAFTING SERVICES  
P.O. BOX 809 870 WEST MACMAHON STREET  
STARKE, FLORIDA 32091 (904) 964-8292



**Exhibit B:**  
**Environmental Resource Permit**





# FLORIDA DEPARTMENT OF Environmental Protection

Bob Martinez Center  
2600 Blair Stone Road MS 3577  
Tallahassee, FL 32399-2400

**Ron DeSantis**  
Governor

**Jeanette Nuñez**  
Lt. Governor

**Noah Valenstein**  
Secretary

## MINING AND MITIGATION PROGRAM DEPARTMENT OF ENVIRONMENTAL PROTECTION STATE OF FLORIDA FINAL PERMIT

### ENVIRONMENTAL RESOURCE PERMIT

#### PERMITTEE:

The Chemours Company FC, LLC  
c/o Mr. Stuart Forrester  
PO Box 753  
Starke, FL 32091

Permit Number: MMR\_137482-018  
Date of Issue: May 26, 2021  
Exp. of Construction Phase: May 26, 2035  
County: Bradford & Clay  
Project: Trail Ridge South Mine

#### PROJECT LOCATION

The project site is located approximately 4.5 miles southeast of Starke, Florida, along Treat Road, in Clay County, Sections 6, 7, 18, and 19, Township 7 South, Range 23 East; Parcel ID Numbers 06-07-23-000731-005-00, 07-07-23-000731-006-00, 18-07-23-000731-017-00, and 19-07-23-000732-000-00, and in Bradford County, Sections 12, 13, and 24, Township 7 South, Range 22 East; Parcel ID Numbers 04828-0-00000, 04829-0-00000, and 04986-0-00000. The project is in the Santa Fe River basin, Class III waters.

#### PROJECT DESCRIPTION

The permittee is authorized to construct a surface water management system to facilitate heavy minerals mining and associated on-site mitigation activities at the Trail Ridge South Mine. The mine is located in Bradford and Clay counties, Florida within the Santa Fe River basin, Class III waters. Authorized activities are depicted on the attached exhibits and described below.

This Environmental Resource Permit (ERP) is designated No. MMR\_137482-018. The Trail Ridge South Mine permit boundary encompasses approximately 2,884.4 acres; the surface water management system project area for heavy minerals mining activities will consist of a total of approximately 1,749.92 acres within the permit boundary. The project will include impacts to approximately 740.45 acres of wetlands and other surface waters; 725.96 acres of wetlands and other surface waters within the permit boundary will be avoided. Approximately 26.14 acres of other surface waters (25.47 acres man-made ditches and 0.67-acre lake) are upland-cut and do not require mitigation pursuant to Applicant's Handbook Volume I, Section 10.2.2.2. The 0.67-acre lake is located in an area that was previously disturbed by mining activities prior to the requirement to reclaim the land. Approximately 0.56 acres of wetlands (0.10 and 0.04 acres freshwater marsh, 0.4 acres wetland forested mixed, and 0.02 acres wetland scrub) total are

isolated and less than half an acre in size, and do not require mitigation pursuant to Applicant's Handbook Volume I, Section 10.2.2.1. The remaining impacts to wetlands and other surface waters require mitigation; 710.59 acres of wetland creation and 136.49 acres of wetland enhancement are required as mitigation to offset impacts under this permit.

The proposed project will impact approximately 740.45 acres of wetland and other surface waters at the Trail Ridge South Mine, including 710.59 acres of wetlands [227.53 acres coniferous plantation wetland (FLUCCS 441W), 1.29 acres bay swamp (FLUCCS 611), 0.21 acres gum swamp (FLUCCS 613), 0.51 acres cypress (FLUCCS 621), 376.59 acres wetland forested mixed (FLUCCS 630), 15.84 acres wetland scrub (FLUCCS 631), and 88.62 acres freshwater marsh (FLUCCS 641)], 29.19 acres of man-made ditches [3.72 acres ditched wetland and 25.47 acres upland-cut ditches (FLUCCS 510d)], and 0.67 acres of lake (FLUCCS 524). Mitigation includes creation of 710.59 acres of wetlands [1.29 acres bay swamp (FLUCCS 611), 0.21 acres gum swamp (FLUCCS 613), 0.51 acres cypress (FLUCCS 621), 619.96 acres wetland forested mixed (FLUCCS 630), and 88.62 acres freshwater marsh (FLUCCS 641)] and enhancement of 136.49 acres of wetlands [converting 136.49 acres of coniferous plantation wetland (FLUCCS 441W) to wetland forested mixed (FLUCCS 630)]. The functional gain provided by the mitigation projects exceeds the functional loss of the wetlands proposed for impacts.

The Trail Ridge South Mine will be mined via mobile mining units, with a land-based separation plant site, the mobile concentrator. Approximately 1,548.99 acres will be mined. The depth of mining will average 22 feet below grade with a maximum depth of 40 feet below grade. Groundwater will be maintained a minimum of 1-foot below ground surface using a ditch and sump system to allow equipment to access material. Mining cells will be dewatered in advance of mining via rim ditches and hydraulic pumps operating within the mining cell perimeter containment berm. The dewatering effluent will be mixed with the excavated ore (after oversize materials are removed) to form a slurry that will be pumped to the process water pond at the plant site for further processing. After each mine cell has been excavated, sand tailings from the plant site will be pumped into the excavated pit. Excess water from the tailings will be decanted and incorporated into the active mining process for the next mine cell. Reclamation of mined areas will occur concurrently with mining. As mining and reclamation progress, new areas will be incorporated into the stormwater management system and reclaimed areas will be removed from the system. Approximately 160 acres (80 acres per Mobile Mining Unit) may be in various stages of the mining process (site preparation, active mining, tailings, contouring/reclamation) at the active mining areas at one time. The stormwater management system will be capable of containing the runoff from a 25-year, 24-hour storm event. Five existing culverted trail road wetland crossings will be widened during the mining phase to provide access for vehicles, equipment, and pipelines. When the crossings are expanded, the culverts will be extended in order to maintain proper flow through avoided wetland systems. After mining is complete, four of the expanded crossings shall be removed. One of the expanded crossings will be removed and returned to the original approximately 25-foot wide culverted trail road wetland crossing in the post-reclamation condition, while three new approximately 25-foot wide culverted trail road wetland crossings will be established to provide upland access. Each culvert or set of culverts is

designed to handle the 25-year, 24-hour design storm. The construction of the Trail Ridge South Plant Site, including the laydown area, processing area, and stormwater ponds, is authorized under ERP # MMR\_137482-017. The construction of the industrial wastewater ponds (Process Pond, IWW Pond 1-Lime Neutralization Pond, IWW Pond 2-Treatment Pond, and IWW Pond 3-Final Effluent Pond) is permitted under this permit (MMR\_137482-018). The operation and reclamation of the Trail Ridge South Plant Site are authorized under this permit (MMR\_137482-018). The completion of construction, including reclamation, will be by the year 2035.

## **AUTHORIZATIONS**

### Environmental Resource Permit

The Department has determined that the activity qualifies for an Environmental Resource Permit. Therefore, the Environmental Resource Permit is hereby granted, pursuant to Part IV of Chapter 373, Florida Statutes (F.S.), and Chapter 62-330, Florida Administrative Code (F.A.C.).

### Sovereignty Submerged Lands Authorization

As staff to the Board of Trustees of the Internal Improvement Trust Fund (Board of Trustees), the Department has determined the activity is not on submerged lands owned by the State of Florida. Therefore, your project is not subject to the requirements of Chapter 253, F.S., or Rule 18-21, F.A.C.

### Federal Review – SPGP NOT APPROVED – State 404 Required

As of Dec. 22, 2020, Florida has assumed authority to administer the dredge and fill permitting program under Section 404 of the federal Clean Water Act within certain waters in the state “assumed waters.” The activity as proposed and outlined in the application and attached drawings has been determined to be located within State 404 assumed waters and is therefore, **not eligible** for authorization pursuant to the State Programmatic General Permit. If you do not already have a valid permit from the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act, a **SEPARATE State 404 Individual Permit will be required** from the Department prior to construction commencement. Please contact Janelle Strong at 850-245-7549 for additional information.

Authority for review - an agreement with the USACOE entitled “Coordination Agreement Between the U. S. Army Corps of Engineers (Jacksonville District) and the Florida Department of Environmental Protection (or Duly Authorized Designee), State Programmatic General Permit”, Section 10 of the Rivers and Harbor Act of 1899, and Section 404 of the Clean Water Act.

### Coastal Zone Management

Issuance of this authorization also constitutes a finding of consistency with Florida's Coastal Zone Management Program, as required by Section 307 of the Coastal Zone Management Act.

### Water Quality Certification

This permit also constitutes a water quality certification under Section 401 of the Clean Water Act, 33 U.S.C. 1341



### Other Authorizations

You are advised that authorizations or permits for this activity may be required by other federal, state, regional, or local entities including but not limited to local governments or municipalities. This permit does not relieve you from the requirements to obtain all other required permits or authorizations.

The activity described may be conducted only in accordance with the terms, conditions and attachments contained in this document. Issuance and granting of the permit and authorizations herein do not infer, nor guarantee, nor imply that future permits, authorizations, or modifications will be granted by the Department.

### **PERMIT CONDITIONS**

The activities described must be conducted in accordance with:

- **The Specific Conditions**
- **The General Conditions**
- **The limits, conditions and locations of work shown in the attached drawings**
- **The term limits of this authorization**

You are advised to read and understand these conditions and drawings prior to beginning the authorized activities, and to ensure the work is conducted in conformance with all the terms, conditions, and drawings herein. If you are using a contractor, the contractor also should read and understand these conditions and drawings prior to beginning any activity. Failure to comply with these conditions, including any mitigation requirements, shall be grounds for the Department to revoke the permit and authorization and to take appropriate enforcement action. Operation of the facility is not authorized except when determined to be in conformance with all applicable rules and this permit, as described.

### **GENERAL CONDITIONS FOR INDIVIDUAL PERMITS**

The following general conditions are binding on all individual permits issued under this chapter, except where the conditions are not applicable to the authorized activity, or where the conditions must be modified to accommodate project-specific conditions.

1. All activities shall be implemented following the plans, specifications and performance criteria approved by this permit. Any deviations must be authorized in a permit modification in accordance with rule 62-330.315, F.A.C. Any deviations that are not so authorized may subject the permittee to enforcement action and revocation of the permit under chapter 373, F.S.
2. A complete copy of this permit shall be kept at the work site of the permitted activity during the construction phase, and shall be available for review at the work site upon request by the Agency staff. The permittee shall require the contractor to review the complete permit prior to beginning construction.

3. Activities shall be conducted in a manner that does not cause or contribute to violations of state water quality standards. Performance-based erosion and sediment control best management practices shall be installed immediately prior to, and be maintained during and after construction as needed, to prevent adverse impacts to the water resources and adjacent lands. Such practices shall be in accordance with the *State of Florida Erosion and Sediment Control Designer and Reviewer Manual (Florida Department of Environmental Protection and Florida Department of Transportation, June 2007)*, and the *Florida Stormwater Erosion and Sedimentation Control Inspector's Manual (Florida Department of Environmental Protection, Nonpoint Source Management Section, Tallahassee, Florida, July 2008)*, which are both incorporated by reference in subparagraph 62-330.050(9)(b)5., F.A.C., unless a project-specific erosion and sediment control plan is approved or other water quality control measures are required as part of the permit.
4. At least 48 hours prior to beginning the authorized activities, the permittee shall submit to the Agency a fully executed Form 62-330.350(1), "Construction Commencement Notice," (October 1, 2013), (<http://www.flrules.org/Gateway/reference.asp?No=Ref-02505>), incorporated by reference herein, indicating the expected start and completion dates. A copy of this form may be obtained from the Agency, as described in subsection 62-330.010(5), F.A.C., and shall be submitted electronically or by mail to the Agency. However, for activities involving more than one acre of construction that also require a NPDES stormwater construction general permit, submittal of the Notice of Intent to Use Generic Permit for Stormwater Discharge from Large and Small Construction Activities, DEP Form 62-621.300(4)(b), shall also serve as notice of commencement of construction under this chapter and, in such a case, submittal of Form 62-330.350(1) is not required.
5. Unless the permit is transferred under rule 62-330.340, F.A.C., or transferred to an operating entity under rule 62-330.310, F.A.C., the permittee is liable to comply with the plans, terms, and conditions of the permit for the life of the project or activity.
6. Within 30 days after completing construction of the entire project, or any independent portion of the project, the permittee shall provide the following to the Agency, as applicable:
  - a) For an individual, private single-family residential dwelling unit, duplex, triplex, or quadruplex – "Construction Completion and Inspection Certification for Activities Associated with a Private Single-Family Dwelling Unit" [Form 62-330.310(3)]; or
  - b) For all other activities – "As-Built Certification and Request for Conversion to Operation Phase" [Form 62-330.310(1)].
  - c) If available, an Agency website that fulfills this certification requirement may be used in lieu of the form.
7. If the final operation and maintenance entity is a third party:

- a) Prior to sales of any lot or unit served by the activity and within one year of permit issuance, or within 30 days of as-built certification, whichever comes first, the permittee shall submit, as applicable, a copy of the operation and maintenance documents (see sections 12.3 thru 12.3.4 of Volume I) as filed with the Florida Department of State, Division of Corporations, and a copy of any easement, plat, or deed restriction needed to operate or maintain the project, as recorded with the Clerk of the Court in the County in which the activity is located.
  - b) Within 30 days of submittal of the as-built certification, the permittee shall submit "Request for Transfer of Environmental Resource Permit to the Perpetual Operation and Maintenance Entity" [Form 62-330.310(2)] to transfer the permit to the operation and maintenance entity, along with the documentation requested in the form. If available, an Agency website that fulfills this transfer requirement may be used in lieu of the form.
8. The permittee shall notify the Agency in writing of changes required by any other regulatory agency that require changes to the permitted activity, and any required modification of this permit must be obtained prior to implementing the changes.
9. This permit does not:
  - a) Convey to the permittee any property rights or privileges, or any other rights or privileges other than those specified herein or in chapter 62-330, F.A.C.;
  - b) Convey to the permittee or create in the permittee any interest in real property;
  - c) Relieve the permittee from the need to obtain and comply with any other required federal, state, and local authorization, law, rule, or ordinance; or
  - d) Authorize any entrance upon or work on property that is not owned, held in easement, or controlled by the permittee.
10. Prior to conducting any activities on state-owned submerged lands or other lands of the state, title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund, the permittee must receive all necessary approvals and authorizations under chapters 253 and 258, F.S. Written authorization that requires formal execution by the Board of Trustees of the Internal Improvement Trust Fund shall not be considered received until it has been fully executed.
11. The permittee shall hold and save the Agency harmless from any and all damages, claims, or liabilities that may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any project authorized by the permit.



12. The permittee shall notify the Agency in writing:
  - a) Immediately if any previously submitted information is discovered to be inaccurate; and
  - b) Within 30 days of any conveyance or division of ownership or control of the property or the system, other than conveyance via a long-term lease, and the new owner shall request transfer of the permit in accordance with rule 62-330.340, F.A.C. This does not apply to the sale of lots or units in residential or commercial subdivisions or condominiums where the stormwater management system has been completed and converted to the operation phase.
13. Upon reasonable notice to the permittee, Agency staff with proper identification shall have permission to enter, inspect, sample and test the project or activities to ensure conformity with the plans and specifications authorized in the permit.
14. If prehistoric or historic artifacts, such as pottery or ceramics, projectile points, stone tools, dugout canoes, metal implements, historic building materials, or any other physical remains that could be associated with Native American, early European, or American settlement are encountered at any time within the project site area, the permitted project shall cease all activities involving subsurface disturbance in the vicinity of the discovery. The permittee or other designee shall contact the Florida Department of State, Division of Historical Resources, Compliance Review Section (DHR), at (850)245-6333, as well as the appropriate permitting agency office. Project activities shall not resume without verbal or written authorization from the Division of Historical Resources. If unmarked human remains are encountered, all work shall stop immediately and the proper authorities notified in accordance with section 872.05, F.S. For project activities subject to prior consultation with the DHR and as an alternative to the above requirements, the permittee may follow procedures for unanticipated discoveries as set forth within a cultural resources assessment survey determined complete and sufficient by DHR and included as a specific permit condition herein.
15. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding unless a specific condition of this permit or a formal determination under rule 62-330.201, F.A.C., provides otherwise.
16. The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other uplands in a manner that does not require a permit under chapter 62-330, F.A.C., or cause violations of state water quality standards.
17. This permit is issued based on the applicant's submitted information that reasonably demonstrates that adverse water resource-related impacts will not be caused by the completed permit activity. If any adverse impacts result, the Agency will require the permittee to eliminate the cause, obtain any necessary permit modification, and take any necessary

corrective actions to resolve the adverse impacts.

18. A Recorded Notice of Environmental Resource Permit may be recorded in the county public records in accordance with subsection 62-330.090(7), F.A.C. Such notice is not an encumbrance upon the property.
19. In addition to those general conditions in subsection (1), above, the Agency shall impose any additional project-specific special conditions necessary to assure the permitted activities will not be harmful to the water resources, as set forth in rules 62-330.301 and 62-330.302, F.A.C., Volumes I and II, as applicable, and the rules incorporated by reference in this chapter.

## **SPECIFIC CONDITIONS**

### **PRIOR TO CONSTRUCTION**

1. **CONCEPTUAL RECLAMATION PLAN:** Prior to initiating mining operations within the permit boundary, a conceptual reclamation plan shall be approved by the Department.
2. **FINANCIAL RESPONSIBILITY:** To satisfy the property interest requirements of the ERP Applicant's Handbook, Volume I, Section 4.2.3(d)5.d.1, and the mitigation requirements of Section 10.3.7 - 10.3.7.9, the permittee shall maintain financial responsibility in an amount sufficient to cover 110% of the costs for removal of the stormwater management system and reclamation of the site, and to cover construction, monitoring, and maintenance of the mitigation wetlands. The initial approved property interest financial responsibility amount shall be \$9,496,335 and the initial approved mitigation financial responsibility shall be \$8,937,884 per the date of issuance of this permit.
  - a. Draft financial responsibility language shall be approved by the Department. Financial responsibility shall be posted prior to initiation of activities authorized under this permit. Financial responsibility shall be in an amount equal to 110 percent (%) of the estimated costs to meet the requirements of ERP Applicant's Handbook, Volume I, Section 4.2.3(d)5.d.1, Sections 10.3.7 – 10.3.7.9. The initial financial responsibility amount and all updates shall be approved by the Department. A standby trust fund agreement shall be established.
  - b. Financial responsibility shall be updated annually. The amount shall be adjusted annually based on the annual Construction Cost Index, as presented in the first issue of the Engineering News Record published in December. The amount may be adjusted to reduce the costs for work completed. Adjustments shall be submitted with the annual report by March 1 of each year.
  - c. In addition to the above requirements:

- 1) A permittee must notify the Agency by certified mail of the commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming the permittee as debtor within 10 business days after the commencement of the proceeding.
  - 2) A permittee who fulfills the requirements of Sections 10.3.7 through 10.3.7.9 and Section 4.2.3(d)5.d.1 by obtaining a bond will be deemed to be without the required financial assurance in the event of bankruptcy, insolvency, or suspension or revocation of the license or charter of the issuing institution. The permittee must reestablish in accordance with Sections 10.3.7 through 10.3.7.9 and Section 4.2.3(d)5.d.1 a financial responsibility mechanism within 60 days after such event.
  - 3) When transferring a permit, the new owner or person with legal control shall submit documentation to satisfy the financial responsibility requirements of Sections 10.3.7 through 10.3.7.9 and Section 4.2.3(d)5.d.1. The prior owner or person with legal control of the project shall continue the financial responsibility mechanism until the Agency has approved the permit transfer and substitute financial responsibility mechanism.
- d. Financial responsibility to satisfy property interest requirements under ERP Applicant's Handbook, Section 4.2.3.(d)5.d.1 shall be maintained until the entire system has been released from the requirements of Chapter 62C-37, F.A.C., and converted to operational phase and transferred to the final operational entity and/or the system has been abandoned and the operation phase terminated pursuant to 62-330.310(7), F.A.C. Financial responsibility to satisfy the requirements of Sections 10.3.7 through 10.3.7.9 shall no longer be required for individual wetlands and/or other surface waters that have been deemed successful and released from the requirements of Chapter 62C-37, F.A.C. and this ERP by the Department.
3. HISTORICAL AND ARCHAEOLOGICAL ARTIFACTS: Pursuant to General Condition 14, if historical or archaeological artifacts are discovered within the project site, the permittee shall immediately notify the Bureau of Historic Preservation, Division of Historical Resources, R. A. Gray Building, 500 S. Bronough Street, Tallahassee, Florida 32399-0250. The permittee shall also notify the Department either by email at [MiningAndMitigation@FloridaDEP.gov](mailto:MiningAndMitigation@FloridaDEP.gov), by mail at 2600 Blair Stone Road, MS 3577, Tallahassee, Florida 32399, or by phone at 850-245-7554.
  4. WILDLIFE MANAGEMENT: The permittee shall conduct pre-clearing wildlife surveys prior to habitat disturbance. The appropriate Florida Fish and Wildlife Conservation Commission/US Fish and Wildlife Service (FFWCC/USFWS) authorizations shall be obtained prior to the disturbance of habitat occupied by listed wildlife species or relocation of any listed wildlife species. All relocation activities shall be conducted in accordance with FFWCC/USFWS permits or management plans. Copies of all correspondence, permits, authorizations, and reports to or from these agencies shall be provided to the Department no later than 30 days after being generated or received by the permittee.



5. LISTED AND REGULATED SPECIES: This permit does not authorize the permittee to cause any adverse impact to or “take” of state listed species and other regulated species of fish and wildlife. Compliance with state laws regulating the take of fish and wildlife is the responsibility of the owner or applicant associated with this project. Please refer to Chapter 68A-27 of the Florida Administrative Code for definitions of “take” and a list of fish and wildlife species. If listed species are observed onsite, FFWCC staff are available to provide decision support information or assist in obtaining the appropriate FFWCC permits. Most marine endangered and threatened species are statutorily protected and a “take” permit cannot be issued. Requests for further information or review can be sent to [FWCCConservationPlanningServices@MyFWC.com](mailto:FWCCConservationPlanningServices@MyFWC.com).

## **SYSTEM CONSTRUCTION**

6. EXTENT OF CONSTRUCTION: The extent of system construction shall be limited to the areas shown on the attached Figure 10 – Mine Plan Map and Figure 11 Revised – Wetland Impacts Map.
7. SYSTEM MODIFICATIONS: No modifications or additions shall be made to this facility which could alter the stormwater management and storage characteristics of the facility, without prior modification of this permit. The stormwater treatment facility shall at all times be maintained in good working order and operate as efficiently as practicable. All installed treatment facilities shall be operated to achieve the highest practical level of treatment and efficiency.
8. WASTEWATER SYSTEM CONSTRUCTION AND MANAGEMENT: There shall be no discharges unless specifically authorized by this permit or the permittee’s Industrial Wastewater Facility Permit.
- a. Contact stormwater and process wastewater shall be managed through the industrial wastewater ponds (IWW Ponds) as located within the “Water Treatment Area” and shown on Figure 1 – Facility Overview Map (located in the Best Management Practices Plan, attached).
  - b. Non-contact stormwater only shall be managed through the Plant Stormwater Ponds as shown in the Legend on Figure 1 – Facility Overview Map (attached).
  - c. Figure 2 - Plant Site Layout (attached) shows the proposed Primary and conceptual Alternative Outfalls from the industrial wastewater ponds. Three options were provided by the permittee and reviewed during this permit application process for the purpose of discharge of treated contact stormwater and process wastewater: One option utilizing the Primary Outfall only, and two options (Options A and B, as described below) utilizing the Primary Outfall and Alternative Outfall with the purpose of dividing the discharge between the Primary and Alternative Outfalls. These Alternative Outfall options were

provided to the Department on November 6, 2020, within the “Mining Phase Water Balance” document. Options A and B are as follows:

- 1) Option A – Divert 70% of the discharge to the secondary east outfall (TRS D-002)
    - Primary TRS D-001 (west) Outfall Average Annual Daily Flow (AADF) discharge= 0.04 mgd (Santa Fe Watershed)
    - Alternative TRS D-002 (east) Outfall AADF = 0.09 mgd (Keystone Heights)
  - 2) Option B – Divert 85% of the water when Graham Gage is above 2.3 cfs
    - Primary TRS D-001 (west) Outfall AADF = 0.02 mgd (Santa Fe Watershed)
    - Alternative TRS D-002 (east) Outfall AADF = 0.11 mgd (Keystone Heights)
- d. At least 21 days prior to discharging any treated or untreated industrial wastewater, the permittee shall provide to the Department as-builts (“As-Built Certification and Request for Conversion to Operation Phase” [Form 62-330.310(1)]) of the IWW Ponds and outfall structure(s), and identify which of the three options were constructed and how water discharges will be managed. The permittee shall also provide a revised Figure 2, representing as built conditions, at least 21 days prior to discharging any treated or untreated industrial wastewater.
- e. The permittee shall submit the calculated storage capacities of the IWW ponds to the Department for review and approval with the as-builts described in Specific Condition 8d. The permittee shall be able to maintain rainfall storage capacity in the industrial wastewater management system for containing the design (25-year, 24-hour) storm event at or below the maximum operational level while maintaining a minimum 3 feet of freeboard. This evaluation shall follow the “Table 1. Trail Ridge South IWW Ponds Capacity Analysis for the 25-Year, 24-Hour Storm Event – Conceptual Pre-Construction” template included in Appendix A – IWW Pond Design and Operating Information (attached), and shall demonstrate the system’s ability to recover from the design storm event according to the ERP Applicant’s Handbook Volume II for the St. Johns River Water Management District.
9. **WATER QUALITY PROTECTION:** Prior to initiating any dredging or filling within wetlands, stockpiling material, waste, or overburden in the vicinity of a wetland or other surface waters, or conducting any other earth-disturbing activity in the vicinity of a wetland or other surface waters, the permittee shall implement measures to protect from turbidity and sediment on-site and off-site wetlands and surface waters that are not approved for dredging or filling. Adjacent and/or downstream wetlands and other surface waters shall be protected as follows:
- a. The stormwater management system shall be constructed to manage or prevent discharge from a 25-year, 24-hour storm event. Operation, maintenance and inspection of the system shall be in accordance with the permittee’s Best Management Practices Plan (attached).

- b. The permittee shall instruct all personnel (including subcontractors) that the above referenced activities shall not occur within wetlands or surface waters not authorized for dredging or filling, nor within or adjacent to wetlands or other surface waters where turbidity and sediment control devices are not present.
- c. Prior to any activities the permittee shall clearly flag and stake the limits of the permitted construction areas to demarcate and protect adjacent upland, wetland, and other surface waters from encroachment. All construction personnel shall be shown the locations of all wetland and buffer areas outside of the construction area to prevent encroachment from heavy equipment into these areas.
- d. Best management practices (BMP) for turbidity and erosion control shall be installed prior to the commencement of any construction activities. Methods shall include, but are not limited to, the use of staked hay bales, berms, staked filter cloth, temporary containment berms, silt-control polymers, sodding, seeding, mulching, and the deployment of turbidity screens around the immediate project site, as appropriate for each area. All wetland areas or waterbodies that are adjacent to the specific limits of construction authorized by this permit shall be protected from erosion, sedimentation, siltation, scouring, excess turbidity or dewatering.
- e. The permittee shall be responsible for ensuring that erosion control devices and procedures, as required by General Condition No. 3, are inspected and maintained during all phases of construction (i.e. site preparation, construction, earthmoving, reclamation, etc.) authorized by this permit until all areas that were disturbed during construction are sufficiently stabilized to prevent erosion, siltation, and turbid discharges. In no case shall surface water discharges result in exceedance of State water quality standards pursuant to Chapter 62-302, F.A.C.
- f. Erosion and turbidity control devices shall be inspected and maintained daily and within 24 hours after each rainfall event greater than ½-inch. Erosion and turbidity control devices shall also be inspected and maintained on a regular basis during all phases of earthmoving and reclamation. Inspectors shall have completed stormwater erosion control training, shall receive annual training updates, and be familiar with all BMP plans. Records of inspections shall be maintained on site for a period of three (3) years and shall be available to Department staff upon request. Erosion control devices shall remain in place until all areas are sufficiently stabilized to prevent erosion, siltation, and turbid discharges.
- g. The turbidity control barriers shall remain in place until all construction work and reclamation have been completed and the reclaimed areas are adequately stabilized. The determination to remove turbidity and erosion control devices shall be based on site inspections and water quality monitoring data (outlined in the Monitoring Requirements Section of this permit) indicating that no violations of State water quality standards are expected to occur.



10. **STORMWATER SYSTEM MANAGEMENT:** Mining operation areas shall be surrounded by a perimeter containment berm. The stormwater management system shall be managed such that a 25-year, 24-hour storm event can be contained with appropriate freeboard. The system shall be constructed and managed as follows:

- a. The top of any berms (including temporary roads) adjacent to areas not designated for disturbance (including preservation areas) shall be sloped such that they drain towards the construction area and not undisturbed areas. Berms and other disturbed areas in or adjacent to wetlands shall be seeded, mulched, sodded, or appropriately treated to facilitate the rapid growth of vegetation and stabilization of the area. Any breach of integrity shall be immediately repaired.
- b. Slopes and exterior sides of berms, immediately up gradient from property lines, wetlands, and surface waters, shall be inspected daily and within 24 hours after each rainfall event that is greater than ½-inch in a 24-hour period until the vegetation has been established. Thereafter, inspections shall occur weekly and within 24 hours after each rainfall event that is greater than ½-inch in a 24-hour period. Should washes or rills develop, the permittee shall repair the eroded areas and stabilize the slopes within 48 hours. Where the possibility of cascading failure exists, up gradient dikes and berms must also meet this requirement.
- c. All berms shall be removed as part of the reclamation of each area.
- d. Pumps in the water collection areas shall be inspected daily when running to ensure correct operation.
- e. Each inspection shall be documented and kept on file at the facility office. Each inspection report shall contain, as a minimum, date, name of inspector, as-found condition of system features, and nature and extent of maintenance/repair performed.

11. **VIOLATION OF STATE WATER QUALITY STANDARDS:** The following measures shall be taken immediately by the permittee whenever the water quality levels at a monitoring station, or any water leaving the project area, violates state water quality standards established pursuant to Chapter 62-302, F.A.C.;

- a. Cease all work contributing to the water quality violation.
- b. Modify the work procedures that were responsible for the violation, and repair any non-functioning containment devices.
- c. Within 24 hours of identifying the violation notify the Department of the time the violation is first detected, the extent of the violation, and the corrective measures that have been and will be implemented.

- d. Continue water quality monitoring at 8-hour intervals until samples no longer violate water quality standards.
12. **FLOWABLE LIQUID STORAGE:** Stormwater ponds, topsoil storage piles, rim ditches, and other water control structures shall not be constructed to operate as a dam, unless the design is specifically approved in this permit. “Dam” means any artificial or natural barrier, with appurtenant works, raised to obstruct or impound, or which does obstruct or impound, any of the surface waters of the state.
- a. Water control structures shall not store flowable liquid more than four feet above natural grade. A minimum of three feet of freeboard should be provided above the expected high-water level within the containment system. All water management structures shall be constructed of clean fill, devoid of materials or vegetation that could allow water to be piped through the structure. Vegetated structures should be mowed annually.
  - b. Topsoil storage piles or berms constructed as roadway safety barriers shall not be utilized to store flowable liquid, but may be used to divert stormwater to sumps. Water deeper than one foot above grade shall be pumped away from these structures within 72 hours.
13. **DESIGN STORM CONTAINMENT:** All mining and mining-related activities shall be conducted within a surface water management system capable of containing a 25-year, 24-hour storm. All exterior containment structures and appurtenant works must be designed by a professional engineer. All construction and modification of exterior containment structures and appurtenant works shall be supervised by a professional engineer. Where the possibility of cascading failure exists, upstream dikes and berms must also meet this requirement. The permittee shall establish internal procedures to ensure compliance with this condition. Operation, maintenance and inspection of the system shall be in accordance with the permittee’s stormwater pollution prevention and best management practices plan for the facility.
14. **FLOOD CONTROL:** The permittee shall take all reasonable steps necessary to eliminate the risk that there will be flooding on lands not controlled by the permittee caused by silting or damming of stream channels, channelization, slumping or debris slides, uncontrolled erosion, or intentional spoiling or diking, or other similar actions within the control of the permittee.

### **WETLAND CONSTRUCTION & RECLAMATION**

15. **UTILITY CROSSINGS:** Five existing culverted trail road wetland crossings will be widened to allow for vehicle, equipment, and pipeline access, as shown on Figure 10 – Mine Plant Map, Figure 10C – Cross Section E-F, and Figure 11 Revised – Wetland Impacts Map. When the crossings are expanded, the culverts will be extended in order to maintain proper flow through avoided wetland systems. After mining is complete, four of the expanded

crossings shall be removed. One of the expanded crossings will be removed and returned to the original approximately 25-foot wide elevated crossing in the post-reclamation condition. Three new approximately 25-foot wide elevated crossings will be established to provide upland access, as represented in the attached Figure 13 Revised – Post-Mining Land Use and Vegetation Map, Figure 15 – Wetland Mitigation Map, and Figure 16 – Cross Section G-H (attached) represents the post-reclamation condition of the culverted trail road wetland crossings. Each culvert or set of culverts is designed to handle the 25-year, 24-hour design storm. The roads will be graded approximately 2-feet above the top of the culverts and are not expected to cause adverse flooding during large storm events or reduce discharges to adjacent downgradient wetlands. Construction, removal, and revegetation of the pipeline/utility crossings described herein shall be completed as described herein, outlined in the Figures, and as follows:

- a. Best management practices for turbidity and erosion control as outlined in Specific Condition 9 above, shall be used and maintained at all times beginning prior to construction and through crossing removal and stabilization. Daily turbidity monitoring shall be conducted and reported in accordance with Specific Conditions 28 and 29 during utility crossing expansion, construction, and removal.
- b. Clean sand or fill shall be compacted over the crossing area.
- c. Pipelines for transport of any substance other than clear water shall be double-walled, and shall be equipped with properly engineered pressure sensing devices capable of shutting down pumping in the event of pipe pressure loss or pipe coupling/blowout failure. The permittee shall, at least 21 days prior to the commencement of pipeline use, provide to the Department a certification of construction details confirming the installation of the devices.
- d. Certified as-built engineering drawings for the pipeline/utility crossings shall be submitted to the Department within 30 days of construction completion.
- e. The construction and removal of all structures and fill material will be timed to coincide with periods of low flow and shall not be done during the months of July, August, or September.
- f. Fill shall be removed and the area contoured to elevations shown in the post-reclamation design, Figure 14 Revised - Post-Mining Topography and Drainage Basins Map. All exposed soil will be revegetated within 24 hours after final contouring.
- g. The final contours of the restored crossing area shall be surveyed in accordance with general survey procedures utilizing a 50-foot grid and showing elevations to 0.1 foot. Within 60 days of final grading, both a cross section and a topographic map of the crossing site extending the width of the 25-year floodplain, showing sampled points and 0.5-foot contours referenced to NGVD, and certified by a land surveyor or professional



engineer registered in the State of Florida, shall be submitted to the Department for approval. All topographic maps shall meet the minimum technical standards as set forth in Chapter 472, F.S.

h. Revegetation shall be done in accordance with Specific Conditions 17 and 19.

16. SITE CONTOURING: The permittee shall re-contour the project area as shown in attached post-reclamation topography, drainage plans and wetland cross sections. The elevations for the wetlands, as shown in the attachments, are conceptual. The final elevations shall be based on the post-mining hydrology of the site and will be set to ensure healthy, functioning wetlands. Reclamation shall occur in accordance with the timetables in Rule 62C-37.008, F.A.C. and in the attached Figure 10 – Mine Plan Map.

- a. The permittee shall restore the original drainage pattern of the area to the greatest extent possible. Watershed boundaries shall not be crossed in restoring drainage patterns; watersheds shall be restored within their original boundaries. Types of landforms shall be those best suited to enhance the recovery of the land into mature sites with high potential for the intended land use. Slopes of any reclaimed land area shall be no steeper than four feet horizontal to one foot vertical to enhance slope stabilization and provide for the safety of the general public.
- b. At least six inches of topsoil shall be applied to all areas within the project area. If muck is available, muck shall substitute for topsoil within created and restored wetland areas.
- c. Where needed to contain sediment and turbidity on site, minimum topsoil storage piles may remain around the perimeter of the project area. These remaining topsoil storage piles shall be removed to restore over-land sheet flow, planted, and stabilized prior to release.

17. SITE REVEGETATION: The permittee shall reclaim and revegetate the project area to the land uses as shown in attached post-reclamation land use. Reclamation shall occur in accordance with the timetables in Rule 62C-37.008, F.A.C. The permittee shall follow the planned post-reclamation vegetation plan as shown in the attached Figure 13 Revised – Post-Mining Land Use and Vegetation Map and Table 4 – Post Mining Land Use.

18. MITIGATION AS-BUILTS: Within 30 days of achieving final grade, the permittee shall install permanent benchmarks and submit a topographic map of each wetland site to be created. The topographic map shall be submitted to the Department within 60 days of achieving final grade. The topographic map shall meet the following criteria:

- a. It shall show one-foot contour intervals based on a 50-foot, or finer, resolution grid.
- b. It shall clearly depict the topography of the wetland site in such a way as to unambiguously show how the site will retain, detain, shed, or otherwise influence the

flow and detention of water at the site, using a resolution finer than that required in subparagraph a. above, if necessary.

- c. It shall be certified by a registered land surveyor or professional engineer registered in the state of Florida.
- d. It shall extend not less than 50 feet into the adjacent, surrounding uplands; and
- e. The map shall be at a scale of one inch equals 100 feet, or larger.

19. WETLAND MITIGATION AREA REVEGETATION: The wetland mitigation areas shall be planted in accordance with the attached post-reclamation land use figures and tables and the following criteria:

- a. The revegetation shall include the planting of tree, shrub, and ground cover species native to Bradford and Clay Counties; identified as obligate or facultative wet plant species, as defined by Chapter 62-340, F.A.C.; and appropriate for the wetland type.
- b. The tree and shrub locations shall be staggered to result in a more natural spatial distribution and to avoid establishing straight rows of trees/shrubs. The specific location for planting should be determined in the field based on an assessment of the variation in topography, soils and hydrology within the wetland site.
- c. The revegetation of forested mitigation areas shall include the planting of wetland tree species such sweet bay (*Magnolia virginiana*), swamp bay (*Persea palustris*), dahoon holly (*Ilex cassine*), green ash (*Fraxinus pennsylvanica*), sweet gum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), bald cypress (*Taxodium distichum*), pond cypress (*Taxodium ascendens*), and blackgum (*Nyssa sylvatica* var. *biflora*). Other tree species may be substituted with prior written approval of the Department. Mitigation wetlands shall be planted in accordance with Table 5 – Mitigation Planting.
- d. All created wetland mitigation areas shall have a 50-foot Hardwood-Conifer Mixed (FLUCCS 434) upland buffer to provide for enhanced forage and refuge for species utilizing the wetlands.

20. WETLAND MITIGATION MAINTENANCE: The purpose of the periodic management of the wetland mitigation sites is to ensure that the wetland plant species will survive and thrive. As part of ongoing management of the sites, the permittee shall do the following:

- a. Remove nuisance and exotic species from the site, as needed, to meet the requirements of Specific Condition 40. Nuisance and exotic species shall include those plants listed in the current Florida Exotic Pest Plant Council (FLEPPC) Invasive Plant List.

- b. Nuisance and exotic vegetation shall be controlled by herbicide, fire, hydrological, or mechanical means in order to limit cover of nuisance species to less than ten (10) percent and exotic species to less than one (1) percent.
- c. Replant wetland trees in accordance with Specific Condition 19 when the density falls below 400 wetland trees per acre. The permittee shall replant at least as many trees of the appropriate species as needed to meet the release criteria.
- d. If after a period of two years, no positive growth or establishment of desirable native wetland groundcover species is observed, supplemental planting of herbaceous wetland vegetation shall occur.

21. WETLAND EVALUATION AND CORRECTIVE ACTION: If it is determined by Department staff, based upon visual inspection and review of the monitoring reports, that the creation and restoration efforts are not trending toward meeting the release conditions, the permittee shall present methods and proposal for attainment of release criteria to be reviewed and approved by the Department within 30 days of the Department's notification, to ensure success of the efforts. The corrective actions shall be implemented within 90 days of written approval by the Department unless a different time schedule is approved in writing by the Department.

22. WETLAND ENHANCEMENT AREAS: Prior to commencement of construction at the Trail Ridge South Mine, the permittee shall begin the enhancement area activities described herein; enhancement activities shall be completed within 60 days of commencement of construction. Approximately 136.49 acres within the project boundary shall be enhanced and converted to Wetland Forested Mixed (FLUCCS 630) by thinning existing planted pine in Coniferous Plantation Wetland (FLUCCS 441W) areas to a density of no more than 50 trees per acre. Once this has been accomplished the area will be graded to remove furrows, windrows, ditches and old logging decks and transition the elevation into the adjacent, existing mixed hardwood forests. Enhancement areas will be planted with tree species found in Planting Zone A on Table 5 – Mitigation Planting (attached). It is anticipated that herbaceous, shrub and additional wetland tree species will recruit from the adjacent mixed hardwood forests. If insufficient desirable herbaceous and shrub recruitment occurs within two (2) years, herbaceous and shrub species shall be planted. These species shall be native to Bradford and Clay Counties, identified as obligate or facultative wet plant species (as defined by Chapter 62-340, F.A.C.), and appropriate for the wetland type. The following area shall be enhanced:

Coniferous Plantation Wetland (FLUCCS 441W) to Wetland Forested Mixed (FLUCCS 630), 136.49 acres, as shown on the attached Figure 15 – Wetland Mitigation Map.

After grading and planting is completed in the enhancement areas, the permittee shall notify the Department in writing that the enhancement construction has been completed to allow Department staff to inspect the work.



## **MONITORING & REPORTING**

23. QUALITY ASSURANCE: In order to assure minimum field and laboratory quality assurance, methodological and reporting requirements, all field sampling shall follow the applicable collection and quality control protocols and requirements described in Chapter 62-160, F.A.C., and the appropriate Department of Environmental Protection Standard Operation Procedures.
24. DEPARTMENT SUBMITTAL ADDRESS: Unless otherwise specified, all notices, plans, draft easements, reports or other documents or information required by this permit to be submitted to the Department shall be provided to:
- Florida Department of Environmental Protection  
Mining and Mitigation Program  
2600 Blair Stone Road, MS 3577  
Tallahassee, Florida 32399-2400  
850-245-7554  
[MiningAndMitigation@FloridaDEP.gov](mailto:MiningAndMitigation@FloridaDEP.gov)
25. AGENT CHANGE: The permittee shall notify the Department in writing within 14 days of any change in agents, address or telephone number for the permittee or project.
26. SYSTEM INSPECTION: All mining and mining-related activities shall be conducted within a surface water management system capable of containing a 25-year, 24-hour storm.
- a. Slopes and exterior sides of berms, immediately up gradient from property lines, wetlands, and surface waters, shall be inspected daily and within 24 hours after each rainfall event that is greater than ½-inch in a 24-hour period until the vegetation has been established. Thereafter, inspections shall occur weekly and within 24 hours after each rainfall event that is greater than ½-inch in a 24-hour period. Should washes or rills develop, the permittee shall repair the eroded areas and stabilize the slopes within 48 hours. Where the possibility of cascading failure exists, up gradient dikes and berms must also meet this requirement.
  - b. Pumps in the water collection areas shall be inspected daily when running to ensure correct operation.
  - c. Each inspection shall be documented and kept on file at the facility office. Each inspection report shall contain, as a minimum, date, name of inspector, as-found condition of system features, and nature and extent of maintenance/repair performed.
27. SPILL REPORTING: Pursuant to 403.077, F.S., the permittee shall:

- a. Report all unauthorized releases or spills of:
  - 3) oil or petroleum products in excess of 25 gallons per incident (Chapter 62-780, F.A.C.);
  - 4) untreated or treated wastewater or stormwater in excess of 1,000 gallons per incident;
  - 5) other hazardous substances where public health or the environment may be endangered.
- b. Unauthorized releases or spills shall be reported to:
  - 1) The State Watch Office Toll Free Number, (800) 320-0519;
  - 2) The Department's Pollution Notice website at <https://floridadep.gov/pollutionnotice>; and
  - 3) The Department's Mining and Mitigation Program at [MiningAndMitigation@FloridaDEP.gov](mailto:MiningAndMitigation@FloridaDEP.gov).
- c. Unauthorized releases or spills shall be reported as soon as practical, but no later than 24 hours from the time the permittee becomes aware of the discharge. The permittee, to the extent known, shall provide the following information:
  - 1) Name, mailing and email addresses, and telephone number of person reporting.
  - 2) Name, mailing and email addresses, and telephone number of permittee or responsible person for the discharge.
  - 3) Date and time of the discharge and status of discharge (ongoing or ceased).
  - 4) Characteristics of the wastewater spilled or released (untreated or treated, industrial or domestic wastewater or stormwater).
  - 5) Estimated amount of the discharge.
  - 6) Location or address of the discharge.
  - 7) Source and cause of the discharge.
  - 8) Whether the discharge was contained on site and cleanup actions taken to date.
  - 9) Description of area affected by the discharge, including name of water body affected, if any.
  - 10) Other persons or agencies contacted.
- d. A written submission shall also be provided to the Department at the email address listed above, within five (5) days of the time the permittee becomes aware of the unauthorized release or spill. The written submission shall contain: all of the information listed above, a description of the unauthorized discharge and its cause; the period of the unauthorized discharge including exact dates and time, and if the unauthorized discharge has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the unauthorized discharge.
- e. Pursuant to 403.077(2)(d), F.S., if the permittee discovers that a reportable pollution release has migrated outside the property boundaries of the installation, **the permittee must provide an additional notice** to the Department via the Pollution Notice website

that the release has migrated outside the property boundaries within 24 hours after discovery.

- f. For unauthorized stormwater releases or spills of **1,000 gallons or less**, per incident, notification emails shall be provided to the Department at [MiningAndMitigation@FloridaDEP.gov](mailto:MiningAndMitigation@FloridaDEP.gov), within 24 hours from the time the permittee becomes aware of the discharge.

28. **SURFACE WATER QUALITY MONITORING:** Water quality monitoring shall occur down gradient from each dredging or filling activity within waters of the state.

- a. Permanent water quality monitoring stations shall be installed in the avoided wetland areas, 25 to 50 feet down gradient from the areas that have been, or will be dredged or filled. Proposed monitoring locations shall be submitted to the Department for approval within 60 days of permit issuance.
- b. Daily monitoring of turbidity shall be conducted at each station in the avoided wetlands during all phases of the construction of the surface water containment control berm until the external face of the berm has vegetated and stabilized.
- c. If monitoring reveals turbidity levels at the monitoring station greater than or equal to 29 Nephelometric Turbidity Units (NTU's) above the average turbidity levels measured in that location prior to construction, the requirements of Specific Condition 11 shall be implemented.

29. **SURFACE WATER QUALITY REPORTING:** All daily turbidity monitoring shall be summarized on a monthly basis and shall be submitted by the 7th of each month.

- a. Each monitoring report shall be submitted with the following information:
  - 1) permit number;
  - 2) dates of sampling and analysis;
  - 3) a statement describing the methods used in collection, handling, storage and analysis of the samples;
  - 4) a map indicating the sampling locations;
  - 5) a statement by the individual responsible for implementation of the sampling program concerning the authenticity, precision, limits of detection and accuracy of the data; and
  - 6) documentation that the laboratory performing the sampling and analyses has an approved quality control and assurance plan on file with the Department.
- b. The monitoring reports shall also include the following information for each sample that is taken:
  - 1) time of day samples taken,
  - 2) water temperature,



- 3) depth of water body,
- 4) depth of sample, and
- 5) antecedent weather conditions.

30. GROUNDWATER LEVEL MONITORING: Within 3 months of the date of issuance of this permit or prior to the commencement of mining operations (whichever occurs first), the permittee shall install 11 piezometers in the undisturbed wetlands and 2 staff gauges in the undisturbed surface waters as shown in Figure 17 – Undisturbed Wetland Monitoring Piezometer Locations Map (attached), to provide assurance that there will be no significant impacts to water quantity on-site or downstream resources and to ensure that adequate water levels are maintained to support the adjacent undisturbed wetlands and surface waters.

- a. Upon completed installation of the 11 piezometers and 2 staff gauges, the permittee shall submit a report certifying the construction details. This report shall also include:
  - 1) A map with the latitude and longitude coordinates of the devices, including casing and ground elevation information; and
  - 2) Measured water levels and elevations.
- b. The piezometers will monitor the surficial groundwater levels during mining and through the completion and release of reclamation at least monthly.
- c. Undisturbed wetlands will be visually evaluated on at least a monthly basis to ensure no adverse impacts occur.
- d. Should the piezometers indicate groundwater lowering that has the potential to cause adverse secondary impacts to undisturbed on-site or downstream wetlands or surface waters, the permittee shall immediately coordinate with the Department to institute corrective measures and implement appropriate controls to maintain hydration. Possible controls include recharge ditches or flow diversions.

31. GROUNDWATER LEVEL REPORTING: The permittee shall commence keeping groundwater level monitoring reports beginning within 3 months of the date of issuance of this permit or prior to the commencement of mining operations (whichever occurs first), through the successful completion and release of reclamation.

The permittee shall submit the following in the groundwater level report to the Department with the annual report for the mine:

- 1) A narrative that describes the monitoring performed, dates of monitoring, groundwater elevations, and surface water levels;
- 2) Summary tables of the dates of monitoring and results;
- 3) Applicable figures, including a map showing the project location and piezometer and staff gauge locations;
- 4) Groundwater elevation contours;
- 5) Any conclusions and recommendations; and

- 6) A statement by the individual responsible for implementation of the monitoring program concerning the authenticity, precision, limits of detection and accuracy of the data.

32. MITIGATION VEGETATION MONITORING: Monitoring of mitigation areas shall be conducted to ensure that these areas are trending toward meeting release criteria and provide time for mitigation areas to establish natural vegetative community structures. Mitigation areas shall be monitored until they meet release criteria outlined in Specific Conditions 40 and 41 and the Department issues formal release.

- a. Created Mitigation: Vegetation monitoring of the created mitigation areas shall be conducted on an annual basis for 5 years or until such time that release success criteria are met. Within six months or at the onset of the next growing season following completion of final contouring and initial planting, a baseline quantitative monitoring event shall be conducted to document the baseline conditions for the area. Quantitative monitoring is conducted during the first- and fifth-year annual monitoring events. Qualitative monitoring is conducted during the second, third- and fourth-year annual monitoring events. If the wetland mitigation areas have not reached release criteria by the fifth-year monitoring event, the monitoring methods will be re-established.
- b. Enhancement Areas: Qualitative wetland monitoring for these areas shall take place prior to the enhancement work and again at one year after enhancement completion.

33. MITIGATION AREA HYDROLOGIC MONITORING: Hydrologic monitoring shall be conducted within the created wetlands. The location and number of monitoring stations shall be determined based upon the acreage and land use types within the wetland area to be monitored. Following final contouring of wetland mitigation areas, an as-built survey of post reclamation contours along with the proposed location for surficial piezometers will be provided to the Department for approval. Monitoring stations will be approved by Department staff after reviewing the topographic map of the mitigation area and/or after a field inspection of the final graded site. Natural ground and top of casing of the piezometers shall be surveyed in by a Florida Professional Land Surveyor. All benchmarks shall be clearly identified. After achieving final grade for the wetland mitigation site, the permittee shall install one of the following two options:

- a. Option 1: one surficial piezometer and one wetland staff gauge. If Option 1 is chosen for hydrologic monitoring, the permittee shall record water elevations at the staff gauge and record the depth to water at the surficial piezometer on a weekly basis for 1 year and then on a monthly basis thereafter.
- b. Option 2: a surficial piezometer fitted with a data logger unit to monitor daily water elevations within the wetland. If Option 2 is chosen for hydrologic monitoring, then the surficial piezometer will be fitted with a continuous data recorder which will collect daily water elevations. Water elevations from the data logger shall be downloaded

monthly. If the data logger is not functioning as required, the permittee shall manually record water elevations at the piezometer weekly, until the data logger is repaired.

Under both options, daily rainfall shall be monitored at the nearest representative rainfall monitoring station. Hydrologic monitoring shall begin immediately after the monitoring stations have been surveyed in, and shall continue until the Department determines that the mitigation satisfactorily meets the release criteria. Elevations will be checked if there is reason to believe the piezometer has shifted in some way.

**34. MITIGATION VEGETATION AND HYDROLOGY MONITORING REPORTING:**

Annual mitigation monitoring reports for the previous calendar year shall be submitted to the Department on or before March 1 of each year. The reports shall continue to be submitted until all wetland mitigation has been released. Each report shall include the following information:

- a. The cover page shall indicate the permit number, project name and the permittee name. Just below the title, the certification of the following statement by the individual who supervised preparation of the report: "This report represents a true, accurate, and representative description of the site conditions present at the time of monitoring."
- b. Dates of monitoring inspections, observations made during the inspections, and corrective actions implemented or proposed, if any.
- c. Statistical summaries of water elevations within created and restored wetlands as monitored pursuant to Specific Condition 33. Water elevation monitoring shall be sufficient to demonstrate whether the constructed wetlands and waterbodies meet the design requirements of this permit and are appropriate for the wetland type being created or restored. All water level data shall be compared tabularly and graphically (multiple plots on the same chart) with daily precipitation data. Hydrologic determinations, assumptions, and conclusions shall be substantiated. Note any observed hydrologic and biologic indicators of hydrology.
- d. Statistical summaries of the wetland vegetation cover. Vegetation monitoring shall be sufficient to demonstrate whether the revegetation meets the design requirements of this permit.
- e. Photographs of wetlands and waterbodies taken at each transect from the same permanent photo stations.

**35. WEATHER MONITORING STATION:** The applicant shall maintain a weather station at Trail Ridge South Mine. The weather station shall measure and accumulate data on wind speed and direction, precipitation on an hourly basis, temperature, humidity, and barometric pressure. In the event of a discharge, information from, but not necessarily limited to, this station will be used to determine whether the event exceeded the design conditions provided



in the permit. The weather station shall be inspected weekly to ensure that it is functioning as required. If the permittee becomes aware of an approaching storm that could cause significant rainfall, the weather station shall also be inspected prior to the storm. Each inspection shall be documented and kept on file at the facility office. Each inspection report shall contain, as a minimum, date, name of inspector, as-found condition of the weather station, and nature and extent of maintenance/repair performed. Within 60 days of the effective date of this permit, the permittee shall submit the proposed location of the weather monitoring station to the Department for approval.

36. WEATHER MONITORING STATION REPORTING: The permittee shall report the data from the weather station on a quarterly basis. During each reporting period, the report shall include the minimum, maximum, mean and standard deviation for each parameter. Also, the permittee shall provide rainfall and wind data from the weather station within 48 hours after any off-site discharge through an emergency spillway, emergency discharge point or failure in a surface water management structure.

37. INDUSTRIAL WASTEWATER MANAGEMENT REPORTS:

- a. In order to determine the amount of storage lost as a result of the accumulation of infill materials such as silt, sediment, or humate in the ponds, the permittee shall annually re-evaluate the IWW pond storage capacity and submit an updated industrial wastewater management system capacity report to the Department. The report shall be submitted with the annual reports required in Specific Condition 38. If it is determined that the available storage capacity and the rate of storage capacity recovery in the system is insufficient to meet the applicable design capacity and recovery requirements, the permittee shall include a proposed plan for restoring the required design storage capacity within 90 days of the required annual report submittal under Specific Conditions 38.
- b. The permittee shall monitor the IWW ponds on a weekly basis based on Table 2. Trail Ridge South IWW Pond Weekly Management Report – Template” included in Appendix A – IWW Pond Design and Operating Information (attached). Whenever the storage capacity of any pond drops below the capacity to contain the storage capacity equivalent to the 25-year, 24-hour design storm at or below the maximum operational level, the permittee shall provide this written report to the Department in an approved spreadsheet format which identifies water levels and corresponding storage capacities for each pond in relation to the pond's storage capacity.

38. ANNUAL REPORTS: Annual narrative reports shall be submitted to the Department on or before March 1 of each year. The reports shall continue to be submitted until all work authorized has been completed. Each report shall include the following information:

- a. The cover page shall indicate the permit number, project name and the permittee name. Just below the title, the certification of the following statement by the individual who supervised preparation of the report: “This report represents a true and accurate description of the activities conducted during the period covered by this report.”

- b. The date permitted activity began or projected commencement date if work has not begun on site.
- c. A brief description and drawings showing the extent of the work completed during the previous calendar year.
- d. A brief description and drawings showing the work anticipated during the current calendar year.
- e. A description of problems encountered and solutions implemented or proposed, if any.
- f. The results of any pre-disturbance wildlife and endangered/threatened species surveys conducted during the year; a description of activities taken to avoid or relocate these species shall also be provided.
- g. The groundwater level report described in Specific Condition 31.
- h. The mitigation vegetation and hydrology monitoring report described in Specific Condition 34.
- i. The re-evaluation of the industrial wastewater pond storage capacity described in Specific Condition 37a.

### **RELEASE**

39. RECLAMATION RELEASE STANDARDS: Reclamation release conditions for the project include:

- a. All lands that are reclaimed shall be completed in a neat, clean manner by removing all visible debris, litter, junk, worn-out or unusable equipment or materials, as well as all footings, poles, pilings, and cables. If any large rocks or boulders exist as a result of mining, these should be left either at the surface where they are distinctly visible or placed in mined-out areas and covered to achieve a minimum depth of four feet.
- b. All temporary buildings, pipelines, and other man-made structures shall be removed with the exception of those that are of sound construction with potential use compatible with the reclamation goals.
- c. Washes or rills shall be repaired and stabilized.
- d. The ground cover of upland areas shall at least meet the reclamation standards of rule 62C-37.008(10)(a), F.A.C.

40. WETLAND MITIGATION SUCCESS CRITERIA: Each wetland creation and restoration area shall be deemed successful when all of the following criteria have been continuously met for a period of at least one growing season, without intervention in the form of irrigation, dewatering, removal of undesirable vegetation, or replanting of desirable vegetation.
- a. Each wetland mitigation area shall provide at least the minimum number acres of wetlands to offset wetland functional losses resulting from dredging or filling as defined in ERP Table 2 (attached). The wetland acreage shall be determined by the Department, pursuant to Chapter 62-340, F.A.C., and the hydrologic records.
  - b. The desirable herbaceous species and shrub cover equals or exceeds 80 percent of the wetland area, and the plants are reproducing naturally, either by normal, healthy, vegetative spread (in ways that would be normal for each wetland species) or through seedling establishment, growth and survival.
  - c. An average of least 400 desirable trees per acre shall be growing above the herbaceous and shrub stratum. No area greater than an acre in size shall have less than 200 trees per acre. Desirable canopy and shrub species shall be reproducing naturally, as evidenced by the presence of natural recruitment, positive canopy growth, fruit, cones, or seedlings.
  - d. Desirable species are those species that are identified as aquatic, obligate or facultative wet plant species, as defined by Chapter 62-340, F.A.C., and are native to Bradford and Clay counties.
  - e. Nuisance species such as cattail (*Typha* spp.) and climbing hempvine (*Mikania scandens*) shall not exceed ten percent (10%) of the total cover. Exotic species as defined by those species listed on the current Florida Exotic Pest Plant Council (FLEPPC) Invasive Plant List (<http://www.fleppc.org/list/list.htm>), shall not exceed 1 percent (1%) of the total cover.
  - f. The created wetlands shall have hydroperiods, depth of inundation, and flow regimes appropriate to the community type, which benefit the target plant community and communities downstream.
  - g. Species richness and dominance regimes for canopy, shrub, and herbaceous vegetation shall be within the range of values documented within target community type. The relative age of the mitigation site when compared to mature systems shall be considered in the evaluation.
  - h. Water within all wetlands and waterbodies shall meet applicable Class III standards, pursuant to Chapter 62-302, F.A.C.



41. WETLAND ENHANCEMENT SUCCESS CRITERIA: Wetland enhancement areas shall be deemed successful when they have at least 400 trees per acre, and at least 80% herbaceous and shrub cover by desirable native species; and cover by nuisance and exotic vegetation shall be limited to less than ten (10) percent for nuisance species and less than one (1) percent for exotic species. Wetland enhancement areas shall be protected for a minimum of 5 years to allow for establishment prior to release request. Release procedures shall be as described in Specific Condition 42.
42. MITIGATION RELEASE PROCEDURES: The required mitigation shall be released when success criteria outlined in Specific Conditions 39, 40, and 41 have been met. Mitigation wetlands shall be released as follows:
- a. The permittee shall notify the Department whenever the permittee believes the mitigation is ready for release, but in no event earlier than three years after the mitigation is completed. The notice shall include:
    - 1) A copy of the most recent Annual Narrative and Monitoring Report and a narrative describing how the reported data support the contention that each of the criteria has been met.
    - 2) As-Built Certification And Request for Conversion to Operation Phase, Form 62-330.310(1), effective June 1, 2018.
  - b. Within 120 days of receipt of the notice, the Department shall notify the permittee that the Department determined:
    - 1) That the mitigation can be released; or,
    - 2) That the mitigation cannot be released, identifying those elements of the mitigation that do not meet the success criteria.
  - c. The mitigation shall be considered released if the Department fails to respond to the permittee's request for success determination.

## **OPERATIONS PHASE**

43. OPERATION, AND MAINTENANCE: The surface water management system approved in this permit shall meet the following requirements:
- a. All construction, operation and maintenance shall be as set forth in the plans, specifications, and performance criteria approved by this permit;
  - b. If revisions or modifications to the permitted project are required by other regulatory agencies, the Department shall be notified of the revisions so that a determination can be made whether a permit modification is required;
  - c. This permit also authorizes operation and reclamation of the Trail Ridge South Plant Site, a minerals processing facility and associated stormwater management structures.

Construction of the facility is not authorized under this permit. A separate ERP, Permit No. MMR\_137482-017, was previously obtained by the permittee that authorizes construction of the Trail Ridge South Plant Site.

- c. Within ninety (90) days after removal of the berm and separation of the surface water management system of an area from lands that report to any surface water discharges permitted under Chapter 62-620, F.A.C., the permittee shall submit one set of certified record drawings of the surface water management system as actually constructed and notify the Department that the facilities are ready for inspection and approval.
- d. The operational phase applies to those lands disturbed by mining operations, where reclamation has been completed, that no longer report to any surface water discharges permitted under Chapter 62-620, F.A.C., but have not been released in accordance with Specific Conditions 39, 40, and 41 above and the reclamation requirements of Chapter 62C-37, F.A.C., as applicable.
- e. Pursuant to Rule 330.310(7)(a), F.A.C., the operation phase of mining activities subject to the land reclamation requirements of Chapter 378, F.S., shall terminate, without the need to apply for abandonment of the permit, after the mine, or its subunits as applicable:
  - 1) Has been successfully reclaimed in accordance with Chapter 378, F.S., other than lands disturbed by mining operations that are not subject to the requirements of Chapter 378, F.S.;
  - 2) Has met all success requirements of the individual permit issued under Part IV of Chapter 373, F.S.; when the construction phase of the permit includes all phases of construction, abandonment, reclamation, and final success determination over reclaimed lands; and
  - 3) Does not contain components that require long-term operation or maintenance, such as: stormwater management systems; achievement of mitigation success criteria; work in conservation easements requiring a permit under this chapter; state-owned submerged lands authorizations; dams; above-grade impoundments; works; water control structures; erosion and sedimentation controls; or dewatering pits.
- f. For areas containing structures that require long-term operation or maintenance, upon completion of construction and release from the land reclamation requirements of Chapter 378, F.S., the permittee shall apply for a permit modification for transfer of the operational phase of the permit, or its subunits as applicable, to the perpetual operation and maintenance entity/entities. This application shall be submitted pursuant to Rule 62-330.310(4)(a), F.A.C. and form 62-330.310(2).
- g. Areas containing structures that require long-term operation or maintenance will be managed in accordance with a long-term operation and maintenance plan that must be reviewed and approved in writing by the Department prior to transfer of the permit to operational phase.

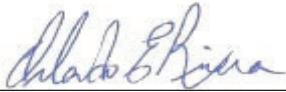
- h. Following release, the site shall be managed in accordance with Exhibit I - CBJTC Integrated Natural Resources Management Plan (INRMP) & SRWMD/CBJTC Cooperative Management Agreement, attached. Land management activities, including prescribed burns every 3-5 years in order to maintain the pine flatwoods (FLUCCS 411) post-reclamation land use, shall be consistent with this plan.

#### Judicial Review

Once this decision becomes final, any party to this action has the right to seek judicial review pursuant to Section 120.68, F.S., by filing a Notice of Appeal pursuant to Rules 9.110 and 9.190, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, M.S. 35, Tallahassee, Florida 32399-3000; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this action is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT  
OF ENVIRONMENTAL PROTECTION



---

Orlando E. Rivera, PWS, CERP  
Program Administrator  
Mining and Mitigation Program  
Florida Department of Environmental Protection  
[Orlando.Rivera@FloridaDEP.gov](mailto:Orlando.Rivera@FloridaDEP.gov)

**Attachments:** See attached table

#### **CERTIFICATE OF SERVICE**

The undersigned duly designated deputy clerk hereby certifies that this permit modification and all copies were sent on the filing date below to the following listed persons:

#### **Copies furnished via e-Mail:**

Beth Carson – Clay County - [Elizabeth.Carson@claycountygov.com](mailto:Elizabeth.Carson@claycountygov.com)  
Brad Carter, CPM - Bradford County - [brad\\_carter@bradfordcountyfl.gov](mailto:brad_carter@bradfordcountyfl.gov)  
Chereese Stewart – Clay County - [Chereese.Stewart@claycountygov.com](mailto:Chereese.Stewart@claycountygov.com)



Chryl DeCrenza – Kleinfelder – [cdecrenza@kleinfelder.com](mailto:cdecrenza@kleinfelder.com)  
Connie Henderson – Chemours – [Connie.Henderson@chemours.com](mailto:Connie.Henderson@chemours.com)  
Daniel Penniman - Florida Fish and Wildlife Conservation Commission-  
[Daniel.Penniman@MyFWC.com](mailto:Daniel.Penniman@MyFWC.com)  
Ed Lehman – Clay County - [ed.lehman@claycountygov.com](mailto:ed.lehman@claycountygov.com)  
Gregory M. Hitz – Lampl Herbert Consultants, Inc - [gmhitz@lampl-herbert.com](mailto:gmhitz@lampl-herbert.com)  
Jack Lohmann - [jlohmann@alumni.princeton.edu](mailto:jlohmann@alumni.princeton.edu)  
Jaclyn Slaybaugh – Clay County – [Jaclyn.Slaybaugh@claycountygov.com](mailto:Jaclyn.Slaybaugh@claycountygov.com)  
Jane Chabre – FWC – [jane.chabre@MyFWC.com](mailto:jane.chabre@MyFWC.com)  
Jeff Martin –DEP Northeast District, Industrial Wastewater – [Jeff.Martin@dep.state.fl.us](mailto:Jeff.Martin@dep.state.fl.us)  
Jim Maher - DEP, Northeast District, SLERP – [Jim.Maher@dep.state.fl.us](mailto:Jim.Maher@dep.state.fl.us)  
Lance McNeill – Minerals Development – [lance@mindev.us](mailto:lance@mindev.us)  
Major Phillip Willard - Florida National Guard, Camp Blanding –  
[phillip.h.willard.mil@mail.mil](mailto:phillip.h.willard.mil@mail.mil)  
Matthew Kershner – DEP, Northeast District, ERP – [Matthew.Kershner@dep.state.fl.us](mailto:Matthew.Kershner@dep.state.fl.us)  
Our Santa Fe River, Inc., Michael Roth, [michael.roth@oursantaferiver.org](mailto:michael.roth@oursantaferiver.org)  
Paul Still - [stillpe@aol.com](mailto:stillpe@aol.com)  
Rachel Rhoden – Bradford County Deputy County Manager -  
[rachel\\_rhoden@bradfordcountyfl.gov](mailto:rachel_rhoden@bradfordcountyfl.gov)  
Richard Owens – DEP Division of Recreation & Parks – [Richard.Owen@dep.state.fl.us](mailto:Richard.Owen@dep.state.fl.us)  
Samantha Browne – Office of Greenways and Trails – [Samantha.Browne@dep.state.fl.us](mailto:Samantha.Browne@dep.state.fl.us)  
SRWMD, [resourcemanagement@SRWMD.org](mailto:resourcemanagement@SRWMD.org)  
SJRWMD - [applicationsupport@sjrwmd.com](mailto:applicationsupport@sjrwmd.com)  
Stuart Forrester – Chemours - [Stuart.R.Forrester@chemours.com](mailto:Stuart.R.Forrester@chemours.com)  
USACE, Jacksonville District, Mining Team - [CESAJ-Mine.Team@usace.army.mil](mailto:CESAJ-Mine.Team@usace.army.mil)  
W. Ben Hart, CMSP - W. Ben Hart & Associates - [WBenHart@gmail.com](mailto:WBenHart@gmail.com)  
Mining & Mitigation Program File

## FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to 120.52, F.S., with the designated Department Clerk, receipt of which is hereby acknowledged.

Marjan  
e Taylor

Digitally signed  
by Marjane  
Taylor  
Date: 2021.05.26  
09:59:11 -04'00'

Clerk

05/26/2021  
Date

## ERP No. MMR\_137482-018, List of Attachments

### Tables

Table Title	Date Received by FDEP
ERP Table 1 [Wetland and Surface Water Impacts] [2 pages]	November 1, 2019
ERP Table 2 [Wetland Mitigation]	November 1, 2019
Table 3 – Pre-Mining Land Use	November 1, 2019
Table 4 – Post-Mining Land Use	June 10, 2020
Table 5 – Mitigation Planting	November 1, 2019

### Figures

Figure No.	Figure Title	Date Received by FDEP
Figure 1	Location Map	November 1, 2019
Figure 2	Aerial Map	November 1, 2019
Figure 2	Plant Site Layout (from Mining Phase Water Balance)	November 6, 2020
Figure 3	USGS Topographic Map	November 1, 2019
Figure 3	Regional Hydrology (from Mining Phase Water Balance)	November 6, 2020
Figure 4	Soils Map	November 1, 2019
Figure 5	FEMA Floodplain Map	November 1, 2019
Figure 5	Location of Existing Piezometers (from Hydrogeologic Analysis)	November 1, 2019
Figure 6	Pre-Mining Average Depth to Water	November 1, 2019
Figure 7	Average Water Table Elevation Map (from Hydrogeologic Analysis)	November 1, 2019
Figure 7	Pre-Mining Land Use and Vegetation Map	November 1, 2019
Figure 8 Revised	Pre-Mining Wetlands	June 10, 2020
Figure 9 Revised	Pre-Mining Topography and Drainage Basins Map	June 10, 2020
Figure 10	Mine Plan Map	November 1, 2019
Figure 10A	Cross Section A-B	November 1, 2019
Figure 10B	Cross Section C-D	November 1, 2019
Figure 10C	Cross Section E-F	November 1, 2019
Figure 10D	Typical Mining Footprint	November 1, 2019
Figure 11 Revised	Wetland Impacts Map	April 22, 2021
Figure 11A	Wetland Impact Cross-Section Wetland 1 & 3	November 1, 2019
Figure 11B	Wetland Impact Cross-Section Wetland 5	November 1, 2019
Figure 11C	Wetland Impact Cross-Section Wetland 6 & 7	November 1, 2019
Figure 11D	Wetland Impact Cross-Section Wetland 8 & 9	November 1, 2019
Figure 11E	Wetland Impact Cross-Section Wetland 10 & 11	November 1, 2019

Figure 11F	Wetland Impact Cross-Section Wetland 12 & 14	November 1, 2019
Figure 11G	Wetland Impact Cross-Section Wetland 15 & 16	November 1, 2019
Figure 11H	Wetland Impact Cross-Section Wetland 17 & 18	November 1, 2019
Figure 11I	Wetland Impact Cross-Section Wetland 19 & 20	November 1, 2019
Figure 11J	Wetland Impact Cross-Section Wetland 21 & 23	November 1, 2019
Figure 11K	Wetland Impact Cross-Section Wetland 24	November 1, 2019
Figure 11L	Wetland Impact Cross-Section Wetland 25 & 26	November 1, 2019
Figure 11M	Wetland Impact Cross-Section Wetland 27 & 28	November 1, 2019
Figure 11N	Wetland Impact Cross-Section Wetland 30 & 32	November 1, 2019
Figure 11O	Wetland Impact Cross-Section Wetland 33 & 34	November 1, 2019
Figure 11P	Wetland Impact Cross-Section Wetland 34	November 1, 2019
Figure 11Q	Wetland Impact Cross-Section Wetland 36 & 37	November 1, 2019
Figure 11R	Wetland Impact Cross-Section Wetland 38	November 1, 2019
Figure 11S	Wetland Impact Cross-Section Wetland 38 & 29	November 1, 2019
Figure 11T	Wetland Impact Cross-Section Wetland 41 & 42	November 1, 2019
Figure 11U	Wetland Impact Cross-Section Wetland 43 & 45	November 1, 2019
Figure 12	Post-Mining Average Depth to Water	November 1, 2019
Figure 13 Revised	Post-Mining Land Use and Vegetation Map	April 22, 2021
Figure 14 Revised	Post-Mining Topography and Drainage Basins Map	June 10, 2020
Figure 15	Wetland Mitigation Map	November 1, 2019
Figure 16	Cross Section G-H	April 22, 2021
Figure 16A	Wetland Mitigation Cross-Section 1A & 1B	November 1, 2019
Figure 16B	Wetland Mitigation Cross-Section 1C & 1D	November 1, 2019
Figure 16C	Wetland Mitigation Cross-Section 1E & 1F	November 1, 2019
Figure 16D	Wetland Mitigation Cross-Section 1G & 1H	November 1, 2019
Figure 16E	Wetland Mitigation Cross-Section 1I, 1J, 1K	November 1, 2019
Figure 16F	Wetland Mitigation Cross-Section 1L	November 1, 2019
Figure 16G	Wetland Mitigation Cross-Section 1M & 1N	November 1, 2019
Figure 16H	Wetland Mitigation Cross-Section 1O & 1P	November 1, 2019
Figure 16I	Wetland Mitigation Cross-Section 1Q & 1R	November 1, 2019
Figure 16J	Wetland Mitigation Cross-Section 1S & 1T	November 1, 2019
Figure 16K	Wetland Mitigation Cross-Section 2 & 3	November 1, 2019
Figure 16L	Wetland Mitigation Cross-Section 4 & 5	November 1, 2019
Figure 16M	Wetland Mitigation Cross-Section 6 & 7	November 1, 2019
Figure 16N	Wetland Mitigation Cross-Section 8 & 9	November 1, 2019
Figure 16O	Wetland Mitigation Cross-Section 10 & 11	November 1, 2019
Figure 16P	Wetland Mitigation Cross-Section 12	November 1, 2019
Figure 17	Undisturbed Wetland Monitoring Piezometer Location Map	November 1, 2019
[Attachment]	Sketch of Description [Boundary Survey]	November 1, 2019
Appendix F	During Operations Landuse Map (from Stormwater Management Report)	June 10, 2020



Appendix H	During Operations Drainage Map (from Stormwater Management Report)	June 10, 2020
Appendix K	Post-Mining Stormwater Pond Drainage Map (from Stormwater Management Report)	June 10, 2020
Appendix O	Post-Mining Road Crossing Drainage Map (from Stormwater Management Report)	November 6, 2020

## Plans

Attachment 4 – Ambient Groundwater Quality Data [6 pages], Received June 10, 2020

Appendix A – IWW Pond Design and Operating Information (from Mining Phase Water Balance) [6 pages], Received November 6, 2020

Appendix E – Plant Site Development Plans [8 pages], Received June 10, 2020

Exhibit I - CBJTC Integrated Natural Resources Management Plan (INRMP) & SRWMD/CBJTC Cooperative Management Agreement [170 pages], Received June 10, 2020

Best Management Practices Plan [166 pages], Received March 5, 2021  
(including Figure 1, Facility Overview Map)

**Exhibit C:**  
**Listed Species Determination Keys**

## **Eastern Indigo Snake Determination Key**





# United States Department of the Interior

## U. S. FISH AND WILDLIFE SERVICE

7915 BAYMEADOWS WAY, SUITE 200  
JACKSONVILLE, FLORIDA 32256-7517

IN REPLY REFER TO:

August 13, 2013

Colonel Alan M. Dodd, District Engineer  
Department of the Army  
Jacksonville District Corps of Engineers  
P.O Box 4970  
Jacksonville, Florida 32232-0019  
(Attn: Mr. David S. Hobbie)

RE: Update Addendum to USFWS Concurrence Letter to U.S. Army Corps of Engineers  
Regarding Use of the Attached Eastern Indigo Snake Programmatic Effect Determination Key

Dear Colonel Dodd:

This letter is to amend the January 25, 2010, letter to the U.S. Army Corps of Engineers regarding the use of the attached eastern indigo snake programmatic effect determination key (key). It supersedes the update addendum issued January 5, 2012.

We have evaluated the original programmatic concurrence and find it suitable and appropriate to extend its use to the remainder of Florida covered by the Panama City Ecological Services Office.

### **On Page 2**

The following replaces the last paragraph above the signatures:

“Thank you for your continued cooperation in the effort to conserve fish and wildlife resources. Any questions or comments should be directed to Annie Dziergowski (North Florida ESO) at 904-731-3089, Harold Mitchell (Panama City ESO) at 850-769-0552, or Victoria Foster (South Florida ESO) at 772-469-4269.”

### **On Page 3**

The following replaces both paragraphs under “Scope of the key”:

“This key should be used only in the review of permit applications for effects determinations for the eastern indigo snake within the State of Florida, and not for other listed species or for aquatic resources such as Essential Fish Habitat (EFH).”

### **On Page 4**

The following replaces the first paragraph under Conservation Measures:

“The Service routinely concurs with the Corps’ “not likely to adversely affect” (NLAA) determination for individual project effects to the eastern indigo snake when assurances are given that

our *Standard Protection Measures for the Eastern Indigo Snake* (Service 2013) located at: <http://www.fws.gov/northflorida/IndigoSnakes/indigo-snakes.htm> will be used during project site preparation and project construction. There is no designated critical habitat for the eastern indigo snake.”

**On Page 4 and Page 5 (Couplet D)**

The following replaces D. under Conservation Measures:

D. The project will impact less than 25 acres of xeric habitat (scrub, sandhill, or scrubby flatwoods) or less than 25 active and inactive gopher tortoise burrows.....go to E

The project will impact more than 25 acres of xeric habitat (scrub, sandhill, or scrubby flatwoods) or more than 25 active and inactive gopher tortoise burrows and consultation with the Service is requested<sup>2</sup>..... ”may affect”

**On Page 5**

The following replaces footnote #3:

“<sup>3</sup>If excavating potentially occupied burrows, active or inactive, individuals must first obtain state authorization via a FWC Authorized Gopher Tortoise Agent permit. The excavation method selected should also minimize the potential for injury of an indigo snake. Applicants should follow the excavation guidance provided within the most current Gopher Tortoise Permitting Guidelines found at <http://myfwc.com/gophertortoise> .”

Thank you for making these amendments concerning the Eastern Indigo Snake Key. If you have any questions, please contact Jodie Smithem of my staff at the address on the letterhead, by email at [jodie\\_smithem@fws.gov](mailto:jodie_smithem@fws.gov), or by calling (904)731-3134.

Sincerely,



Dawn Jennings  
Acting Field Supervisor

cc:

Panama City Ecological Services Field Office, Panama City, FL  
South Florida Ecological Services Field Office, Vero Beach, FL



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
South Florida Ecological Services Office  
1339 20<sup>th</sup> Street  
Vero Beach, Florida 32960



January 25, 2010

David S. Hobbie  
Chief, Regulatory Division  
U.S. Army Corps of Engineers  
Post Office Box 4970  
Jacksonville, Florida 32232-0019

Service Federal Activity Code: 41420-2009-FA-0642

Service Consultation Code: 41420-2009-I-0467

41910-2010-I-0045

Subject: North and South Florida  
Ecological Services Field Offices  
Programmatic Concurrence for Use  
of Original Eastern Indigo Snake  
Key(s) Until Further Notice

Dear Mr. Hobbie:

The U.S. Fish and Wildlife Service's (Service) South and North Florida Ecological Services Field Offices (FO), through consultation with the U.S. Army Corps of Engineers Jacksonville District (Corps), propose revision to both Programmatic concurrence letters/keys for the federally threatened Eastern Indigo Snake (*Drymarchon corais couperi*), (indigo snake), and now provide one key for both FO's. The original programmatic key was issued by the South Florida FO on November 9, 2007. The North Florida FO issued a revised version of the original key on September 18, 2008. Both keys were similar in content, but reflected differences in geographic work areas between the two Field Offices. The enclosed key satisfies each office's responsibilities under the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C.1531 *et seq.*).

Footnote number 3 in the original keys indicated "A member of the excavation team should be authorized for Incidental Take during excavation through either a section 10(a)(1)(A) permit issued by the Service or an incidental take permit issued by the Florida Fish and Wildlife Conservation Commission (FWC)." We have removed this reference to a Service issued Section 10(a)(1)(A) permit, as one is not necessary for this activity. We also referenced the FWC's revised April 2009 Gopher Tortoise Permitting Guidelines with a link to their website for updated excavation guidance, and have provided a website link to our Standard Protection Measures. All other conditions and criteria apply.

We believe the implementation of the attached key achieves our mutual goal for all users to make consistent effect determinations regarding this species. The use of this key for review of projects

**TAKE PRIDE<sup>®</sup>**  
**IN AMERICA** 

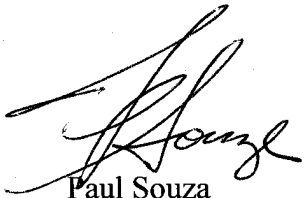


located in all referenced counties in our respective geographic work areas leads the Service to concur with the Corps' determination of "may affect, not likely to adversely affect" (MANLAA) for the Eastern indigo snake. The biological rationale for the determinations is contained within the referenced documents and is submitted in accordance with section 7 of the Act.

Should circumstances change or new information become available regarding the eastern indigo snake or implementation of the key, the determinations may be reconsidered as deemed necessary.

Thank you for your continued cooperation in the effort to conserve fish and wildlife resources. Any questions or comments should be directed to either Allen Webb (Vero Beach) at 772-562-3909, extension 246, or Jay Herrington (Jacksonville) at 904-731-3326.

Sincerely,



Paul Souza  
Field Supervisor  
South Florida Ecological Services Office



David L. Hankla  
Field Supervisor  
North Florida Ecological Services Office

Enclosure

cc: electronic only  
FWC, Tallahassee, Florida (Dr. Elsa Haubold)  
Service, Jacksonville, Florida (Jay Herrington)  
Service, Vero Beach, Florida (Sandra Sneckenberger)

## Eastern Indigo Snake Programmatic Effect Determination Key

### Scope of the key

This key should be used only in the review of permit applications for effects determinations within the North and South Florida Ecological Services Field Offices Geographic Areas of Responsibility (GAR), and not for other listed species or for aquatic resources such as Essential Fish Habitat (EFH). Counties within the **North** Florida GAR include Alachua, Baker, Bradford, Brevard, Citrus, Clay, Columbia, Dixie, Duval, Flagler, Gilchrist, Hamilton, Hernando, Hillsborough, Lafayette, Lake, Levy, Madison, Manatee, Marion, Nassau, Orange, Pasco, Pinellas, Putnam, St. Johns, Seminole, Sumter, Suwannee, Taylor, Union, and Volusia.

Counties in the **South** Florida GAR include Broward, Charlotte, Collier, De Soto, Glades, Hardee, Hendry, Highlands, Lee, Indian River, Martin, Miami-Dade, Monroe, Okeechobee, Osceola, Palm Beach, Polk, Sarasota, St. Lucie.

### Habitat

Over most of its range, the eastern indigo snake frequents several habitat types, including pine flatwoods, scrubby flatwoods, high pine, dry prairie, tropical hardwood hammocks, edges of freshwater marshes, agricultural fields, coastal dunes, and human-altered habitats (Service 1999). Eastern indigo snakes appear to need a mosaic of habitats to complete their life cycle. Wherever the eastern indigo snake occurs in xeric habitats, it is closely associated with the gopher tortoise (*Gopherus polyphemus*), the burrows of which provide shelter from winter cold and summer desiccation (Speake et al. 1978; Layne and Steiner 1996). Interspersion of tortoise-inhabited uplands and wetlands improves habitat quality for this species (Landers and Speake 1980; Auffenberg and Franz 1982).

In south Florida, agricultural sites, such as sugar cane fields, created in former wetland areas are occupied by eastern indigo snakes (Enge pers. comm. 2007). Formerly, indigo snakes would have only occupied higher elevation sites within the wetlands. The introduction of agriculture and its associated canal systems has resulted in an increase in rodents and other species of snakes that are prey for eastern indigo snakes. The result is that indigos occur at higher densities in these areas than they did historically.

Even though thermal stress may not be a limiting factor throughout the year in south Florida, indigo snakes still seek and use underground refugia. On the sandy central ridge of central Florida, eastern indigos use gopher tortoise burrows more (62 percent) than other underground refugia (Layne and Steiner 1996). Other underground refugia used include armadillo (*Dasypus novemcinctus*) burrows near citrus groves, cotton rat (*Sigmodon hispidus*) burrows, and land crab (*Cardisoma guanhum*) burrows in coastal areas (Service 2006). Natural ground holes, hollows at the base of trees or shrubs, ground litter, trash piles, and crevices of rock-lined ditch walls are also used (Layne and Steiner 1996). These refugia are used most frequently where tortoise burrows are not available, principally in low-lying areas off the central and coastal ridges. In extreme south Florida (the Everglades and Florida Keys), indigo snakes are found in tropical

hardwood hammocks, pine rocklands, freshwater marshes, abandoned agricultural land, coastal prairie, mangrove swamps, and human-altered habitats (Steiner et al. 1983). It is suspected that they prefer hammocks and pine forests, because most observations occur in these habitats disproportionately to their presence in the landscape (Steiner et al. 1983). Hammocks may be important breeding areas as juveniles are typically found there. The eastern indigo snake is a snake-eater so the presence of other snake species may be a good indicator of habitat quality.

### **Conservation Measures**

The Service routinely concurs with the Corps' "not likely to adversely affect" (NLAA) determination for individual project effects to the eastern indigo snake when assurances are given that our *Standard Protection Measures for the Eastern Indigo Snake* (Service 2004) located at: <http://www.fws.gov/northflorida/IndigoSnakes/indigo-snakes> will be used during project site preparation and project construction. There is no designated critical habitat for the eastern indigo snake.

In an effort to reduce correspondence in effect determinations and responses, the Service is providing an Eastern Indigo Snake Effect Determination Key, similar in utility to the West Indian Manatee Effect Determination Key and the Wood Stork Effect Determination Keys presently being utilized by the Corps. If the use of this key results in a Corps' determination of "no effect" for a particular project, the Service supports this determination. If the use of this Key results in a determination of NLAA, the Service concurs with this determination and no additional correspondence will be necessary<sup>1</sup>. This key is subject to revisitation as the Corps and Service deem necessary.

- A. Project is not located in open water or salt marsh.....go to B  
     Project is located solely in open water or salt marsh..... "no effect"
- B. Permit will be conditioned for use of the Service's *Standard Protection Measures For The Eastern Indigo Snake* during site preparation and project construction.....go to C  
     Permit will not be conditioned as above for the eastern indigo snake, or it is not known whether an applicant intends to use these measures and consultation with the Service is requested<sup>2</sup> ..... "may affect"
- C. There are gopher tortoise burrows, holes, cavities, or other refugia where a snake could be buried or trapped and injured during project activities .....go to D  
     There are no gopher tortoise burrows, holes, cavities, or other refugia where a snake could be buried or trapped and injured during project activities ..... "NLAA"
- D. The project will impact less than 25 acres of xeric habitat supporting less than 25 active and inactive gopher tortoise burrows.....go to E



The project will impact more than 25 acres of xeric habitat or more than 25 active and inactive gopher tortoise burrows and consultation with the Service is requested<sup>2</sup>..... "may affect"

- E. Any permit will be conditioned such that all gopher tortoise burrows, active or inactive, will be evacuated prior to site manipulation in the vicinity of the burrow<sup>3</sup>. If an indigo snake is encountered, the snake must be allowed to vacate the area prior to additional site manipulation in the vicinity. Any permit will also be conditioned such that holes, cavities, and snake refugia other than gopher tortoise burrows will be inspected each morning before planned site manipulation of a particular area, and, if occupied by an indigo snake, no work will commence until the snake has vacated the vicinity of proposed work..... "NLAA"

Permit will not be conditioned as outlined above and consultation with the Service is requested<sup>2</sup> ..... "may affect"

---

<sup>1</sup>With an outcome of "no effect" or "NLAA" as outlined in this key, the requirements of section 7 of the Act are fulfilled for the eastern indigo snake and no further action is required.

<sup>2</sup>Consultation may be concluded informally or formally depending on project impacts.

<sup>3</sup> If burrow excavation is utilized, it should be performed by experienced personnel. The method used should minimize the potential for injury of an indigo snake. Applicants should follow the excavation guidance provided within the Florida Fish and Wildlife Conservation Commission's revised April 2009 Gopher Tortoise Permitting Guidelines located at [http://myfwc.com/License/Permits\\_ProtectedWildlife.htm#gophertortoise](http://myfwc.com/License/Permits_ProtectedWildlife.htm#gophertortoise). A member of the excavation team should be authorized for Incidental Take during excavation through an incidental take permit issued by the Florida Fish and Wildlife Conservation Commission.

## **Wood Stork Determination Key**

**THE CORPS OF ENGINEERS, JACKSONVILLE DISTRICT, U. S. FISH AND  
WILDLIFE SERVICE, JACKSONVILLE ECOLOGICAL SERVICES FIELD  
OFFICE AND STATE OF FLORIDA EFFECT DETERMINATION KEY FOR  
THE WOOD STORK IN CENTRAL AND NORTH PENINSULAR FLORIDA  
September 2008**

**Purpose and Background**

The purpose of this document is to provide a tool to improve the timing and consistency of review of Federal and State permit applications and Federal civil works projects, for potential effects of these projects on the endangered wood stork (*Mycteria americana*) within the Jacksonville Ecological Services Field Office (JAFL) geographic area of responsibility (GAR see below). The key is designed primarily for Corps Project Managers in the Regulatory and Planning Divisions and the Florida Department of Environmental Protection or its authorized designee, or Water Management Districts. The tool consists of the following dichotomous key and reference material. The key is intended to be used to evaluate permit applications and Corps' civil works projects for impacts potentially affecting wood storks or their wetland habitats. At certain steps in the key, the user is referred to graphics depicting known wood stork nesting colonies and their core foraging areas (CFA), footnotes, and other support documents. The graphics and supporting documents may be downloaded from the Corps' web page at <http://www.saj.usace.army.mil/permit> or at the JAFL web site at <http://www.fws.gov/northflorida/WoodStorks>. We intend to utilize the most recent information for both the graphics and supporting information; so should this information be updated, we will modify it accordingly. **Note: This information is provided as an aid to project review and analysis, and is not intended to substitute for a comprehensive biological assessment of potential project impacts. Such assessments are site-specific and usually generated by the project applicant or, in the case of civil works projects, by the Corps or project co-sponsor.**

**Explanatory footnotes provided in the key must be closely followed whenever encountered.**

**Scope of the key**

This key should only be used in the review of permit applications for effects determinations on wood storks within the JAFL GAR, and not for other listed species. Counties within the JAFL GAR include Alachua, Baker, Bradford, Brevard, Citrus, Clay, Columbia, Dixie, Duval, Flagler, Gilchrist, Hamilton, Hernando, Hillsborough, Lafayette, Lake, Levy, Madison, Manatee, Marion, Nassau, Orange, Pasco, Pinellas, Putnam, St. Johns, Seminole, Sumter, Suwannee, Taylor, Union, and Volusia.

The final effect determination will be based on project location and description, the potential effects to wood storks, and any measures (for example project components, special permit conditions) that avoid or minimize direct, indirect, and/or cumulative



impacts to wood storks and/or suitable wood stork foraging habitat. Projects that key to a “no effect” determination do not require additional consultation or coordination with the JAFL. Projects that key to “NLAA” also do not need further consultation; however, the JAFL staff will assist the Corps if requested, to answer questions regarding the appropriateness of mitigation options. Projects that key to a “may affect” determination equate to “likely to adversely affect” situations, and those projects should not be processed under the SPGP or any other programmatic general permit. For all “may affect” determinations, Corps Project Managers should request the JAFL to initiate formal consultation on the Wood stork.

### **Summary of General Wood Stork Nesting and Foraging Habitat Information**

The wood stork is primarily associated with freshwater and estuarine habitats that are used for nesting, roosting, and foraging. Wood storks typically nest colonially in medium to tall trees that occur in stands located either in swamps or on islands surrounded by relatively broad expanses of open water (Ogden 1991; Rodgers et al. 1996). Successful breeding sites are those that have limited human disturbance and low exposure to land based predators. Nesting sites protected from land-based predators are characterized as those surrounded by large expanses of open water or where the nest trees are inundated at the onset of nesting and remain inundated throughout most of the breeding cycle. These colonies have water depths between 0.9 and 1.5 meters (3 and 5 feet) during the breeding season.

In addition to limited human disturbance and land-based predation, successful nesting depends on the availability of suitable foraging habitat. Such habitat generally results from a combination of average or above-average rainfall during the summer rainy season, and an absence of unusually rainy or cold weather during the winter-spring breeding season (Kahl 1964; Rodgers et al. 1987). This pattern produces widespread and prolonged flooding of summer marshes that tends to maximize production of freshwater fishes, followed by steady drying that concentrate fish during the season when storks nest (Kahl 1964). Successful nesting colonies are those that have a large number of foraging sites. To maintain a wide range of foraging opportunities, a variety of wetland habitats exhibiting short and long hydroperiods should be present. In terms of wood stork foraging, the Service (1999) describes a short hydroperiod as one where a wetland fluctuates between wet and dry in 1 to 5-month cycles, and a long hydroperiod where the wet period is greater than five consecutive months. Wood storks during the wet season generally feed in the shallow water of short-hydroperiod wetlands and in coastal habitats during low tide. During the dry season, foraging shifts to longer hydroperiod interior wetlands as they progressively dry down (though usually retaining some surface water throughout the dry season).

Because of their specialized feeding behavior, wood storks forage most effectively in shallow-water areas with highly concentrated prey. Typical foraging sites for the wood stork include freshwater marshes, depressions in cypress heads, swamp sloughs, managed impoundments, stock ponds, shallow-seasonally flooded roadside or agricultural ditches, and narrow tidal creeks or shallow tidal pools. Good foraging conditions are characterized by water that is relatively calm, open, and having water depths between 5 and 15 inches (5 and 38 cm). Preferred foraging habitat includes wetlands exhibiting a mosaic of submerged and/or emergent aquatic vegetation, and shallow, open-water areas subject to hydrologic

regimes ranging from dry to wet. The vegetative component provides nursery habitat for small fish, frogs, and other aquatic prey, and the shallow, open-water areas provide sites for concentration of the prey during daily or seasonal low water periods.

## WOOD STORK KEY

**Although designed primarily for use by Corps Project Managers in the Regulatory and Planning Divisions, and State Regulatory agencies or their designees, project permit applicants and co-sponsors of civil works projects may find this key and its supporting documents useful in identifying potential project impacts to wood storks, and planning how best to avoid, minimize, or compensate for any identified adverse effects.**

- A. Project within 2,500 feet of an active colony site<sup>1</sup>.....*May affect*  
Project more than 2,500 feet from a colony site.....go to B
- B. Project does not affect suitable foraging habitat<sup>2</sup> (SFH).....*no effect*  
Project impacts SFH<sup>2</sup>.....go to C
- C. Project impacts to SFH are less than or equal to 0.5 acre<sup>3</sup>.....*NLAA*<sup>4</sup>  
Project impacts to SFH are greater than or equal to 0.5 acre.....go to D
- D. Project impacts to SFH not within a Core Foraging Area<sup>5</sup> (see attached map) of a colony site, and no wood storks have been documented foraging on site.....*NLAA*<sup>4</sup>  
Project impacts to SFH are within the CFA of a colony site, or wood storks have been documented foraging on a project site outside the CFA .....go to E
- E. Project provides SFH compensation within the Service Area of a Service-approved wetland mitigation bank or wood stork conservation bank preferably within the CFA, or consists of SFH compensation within the CFA consisting of enhancement, restoration or creation in a project phased approach that provides an amount of habitat and foraging function equivalent to that of impacted SFH (see *Wood Stork Foraging Habitat Assessment Procedure*<sup>6</sup> for guidance), is not contrary to the Service's *Habitat Management Guidelines For The Wood Stork In The Southeast Region* and in accordance with the CWA section 404(b)(1) guidelines.....*NLAA*<sup>4</sup>  
Project does not satisfy these elements.....*May affect*



<sup>1</sup> An active nesting site is defined as a site currently supporting breeding pairs of wood storks, or has supported breeding wood storks at least once during the preceding 10-year period.

<sup>2</sup> Suitable foraging habitat (SFH) is described as any area containing patches of relatively open (< 25% aquatic vegetation), calm water, and having a permanent or seasonal water depth between 2 and 15 inches (5 to 38 cm). SFH supports and concentrates, or is capable of supporting and concentrating small fish, frogs, and other aquatic prey. Examples of SFH include, but are not limited to, freshwater marshes and stock ponds, shallow, seasonally flooded roadside or agricultural ditches, narrow tidal creeks or shallow tidal pools, managed impoundments, and depressions in cypress heads and swamp sloughs. See above *Summary of General Wood Stork Nesting and Foraging Habitat Information*.

<sup>3</sup> On an individual basis, projects that impact less than 0.5 acre of SFH generally will not have a measurable effect on wood storks, although we request the Corps to require mitigation for these losses when appropriate. Wood Storks are a wide ranging species, and individually, habitat change from impacts to less than 0.5 acre of SFH is not likely to adversely affect wood storks. However, collectively they may have an effect and therefore regular monitoring and reporting of these effects are important.

<sup>4</sup> Upon Corps receipt of a general concurrence issued by the JAFL through the Programmatic Concurrence on this key, "NLAA" determinations for projects made pursuant to this key require no further consultation with the JAFL.

<sup>5</sup> The U.S. Fish and Wildlife Service (Service) has identified core foraging area (CFA) around all known wood stork nesting colonies that is important for reproductive success. In Central Florida, CFAs include suitable foraging habitat (SFH) within a 15-mile radius of the nest colony; CFAs in North Florida include SFH within a 13-mile radius of a colony. The referenced map provides locations of known colonies and their CFAs throughout Florida documented as active within the last 10 years. The Service believes loss of suitable foraging wetlands within these CFAs may reduce foraging opportunities for the wood stork.

<sup>6</sup> This draft document, *Wood Stork Foraging Habitat Assessment Procedure*, by Passarella and Associates, Incorporated, may serve as further guidance in ascertaining wetland foraging value to wood storks and compensating for impacts to wood stork foraging habitat.

## **Monitoring and Reporting Effects**

For the Service to monitor cumulative effects, it is important for the Corps to monitor the number of permits and provide information to the Service regarding the number of permits issued that were determined "may affect, not likely to adversely affect." It is requested that information on date, Corps identification number, project acreage, project wetland acreage, and latitude and longitude in decimal degrees be sent to the Service quarterly.

## **Literature Cited**

Kahl, M.P., Jr. 1964. Food ecology of the wood stork (*Mycteria americana*) in Florida. *Ecological Monographs* 34:97-117.

Ogden, J.C. 1991. Nesting by wood storks in natural, altered, and artificial wetlands in central and northern Florida. *Colonial Waterbirds* 14:39-45.

Rodgers, J.A. Jr., A.S. Wenner, and S.T. Schwikert. 1987. Population dynamics of wood storks in northern and central Florida, USA. *Colonial Waterbirds* 10:151-156.

Rodgers, J.A., Jr., S.T. Schwikert, and A. Shapiro-Wenner. 1996. Nesting habitat of wood storks in north and central Florida, USA. *Colonial Waterbirds* 19:1-21.

U.S. Fish and Wildlife Service. 1999. South Florida multi-species recovery plan. Fish and Wildlife Service; Atlanta, Georgia. Available from:  
<http://verobeach.fws.gov/Programs/Recovery/vbms5.html>.

**Exhibit D:**  
**SHPO Concurrence Letter**





## FLORIDA DEPARTMENT of STATE

**RON DESANTIS**  
Governor

**LAUREL M. LEE**  
Secretary of State

Florida Department of Environmental Protection  
Mining and Mitigation Program  
2600 Blair Stone Road, MS 3577  
Tallahassee, Florida 32399-2400

June 26, 2019

RE: DHR Project File No.: 2018-0132-B, Received by DHR: May 29, 2019  
*An Intensive Cultural Resource Assessment Survey of Camp Blanding - Trail Ridge South, Clay County, Florida*

To Whom It May Concern:

Our office reviewed the referenced project in accordance with Chapters 267.061 and 373.414, *Florida Statutes*, and implementing state regulations, for possible effects on historic properties listed in, or eligible for, the *National Register of Historic Places* (NRHP), or otherwise of historical, architectural, or archaeological value.

Between January and April 2019, Environmental Services, Inc., A Terracon Company (ESI) conducted the above referenced cultural resources assessment survey (CRAS) on behalf of Kleinfelder in compliance with permitting requirements in association with Department of Environmental Protection (DEP) file No. MMR\_137482.

ESI recorded one (1) new archaeological site, 8CL01651, and three (3) archaeological occurrences (AO) within a 974-acre area of potential effect (APE) during their investigation. They also revisited two (2) previously recorded sites, 8BF00780 and 8BF00781, in the adjacent property to the west as SHPO had requested that the delineations be completed so that a NRHP determination could be rendered (DHR No. 2019-0362, sent February 20, 2019). The AOs are categorically ineligible for NRHP listing, and ESI recommended all three sites as ineligible for NRHP listing due to lack of features, subsurface context, or research potential. ESI concluded that the proposed project will have no effect on resources listed on, or eligible for listing in, the NRHP, or otherwise of historical, architectural, or archaeological value. ESI recommended no further archaeological work.

Based on the information provided, our office concurs with the NRHP determinations and recommendations presented, and determined that the proposed project will have no effect on historic properties listed, or eligible for listing, in the NRHP, or otherwise of historical, architectural, or archaeological value. We find the submitted report complete and sufficient in accordance with Chapter 1A-46, *Florida Administrative Code*. If I can be of any further help, or if you have and questions about this letter, please feel free to contact Lindsay Rothrock at [Lindsay.Rothrock@dos.myflorida.com](mailto:Lindsay.Rothrock@dos.myflorida.com).

Sincerely,

Timothy A. Parsons, Ph.D.  
Director, Division of Historical Resources  
and State Historic Preservation Officer

**Exhibit E:**  
**Camp Blanding's Integrated Natural Resource Management  
Plan**

# **INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (INRMP)**

CAMP BLANDING  
JOINT TRAINING CENTER  
CLAY COUNTY, FLORIDA



**FLORIDA ARMY NATIONAL GUARD**

**FEBRUARY 2022**



THIS PAGE IS INTENTIONALLY LEFT BLANK

**UPDATED**  
**INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN**  
**CAMP BLANDING JOINT TRAINING CENTER**  
**CLAY COUNTY, FLORIDA**

**SIGNATURE PAGE**

This Integrated Natural Resources Management Plan (INRMP) is an update of the 2014 Camp Blanding Joint Training Center (CBJTC) INRMP that has been reviewed for operation and effect and recommended for update and continued implementation. It meets the requirements for INRMPs as specified in the Sikes Act, as amended (16 USC §670a *et seq.*). It has set appropriate and adequate guidelines for conserving and protecting the natural resources of CBJTC.

**Signatures kept on file at the Camp Blanding Environmental Division (bldg. 4540)**

**Approving Officials:**

\_\_\_\_\_ Date: \_\_\_\_\_

**COL ANTHONY HAMMETT**  
US Army  
Chief, G-9 Army National Guard

\_\_\_\_\_ Date: \_\_\_\_\_

**MAJ GEN JAMES O. EIFERT**  
The Adjutant General  
Florida National Guard

\_\_\_\_\_ Date: \_\_\_\_\_

**LTC RYAN A. LEONARD**  
Construction & Facilities Management Officer  
Florida Army National Guard

\_\_\_\_\_ Date: \_\_\_\_\_

**LTC JASON M. HUNT**  
Training Site Commander  
Camp Blanding Joint Training Center

\_\_\_\_\_ Date: \_\_\_\_\_

**PAUL CATLETT**  
Environmental Program Manager  
Camp Blanding Joint Training Center

THIS PAGE IS INTENTIONALLY LEFT BLANK



## Executive Summary

The Integrated Natural Resources Management Plan (INRMP) is the primary guidance document and tool for managing natural resources at Florida Army National Guard's (FLARNG's) Camp Blanding Joint Training Center (CBJTC). CBJTC includes approximately 73,000 acres of land owned and operated by the State of Florida Armory Board in Clay County, Florida. CBJTC must provide a variety of environmental conditions and habitats in which to train soldiers. The management of CBJTC must be conducted in a way that provides for sustainable, healthy ecosystems, complies with applicable environmental laws and regulations, and provides for no net loss in the capability of military installation lands to support the military mission of the installation. Installation commanders can use INRMPs to manage natural resources more effectively to ensure that installation lands remain available and in good condition to support the installation's military mission over the long term.

This updated INRMP is intended to be consistent with the Sikes Act Improvement Act (SAIA) of 1997, 16 US Code (USC) §670a *et seq.*, as amended, Department of Defense Instruction (DoDI) 4715.03, *Natural Resources Conservation Program*, Army Regulation (AR) 200-1 *Environmental Protection and Enhancement*, Army National Guard (ARNG) Directorate Environmental Programs Division (ARNG G-9), Memorandum 2019, *Guidance for the Creation, Implementation, Review, Revision and Update of INRMPs*, Department of the Army (DA), the DoDI 4715.03, *Natural Resources Conservation Program*, and Department of Defense (DoD) Office of the Deputy Under Secretary of Defense (DUSD) DoDM 4715.03, *Integrated Natural Resources Management Plan (INRMP) Implementation Manual*. This INRMP integrates all aspects of natural resources management with the rest of CBJTC's mission, and therefore becomes the primary tool for managing CBJTC's ecosystems and habitats while ensuring the successful accomplishment of the military mission at the highest possible levels of efficiency.

This INRMP is an update and reorganization of the 2014 CBJTC INRMP and is the result of a review for operation and effect done by US Fish and Wildlife Service (USFWS), Florida Fish and Wildlife Conservation Commission (FFWCC), and FLARNG. The review for operation and effect determined that only an update is required since there are no military mission changes, no program or management philosophy changes, and no input received from USFWS or FFWCC that resulted in changes to the way natural resources are managed at CBJTC. Based on the desire to update the INRMP, FLARNG updated and reorganized the plan in accordance with the DoD INRMP template guidance and incorporated updated natural resources data.

Goals and objectives provide the framework for the natural resources management programs. Goals provide a general guiding direction for each technical area and logical objectives that facilitate achieving those goals are described for any priority issues within each technical area.

GOAL Natural Resources Program Development (PM): Manage natural resources in a manner that is compatible with and supports the military mission while complying with applicable federal and state laws and DA regulations and policies.

GOAL Soil Conservation and Sediment Management (SO): Manage soil to minimize sediment loss and erosion, while protecting water quality.

GOAL Water Resources Management (WA): Maintain water resources so they remain resilient, functional, and with no net loss of acreage.

GOAL Vegetation Management (VE): Manage vegetation to provide a variety of habitats to support the military mission, maintain native species, provide a sustainable forestry program, and enhance wildlife habitat.

GOAL Wildland Fire Management (FI): Implement a wildland fire program that minimizes safety concerns and wildfire risk, enhances the military mission, benefits rare species, protects cultural resources, and maximizes habitat management and ecological benefits.

GOAL Fish and Wildlife Management (FW): Maintain fish and wildlife populations while minimizing potential impacts to the military mission.

GOAL Threatened and Endangered Species Management (TE): Manage rare species using an ecosystem approach while maintaining the military mission at CBJTC.

GOAL Invasive Species and Integrated Pest Management (IN): Minimize impacts of invasive and pest species, while minimizing use of chemicals to manage those species, utilizing an integrated pest management approach.

These goals are supported in the INRMP by objectives and projects, as well as management strategies and specific actions to achieve these goals. Goals and objectives are listed in **Section 4.0** of the INRMP, and activities and projects are summarized in **Tables 15** and **16** of **Section 5.0**. These goals will ensure the success of the military mission and conservation of natural resources. The general philosophies and methodologies used throughout CBJTC natural resources management program are focused on conducting doctrinally required military training while maintaining ecosystem viability and sustainability.

This INRMP provides a description of the installation and the military mission, information regarding the environment on CBJTC, and specific natural resource management programs designed for successful and sustainable military training. The implementation of this INRMP at CBJTC will ensure the successful accomplishment of FLARNG's military missions while promoting adaptive management that sustains ecosystem and biological integrity and provides for multiple uses of natural resources.

# TABLE OF CONTENTS

SECTION	PAGE
1.0 INRMP OVERVIEW AND POLICIES .....	1
1.1 Purpose .....	1
1.2 Authority and Legal Requirements .....	2
1.3 Responsibilities .....	4
1.3.1 ARNG Headquarters .....	4
1.3.2 FLARNG .....	4
1.3.3 Other Organizations .....	5
1.4 Conditions for Implementation and Revision .....	5
1.4.1 Implementation and Annual Reviews .....	5
1.4.2 INRMP Review for Operation and Effect .....	6
1.5 Management Philosophy .....	7
1.5.1 Support of the Military Mission .....	7
1.5.2 Environmental Management System .....	8
1.5.3 Ecosystem Management .....	8
1.5.4 Sustainable Range Program .....	10
1.5.5 Range and Training Land Program .....	10
1.5.6 Integrated Training Area Management Program .....	11
1.5.7 Goals and Objectives .....	12
1.5.8 Integration with Other Plans .....	12
2.0 INSTALLATION INFORMATION .....	14
2.1 General Description .....	14
2.1.1 Regional Land Use .....	15
2.1.2 Installation History .....	16
2.1.3 Military Mission .....	17
2.1.4 Training Operations and Infrastructure .....	18
2.1.5 Constraints and Opportunities .....	21
2.2 Physical Environment .....	22
2.2.1 Climate .....	22
2.2.2 Topography .....	23
2.2.3 Geology .....	24
2.2.4 Soils .....	24
2.2.5 Water Resources .....	30
2.3 Ecosystem and Biotic Environment .....	34
2.3.1 Ecosystem Classification .....	34
2.3.2 Vegetation .....	34
2.3.3 Fish and Wildlife .....	39
2.3.4 Threatened and Endangered Species .....	42



3.0	MISSION SUSTAINABILITY .....	48
3.1	Integrating Natural Resources Management and Military Mission.....	48
3.1.1	Operations Planning & Review .....	48
3.1.2	Natural Resources Management Actions .....	48
3.1.3	Environmental Awareness .....	49
	This section does not address the role of sustainability here on CBJTC. ....	49
3.2	Consultation Requirements .....	49
3.3	NEPA.....	50
3.4	Encroachment Management .....	50
3.5	Beneficial Partnerships and Collaborative Resource Planning.....	50
3.6	Public Access and Outreach .....	53
3.7	State Wildlife Action Plan .....	53
3.8	INRMP Implementation Analysis.....	54
4.0	NATURAL RESOURCES PROGRAM MANAGEMENT .....	60
4.1	Natural Resources Program Development .....	60
4.1.1	Environmental Awareness and Public Outreach .....	61
4.1.2	Outdoor Recreation.....	61
4.1.3	Public Access.....	62
4.1.4	Natural Resources Law Enforcement .....	62
4.1.5	GIS Data Management .....	62
4.2	Soil Conservation and Sediment Management.....	64
4.2.1	Regulatory Authority and BMPs.....	64
4.2.2	ITAM Program.....	65
4.2.3	Erosion Control Guidelines .....	65
4.2.4	Revegetation Management Guidelines.....	66
4.3	Water Resources Management.....	67
4.3.1	Regulatory Requirements .....	68
4.3.2	Permitting .....	69
4.3.3	Riparian Zones and SMZs .....	69
4.3.4	Management Guidelines .....	71
4.4	Vegetation Management .....	72
4.4.1	Historic Vegetation .....	73
4.4.2	Forestry Program .....	73
4.4.3	Restoration and Management of Longleaf Pine in Flatwoods .....	75
4.4.4	Restoration and Management of Longleaf Pine in Sandhills.....	76
4.4.5	Restoration of Former DuPont Mining Lease .....	77
4.4.6	Scrub Management.....	78
4.4.7	Riparian and Wetland Management .....	79
4.4.8	Vegetation Management in Direct Support of Military Training .....	79
4.4.9	Landscaping and Grounds Maintenance .....	80

4.5	Wildland Fire Management .....	81
4.5.1	Fire Ecology .....	82
4.5.2	Wildland Fire History on CBJTC .....	83
4.5.3	Prescribed Fires .....	83
4.5.4	Smoke Management .....	84
4.5.5	Management Guidelines .....	84
4.6	Fish and Wildlife Management .....	85
4.6.1	Migratory Bird Treaty Act .....	86
4.6.2	Hunting and Fishing at CBJTC and Public Access .....	87
4.6.3	Wildlife Habitat Management .....	89
4.6.4	Game Species Management .....	92
4.6.5	Nuisance Wildlife .....	94
4.7	Threatened and Endangered Species Management .....	95
4.7.1	Federally Endangered Species .....	96
4.7.2	Federally Threatened Species .....	98
4.7.3	Federal Candidate Species .....	100
4.7.4	General Management Strategies .....	101
4.8	Invasive Species and Integrated Pest Management .....	103
4.8.1	Integrated Pest Management .....	103
4.8.2	Guidelines for Invasive Species Management .....	105
4.8.3	Potential and Known Invasive Species .....	106
4.8.4	Priority Invasive Plant Species .....	113
4.8.4.1	Cogongrass (Priority 1) .....	113
4.8.4.2	Japanese climbing fern (Priority 1) .....	114
4.8.4.3	Chinese tallow tree (Priority 2) .....	115
4.8.4.4	Red sesbania (Priority 2) .....	116
4.8.4.5	Wild taro (Priority 2) .....	117
4.8.4.6	Chinaberry tree (Priority 2) .....	118
4.8.5	Priority Invasive Animal Species .....	118
5.0	PLAN IMPLEMENTATION .....	119
5.1	Project Development .....	119
5.1.1	Project Implementation .....	119
5.1.2	Priorities and Scheduling .....	120
5.2	Cooperative Agreements .....	122
5.3	Funding .....	122
5.3.1	Forestry Program .....	123
5.3.2	ARNG Funding .....	123
5.3.3	Other Federal Funds .....	123
5.3.4	Non-Federal Funds .....	124
5.4	Natural Resources Management Staffing .....	124

5.5	Monitoring INRMP Implementation .....	126
5.5.1	CBJTC INRMP Monitoring .....	126
5.5.2	DA and DoD INRMP Monitoring .....	127
6.0	REFERENCES .....	129

## LIST OF TABLES

Table 1.	Elements of Ecosystem Management .....	9
Table 2.	Outcomes of Biodiversity Conservation .....	10
Table 3.	Potential Impacts to Natural Resources from Training Activities at CBJTC .....	20
Table 4.	Land Use on CBJTC .....	21
Table 5.	NCDC Monthly Normals for Starke, FL (1971-2000) .....	22
Table 6.	NRCS Soil Map Units on CBJTC .....	27
Table 7.	Summary of NWI Wetlands within CBJTC .....	33
Table 8.	Natural Communities and Altered Land Cover Types within CBJTC .....	35
Table 9.	Federal and State Listed Animal Species Documented on CBJTC or with the Potential to Occur in Clay County .....	43
Table 10.	Federal and State Listed Plant Species Documented on CBJTC or Known to Occur in Clay County .....	44
Table 11.	Implementation Status of the 2007 INRMP .....	56
Table 12.	Summary of GIS Data Available for CBJTC .....	62
Table 13.	Fire Intervals for Vegetation Communities Requiring Regular Fire within CBJTC .....	82
Table 14.	Potential Non-Native Species at CBJTC .....	107



## FIGURES

Figure 1. EMS Process from US Environmental Protection Agency (USEPA).....	8
Figure 2. Why Conserve Biodiversity on Military Lands? .....	9
Figure 3. Location of CBJTC within Florida .....	14

## MAPS

### (Appendix B)

Regional Map .....	Map 1
CBJTC Facility Map .....	Map 2
Topography Map .....	Map 3
Soils Map.....	Map 4
Surface Waters and Watersheds Map .....	Map 5
Wetlands Map .....	Map 6
Natural Communities & Altered Land Cover .....	Map 7
RCW Cluster Locations at CBJTC in 2020 .....	Map 8

## APPENDICES

Glossary .....	Appendix A
Maps (see above) .....	Appendix B
CBJTC Flora and Fauna Species Lists.....	Appendix C
Red-cockaded Woodpecker Guidelines and Biological Opinion.....	Appendix D
Rare Species Information and Species-Specific Management Plans .....	Appendix E
Forest Resources Management Plan (FRMP).....	Appendix F
Integrated Wildland Fire Management Plan (IWFMP) .....	Appendix G
CBJTC Natural Resources Reports Summary .....	Appendix H
Cooperative Agreements .....	Appendix I
Laws, Regulations, Policies and Executive Orders .....	Appendix J
Agency Correspondence and Concurrence Letters.....	Appendix K
INRMP Annual Review Documentation .....	Appendix L
Record of Environmental Consideration (REC) for Updated INRMP .....	Appendix M
Gopher Tortoise Relocations and Permitting .....	Appendix N
Integrated Training Area Management Program (ITAM) Workplan .....	Appendix O
Integrated Cultural Resource Management Plan (ICRMP).....	Appendix P
Integrated Pest Management Plan (IPMP) .....	Appendix Q
FLARNG Statewide Operational Noise Management Plan .....	Appendix R
Annual CCAA Reports .....	Appendix S
Table 15. On-going Natural Resources Management Activities .....	Appendix T
Table 16. Planned Projects .....	Appendix U

## ABBREVIATIONS AND ACRONYMS

AEDB-EQ	Army Environmental Database - Environmental Quality	DA Pam	Department of the Army Pamphlet
AERO	Army Environmental Reporting Online	DoD	Department of Defense
AFP	Artillery Firing Point	DoDI	DoD Instruction
amsl	above mean sea level	DOI	Department of the Interior
AR	Army Regulation	DUSD	Deputy Under Secretary of Defense
ARNG	Army National Guard	DZ	Drop Zone
ARNG G-9	ARNG Directorate Environmental Programs Division	EA	Environmental Assessment
AT	Annual Training	ECO	Environmental Compliance Officer
ATAG	Assistant Adjutant General	EIS	Environmental Impact Statement
ATV	All-Terrain Vehicle	EMS	Environmental Management System
BMP	Best Management Practice	EO	Executive Order
BO	Biological Opinion	EQCC	Environmental Quality Control Committee
CBFI	Camp Blanding Forever Initiative	EQR	Environmental Quality Report
CBMTF	Camp Blanding Management Trust Fund	ERP	Environmental Resource Permit
CBJTC	Camp Blanding Joint Training Center	ESA	Endangered Species Act
CBJTC-DPW	CBJTC Department of Public Works	ESMC	Endangered Species Management Component
CBJTC-ED	CBJTC Environmental Division	° F	degrees Fahrenheit
CCAA	Candidate Conservation Agreement with Assurances	FAC	Florida Administrative Code
CCVI	Climate Change Vulnerability Index	FDACS	Florida Department of Agriculture and Consumer Services
CEC	Commission for Environmental Cooperation	FDEP	Florida Department of Environmental Protection
CFMO	Construction and Facilities Management Officer	FDMA	Florida Department of Military Affairs
CFR	Code of Federal Regulations	FEMA	Federal Emergency Management Agency
CIP	Common Installation Picture	FFS	Florida Forest Service
CWA	Clean Water Act	FFWCC	Florida Fish and Wildlife Conservation Commission
DA	Department of the Army	FI	Wildland Fire Management
		FIRM	Flood Insurance Rate Map

FLARNG	Florida Army National Guard	LZ	Landing Zone
FLEPPC	Florida Exotic Pest Plant Council	MBTA	Migratory Bird Treaty Act
FLMNH	Florida Museum of Natural History	METL	Mission Essential Task List
FLNG	Florida National Guard	MOA	Memorandum of Agreement
FMA	Fish Management Area	MOU	Memorandum of Understanding
FMO-ENV	Facility Management Office Environmental Section	MOUT	Military Operations on Urban Terrain
FNAI	Florida Natural Areas Inventory	NCDC	National Climatic Data Center
FNSI	Finding of No Significant Impact	NEPA	National Environmental Policy Act of 1969
FRMP	Forest Resources Management Plan	NGB	National Guard Bureau
F.S.	Florida Statute	NHPA	National Historic Preservation Act
FTA	Florida Trail Association	NOI	Notice of Intent
FW	Fish and Wildlife Management	NPDES	National Pollutant Discharge Elimination System
FY	Fiscal Year	NRCS	Natural Resources Conservation Service
GIS	Geographic Information Systems	NWCG	National Wildfire Coordinating Group
HUC	Hydrologic Unit Code	NWI	National Wetland Inventory
ICRMP	Integrated Cultural Resources Management Plan	NWP	Nationwide Permit
IDT	Inactive Duty Training	OFW	Outstanding Florida Water
INRMP	Integrated Natural Resources Management Plan	ONRW	Outstanding Natural Resource Water
IPM	Integrated Pest Management	PAO	Public Affairs Officer
IPMP	Integrated Pest Management Plan	PBG	Potential Breeding Group
ISO	International Standards Organization	PLS	Planning Level Survey
ITAM	Integrated Training Area Management	PM	Natural Resources Program Development
IWFMP	Integrated Wildland Fire Management Plan	POTO	Plans, Operations, and Training Officer
JFHQ-FL	Florida Joint Forces Headquarters	REDHORSE	Rapid Engineer Deployable Heavy Operational Repair Squadron Engineers
LRAM	Land Rehabilitation and Maintenance	RCMP	Range Complex Master Plan
		RCW	Red-cockaded Woodpecker
		REC	Record of Environmental Consideration
		RTLA	Range and Training Land Analysis



RTLTP	Range and Training Land Program	TE	Threatened and Endangered Species Management
SAIA	Sikes Act Improvement Act	TRI	Training Requirements Integration
SERCC	Southeast Regional Climate Center	TSC	Training Site Commander
SGCN	Species of Greatest Conservation Need	US	United States
SJA	Staff Judge Advocate	USACE	United States Army Corps of Engineers
SMZ	Special Management Zone	USC	United States Code
SO	Soil Conservation and Sediment Management	USDA	United States Department of Agriculture
SOP	Standard Operating Procedure	USEPA	United States Environmental Protection Agency
SPCCP	Spill Prevention Control Countermeasure Plan	USFWS	United States Fish and Wildlife Service
SPGP	State Programmatic General Permit	USFS	United States Forest Service
sq-ft	square feet	USGS	United States Geological Survey
SR	State Road	UXO	Unexploded Ordnance
SRA	Sustainable Range Awareness	VE	Vegetation Management
SRP	Sustainable Range Program	WA	Water Resources Management
STEP	Status Tool for Environmental Progress	WEA	Wildlife and Environmental Area
STRAC	Standards in Training Commission	WMA	Wildlife Management Area
SWAP	State Wildlife Action Plan	WMD	Water Management District
SWPPP	Stormwater Pollution Prevention Plan		
TA	Training Area		
TAG	The Adjutant General		

## 1.0 INRMP OVERVIEW AND POLICIES

### 1.1 Purpose

The Integrated Natural Resources Management Plan (INRMP) is the primary guidance document and tool for managing natural resources at Florida Army National Guard's (FLARNG's) Camp Blanding Joint Training Center (CBJTC). CBJTC includes approximately 73,000 acres of land owned and operated by the State of Florida Armory Board in Clay County, Florida (see **Section 2.1** for details). CBJTC must provide a variety of environmental conditions and habitats in which to train soldiers. The management of CBJTC must be conducted in a way that provides for sustainable, healthy ecosystems, complies with applicable environmental laws and regulations, and provides for no net loss in the capability of military installation lands to support the military mission of the installation. Installation commanders can use INRMPs to manage natural resources more effectively to ensure that installation lands remain available and in good condition to support the installation's military mission over the long term.

This updated INRMP is intended to be consistent with the Sikes Act Improvement Act (SAIA) of 1997, 16 US Code (USC) §670 *et seq.*, as amended, Department of Defense Instruction (DoDI) 4715.03, *Natural Resources Conservation Program*, Army Regulation (AR) 200-1 *Environmental Protection and Enhancement*, Army National Guard (ARNG) Directorate Environmental Programs Division (ARNG G-9), Memorandum 2019, *Guidance for the Creation, Implementation, Review, Revision and Update of INRMPs*, Department of the Army (DA), the DoDI 4715.03, *Natural Resources Conservation Program*, and Department of Defense (DoD) Office of the Deputy Under Secretary of Defense (DUSD) DoDM 4715.03, *Integrated Natural Resources Management Plan (INRMP) Implementation Manual*. This INRMP integrates all aspects of natural resources management with the rest of CBJTC's mission, and therefore becomes the primary tool for managing CBJTC's ecosystems and habitats while ensuring the successful accomplishment of the military mission at the highest possible levels of efficiency. The INRMP is the guide for the management and stewardship of all natural resources present on CBJTC. A multiple-use approach will be implemented to allow for the presence of mission-oriented activities, as well as protecting environmental quality through the efficient management of natural resources.

This INRMP is an update and reorganization of the 2014 CBJTC INRMP and is the result of a review for operation and effect done by the US Fish and Wildlife Service (USFWS), Florida Fish and Wildlife Conservation Commission (FFWCC), and FLARNG. The review for operation and effect determined that only an update is required since there are no military mission changes, no program or management philosophy changes, and no input received from USFWS or FFWCC that resulted in changes to the way natural resources are managed at CBJTC. Both FLARNG's environmental office and military trainers were included in the review. The projects identified in **Section 5** include recurring or ongoing projects as well as some newly identified projects needed for the implementation of the existing program.

FLARNG updated and reorganized this INRMP in accordance with the DoD INRMP template guidance and incorporated updated natural resources data. These templates were used to ensure the plan content would meet ARNG G-9 requirements and to provide an easy to follow and logical organization for the INRMP. The INRMP has been updated and reorganized as follows.

To determine what projects and programs have been implemented, an INRMP Implementation Analysis was developed and included in **Section 3.9** (see **Table 11**).

- Management goals and objectives have been reorganized and consolidated by resource area in **Section 4.0**.
- The list of implementation projects has been updated from the 2014 INRMP. See **Table 11** in **Section 3.0** for a summary on 2007 project implementation and **Tables 15** and **16** in **Section 5.0** for activities and projects to be carried out under this INRMP.
- Natural resources data and species lists have been updated to include new data and to include changes in the status of rare species (see **Section 2.0**).
- The Florida State Wildlife Action Plan (SWAP) has been incorporated (see **Section 3.8**).

## 1.2 Authority and Legal Requirements

The **SAIA** requires federal military installations and state-owned National Guard facilities with adequate wildlife habitat to develop a long-range INRMP and implement cooperative agreements with other agencies. All of CBJTC land is state-owned.

The **DoDI 4715.03**, *Natural Resources Conservation Program*, dated 18 March 2011, establishes policies and assigns responsibilities for complying with applicable federal, state, and local laws and regulations, executive orders (EOs), presidential memorandums, and DoD policies for the integrated management of natural resources on facilities managed or controlled by DoD. This instruction also implements new natural resources conservation metrics and provides procedures for developing, implementing, and evaluating effective natural resources management programs.

**AR 200-1**, *Environmental Protection and Enhancement*, dated 13 December 2007, addresses the environmental responsibilities of all Army organizations and agencies, and provides a framework for the Army Environmental Management System (EMS). This regulation provides guidance on when to develop and implement an INRMP and discusses associated coordination requirements.

**DoDI and DODM 4715.03**, *Supplemental Guidance concerning INRMP Reviews*, identifies the DoD policies and procedures concerning natural resources management and INRMP reviews, public comment, and endangered species consultation. INRMPs are required to be jointly reviewed by USFWS, the state conservation agency, and a military proponent for operation and effect on a regular basis, but not less often than every five years. Minor updates and continued implementation of an existing INRMP do not require an opportunity for public comment. Major revisions to an INRMP do require an opportunity for public review. The degree of endangered species consultation when updating or revising an INRMP depends upon the management strategies identified in the INRMP and the amount of past consultation. Most updates and revisions will not require formal consultation. Endangered Species Act (ESA) Section 7 consultation is required for INRMPs that contain management strategies that may affect federally listed species or critical habitat. The need for such consultation should become apparent during the review for operation and effect and be implemented if necessary, as part of a revision. USFWS issued a Biological Opinion (BO) for the red-cockaded woodpecker (RCW; *Picoides borealis*) on Army Installations in 2007 (Costa 2007). A revision to this BO was made in 2008 (Hankla 2008) for CBJTC based on FLARNG's Endangered Species Management Component (ESMC) Update for Incidental Take (Robinson 2008) (see **Appendix D**).



**ARNG G-9 Memorandum**, *Guidance for the Creation, Implementation, Review, Revision and Update of INRMPs*, 2019, is intended to supplement the SAIA and AR 200-1 and supersede all previous ARNG INRMP guidance. The memorandum provides guidance for state ARNG Environmental Programs on when an INRMP is required, coordination requirements for new and revised INRMPs, INRMP format, integration of component plans (e.g., Integrated Wildland Fire Management Plan [IWFMP]), integration with other programs, critical habitat designations, INRMP implementation and funding, annual reviews and reviews for operation and effect, reporting and tracking, plan updates and revisions, when public review is necessary, and National Environmental Policy Act of 1969 (NEPA) requirements.

In accordance with **NEPA** (42 USC §4321 *et seq.*), an Environmental Assessment (EA) of the 2000 CBJTC INRMP was completed. The EA presented the *Preferred Alternative* (implementation of the INRMP) and other alternatives, summarized the affected environment, and assessed the environmental consequences of INRMP implementation. The EA concluded that implementation of the INRMP under the *Preferred Alternative* was expected to result in net positive effects by sustaining and enhancing the natural resources while providing for no net loss in training lands. A Finding of No Significant Impact (FNSI) was signed by the National Guard Bureau (NGB), and the 2000 CBJTC INRMP was implemented. In 2007, FLARNG updated the original 2000 CBJTC INRMP. At that time, it was determined no significant changes would occur as a result of the INRMP update and that the 2000 EA and FNSI were still valid.

Similarly, this INRMP is an update and reorganization of the 2007 CBJTC INRMP. The review for operation and effect determined that only an update is required since there are no military mission changes, no program or management philosophy changes, and no input received from USFWS or FFWCC that resulted in changes to the way natural resources are managed at CBJTC. An Environmental Checklist and a Record of Environmental Consideration (REC) were prepared and are included in **Appendix M**. The Environmental Checklist describes the Proposed Action (update and continued implementation of the 2007 CBJTC INRMP), identifies that the updated INRMP is addressed in the 2000 CBJTC INRMP EA, identifies potential impacts to various environmental media, and concludes that a REC is the appropriate level of NEPA documentation. The REC that accompanies the Environmental Checklist cites the EA for the 2000 CBJTC INRMP as adequately covering the updated INRMP.

In addition to these laws, regulations and directives, a number of others apply to natural resources management at CBJTC and are summarized in **Appendix J**.

## 1.3 Responsibilities

### 1.3.1 ARNG Headquarters

**ARNG G-9** is responsible for review and approval of this INRMP. ARNG G-9 is also involved in programming, funding, and reviewing implementation projects set forth in the INRMP. ARNG G-9 is also the responsible federal agency for ESA compliance. Through this updated INRMP, the ARNG G-9, per 50 CFR 402.08, has expressed that his signature authorizes the FLARNG to act as the non-federal representative for informal consultation under the ESA. The ARNG G-9 is/will be involved with any and all ESA Section 7 formal consultations, and will initiate such consultation with the USFWS when necessary.

### 1.3.2 FLARNG

**The Adjutant General (TAG)** is directly responsible for the operation and maintenance of CBJTC, including implementation of this INRMP. Under the direction of TAG, the force structure (e.g., types and number of units, types of equipment, training events), projects, construction, and budgets at CBJTC are determined throughout the 5-year period of the INRMP. Under the leadership of TAG, all CBJTC personnel are trained in environmental awareness and as such, comply with policies, procedures, requirements, and applicable laws and regulations that accomplish the goals and objectives of the INRMP. TAG also ensures coordination of projects and construction between environmental, training, and engineering staffs. The office of TAG is located at FLARNG's headquarters in St. Augustine, Florida.

Two key positions within TAG's Office are the **Assistant Adjutant General (ATAG)** and the **Construction and Facilities Management Officer (CFMO)**. These positions ensure that natural resource issues are considered in Florida Department of Military Affairs (FDMA) budget and policies. The ATAG also serves as chairman of the FDMA Environmental Quality Control Committee, which provides overall guidance and policy direction to the environmental program, including management of CBJTC's natural resources.

The **Plans, Operations, and Training Officer (POTO)** has the primary responsibility of scheduling military training and safety of all personnel while training exercises are being conducted. The POTO and the **Training Site Commander (TSC)** determine the training load of CBJTC based upon the force structure determined by TAG. CBJTC Operations staff is familiar with all aspects of the training center, including training scheduling and conflicts, locations of training facilities, impairments, or problems with human-made structures or natural functions and needs for improvement or maintenance of the training land. Secondary to scheduling is maintaining a high-quality training environment, which is also a primary goal of this INRMP. The **Integrated Training Area Management (ITAM) Coordinator**, with oversight from the POTO, identifies construction and maintenance priorities, determines ITAM projects, and submits an annual ITAM work plan.

**CBJTC Department of Public Works (CBJTC-DPW)**, along with the CFMO located at headquarters in St. Augustine, Florida, provides a full range of environmental, financial, and engineering disciplines for all facilities under the jurisdiction of the FDMA, including CBJTC. The CFMO is responsible for master planning and ensuring that all construction projects comply with environmental regulations by consulting with the CBJTC-ED and FMO-ENV prior to implementing any construction projects. The CBJTC-DPW also provides expertise in the development and production of environmental awareness materials for distribution to troop commanders.

**CBJTC Environmental Division (CBJTC-ED)**, with support from the statewide **Facility Management Office Environmental Section (FMO-ENV)**, is assigned day-to-day responsibility for development and implementation of the revised INRMP. CBJTC-ED, housed in the Land Management Center at CBJTC, is composed of three primary sections: Conservation (including Forestry), Compliance, and Geographic Information Systems (GIS). The FMO-ENV is located at FLARNG's headquarters in St. Augustine, Florida. CBJTC-ED is responsible for directing the management of natural resources on CBJTC, identifying compliance requirements, and providing guidance to the TSC and other training site personnel. Specifically, CBJTC-ED provides technical assistance to the TSC and the training site personnel to develop projects, secure required permits, conduct field studies, provide environmental awareness materials, identify and map natural and cultural resources, direct the NEPA process, and manage the development and revision of the INRMP. CBJTC staff is responsible for providing input to the plan and implementing specific elements of the plan.

The **Public Affairs Officer (PAO)** serves as a liaison between FLARNG and the public. The PAO represents FLARNG in public meetings, prepares media presentations, and promotes the personnel and events occurring at various FLARNG locations. The PAO also offers photography services for natural resources projects and community educational events.

The **Staff Judge Advocate (SJA)** is the legal advisor to TAG and FLARNG staff on laws and regulations that affect training land use, environmental compliance, and policy.

### 1.3.3 Other Organizations

**USFWS** provides technical assistance to CBJTC-ED and is a cooperator during preparation of this INRMP. Specifically, the USFWS is the principal advisor to FLARNG on issues regarding federally protected rare, threatened, and endangered species.

**FFWCC** provides guidance to CBJTC-ED on species and habitats of special state concern and is a cooperator during the preparation of this INRMP. They also provide information for the management of fish and wildlife, water quality protection, and recreation.

## 1.4 Conditions for Implementation and Revision

### 1.4.1 Implementation and Annual Reviews

In accordance with DoD and Army policy, FLARNG will review the INRMP annually in cooperation with USFWS and FFWCC. On an annual basis, FLARNG will coordinate with USFWS local field office and FFWCC to review the previous year's INRMP implementation and discuss implementation of upcoming programs and projects. Coordination will be done through a meeting or by letter or email. A memorandum of record detailing each annual review will be prepared by FLARNG, and these annual review documents will be appended in **Appendix L**. Additionally, CBJTC-ED will ensure that completed annual reviews are tracked and reported in the annual Army Environmental Database data submission (see **Section 5.5.2** for more details).

During this annual review, the need for updates or revisions will be discussed. If minor updates are needed, the requesting party will initiate the updates. After agreement of all three parties, these will be added to the



INRMP. If it is determined that major changes are needed, all three parties will provide input and an INRMP revision and associated NEPA review will be initiated with FLARNG acting as the lead coordinating agency. The annual meeting will be used to help expedite the more formal review for operation and effect and if all parties agree and document their mutual agreement, it can fulfill the requirement to review the INRMP for operation and effect.

If not already determined in previous annual meetings, by the fourth year annual review a determination will be jointly made to continue implementation of the existing INRMP with minor updates or to proceed with a revision. If the parties feel that the annual reviews have not been sufficient to evaluate operation and effect and they cannot determine if the INRMP implementation should continue or be revised, a formal review for operation and effect will be initiated. The determination on how to proceed with INRMP implementation or revision will be made after the parties have had time to complete this review.

As part of the annual review, FLARNG will specifically:

- Invite feedback from USFWS and FFWCC on the effectiveness of the INRMP
- Inform USFWS and FFWCC which INRMP projects and activities are required to meet current natural resources compliance needs
- Document specific INRMP action accomplishments from the previous year and discuss upcoming projects and activities
- Verify that all must-fund projects and activities are budgeted and on schedule, all trained natural resources positions are either filled or in the process of being filled, INRMP goals and objectives are still valid, no significant changes to natural resources or the mission have occurred, and no net loss to CBJTC's training capability has occurred in accordance with DA and ARNG Policy

Information for the annual reviews comes from FLARNG environmental staff, CBJTC military leadership, cooperating agencies, project files, and ARNG G-9 as applicable. Natural resources data and program and project information are available to cooperating agencies. They may request to see project folders or to have a site visit to view natural resources projects in progress at any time.

#### **1.4.2 INRMP Review for Operation and Effect**

Not less than every five years, the INRMP will be reviewed for operation and effect to determine if the INRMP is being implemented to meet the requirements of the SAIA and Army Policy and contributing to the conservation and rehabilitation of natural resources at CBJTC. The review will be conducted by the three cooperating parties to include the commander responsible for the INRMP, the Regional Director of USFWS, and the Director of FFWCC. These agencies all have technical representatives who actually perform the review.

The review for operation and effect will either conclude that the INRMP is meeting the intent of the SAIA and it can be updated and implementation can continue; or that it is not effective in meeting the intent of the SAIA to conserve natural resources while providing for no net loss in training capability and it must be revised. The conclusion of the review will be documented in a jointly executed memorandum, meeting minutes, or in some other way that reflects mutual agreement.

If only minor updates are needed, they will be done in a manner agreed to by all parties. The updated INRMP will be reviewed by the local USFWS office, USFWS Regional Director, and FFWCC Director. Once concurrence letters or signatures are received from USFWS's Regional Director and FFWCC's Director, the INRMP will continue to be implemented. A new NEPA review is not necessary for an update and the continued implementation of an existing INRMP that has previously undergone NEPA review. In this case, an Environmental Checklist and REC citing the previous NEPA-compliant document is needed.

If a review of operation and effect concludes that an INRMP must be revised, there is no set time to complete the revision. The existing INRMP remains in effect until the revision is complete and USFWS and FFWCC concur with the revised INRMP. FLARNG will endeavor to complete such revisions within 18 months depending upon funding availability. Revisions to the INRMP will go through a more detailed review process similar to development of the initial INRMP to ensure FLARNG's military mission and USFWS and FFWCC concerns are adequately addressed, and the plan meets the intention of the SAIA and Army Policy. Revisions will usually require a new NEPA-compliant analysis. An EA will be done as part of the revision process if determined by ARNG G-9 to be necessary.

## **1.5 Management Philosophy**

This INRMP update for CBJTC has been developed in cooperation with USFWS and FFWCC. Developed using an interdisciplinary approach, information has been gathered from various FLARNG directorates, CBJTC staff, as well as other federal, state, and local agencies and special interest groups with an interest in the management of CBJTC natural resources. Agencies and organizations consulted during the development of this INRMP update, as well as initial agency coordination and response letters, have been included in **Appendix K**.

### **1.5.1 Support of the Military Mission**

The overall policies and philosophy of land management at CBJTC support AR 200-1 and 32 Code of Federal Regulations (CFR) 651, *Environmental Effects of Army Actions*, which are based on the concept that natural resources management is an integral component of the military training environment. Management of natural resources using an ecosystem approach ensures the sustainable use of training lands while considering the effects on the surrounding environment and public concern. FLARNG shall maintain sustainable natural resources as a critical training asset upon which to accomplish CBJTC's mission. To accomplish this, FLARNG will:

- Ensure no net loss in the capability of installation lands to support existing and projected military training and operations at CBJTC
- Maintain quality training lands through proactive management, range and training land monitoring and damage minimization, mitigation, and rehabilitation

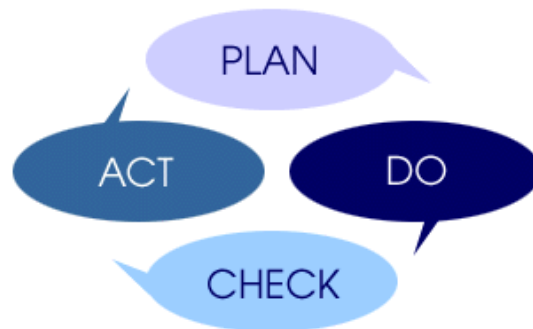
### 1.5.2 Environmental Management System

The ARNG G-9 and FLARNG consider CBJTC to be part of the combined FLARNG operations in Florida. The EMS is part of the overall FLARNG management system and includes organizational structure, planning, responsibilities, practices, procedures, and processes, and resource allocation for developing, implementing, achieving, reviewing, and maintaining environmental commitments. The International Standards Organization (ISO)-14001 EMS model used by FLARNG leads to continual improvement based upon a cycle of “plan, do, check, act” (also known as adaptive management):

**Developing and implementing an EMS is required at all ARNG installations.**

In 2000, EO 13148, *Greening the Government through Leadership in Environmental Management*, established a 5-year EMS implementation goal for federal facilities.

- Planning, including identifying environmental aspects and establishing goals [plan]
- Implementing, including training and operational controls [do]
- Checking, including monitoring and corrective action [check]
- Reviewing, including progress reviews and acting to make needed changes to the EMS [act]



**Figure 1. EMS Process from US Environmental Protection Agency (USEPA)**

The EMS is continually updated through this cycle by fine-tuning its management of operations that may harm the environment. This continual improvement cycle is a fundamental attribute of the EMS that allows the system to adapt to the dynamic nature of the organization’s operations.

This INRMP directly supports FLARNG’s EMS. FLARNG personnel will perform annual reviews of the INRMP in conjunction with USFWS, FFWCC and other agencies in order to support the concept of EMS. Annual reviews are discussed in **Section 1.4.1** and monitoring of implementation is discussed in **Section 5.5**.

### 1.5.3 Ecosystem Management

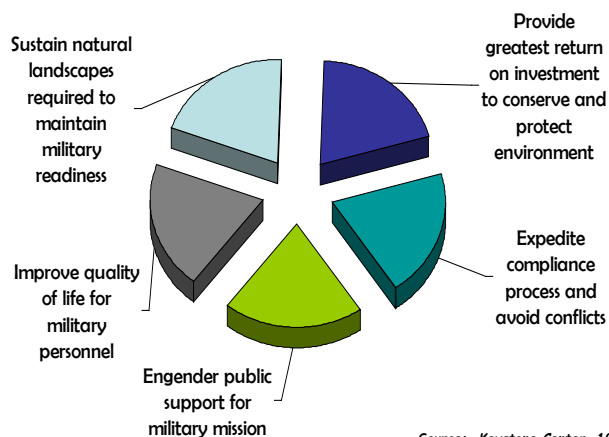
Natural resources at CBJTC will be managed with an ecosystem management approach as directed by AR 200-1 and DoDI 4715.03. Ecosystem management may be defined as management to restore and maintain the health, sustainability, and biological diversity of ecosystems while supporting sustainable economies and communities. The goal of ecosystem management on military lands is to ensure that military lands



support present and future training and testing requirements while preserving, improving, and enhancing ecosystem integrity. As described in DoDI 4715.03, ecosystem management will incorporate the following elements as described in **Table 1**.

<b>Table 1. Elements of Ecosystem Management</b>	
<b>Elements</b>	
<b>1</b>	Avoid single-species management and implement an ecosystem-based multiple species management approach, insofar as that is consistent with the requirements of the ESA
<b>2</b>	Use an adaptive management approach to manage natural resources in response to conditions such as climate change
<b>3</b>	Evaluate and engage in the formation of local or regional partnerships that benefit the goals and objectives of the INRMP
<b>4</b>	Use the best available scientific information in decision-making and adaptive management techniques in natural resource management
<b>5</b>	Foster long-term sustainability of ecosystem services

Biodiversity is the degree of variation of life forms within a given ecosystem, biome, or an entire planet. The DoD's challenge is to manage for biodiversity in a way that supports the military mission. The INRMP is identified by DoD as the primary vehicle for conserving biodiversity on military installations. Specific management practices identified in this INRMP have been developed to enhance and maintain biological diversity within the ecosystems at CBJTC. The outcome of biodiversity conversation on DoD land includes the items listed in **Table 2**.



**Figure 2. Why Conserve Biodiversity on Military Lands?**

Table 2. Outcomes of Biodiversity Conservation	
Outcomes	
1	Maintain or restore remaining native ecosystem types across their natural range of variation
2	Maintain or reestablish viable populations of native species on an installation, when practical
3	Maintain ecological processes, such as disturbance regimes, hydrological processes, and nutrient cycles, to the extent practicable
4	Manage and monitor resources over sufficiently long time periods to allow for adaptive management and assessment of changing ecosystem dynamics (i.e., incorporate a monitoring component to management plans)

#### 1.5.4 Sustainable Range Program

The Sustainable Range Program (SRP) is the Army's overall approach for improving the way in which it designs, manages, and uses its ranges to ensure long-term sustainability. Requirements for the SRP are set forth in AR 350-19, *Army Sustainable Range Program*, dated 30 August 2005. The SRP is defined by its two core programs, the Range and Training Land Program (RTLTP) and the ITAM Program, which focus on the doctrinal capability of the Army's ranges and training land. To ensure the accessibility and availability of Army ranges and training land, the SRP core programs are integrated with the facilities management, environmental management, munitions management, and safety program functions supporting the doctrinal capability.

#### 1.5.5 Range and Training Land Program

The RTLTP provides a range operations and modernization capability for the central management and programming of live-fire training ranges and maneuver training lands, including the design and construction activities associated with them. The RTLTP planning process integrates mission support, environmental stewardship, and economic feasibility and defines procedures for determining range projects and training land requirements to support live-fire and maneuver training. The RTLTP defines the quality assurance and inspection milestones for range development projects and the Standard Operating Procedures (SOPs) to safely operate military training, recreational, or approved civilian ranges under Army control and supports the Commanders' Mission Essential Task List (METL) and Army training strategies. RTLTP also establishes the procedures and means by which the Army range infrastructure is managed and maintained on a daily basis in support of the training mission.

### 1.5.6 Integrated Training Area Management Program

The ITAM program provides for the management and maintenance of training lands by integrating mission requirements derived from the RTLP with environmental requirements and environmental management practices. The objectives of FLARNG's ITAM program are to:

- Achieve optimal sustained use of lands for realistic training by providing a sustainable core capability that balances usage, condition, and level of maintenance
- Implement a management process that integrates FLARNG training and other mission requirements for land use with sound natural resources management
- Advocate proactive conservation and land management practices by aligning FLARNG land management priorities with FLARNG training and readiness priorities

ITAM consists of four proactive subprograms designed to facilitate these processes.

- 1) **Range and Training Land Analysis (RTLA)** is the ecological monitoring component that serves to characterize and monitor installation natural resources. RTLA provides a means to collect and maintain GIS data for CBJTC.
- 2) **Training Requirements Integration (TRI)** uses information generated and assimilated from RTLA to assist with military exercise scheduling and logistics to minimize harmful practices or activities within training areas.
- 3) **Land Rehabilitation and Maintenance (LRAM)** provides mitigation measures and land rehabilitation where needed or desired.
- 4) **Sustainable Range Awareness (SRA)** activities serve to promote awareness of environmentally sensitive issues and instill a stewardship ethic among unit commanders, soldiers, and neighboring communities.

The ITAM Program at CBJTC is administered by the ITAM Coordinator with review and approval by the POTO. The ITAM Program at CBJTC was formally initiated in Fiscal Years (FYs) 1992-1993, when a floral inventory was conducted and RTLA plots were established to collect baseline data on CBJTC's flora and fauna. CBJTC is a Category III installation (i.e., an installation with important training missions and significant environmental sensitivity to missions). ITAM requirements for CBJTC are identified yearly and submitted to ARNG G-9, so that projects can be validated and funded through the ITAM Work Plan budgeting process.

The requirements of the ITAM Program for CBJTC are detailed in the ITAM Plan and Work Plan (**Appendix O**). Project information relevant to INRMP implementation from the ITAM Work Plan has been incorporated into this INRMP. Together, ITAM and natural resources management as outlined in this INRMP ensure sustainable use of training lands.

In this updated INRMP, the only projects included from programs other than natural resources are those that directly satisfy an objective and are integral to INRMP implementation. The requirement to coordinate ITAM projects, construction, and all other land uses with CBJTC-ED and FMO-ENV, to implement effective natural resources management practices, and to ensure regulatory compliance is inherent in the INRMP



implementation and retained in this updated INRMP. A detailed analysis of 2014 INRMP project implementation status, including ITAM projects, is provided in **Section 3.8**.

### 1.5.7 Goals and Objectives

Goals and objectives provide the framework for the natural resources management programs. Goals provide a general guiding direction for each technical area and logical objectives that facilitate achieving those goals are described for any priority issues within each technical area. The objectives then drive the development of activities and projects to achieve those objectives. Goals and objectives are described in **Section 4.0** under each technical area. Activities and projects, and the objectives they support, are described in **Tables 15 and 16** in **Section 5.0**. Below are the goals identified in **Section 4.0**:

GOAL PM: Manage natural resources in a manner that is compatible with and supports the military mission while complying with applicable federal and state laws and DA regulations and policies.

GOAL SO: Manage soil to minimize sediment loss and erosion, while protecting water quality.

GOAL WA: Maintain water resources so they remain resilient, functional, and with no net loss of acreage.

GOAL VE: Manage vegetation to provide a variety of habitats to support the military mission, maintain native species, provide a sustainable forestry program, and enhance wildlife habitat.

GOAL FI: Implement a wildland fire program that minimizes safety concerns and wildfire risk, enhances the military mission, benefits rare species, protects cultural resources, and maximizes habitat management and ecological benefits.

GOAL FW: Maintain fish and wildlife populations while minimizing potential impacts to the military mission.

GOAL TE: Manage rare species using an ecosystem approach, while maintaining the military mission at CBJTC.

GOAL IN: Minimize impacts of invasive and pest species, while minimizing use of chemicals to manage those species, utilizing an integrated pest management approach.

### 1.5.8 Integration with Other Plans

By its nature, an INRMP is multidisciplinary and provides the summary for natural resources at a specific installation. As a result, information from an INRMP is incorporated into other plans and other plans help identify management priorities and potential impacts to natural resources. The INRMP is integrated with a number of FLARNG plans including:

- Integrated Cultural Resources Management Plan (ICRMP) for Installations of FLARNG (**Appendix P**)— plan for management of cultural resources, including consultation and other legal requirements, known cultural resources, processes, and responsibilities at FLARNG facilities.
- Integrated Pest Management Plan (IPMP) (**Appendix Q**) – plan for management of pest species, including nuisance wildlife and invasive species, to minimize impact to mission, natural resources, and the environment.

- Integrated Wildland Fire Management Plan (IWFMP) for CBJTC – plan lays out specific guidance, procedures, and protocols in the prevention, detection, and suppression of wildfires and the planning and operating procedures involved with prescribed burning on CBJTC (Florida National Guard [FLNG] 2011a).
- Stormwater Pollution Prevention Plan (SWPPP) for CBJTC – plan for management of stormwater and water-borne pollution (FLARNG 2000).
- Spill Prevention Control Countermeasure Plan (SPCCP) – plan for managing oil spill prevention, preparedness, and response to prevent oil discharges to surface waters (FLARNG 2012).
- Forest Resources Management Plan (FRMP) for CBJTC – plan establishes management strategies focused on providing a variety of habitat and stand conditions for the purpose of military training, maintaining a sustainable revenue from harvest of forest products, and other resource uses, and enhancing the quality of wildlife habitat for both recreational game and non-game species (FLNG 2005).
- Range Complex Master Plan (RCMP) for the State of Florida – plan establishes the range and maneuver land requirements for the State of Florida to support the installation training missions (FLNG 2011b).
- Camp Blanding Army Compatible Use Buffer Plan, 24-Oct-2018 - plan provides guidance for Army Compatible Use Buffer program and articulates land acquisition priorities for ACUB and Readiness and Environmental Protection Initiative (REPI) funds. Various entities have partnered with DMA to secure lands in the buffer since the plan's inception, including the Florida Division of State Lands, the St. Johns River and Suwannee River Water Management Districts, Clay County and the North Florida Land Trust. Several parcels purchased under these programs are managed by Camp Blanding and directly alleviate T&E-based mission encroachment by providing habitat for relocations of protected gopher tortoises.
- Master Plan for CBJTC – plan identifies future needs and requirements of the installation as it relates to the use and/or designation of lands, facilities, and resources and establishes a guide for installation growth and development (FLARNG 2006).

## 2.0 INSTALLATION INFORMATION

### 2.1 General Description

The 73,000-acre CBJTC is located in northeast Florida (see **Figure 3**). The installation lies completely within Clay County and is roughly 45 miles equidistant from the cities of Gainesville to the southwest, Jacksonville to the northeast, and St. Augustine to the east. The main gate is located on State Road (SR) 16 approximately 12 miles east of the City of Starke. Middleburg is located adjacent to the northeast of CBJTC, while the town of Keystone Heights lies adjacent to the southwest (see **Maps 1 and 2; Appendix B**). All maps are provided in **Appendix B** and only the map number is referenced in the remainder of the document.

CBJTC land is owned and operated on behalf of FLARNG by the Florida Armory Board. FLARNG is responsible for the management of the entire site, with the exception of game management, hunting activities, and leased areas. Since its establishment in 1939, CBJTC has fluctuated in size from approximately 39,000 to 125,000 acres, and presently encompasses approximately 73,000 acres. CBJTC is divided into a Cantonment Area, Impact Area, and 37 maneuver training areas (TAs) (see **Map 2**). TAs are often referred to by location within the installation. North Post includes the TAs north of SR 16. TAs to the east of the Cantonment Area and Impact Area are in East Post, while the remainder of the site is characterized as South Post.



**Figure 3. Location of CBJTC within Florida**



### 2.1.1 Regional Land Use

According to the US Census Bureau's *2010 Census*, Clay County has an estimated population of 190,865, which is about 1 percent of Florida's total population (18,801,310). Clay County is part of the Jacksonville metropolitan area, which comprises the five counties in the northeastern corner of Florida. The installation is adjacent to the city of Middleburg (population 13,008) and the city of Keystone Heights (population 1,350). CBJTC lies along the eastern boundary of Bradford County (population 28,520). The city of Starke (population 5,449) and town of Lawtey (population 730) are located within approximately 3 miles and 1 mile, respectively, to the west of CBJTC (see **Map 1**).

In general, Florida's population increased by approximately 45.4 percent from 1990 to 2010, which is nearly two times more than the overall US population increase (24.1 percent) during this time. Clay County has experienced tremendous population growth; it increased in population between 1990 (population 105,986) and 2010 (population 190,865) by about 80 percent, while the populations of the cities of Middleburg and Keystone Heights have more than doubled. Despite Bradford County's population increase of 26.7 percent between 1990 and 2010, the growth of Bradford County, the city of Starke and town of Lawtey were much lower than Clay County. Population growth in the immediate vicinity of CBJTC appeared to slow slightly between 2000 and 2010 in comparison to 1990 and 2000. For example, Starke's population declined slightly (about 2 percent) and Keystone Heights stayed essentially the same between 2000 and 2010. The city of Middleburg's population increased by 25.8 percent between 2000 and 2010; however, in comparison, the city experienced a 66 percent increase during the previous 10 years (US Census 1990, 2000 and 2010). CBJTC is in an area where development is approaching from several directions. CBJTC has been partnering with ARNG G-9 and the State of Florida through the Florida Forever program since 2003 to establish a three-mile compatible use buffer around the installation to manage encroachment (see **Section 3.5**).

Regional land use is relatively rural, being mostly undeveloped and forested. CBJTC is located in a region of strategic importance to the southeastern US and statewide conservation system. The installation is situated approximately 25 miles northwest of Ocala National Forest and 25 miles southeast of Osceola National Forest (see **Map 1**). CBJTC is bordered to the southeast by Gold Head Branch State Park, to the north by Jennings State Forest Wildlife Management Area (WMA) and to the east by private timberlands. Additionally, the Santa Fe Swamp Wildlife and Environmental Area (WEA), Belmore State Forest WMA, and Raiford WMA occur within approximately 4 miles of the installation (see **Map 1**). CBJTC contributes directly to regional conservation since approximately 56,197 acres, or 77 percent, of CBJTC is managed by FFWCC as a WMA (see **Section 2.2.3**). A brief description of the natural areas adjacent to and in the immediate vicinity of CBJTC is provided below.

#### **Jennings State Forest WMA**

The Jennings State Forest WMA is located in northwest Clay County north of CBJTC, and includes approximately 24,000 acres that encompass the headwaters of Black Creek. An upland ecosystem restoration project is underway to restore habitat for the gopher tortoise (*Gopherus polyphemus*), northern bobwhite (*Colinus virginianus*) and other upland species. Hunting, fishing, wildlife viewing, primitive camping, hiking, horseback riding, bicycling, and canoeing are allowed (FFWCC 2020).

### **Gold Head Branch State Park**

The Mike Roess Gold Head Branch State Park was one of the first Florida state parks developed by the Civilian Conservation Corps during the 1930s. The 2,000-acre park is situated on rolling sandhills containing marshes, lakes, and scrub habitat, and is situated directly adjacent to CBJTC to the southeast. Visitors to the park can enjoy hiking and wildlife viewing along the park's nature trails and a 5.44-mile stretch of the Florida National Scenic Trail, which also passes through CBJTC. Group and primitive campsites are available as are fully equipped lakefront cabins (Florida State Parks 2020).

### **Santa Fe Swamp WEA**

The Santa Fe Swamp WEA is approximately 5,627 acres of floodplain swamp located approximately 2.5 miles southwest of CBJTC in Bradford County; the WEA protects the water quality and quantity of the Santa Fe River and Lake. Only primitive weapons (e.g., bow and arrow and muzzleloader) hunting of white-tailed deer (*Odocoileus virginianus*), feral hog (*Sus scrofa*), wild turkey (*Meleagris gallopavo*), gray squirrel (*Sciurus carolinensis*), and eastern cottontail rabbit (*Sylvilagus floridanus*) is allowed on this area during specified seasons. Falconry is also permitted. Fishing, wildlife viewing, horseback riding, hiking, and bicycling are permitted throughout the year (FFWCC 2020).

### **Belmore State Forest WMA**

The Belmore State Forest WMA occupies 8,737 acres in south-central Clay County, approximately 3 miles southeast of CBJTC. Ates Creek, a tributary of the South Fork of Black Creek, flows through the forest for six miles. The variety of natural communities here provides public recreation opportunities and wildlife habitat while performing essential roles in the protection of water quality, groundwater recharge, flood control, and aquatic habitat (FFWCC 2020).

### **Raiford WMA**

Raiford WMA consists of 9,141 acres in Bradford County approximately 4 miles northwest of CBJTC. The WMA is dominated by pine flatwoods, pine plantations, and lowland hardwoods, and is bisected by the New River. A portion of the area is only open during hunting seasons (FFWCC 2020).

## **2.1.2 Installation History**

Before the Spaniards arrived in 1821, the Timucuan Indians occupied the area. However, by 1728 the Timucuan Indians had been nearly eliminated by a succession of raids by the English and their Lower Creek and Seminole Indian allies. Spanish ownership of Florida continued until 1763, when the English acquired it and kept ownership until 1783. During this period, a Seminole village was on the Old Spanish road in what is now Clay County. For details on prehistoric land use, refer to the FLARNG ICRMP (**Appendix P**).

Permanent settlement of Clay County began during the second Spanish rule. Examination of US Rectangular Surveys from 1833 and 1855 suggest that the location of CBJTC was little altered by humans at the time of the 1833 survey, but was beginning to be substantially altered by the time of the 1855 survey. In 1860 the population of the county was 1,914. Much of Clay County's prosperity and growth during this period was associated with the expansion of woodland production and other agricultural cash crops.

In the 1910s the Dowling-Shands Lumber Company operated a logging railroad that extended from Green Cove Springs to the western region of the lands soon to be occupied by CBJTC. Beginning in 1919, the Florida Essential Oil Company harvested the outer leaves from more than 2,000 camphor (*Cinnamomum camphora*) trees and distilled them to extract camphor, which was used in the manufacturing of smokeless gunpowder. By 1940 the timber company had gone out of business, in part due to the over-logging of the area. During that time, the lands that became CBJTC were turpented by a number of firms, including Dowling-Shands Lumber Company, Powell-Smill Company, and O.J. Griffin and Brothers. Turpentine involves obtaining crude gum from living long leaf pine (*Pinus palustris*) trees by removing a section of bark, wounding the tree, and collecting the secreted sap for distillation into spirits of turpentine and rosin. After turpentering and then cutting all the timber, these companies sold their land to the Southern Cattle Feeding Company, and the clear-cut land was then used as pasture. The emphasis on forestry has continued in Clay County, but today the trees are typically planted slash pine (*Pinus elliotti*), the major product is pulp, and the land is usually owned by national paper companies. For more details on historic land use, refer to the FLARNG ICRMP (**Appendix P**).

The State of Florida Armory Board began acquiring real estate for the establishment of CBJTC during 1939-1940. As United States (US) involvement in World War II became imminent, the federal government launched a hasty building program that employed up to 21,311 workers. At peak occupancy during World War II, CBJTC operated a 20,000-man capacity dry cleaning plant (Harris and McCally 1995).

By enacting Public Law 493 in 1954 (effective in 1955), Congress established the present boundaries of CBJTC under the sponsorship of FDMA. The following phases of expansion occurred after 1955:

1. The State Armory Board acquired what is now most of the southern portion of CBJTC, which includes the Cantonment Area, the Impact Area, and "South Post".
2. The federal government acquired (in two phases) what is now known as "North Post".
3. The property was extended eastward to what is now SR 21.
4. Land leases for various areas were made for airfields, including the area that is presently Keystone Airpark.
5. Land is leased to the south and east from J.C. Penney of Penney Farms (which staved off bankruptcy for the national chain retailer), but with many excisions (including Penney Farms itself) to accommodate dwellings and landholdings.
6. A westward reduction in the leases occurred resulting in the current boundary configuration.

### 2.1.3 Military Mission

The **Federal Mission** is to maintain properly trained and equipped units, available for prompt mobilization for war, national emergency, or as otherwise needed. The ARNG is a partner with the Active Army and the Army Reserves in fulfilling the country's military needs. During times of national emergency, National Guard members may be called into active federal service by the President of the US.

The **State Mission** is to provide trained and disciplined forces for domestic emergencies or as otherwise provided by state law to ensure the protection of life and property and the preservation of public safety. The National Guard's "state role" is to assist local law enforcement agencies during emergencies at the direction



of the governor through the Florida Adjutant General. This dual federal-state mission is unique within the US military and sets the National Guard apart from any other regular or reserve component.

**CBJTC Mission** is to support both federal and state missions. In support of the federal mission, CBJTC provides personnel, training, logistical and administrative support, and serves as a training base for improving individual soldier skills, collective training, overall unit readiness, and other essential needs to valued customers. In support of the state mission, CBJTC is to be prepared to respond to State Active Duty missions. The installation has served as a site for continuation of government and continuity of operations for state government and Florida Joint Forces Headquarters (JFHQ-FL). The community-level mission is to be a “good neighbor” which is shown by civilian and government agency use of various facilities for outdoor recreation, education, and controlled public hunting (FLNG 2011b).

#### **2.1.4 Training Operations and Infrastructure**

CBJTC presently serves as a logistical support base during federal and state emergencies, such as hurricanes and disastrous wildfires. The installation is structured to command, operate, manage, and administer services of the facilities and assign use of resources to ensure training and logistical support is provided to FLARNG units. Because the installation is a joint training center, it also provides training support to units from other states, other reserve components, certain elements of active components, federal government organizations, state and local agencies, and civic groups. This support is provided during 5 major annual training (AT) periods, 50 inactive duty training (IDT) weekends per year and Monday through Friday for approximately 50 plus weeks per year.

CBJTC is the major training area for the FLNG and home to a variety of Army and Air National Guard units along with the Florida Youth Challenge Academy, the 211<sup>th</sup> Regiment Florida Regional Training Institute, and other military and civilian operations. CBJTC has been used for more than a half century for a variety of military training activities. CBJTC routinely supports the following units:

- 202<sup>nd</sup> Rapid Engineer Deployable Heavy Operational Repair Squadron Engineers (REDHORSE) and Weather Readiness Training Center, which are Florida Air National Guard tenant units.
- 820<sup>th</sup> Security Forces Group from Moody Air Force Base in Georgia in support of their ground security missions during deployments.
- Navy rotary wing units based at Naval Air Station Jacksonville and Mayport Naval Station that conduct door gunnery and ground-based crew-served weapons training throughout the year.
- Active and reserve Marine Corps units from the local area (active: Kings Bay, reserve: Jacksonville, Tampa, and Tallahassee) use the live fire ranges and training lands.
- Active and reserve Coast Guard units throughout the country conduct training at CBJTC for helicopter door gunnery, sniper training, and waterborne live fire on Lowry Lake.

Civilian tenants occur within CBJTC as well (e.g., truck driving school). Prior to 2008, Du Pont Corporation had leased up to 10,686 acres since the late 1940s on the western boundary of CBJTC for mining operations.

Approximately 56,200 acres of CBJTC is also known as Camp Blanding WMA, which is managed by FFWCC. A memorandum of agreement (MOA) was developed between FDMA and FFWCC for hunting, fishing, and outdoor recreation within the 56,197 acres. Another MOA also exists between FFWCC and FDMA for use of CBJTC as a Fish Management Area (FMA), specifically for Lowry Lake and Magnolia Lake. Copies of the MOAs are provided in **Appendix I**, and additional detail about Camp Blanding WMA is provided in **Section 4.6.2**.

A brief summary of CBJTC training facilities, activities, and land use is provided below. For more detailed information on existing and potential future training operations and infrastructure, refer to the *RCMP for the State of Florida* (FLNG 2011b) and *Master Plan for CBJTC* (FLARNG 2006).

### ***Military Training Facilities and Activities***

CBJTC specializes in supporting military training for light infantry exercises. The 73,000-acre CBJTC is divided into a Cantonment Area, Impact Area, and 37 maneuver TAs in North, East, and South Post (see **Map 2**).

The approximately 4,900-acre Cantonment Area is the developed portion of the training site and is designed with a network of streets dividing it into city block-sized units. This area also encompasses Kingsley Lake and Kingsley Village along its western boundary.

The approximately 15,500-acre Impact Area is considered a high hazard impact area due to unexploded ordnance (UXO) from weapon systems ranging from 20mm grenades to 8-inch artillery. Due to safety concerns, no public access is allowed in this portion of the installation. CBJTC currently has over 100 ranges located on the installation. The majority of these ranges occur within or in the immediate vicinity of the Impact Area. Ranges include, but are not limited to, 31 small arms ranges, 5 infantry squad battle courses, 5 infantry platoon battle courses, 36 artillery points, 27 mortar points, 2 demo ranges, 1 modular shoot house, and 2 Military Operations on Urban Terrain (MOUT) facilities. Refer to the *RCMP for the State of Florida* (FLNG 2011b) for a more detailed summary of CBJTC ranges. Weapon system qualification standards are detailed in DA Pamphlet (DA Pam) 350-38, *Standards in Training Commission (STRAC)* (US Army 2009).

The remainder of the site is divided into 37 maneuver TAs that are connected by an extensive vehicular trail network. The TAs along the western boundary of CBJTC (i.e., MA1, MA2, S11, S12 and S13) were previously leased by DuPont for mining (see **Map 2**). Training activities are conducted in accordance with SOP 210-4.

CBJTC facilities are used to conduct command post exercises, logistical exercises, specialized training, and training conferences; tracked and wheeled operations on roads and major trails; mounted and dismounted maneuvers; and weapons firing (FLNG 2011b). A summary of training activities and their potential impacts to CBJTC natural resources is provided in **Table 3**.

In addition, CBJTC has a complete Air Assault training facility to support a Warrior Training Center Air Assault Course for FLARNG. A grass airfield, 62 Landing Zones (LZs), and a 229-acre Weinberg Drop Zone (DZ) support aviation and airborne operations. CBJTC currently has an active airfield primarily in support of helicopter operations. The airfield has two grass runways with directions of 070/250 and 010/190 that are located in the Cantonment Area. The 2/11<sup>th</sup> Aviation Regiment provides airfield operations support

during IDT weekends to include active air traffic control for flight following and radar supported Precision Approach Radar. CBJTC also has the Anderson-Bartlett Flight Landing Strip, an unimproved air strip that can support C-130 field operations and a concrete skid strip for helicopter operations. Both are located on the north portion of the post. CBJTC has restricted airspace, which allows artillery, mortars, and small arms to fire at maximum altitudes and aviation assets to conduct tactical flight training (FLNG 2011b). Aviation operations are conducted in accordance with SOP 95-1.

<b>Table 3. Potential Impacts to Natural Resources from Training Activities at CBJTC</b>		
<b>Type Training</b>	<b>Minimum Effect Training Activities</b>	<b>Training Activities with the Potential to Disturb Soils and/or Vegetation</b>
Soldier Skills Training	Small unit infantry tactics Reconnaissance Terrain/map analysis Survival, escape, resistance, & evasion Day or night land navigation training Individual weapons familiarization and qualification Setting up communication links Infiltration Patrolling	Tactical bivouac occupation/displacement Wet weather operations Command post exercises without troops Cover and concealment Field fortifications Battle-focused individual training Mobility and counter mobility Fording operations Bridging and rafting operations
Engineer Training	Engineer reconnaissance	Emplace and clear minefields Emplace obstacles Demolitions training and qualification Cut, fill, and haul (horizontal operations) Breaching operations Clearing operations Construct and maintain roads Construct and maintain main supply routes Nonstandard fixed bridges

### ***Installation Land Use***

Training lands can be defined using the following land use categories: improved, semi-improved, and unimproved grounds. Improved grounds are developed areas that have either an impervious surface (e.g., sidewalks, buildings) or landscape plantings that require intensive maintenance and upkeep. Semi-improved grounds are where periodic grading or maintenance is performed for operational reasons (e.g., LZs, wildlife food plots). Unimproved grounds receive little to no grounds maintenance (e.g., streams, wetlands, forests). Land use is summarized for CBJTC in **Table 4**.

Improved grounds include the developed portions of CBJTC, which are primarily located within the central Cantonment Area. However, a few scattered areas of development are found outside this area, which are



associated with transportation and utility corridors and the range complex. Improved grounds make up less than 5 percent of the installation. Semi-improved lands on CBJTC (or 29 percent of the land) include areas that require periodic management or maintenance; they include tree plantations, agricultural lands, previously mined lands, and trails. The remainder of CBJTC (or 66 percent of the land) is classified as unimproved grounds that are used for military training, forestry, wildlife management, and recreation. Unimproved grounds include forests, shrubland, streams, lakes, and wetlands.

<b>Table 4. Land Use on CBJTC</b>		
<b>Land Use Category</b>	<b>Description</b>	<b>Area (acres)<sup>2</sup></b>
Improved Grounds	Developed areas (Cantonment Area, portions of the range complex, and mining spoil areas)	4,944
Semi-Improved Grounds	Pastureland maintained as artillery firing points, landing zones, and drop zones	2,041
	Tree Plantations	16,538
	Trails (~327 miles)	595 <sup>1</sup>
Unimproved Grounds	Forested habitat (includes sandhill, hardwood, and natural upland coniferous woodlands)	32,037
	Wetlands (includes saturated forests, marshes, bogs, wet prairies, and ephemeral ponds)	12,310
	Open water	4,531
	Scrub	340
<sup>1</sup> Unpaved road areas assume 15-foot road surface width		
<sup>2</sup> The primary source for land use estimates is Florida Natural Areas Inventory (FNAI) 2010a, 2010b. Acreages do not add up to 73,000 acres because GIS data equal 73,336 acres and trails overlay FNAI 2010a, 2010b estimates. Road and trail data were obtained from FLARNG.		
Source: FNAI 2010a, 2010b with corrections by CBJTC-ED		

### 2.1.5 Constraints and Opportunities

While there are many constraints to activities on CBJTC, not all of them are applicable for a given situation. For example, a constraint for new building construction may not be a constraint at all - may even be a benefit - for infantry training. Environmental constraints to training include:

- Wildfire risk (**Section 4.5**)
- Federal and state listed species, in particular RCW and gopher tortoise (*Gopherus polyphemus*) (**Section 2.3.4 and 4.7**)
- Special Management Zones (SMZs) and associated wetlands and riparian habitat (**Section 4.3.3**)
- Cemeteries
- Protected cultural resources

Constraints due to military training that can impact natural resources management include:

- Restricted access to Impact Area (permanent)
- Restricted access in active range fans (temporary)

There are no major topographic or soil erosion concerns that limit the military mission on CBJTC with the exception of some of the previously mined areas along the western boundary. No significant new development or military missions are currently planned; thus no opportunity map is provided.

## 2.2 Physical Environment

### 2.2.1 Climate

CBJTC lies within the subtropical division of the humid temperate domain and is characterized by high humidity especially in the summer and an absence of extremely cold winters (Bailey 1995). Within Clay County relative humidity is typically about 75 percent (Weatherspoon et al. 1989). The nearest National Climatic Data Center (NCDC) weather station is located in Starke, Florida, which is approximately 3 miles west of the installation. Average temperature and rainfall data for Starke, Florida is provided in **Table 5**. Temperatures range from an average high of 93 degrees Fahrenheit (°F) in July and August to an average low of 43.9°F in January. Average annual precipitation is about 53 inches. About 50 percent of the annual rainfall occurs in the summer (June – September) as a result of afternoon and evening thunderstorms, which can produce 2 to 3 inches of rainfall within a couple hours (Southeast Regional Climate Center [SERCC] 2012, Weatherspoon et al. 1989). Tropical storms are possible between June and November but typically do not generate hurricane-force winds at CBJTC due to its inland location (Weatherspoon et al. 1989).

<b>Table 5. NCDC Monthly Normals for Starke, FL (1971-2000)</b>				
<b>Month</b>	<b>Average Maximum Temperature (°F)</b>	<b>Average Minimum Temperature (°F)</b>	<b>24-hr Average Temperature (°F)</b>	<b>Average Rainfall (inches)</b>
Jan	65.4	43.9	52.8	3.31
Feb	67.6	45.5	55.1	3.32
Mar	74.2	56.2	61.1	3.87
Apr	79.0	62.0	66.1	2.89
May	85.5	70.1	73.0	3.76
Jun	89.2	75.4	78.2	6.32
Jul	90.9	77.6	80.3	6.28
Aug	90.1	78.3	79.9	6.76
Sep	87.4	74.9	77.7	5.82
Oct	80.7	64.0	70.0	1.95
Nov	73.6	54.7	61.8	2.58
Dec	67.1	47.9	55.1	3.48
<b>Total</b>	<b>79.2</b>	<b>43.9</b>	<b>67.6</b>	<b>50.34</b>
Source: SERCC 2012; Starke, Florida NCDC Station # 088527				

Because of Florida's unique ecology and topography, any potential impacts as a result of climate change may be particularly acute and affect multiple economic, agricultural, environmental, and health sectors across the state. The impact of climate change on wildlife and habitat is likely already be occurring.

The Intergovernmental Panel on Climate Change (IPCC), a multi-national scientific body, reports that climate change is likely proceeding at a rate where there will be unavoidable impacts to humans, wildlife, and habitat. Given current levels of heat-trapping greenhouse gas emissions, shifts in local, regional, and national climate patterns including changes in precipitation, temperature, increased frequency and intensity of extreme weather events, rising sea levels, tidal fluctuations, and ocean acidification are projected. The current trend of global temperature increase has appeared to accelerate in recent decades, and continued greenhouse gas emissions may result in projected global average increases of 2 - 11.5° F by the end of the century. This apparent change in global climate has the potential to disrupt natural processes; in some areas, climate change may cause significant degradation of ecosystems that provide services such as clean and abundant water, sustainable natural resources, protection from flooding, as well as hunting, fishing and other recreational opportunities. Consequently, climate change is a challenge not only because of its likely direct effects, but also because of its potential to amplify the stress on ecosystems, habitats, and species from existing threats such as exponential increases in surface and ground water use, habitat loss due to increased urbanization, introduction of invasive species, and fire suppression.

At this time, the potential effects of climate change on Florida's lands are just beginning to be studied and are not yet well understood. There is a continuing need for increased information and research to enable adaptive management to cope with potential long-term climate change impacts. CBJTC will work with FFWCC as they develop future adaptive management strategies to mitigate potential climate change impacts.

### **2.2.2 Topography**

CBJTC lies in western Clay County within the Trail Ridge physiographic region of the state. The Trail Ridge is an ancient coastal terrace, which is part of the oldest terrestrial formation in Florida, dating from the early Pleistocene about 25 million years ago. These formations traverse CBJTC from the northwest boundary in a southeasterly direction. This ridge is located on top of a calcium carbonate reef platform, which results in the chemical interaction between acidified waters and calcium-rich rocks creating a land surface marked by sinkholes (Webb 1990).

The land surface of CBJTC is level to gently rolling, with only very slight sloping areas in the southern portion of the site. Elevations on CBJTC range from approximately 40 feet above mean sea level (amsl) to 285 feet amsl (or 12 meters to 87 meters asml). Elevations of 40 feet amsl generally occur along creek channels, while elevations of 200 feet amsl and higher are characteristic of the sandhill areas located south of Kingsley Lake. The highest point in Clay County is on the summit of the Trail Ridge at an elevation of 285 feet asml, just south of Kingsley Lake. East of the Trail Ridge, the land slopes to sea level at the St. Johns River. South of the Trail Ridge, the highland fans out into a wide area of sandhills dotted with lakes (see **Map 3**).



### 2.2.3 Geology

Clay County is geomorphically situated in the northern or proximal zone of northeastern peninsular Florida. The late Tertiary, Late Pliocene Cypresshead Formation occurs in the central portion of Clay County. The Cypresshead Formation consists of quartz sands ranging from fine to very coarse with common occurrences of quartz gravel. This formation was deposited in a shallow, nearshore setting. Undifferentiated Quaternary Pleistocene sands overlay the Cypresshead Formation to form the Trail Ridge in the western portion of Clay County. The Trail Ridge sands contain economically important ore grade heavy-mineral concentrations, and were deposited as beach ridges and sands. CBJTC is underlain primarily by undifferentiated quaternary sands; however, in some areas the Cypresshead Formation is near the surface (Scott et al. 2001, Scott 2001).

In the western portion of the county, the Cypresshead sands are underlain by the Hawthorn Formation. The Hawthorn Group (100 to 300 feet) is of Miocene age and composed of many discontinuous lenses of clay, quartz sand, carbonates, and phosphates. The phosphates, which are found throughout the deposits, give the group a low permeability (Scott et al. 2001, Weatherspoon et al. 1989). The Hawthorn Formation is underlain by the Oligocene Suwannee Limestone Formation and the Eocene Ocala Limestone and Avon Park Formations. The Ocala Limestone and Avon Park Formations are part of the Floridan Aquifer, which is one of the most productive aquifers in the world (Scott 2001, Scott et al. 2001, Weatherspoon et al. 1989).

A large portion of the region has been mined for heavy minerals (Weatherspoon et al. 1989). Mining activities on CBJTC began in the late 1940s and have been concentrated on the western boundary of the property. The Du Pont Corporation began leasing property on CBJTC in the mid-1940s for mineral sand mining and ceased in 2008. During this time, they mined ilmenite, zircon, and staurolite, which were used for military and commercial applications.

### 2.2.4 Soils

According to the Natural Resources Conservation Service (NRCS) (Weatherspoon et al. 1989, NRCS 2010), 36 soil series occur either singularly or in combination with other series in 50 distinct soil mapping units that have been identified on CBJTC (**Table 6** and **Map 4**). Of the 50 soil map units, 27 of them are considered hydric soils. NRCS defines hydric soils as soils that are sufficiently wet in the upper part to develop anaerobic conditions during the growing season (NRCS 2012). Soils within CBJTC are divided into three major groups based on their location on the landscape.

- Soils on sandy ridges occur on approximately 32 percent (21,978 acres) of CBJTC. They are common in the southern sandhill areas of the installation. Soil map units in this category include Centenary, Kershaw, Ortega, Penney, and Troup.
- Soils in pine flatwoods, slight knolls, and in transitional areas between uplands and flatwoods occur on 55 percent (38,050 acres) of the installation. Soil map units in this category include Albany, Blanton, Goldhead, Hurricane, Leon, Lynn Haven, Mandarin, Meadowbrook, Neilhurst, Newnan, Ocilla, Ona, Osier, Pelham, Plummer, Pottsburg, Ridgeland, Ridgewood, Sapelo, Scranton, Solite, Surrency, and Wesconnett.

- Soils within floodplains occur on 12 percent (8,505 acres) of the installation. Soil map units in this category include Allanton, Ousley, Pamlico, and Rutlege.

Less than 1 percent (760 acres) of the installation is considered urban land and/or excavated areas (quartzipsamments or Arents sandy soil). The remaining land is characterized as open water.

When determining the potential for soil erosion or compaction, it is important to consider the ability of the soil to withstand or recover from the effects of military training that occur at CBJTC. Erosion can result in sedimentation of streams and loss of productivity of training lands. Unchecked erosion can eventually impact infrastructure and ability to train. Intensive training can also cause disruption to and compaction of the soil surface. There are several indices that incorporate the physical and chemical factors into numeric scales or broad categories that are more easily related to the potential effects of military training and land management activities: K-factor, Land Use Capability Class, and Hydrologic Soil Groups. An in-depth review of these factors can be found in the *Soil Survey for Clay County, Florida* (Weatherspoon et al. 1989).

### ***Soil Erodibility***

The K-factor indicates a soils susceptibility to water erosion. A K-factor or “erodibility factor” of 0.34 or greater indicates a highly erodible soil. Soils at CBJTC range between a K-factor of 0.1 to 0.32. A soil map unit is highly erodible from wind if the wind erodibility index value is 3 or less. Soils at CBJTC are all classified as 1 or 2; thus, they have the potential to be highly susceptible to wind erosion when they are not vegetated. One area on CBJTC with visible wind erosion concerns is the previously mined Du Pont lease area in the western portion of the installation (see **Section 4.4.5** for rehabilitation guidelines for this area). However, in general, soil erosion resulting from military training at CBJTC is rather limited because slopes are generally minimal, tracked and wheeled vehicle usage is low, and revegetation of bare areas is relatively easy due to an abundance of rainfall and warm temperatures (Hall et al. 1997).

### ***Land Use Capability Classification System***

Since intensive tracked vehicle use can disrupt and compact the soil (similar in ways to the effects of cultivation), the Land Use Capability Classification System can be used as an index for military training. In this system, the class numerals (1 - 8) indicate progressively greater limitations and narrower choices for practical use. The subclass letter (e, w, or s) designates limitations due to erosion (e), water (w), and shallowness, drought, or stoniness (s).

The capability class/subclasses from the soil survey reveal that only 1 percent of CBJTC requires very careful management due to risk of erosion (Albany fine sand, 0 to 5 percent slopes). Approximately 48 percent of the installation requires careful management due to being shallow, droughty, or stony, while 49 percent requires special conservation practices due to wetness (NRCS 2010, Weatherspoon et al. 1989). Most soils on CBJTC require special treatment and consideration when planning for land use and rehabilitation.

### ***Hydrologic Soil Groups***

Hydrologic soil group classifications refer to soils grouped by their runoff-producing characteristics. Since infiltration rate generally is inversely related to runoff and erosion, the hydrologic soil group is an indirect index to site erodibility. Group A soils have a high infiltration rate when thoroughly wet and have a low runoff potential (i.e. they are the least erodible). Group B soils have moderate infiltration rates when thoroughly

wet. Group A and Group B soils are most desirable for military training activities. Group C soils have slow infiltration rates when thoroughly wet and are borderline for military training activities. Group D soils have a very slow infiltration rate when thoroughly wet and are marginally suitable for military training activities. Some soils are assigned two soil groups. For example, B/D indicates the soil may have a seasonally high water table, but also drain easily. Thus, this soil type would need further onsite investigation to determine its hydrologic group in a particular location. The soils on CBJTC are distributed across all groups with 40 percent in Group A, less than 1 percent in Group B, 24 percent in Group C, 10 percent in Group D, and 25 percent in Group B/D (NRCS 2010, Weatherspoon et al. 1989).

### ***Woodland Management and Productivity***

Approximately 316,500 acres (approximately 80 percent) of Clay County and more than 40,000 acres of CBJTC is forested. Most woodland areas are on Hurricane, Leon, Pottsburg, and Sapelo soils on the flatwoods; Penney, Centenary, and Ortega soils on the sand ridges; and Rutlege, Osier, and Meadowbrook soils on the floodplains. In this system, the numerical value indicates a progressively greater potential for woodland productivity and less limitations. The subclass letter (w or s) indicates excessive water either seasonally or year-round and dry, sandy soil. Approximately 53 percent of the soils are limited by excessive water and 46 percent are hindered by dry sandy soil.

### ***Prime Farmland***

Prime farmland has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. Prime farmland has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops using acceptable farming methods. None of the soil types found on CBJTC are designated as prime farmland soils (NRCS 2010).



Table 6. NRCS Soil Map Units on CBJTC

Soil Map Unit	Description	Acres	Hydric Soil	K-factor	Wind Erodibility Index	Land Use Capability Class	Hydrologic Soil Group	Woodland Productivity
1	Albany fine sand, 0 to 5 percent slopes	844.0	No	0.24	2	3e	C	11w
2	Blanton fine sand, 0 to 5 percent slopes	194.4	No	0.2	2	3s	A	11s
3	Hurricane fine sand, 0 to 5 percent slopes	9766.0	No	0.1	2	3w	C	11w
4	Ocilla loamy fine sand, 0 to 5 percent slopes	68.9	No	0.24	2	3w	C	11w
5	Penney fine sand, 0 to 5 percent slopes	5878.2	No	0.1	2	4s	A	8s
6	Mandarin fine sand	4178.3	No	0.15	2	6s	C	8s
7	Centenary fine sand, 0 to 5 percent slopes	4081.0	No	0.1	2	3s	A	11s
8	Sapelo fine sand	542.8	Yes	0.24	2	4w	D	10w
9	Leon fine sand	7049.1	Yes	0.15	2	4w	B/D	8w
10	Ortega fine sand, 0 to 5 percent slopes	3592.6	No	0.1	2	3s	A	10s
11	Allanton and Rutlege mucky fine sands, depressional	775.3	Yes	0.17	2	7w	D AND B/D	2w
14	Ortega-Urban land complex, 0 to 5 percent slopes	283.4	No	0.1	2	-	A	-
15	Quartzipsaments, excavated	145.1	No	-	-	-		-
16	Hurricane-Urban land complex, 0 to 5 percent slopes	107.5	No	0.1	2	-	C	-
17	Plummer fine sand	26.0	Yes	0.015	2	4w	B/D	11w
18	Ridgewood fine sand, 0 to 5 percent slopes	1615.1	No	0.1	2	4s	C	10w
19	Osier fine sand	167.0	Yes	0.1	2	5w	B/D	11w
20	Scranton fine sand	60.3	Yes	0.1	2	5w	B/D	11w
21	Goldhead fine sand	3.3	Yes	0.24	2	3w	B/D	10w
22	Pelham fine sand	18.0	Yes	0.24	2	3w	B/D	11w
24	Urban land	176.0	No	-	-	-	-	-

Table 6. NRCS Soil Map Units on CBJTC

Soil Map Unit	Description	Acres	Hydric Soil	K-factor	Wind Erodibility Index	Land Use Capability Class	Hydrologic Soil Group	Woodland Productivity
27	Pamlico muck	421.4	Yes	0.1	2	7w	D	2w
29	Rutlege-Osier complex, frequently flooded	3011.5	No	0.17	2	5w	B/D	7w
30	Arents, sandy	47.6	No	-	2	-	B	-
31	Pottsburg fine sand	1904.2	Yes	0.15	2	4w	B/D	8w
32	Blanton fine sand, 5 to 8 percent slopes	214.4	No	0.2	2	4s	B	11s
34	Penney fine sand, 5 to 8 percent slopes	715.0	No	0.1	2	6s	A	8s
36	Ortega fine sand, 5 to 8 percent slopes	64.3	No	0.1	2	4s	A	10s
37	Ridgewood fine sand, 5 to 8 percent slopes	36.7	No	0.1	2	4s	C	10w
38	Surrency fine sand, frequently flooded	10.6	Yes	0.15	2	6w	D	11w
39	Meadowbrook sand, frequently flooded	307.6	Yes	0.15	2	6w	B/D	10w
40	Ousley fine sand, occasionally flooded	118.8	Yes	0.1	2	3w	C	10s
41	Albany fine sand, 0 to 5 percent slopes, occasionally flooded	27.8	Yes	0.24	2	3w	C	11w
42	Osier fine sand, occasionally flooded	171.7	Yes	0.1	2	5w	B/D	11w
43	Pamlico muck, frequently flooded	54.9	Yes	0.1	2	7w	D	7w
46	Plummer fine sand, depressional	61.8	Yes	0.32	2	5w	B/D	2w
47	Newnan fine sand	118.2	No	0.24	2	3s	C	10w
49	Sapelo-Meadowbrook frequently flooded, complex	7.9	Yes	0.24	2	6w	D AND B/D	10w
50	Leon fine sand, frequently flooded	696.6	Yes	0.15	2	6w	B/D	8w
51	Pottsburg fine sand, occasionally flooded	32.4	Yes	0.15	2	4w	B/D	8w
54	Troup sand, 0 to 5 percent slopes	118.6	No	0.2	2	3s	A	8s
56	Kershaw sand, 0 to 8 percent slopes	7528.3	No	0.1	1	3s	A	8s
58	Allanton fine sand, frequently flooded	4123.7	Yes	0.1	2	5w	D	10w

**Table 6. NRCS Soil Map Units on CBJTC**

Soil Map Unit	Description	Acres	Hydric Soil	K-factor	Wind Erodibility Index	Land Use Capability Class	Hydrologic Soil Group	Woodland Productivity
59	Lynn Haven fine sand	1607.9	Yes	0.15	2	4w	B/D	11w
60	Ridgeland fine sand	113.1	Yes	0.15	1	3w	B/D	10w
61	Wesconnett fine sand, frequently flooded	1597.0	Yes	0.15	2	4w	D	11w
62	Neilhurst fine sand, undulating	5016.5	No	0.1	1	6s	A	8s
63	Solite fine sand	1409.3	Yes	0.1	2	4w	B/D	8w
64	Ona fine sand	182.7	Yes	0.15	2	3w	B/D	10w
CBJTC Total Acreage		69,292.8**						
** CBJTC is approximately 73,000. Acreage not accounted for in this table is designated as open water. Source: NRCS 2010, Weatherspoon et al. 1989								



## 2.2.5 Water Resources

Water resources considered in this INRMP include both surface and groundwater. Surface water resources are lakes, rivers, and streams and are important for a variety of reasons including ecological, economic, recreational, and human health. Groundwater is an essential resource in many areas because it is used as a source of potable water, for agricultural irrigation, and for industrial purposes.

Florida Department of Environmental Protection (FDEP) manages the quality and quantity of water resources in Florida through its association with the five Water Management Districts (WMDs). The WMDs administer flood protection programs and develop water management plans. Regulatory programs for consumptive use of water, aquifer recharge, well construction, and surface water management have been delegated to the WMDs. As part of the surface water program, the WMDs administer FDEP's storm water management program as well. Clay County is located in the St. John's River WMD.

### Groundwater Resources

CBJTC is underlain by two aquifer systems: surficial aquifer and Floridan aquifer. The surficial aquifer system is primarily composed of unconsolidated sands that are under an unconfined condition. Precipitation is the primary source of water entering this system, although in some areas of Florida water leaks upward from the underlying Floridan aquifer when the clayey confining unit separating these aquifers is thin or absent. The majority of the water moves laterally within the system before discharging into a surface waterbody; however, some water does percolate downward into the Floridan aquifer in some areas. Within Clay County, groundwater flows to the east toward the Atlantic Ocean. Freshwater withdrawals from the surficial aquifer in Florida during 1985 were estimated to be approximately 361 million gallons per day, and were used for the following purposes: public supply (47 percent), domestic and commercial use (48 percent), agriculture (4 percent), and industrial, mining, and thermoelectric-power uses (1 percent) (Miller 1990).

The Floridan aquifer system consists of limestone and dolomite, and is the most productive of the aquifers within Florida. During 1985, a total of 3 billion gallons per day were pumped from this aquifer for multiple purposes (Miller 1990). The Floridan Aquifer is the primary source of potable water in the area. It is recharged partly by lakes and by seepage from the surficial aquifer through confining beds in areas where the potentiometric surface of the aquifer is lower than that of the surficial aquifer. Groundwater levels fluctuate in response to variations in rainfall and surface water levels in nearby lakes and streams. Groundwater flow in the vicinity of CBJTC occurs generally to the east and northeast towards the St. Johns River (Motz et al. 1991, Miller 1990).

According to Motz et al. (1993), there is also an intermediate aquifer within the Hawthorn Formation (see **Section 2.2.3**) that is semi-confined by clay layers. This artisan aquifer occurs between the primary aquifers and provides freshwater to some residential areas within Clay County (Annable et al. 1996).

### Surface Waters

CBJTC is situated within five watersheds: North Fork of Black Creek watershed (US Geological Survey [USGS] Hydrologic Unit Code [HUC] #0308010310), South Fork of Black Creek watershed (HUC #0308010309), Levys Prairie watershed (HUC #0308010305), Santa Fe River Headwaters watershed

(HUC #0311020601), and New River watershed (HUC #0311020602). These watersheds initiate at the topographic high in the west-central portion of the installation (see **Map 5**). North Fork and South Fork of Black Creek and Levys Prairie watersheds drain off-Post to the north, east, and south, respectively, eventually draining into the St. John's River, which occurs along the eastern boundary of Clay County. The Santa Fe River Headwaters and New River watersheds drain off-Post to the west and south, respectively, into the Santa Fe River, which flows westward ultimately discharging into the Suwannee River northwest of Gainesville.

Approximately 175 miles of streams and 4,585 acres of lakes and ponds occur within CBJTC. The most significant waterbodies within CBJTC (from largest to smallest) include Kingsley Lake (1,620 acres), Lowry Lake (1,237 acres), Varnes Lake (298 acres), Stevens Lake (222 acres), Magnolia Lake (203 acres), Blue Pond (198 acres), Whitmore Lake (138 acres), and Perch Pond (19 acres).

The primary surface water features in the northern part of CBJTC are North Fork Black Creek, which has its headwaters in Kingsley Lake, and Bull Creek. Both of these creek systems drain toward the north-northeast. Kingsley Lake is located in the west-central part of CBJTC, and is the largest lake on the installation, encompassing approximately 1,620 acres. North Fork Black Creek and Kingsley Lake are designated as Outstanding Florida Waters (OFWs) through the "Special Waters" rulemaking that is outlined in rule 62-302.700 of the Florida Administrative Code (FAC). South Fork Black Creek, which has its headwaters in Stevens Lake (220 acres), is the primary surface water drainage feature in the central part of CBJTC. South Fork Black Creek drains toward the east within CBJTC boundaries, and then turns to the northeast to join North Fork Black Creek near Middleburg, Florida where it forms Black Creek. The Santa Fe River Headwaters and New River Watersheds encompass much of the former Du Pont mining area, and include the headwaters of the Santa Fe River and Alligator Creek, respectively. Finally, the Levys Prairie watershed encompasses the interconnected lakes in the southern part of CBJTC. These lakes are hydrologically connected to a chain of lakes south of CBJTC. This watershed is part of the Upper Etonia Creek Drainage Basin, which encompasses portions of Alachua, Bradford, Clay, and Putnam Counties. None of the surface water features are listed on the Clean Water Act (CWA) 303(d) list of impaired waters for Florida (FDEP 2020).

Several lakes within the Upper Etonia Creek Drainage Basin have been experiencing a decline in water levels over the past few decades. Studies have been conducted to examine the potential causes for this decline. Motz and Heaney (1993) identified rainfall, lake-bottom leakage, and regional water level declines within the Floridan aquifer. Annable et al. (1996) conducted a follow up study to assess the interactions between the lakes and the surficial aquifer within the basin, which included Lowry Lake (also called Sandhill Lake), Blue Pond, and Magnolia Lake. Inflow from the surficial aquifer was found to be a small percentage of the overall lake water budget. A more detailed analysis was recommended to better examine these interactions (Annable et al. 1996).

On CBJTC, Lowry Lake receives surface water inflow from Blue Pond via a creek channel, from the spring located northeast of the lake, and from the surrounding surficial aquifer. Lowry Lake loses water to surface water outflow and vertical leakage to the underlying upper Floridan aquifer. Water levels in Lowry Lake are very stable. Magnolia Lake receives surface water inflow from Lowry Lake and surficial aquifer inflow from the north; it loses water via leakage to the upper Floridan aquifer (Annable et al. 1996, Motz and Heaney 1993). See below for more information on regional groundwater aquifers.

The 650-acre Brooklyn Lake, located south of CBJTC in the city of Keystone Heights, is one of the lakes that has experienced a large decline in water levels. Surface water from CBJTC flows south toward this lake. In comparison to the lakes on CBJTC, it has a very limited confining layer, which makes this lake more likely to lose water as aquifer levels decline. Groundwater extraction has been cited as one of the primary causes (FLARNG 2011). CBJTC has been actively involved with the City of Keystone Heights since 1997 to help find a way to restore water levels (see **Section 3.7**).

### **Floodplains**

Floodplains are generally areas of low, level ground present on one or both sides of a stream channel that are subject to periodic inundation by flood waters. Floodplains are typically the result of lateral erosion and deposition that occurs as a river valley is widened. The porous material that composes the floodplain is conducive to retaining water that enters the soil via flooding events and elevated groundwater tables. Inundation dangers associated with floodplains have prompted federal, state, and local legislation limiting the development in these areas to recreation, agriculture, and preservation activities. Floodplains are regulated by the Federal Emergency Management Agency (FEMA) with standards outlined in 44 CFR Part 60.3. EO 11988 (Floodplain Management) requires agencies to assess the effects that their actions may have on floodplains and to consider alternatives to avoid adverse effects and incompatible development on floodplains. FEMA has identified 100-year floodplains throughout CBJTC that are associated with the various surface water features as shown in the Flood Insurance Rate Maps (FIRMs) 1200640100D, 1200640115D, 1200640120D, 1200640200D, 1200640225D, 1200640325D, and 1200640350D (FEMA 2014).

### **Wetlands**

EO 11990 (Protection of Wetlands) requires federal agencies to take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the beneficial values of wetlands. Wetlands are an important natural system because of the diverse biological and hydrologic functions they perform. These functions may include water quality improvement, groundwater recharge, pollution treatment, nutrient cycling, the provision of wildlife habitat and niches for unique flora and fauna, storm water storage, and erosion protection. The United States Army Corps of Engineers (USACE) defines wetlands as

“those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (33 CFR 328).”

Wetlands are protected as a subset of the “waters of the United States” under Section 404 of the CWA. Jurisdictional waters of the United States are areas regulated under the CWA and may also include coastal and inland waters, lakes, rivers, ponds, streams, intermittent streams, vernal pools, and other waters, that if degraded or destroyed could affect interstate commerce. For an area to be classified as a wetland, three conditions must be present: (1) wetland hydrology; (2) hydric soil; and (3) hydrophytic vegetation. Areas that may be periodically wet, but that do not meet the requisite criteria, are not classified as wetlands.

Section 404 of the CWA authorizes the USACE to issue permits for the discharge of dredged or fill material into the “waters of the United States,” including wetlands. Section 401 of the CWA gives the State of Florida

the authority to regulate, through the state water quality certification program, proposed federally-permitted activities that may result in a discharge to water bodies, including wetlands. Section 373.414 of the Florida Statutes (F.S.) sets forth provisions that give the State jurisdiction over those areas that are delineated wetlands, including all isolated wetlands (i.e., non-jurisdictional wetlands). Further discussion on regulatory authority and protection of wetlands is included in **Section 4.3.1**.

Wetland surveys have been conducted at CBJTC on a project-by-project basis. However, no installation-wide survey has been conducted. To provide a general summary of wetland coverage on CBJTC, a summary of wetlands on CBJTC identified in the National Wetland Inventory (NWI) is presented in **Table 7** and illustrated in **Map 6**. Natural vegetation communities, including wetland communities, have also been mapped by FNAI. See **Section 2.3.2** for more detail on FNAI wetland community types mapped within CBJTC.

Table 7. Summary of NWI Wetlands within CBJTC			
Wetland Type	Cowardin Classification	Description	Acres
Lake	L1UBHx	Lacustrine, Limnetic, Unconsolidated Bottom, Permanently Flooded, Excavated	4,476
	L2UB	Lacustrine, Littoral, Unconsolidated Bottom	89
Freshwater Pond	PAB3	Palustrine, Aquatic Bed, Rooted Vascular	155
	PEM1	Palustrine, Emergent, Persistent	647
	PUBH	Palustrine, Unconsolidated Bottom, Permanently Flooded	409
Freshwater Emergent Wetland	PEM5	Palustrine, Emergent, Phragmites	1
Freshwater Forested Wetland	PFO1	Palustrine, Forested, Broad-leaved Deciduous	1,117
	PFO2	Palustrine, Forested, Needle-leaved Deciduous	11
	PFO3	Palustrine, Forested, Broad-leaved Evergreen	1,050
	PFO4	Palustrine, Forested, Needle-leaved Evergreen	654
	PFO6	Palustrine, Forested, Deciduous	1,403
	PFO7	Palustrine, Forested, Evergreen	1,234
Freshwater Scrub-Shrub Wetland	PSS1	Palustrine, Scrub-Shrub, Broad-leaved Deciduous	20
	PSS3	Palustrine, Scrub-Shrub, Broad-leaved Evergreen	501
	PSS6	Palustrine, Scrub-Shrub, Deciduous	40
	PSS7	Palustrine, Scrub-Shrub, Evergreen	58
Total			11,865
Source: USFWS 2010, Cowardin et al. 1979			



## 2.3 Ecosystem and Biotic Environment

### 2.3.1 Ecosystem Classification

CBJTC is located in the US Ecoregion – Humid Temperate Domain – Subtropical Division – Outer Coastal Plain Mixed Forest Province (Bailey 1995), which is equivalent to the USEPA Level II Ecoregion<sup>1</sup> – Eastern Temperate Forests – Mississippi Alluvial and Southeast US Coastal Plains (Commission for Environmental Cooperation [CEC] 1997). Outer Coastal Plain Mixed Forest Province covers the flat and irregular coastal plains along the Atlantic Ocean and Gulf of Mexico, including an area from as far north as Maryland and as far west as eastern Texas. The region is dominated by flat plains, but is also a diverse region containing barrier islands, coastal lagoons, swamps, marshes and numerous lakes (Bailey 1995).

Based on USEPA ecoregions mapping, CBJTC is located in the Level III Southern Coastal Plain ecoregion (75). More specifically, the installation spans two Level IV ecoregions, which include the Central Florida Ridges and Uplands (75c) and Sea Island Flatwoods (75f) (Griffith et al. 2011). The Southern Coastal Plain was historically covered by an assortment of forest communities that included longleaf pine (*Pinus palustris*), slash pine (*Pinus taeda*), pond pine (*Pinus serotina*), American beech (*Fagus grandifolia*), sweetgum (*Liquidambar styraciflua*), southern magnolia (*Magnolia grandiflora*), white oak (*Quercus alba*), and laurel oak (*Quercus laurifolia*). However, the region is now mostly slash and loblolly pine with oak-gum-cypress forest in some low lying areas.

### 2.3.2 Vegetation

Natural communities at CBJTC are largely influenced by soil drainage. Although most soils are sandy in texture, some in low-lying swampy areas contain a significant organic matter component (see **Section 2.2.4** for soils information). The very poorly drained soils often have standing water during wet seasons and generally support cypress-dominated communities (cypress ponds) and mixed hardwoods in wet swamps or river and stream bottomlands. Scattered pine may occur in these communities, but are more likely to occur in adjacent very-poorly drained soils that are dominated by various "bay" species but seldom have standing water. These wetland communities support many wildlife species and provide water quality protection to the rivers and streams that flow off CBJTC (FLNG 2005).

Poorly to moderately drained soils cover much of the forested land at CBJTC. These soils support mesic hammocks of mixed hardwoods and pine-hardwood communities, as well as the extensive pineland (flatwoods) forests dominated by longleaf and slash pine. Natural vegetation in the mesic hammocks is a mixture of hardwoods and shrubs, dominated by laurel, live and water oaks, several bays and hickories, sweetgum, and mature pines, especially loblolly and pond pine. The mixed hardwood-pine forests represent stages in ecological succession in which naturally regenerated pines are gradually replaced by hardwoods. The pineland forests grade from poorly drained flatwoods with dense bay understories to well-drained uplands with longleaf pine and saw palmetto/wiregrass understories or oak hammocks (FLNG 2005). For

---

<sup>1</sup> Ecoregions are identified through the analysis of the patterns and the composition of biotic and abiotic features, such as geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology. The relative importance of each characteristic varies from one ecological region to another regardless of the hierarchical level. Level I is the coarsest level, while Level IV is the most detailed level.

more details on CBJTC forest stands, their history and their desired future condition, refer to the *FRMP for CBJTC* (FLNG 2005) included in **Appendix F**.

FNAI has identified and mapped natural communities in Florida based on their landscape position, vegetation composition, soil conditions, hydrology, and fire regime (FNAI 2010a). When the natural community type is ambiguous for an area, a broader level category is applied to the area. FNAI defines a natural community as “a distinct and recurring assemblage of populations of plants, animals, fungi, and microorganisms naturally associated with each other and their physical environment.”

A total of 16 natural communities and 8 altered land types are found on CBJTC (FNAI 2010b). Approximately 63 percent of the installation is composed of natural communities, including four rare global and/or state community types. Rare communities include sandhill (G3/S2), scrub (G2/S2), upland mixed woodland (G2/S2), and wet prairie (G2/S2)<sup>2</sup>. Natural communities and other land cover at CBJTC may be grouped into three broad categories: Mesic to Xeric Natural Upland Communities, Forested and Non-Forested Natural Wetland Communities, and Altered Land. The most abundant natural community is the sandhill community (20 percent of CBJTC), while tree plantations are the most abundant altered land cover type (22 percent of CBJTC). Brief descriptions of the natural communities and other land cover found on CBJTC are summarized in **Table 8** and illustrated in **Map 7**. For more detailed information on the natural communities, including pictures, refer to FNAI's *Guide to Natural Communities of Florida 2010 Edition* available at <http://www.fnai.org/>.

Table 8. Natural Communities and Altered Land Cover Types within CBJTC			
Community / Land Cover Type	Description	Acres	Percent Cover
<b>Natural Upland Communities</b>			
Sandhill	Xeric upland savanna of widely spaced longleaf pine and/or turkey oak ( <i>Quercus laevis</i> ) with wiregrass understory, deep sand substrate, and frequent fire (1 to 3 years). This natural community (G3/S2) is found in the Panhandle to central Florida.	14,676	19.9
Mesic Flatwoods	Characterized by flatland with sand substrate, frequent fire (2 to 4 years) and mesic woodland with an open pine canopy, and a layer of low shrubs and herbs. Common species include longleaf pine and/or slash pine, saw palmetto ( <i>Serenoa repens</i> ), gallberry ( <i>Illex glabra</i> ), dwarf live oak ( <i>Quercus minima</i> ), and wiregrass ( <i>Aristida stricta</i> ). This natural community (G4/S4) is found throughout Florida with the exception of the extreme southern peninsula and Keys.	8,095	11

<sup>2</sup> **G2** = Imperiled globally because of rarity or vulnerability to extinction due to some natural or man-made factor; **G3** = either very rare and local throughout its range or found locally in a restricted range or vulnerable to extinction from other factors; **S2** = Imperiled in Florida because of rarity or vulnerability to extinction due to some natural or man-made factor.

**Table 8. Natural Communities and Altered Land Cover Types within CBJTC**

Community / Land Cover Type	Description	Acres	Percent Cover
Upland Mixed Woodland	Mesic-xeric upland with loamy soils and open to partially closed canopy over an open understory of mixed herbs and scattered shrubs that experiences fire at a variable interval (2 to 20 years). Species include a mixture of southern red oak ( <i>Quercus falcata</i> ), mockernut hickory ( <i>Carya tomentosa</i> ), and longleaf or shortleaf pine ( <i>Pinus enchinata</i> ) with other mixed hardwoods and infrequent wiregrass. This natural community (G2/S2) is found in the central Panhandle to extreme northern central Florida.	6,483	8.8
Scrub	Xeric upland with deep sand substrate, rare to occasional fire (5 to 20 years), and open or dense shrubland with or without a pine canopy consisting of sand pine ( <i>Pinus clausa</i> ) and/or scrub oaks and/or Florida rosemary ( <i>Ceratiola ericoides</i> ). This natural community (G2/S2) is found throughout Florida with the exception of the extreme southern peninsula and Keys.	340	0.5
Xeric Hammock	Xeric upland community with a deep sand substrate and a closed canopy of evergreen hardwoods including sand live oak ( <i>Quercus geminata</i> ) and saw palmetto that experience rare or no fire. This natural community (G3/S3) is found primarily in the eastern Panhandle to central Florida.	74	0.1
Upland Hardwood Forest	Mesic upland community with sand/clay and/or calcareous substrate and a closed deciduous or mixed deciduous / evergreen canopy that experiences rare or no fire. Common species include American beech, southern magnolia, hackberry ( <i>Celtis</i> spp.), swamp chestnut oak ( <i>Quercus michauxii</i> ), white oak, horse sugar ( <i>Symplocos tinctoria</i> ), flowering dogwood ( <i>Cornus florida</i> ), and mixed hardwoods. This natural community (G5/S3) is found primarily in the Panhandle to central Florida.	57	0.1
<b>Natural Wetland Communities</b>			
Freshwater Wetland Forested Mixed	Floodplains or depressions dominated by a mix of hydrophytic coniferous and hardwood trees	4,961	6.7
Open Water	Natural streams, lakes, and rivers.	3,961	5.4
Wet Flatwoods	Characterized by flatland with sand substrate, frequent fire (2 to 4 years) for grassy wet flatwoods and 5 to 10 years for shrubby wet flatwoods, seasonally inundated, closed to open pine canopy with grassy or shrubby understory. Common species include slash pine, pond pine, large gallberry ( <i>Illex coriacea</i> ), fetterbush ( <i>Lyonia lucida</i> ), sweetbay ( <i>Magnolia virginiana</i> ), cabbage palm ( <i>Sabal palmetto</i> ), wiregrass, toothache grass. This natural community (G4/S4) is found throughout Florida with the exception of the extreme southern peninsula and Keys. Characterized as hydric pine flatwoods within CBJTC.	3,559	4.8

Table 8. Natural Communities and Altered Land Cover Types within CBJTC			
Community / Land Cover Type	Description	Acres	Percent Cover
Freshwater Mixed Wetland Hardwoods	Floodplains or depressions dominated by hydrophytic hardwood trees.	1,876	2.5
Mixed Scrub-Shrub Wetland	Non-forested wetlands with a short hydroperiod that are dominated by shrubby palustrine plant communities, grasses, sedges, and/or titi ( <i>Cyrilla</i> spp.).	855	1.1
Freshwater Marshes	Non-forested wetlands with a long hydroperiod that are dominated by grasses, sedges, broadleaf emergents, floating aquatics, or shrubs.	380	0.5
Wet Prairie	Characterized by flatland with sand or clayey sand substrate that is usually saturated, but only occasionally inundated. This treeless, dense herbaceous community with few shrubs experiences frequent fire (2 to 3 years). Common species include wiregrass, blue maidencane ( <i>Amphicarpum muhlenbergianum</i> ), cutthroat grass ( <i>Panicum abscissum</i> ), wiry beaksedges ( <i>Rhynchospora</i> spp.), flattened pipewort ( <i>Eriocaulon compressum</i> ), toothache grass ( <i>Ctenium aromaticum</i> ), pitcherplants ( <i>Sarracenia</i> spp.), and coastal plain yelloweyed grass ( <i>Xyris ambigua</i> ). This natural community (G2/S2) is found throughout Florida with the exception of the extreme southern peninsula and Keys.	332	0.4
Cypress	A type of freshwater forested wetland that is dominated by cypress and has a long hydroperiod.	269	0.4
Bay Swamp	A specific variant of the baygall (GS/S4) community that is characterized as a large or small peat filled forested depression dominated by bay species that experience rare or no fire. Bay swamps are found mainly in the eastern Panhandle and central Florida.	144	0.2
Freshwater Non-Forested Wetlands (Other)	Includes floating/emergent aquatic vegetation.	13	<0.1
<b>Total Natural Communities</b>		<b>46,075</b>	<b>62.4</b>
Altered Land Cover Types			
Tree Plantations	Areas altered by silvicultural activities. Tree plantations on CBJTC land are composed of coniferous trees.	17,078	23.1
Extractive	Areas include strip mines and spoil areas.	2,948	4.0
High Intensity Urban	This land category consists of medium density residential areas, and commercial, industrial and institutional land uses.	2,679	3.6



**Table 8. Natural Communities and Altered Land Cover Types within CBJTC**

Community / Land Cover Type	Description	Acres	Percent Cover
Pasture – Improved	Areas cleared of their native vegetation and that have been planted with bahiagrass ( <i>Paspalum notatum</i> ) and to a lesser extent with Bermudagrass ( <i>Cynodon dactylon</i> ) or pangolagrass ( <i>Digitaria eriantha</i> ). Weedy native species are often common and include dogfennel ( <i>Eupatorium capillifolium</i> ), many species of flatsedge ( <i>Cyperus</i> spp.), carpetgrasses ( <i>Axonopus</i> spp.), crabgrasses ( <i>Digitaria</i> spp.), and rustweed ( <i>Polypremum procumbens</i> ) among many others.	2,041	2.8
Shrub / Brush land	Includes saw palmetto, gallberry, wax myrtle ( <i>Morella cerifera</i> ), coastal scrub, and other shrubs and brush. Generally, saw palmetto is the most prevalent plant cover intermixed with a wide variety of other woody scrub plant species as well as various types of short herbs and grasses.	1,828	2.5
Open Water (Artificial)	Open water that is altered or man-made. Includes farm ponds, impoundments/reservoirs, quarry ponds, sewage treatment ponds and industrial cooling ponds.	572	0.8
Low Intensity Urban	Includes low density residential areas, cemeteries and community recreational facilities at CBJTC.	324	0.4
Other (roads, utilities, etc.)	Includes transportation network (paved and unpaved roads), communications, and utilities.	299	0.4
Successional Hardwood Forest	Closed canopy forest dominated by fast growing hardwoods such as laurel oak, water oak, and/or sweetgum, often with remnant pines. This category represents invaded natural habitat due to fire suppression or old fields that succeeded to forest.	21	<0.1
<b>Total Altered Land Cover</b>		<b>27,790</b>	<b>37.6</b>
<p>Note: CBJTC GIS Boundary equals approximately 73,865.</p> <p>Key: Global and State Ranks</p> <p><b>G2</b> = Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.</p> <p><b>G3</b> = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.</p> <p><b>G4</b> = Apparently secure globally (may be rare in parts of range).</p> <p><b>G5</b> = Demonstrably secure globally.</p> <p><b>S2</b> = Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.</p> <p><b>S3</b> = Either very rare and local in Florida (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.</p> <p><b>S4</b> = Apparently secure in Florida (may be rare in parts of range).</p>			
Source: FNAI 2010a, 2010b			

Plant surveys have been conducted previously to identify rare plants occurring on CBJTC (Bio-tech 2009, Florida Museum of Natural History [FLMNH] 1996b), but no comprehensive plant surveys have been conducted. A total of 25 rare species have been documented on the installation, including the federally endangered and state threatened Chapman's rhododendron (*Rhododendron chapmanii*). Rare plant species known to occur on the installation are discussed further in **Section 2.3.4** and in the rare species survey by Bio-tech (2009).

To date, 44 invasive and/or exotic species have been documented at CBJTC. Invasive species management is discussed further in **Section 4.8**. A list of common vascular plant species observed during previous surveys is included in **Appendix C**.

A nonvascular plant survey including bryophytes and lichens was conducted from August 1998 through March 1999 by botanists from the University of Florida at CBJTC (Griffin 1999). A total of 172 species were gathered from six distinct habitats (scrub, sandhill, xeric hammock, baygall, bottomland forest<sup>3</sup>, and ruderal<sup>4</sup>). Species were collected in the following proportions: 55 percent lichens (94 species), 25 percent mosses (43 species), and 20 percent liverworts (35 species). The ecological requirements of the three groups are sufficiently distinct that many species appear in only a few habitats. For instance, lichen diversity reaches its height in open sunny habitats with abundant shrub and tree growth (scrub and sandhill). Mosses and liverworts show their greatest diversity and abundance in habitats that maintain higher humidity and shade. Bottomland forests and baygalls are rich in these groups, with bottomland forests being the optimal habitat for bryophytes. Bottomland forests at CBJTC support basically twice as many species overall as scrub or baygall and 3 to 4 times as many as sandhill or xeric hammock. Xeric hammocks, while supporting representatives of all three groups, have limited diversity and abundance.

### 2.3.3 Fish and Wildlife

The following sections provide an overview of the fish and wildlife found within CBJTC. Fauna surveys and other studies have been conducted onsite for amphibians and reptiles (Bio-tech 2009, FLMNH 1996b, Hall et al. 1994a), birds (Bio-tech 2009, FLMNH 1996a, Hall et al. 1994b), fish (Nelson and Floyd 2011, CH2MHill 1999, Burgess and Matter 1994), aquatic macroinvertebrates (Nelson and Floyd 2011, CH2MHill 1999, Eco-Cognizant 1996a), Lepidoptera (Eco-Cognizant 1996b), and mammals (Bio-tech 2009, Finn 2008, Finn 2001, FLMNH 1996a). Additionally, surveys have been conducted previously to identify rare animals occurring on CBJTC (Bio-tech 2009, FLMNH 1996a). A summary of these findings is provided below. Fauna species lists are presented in **Appendix C**.

#### **Amphibians and Reptiles**

More than 20 amphibian species are known to occur within CBJTC. Amphibians include 17 frogs, 2 toads, and 4 salamanders (Bio-tech 2009, FLMNH 1996a, Hall et al. 1994a).

At total of 27 reptile species are known to occur within CBJTC, including the federally threatened Eastern indigo snake (*Drymarchon couperi*), the federally threatened American alligator (*Alligator mississippiensis*) due to similarity of appearance, the federal candidate and state threatened gopher tortoise (*Gopherus*

---

<sup>3</sup> Bottomland Forest = seasonally flooded forests located along waterways.

<sup>4</sup> Ruderal = Disturbed or altered lands

*polyphemus*), and the state threatened Florida pine snake (*Pituophis melanoleucus mugitus*). Reptiles include 12 snakes, 5 turtles, 5 lizards, 3 skinks, 1 tortoise, and 1 alligator (Bio-tech 2009, FLMNH 1996a, Hall et al. 1994a). A list of amphibians and reptiles found on CBJTC is provided in **Appendix C**.

### **Birds**

More than 130 bird species are known to occur at CBJTC, including the federally endangered RCW, federally endangered wood stork (*Mycteria americana*), federally threatened Florida scrub-jay (*Aphelocoma coerulescens*) and 5 state listed species (see **Table 9**) (Bio-tech 2009, FLMNH 1996a, Moulton and Justice 1996, Hall et al. 1994b). A list of bird species found on CBJTC is included in **Appendix C**.

### **Fish**

During 1993-1995, fish surveys were conducted at 20 sites within three drainage sub-regions on CBJTC: North Fork Black Creek, South Fork Black Creek, and sandhill lakes areas (Burgess and Matter 1994). Fish surveys were conducted again in January 1999 at 24 collection sites (CH2MHill 1999). Most recently during a baseline survey for the Black Creek crayfish (see below), Nelson and Floyd (2011) documented additional fish species. More than 35 fish species from 14 families have been observed during the surveys at CBJTC. No unusual or rare species of fish were collected. The most abundant species were the mosquitofish (*Gambusia holbrooki*), sailfin shiner (*Pteronotropsis hypselopterus*), and bluegill (*Lepomis macrochirus*).

All three major habitat types were sampled during these studies: man-made borrow pits, lakes, and headwater streams. Fish were collected at only two of the borrow pit sites and included five species. Twenty species were collected within the lake habitat, which offered the greatest relative fish abundance. Headwater streams hosted 22 species; however, abundances were low when compared to lake collections. Species diversity was similar within the three drainage sub-regions (CH2MHill 1999, Burgess and Matter 1994). See **Appendix C** for fish species list on CBJTC, showing locations identified on the site.

### **Aquatic Macroinvertebrates**

In 1995, 112 sites in the following habitats were sampled for aquatic macroinvertebrates (Eco-Cognizant 1996a). The following aquatic habitats were surveyed: blackwater streams, clearwater streams, marshy stream headwaters, seeps, lakes, small pools, wet prairies, cypress dome swamps, ponds, and roadside ditches. At least 83 families and approximately 250 species of aquatic macroinvertebrates were observed, which included a freshwater sponge (Porifera); snails and clams (Mollusca); aquatic earthworms, oligochaetes, and leeches (Annelida); scuds, a fairy shrimp, crayfish, shrimp, isopods, and seed shrimp (Crustacea); water mites (Acariformes); and 12 orders of insects (Insecta). Blackwater streams, roadside ditches, clearwater titanium mine ponds, borrow pit ponds, wet prairies, and cypress domes had the highest species richness. Brownwater titanium mine ponds had the lowest diversity.

During a subsequent survey in the late 1990s, sampling stations supported a wide variety of macroinvertebrate taxa, ranging from 71 taxa at one station to 17 taxa at another (CH2MHill 1999). The Black Creek crayfish (*Procambarus pictus*), a state species of special concern, was widespread and abundant in blackwater streams of the Black Creek drainage system (CH2MHill 1999). The rare Say's spiketail dragonfly (*Cordulegaster sayii*) was infrequently found in blackwater streams, especially in the Bull Creek basin. Two other rare species, the southeastern spinyleg dragonfly (*Dromogomphus armatus*) and

tawny sanddragon (*Progomphus alachuensis*), were occasionally found in blackwater streams and lakes, respectively.

Most recently, Nelson and Floyd (2011) conducted a baseline survey for the Black Creek crayfish to obtain a better understanding of the distribution and relative abundance of this species at CBJTC and to identify new sites. Sampling was performed within the North and South Forks of Black Creek and their tributaries, Bull Creek, and Alligator Creek and its tributaries, with the exception of the Impact Area due to safety concerns. Black Creek crayfish were observed at over half of the 245 survey sites (52 percent), while Peninsula crayfish (*Procambarus paeninsulanus*) / Slough crayfish (*Procambarus fallax*) and White Tubercled crayfish (*Procambarus spiculifer*) were found at 15 percent at 2 percent of the sites, respectively. No crayfish were observed at 7 percent of the sites and 30 percent of the sites were dry. Generally, Black Creek crayfish were observed at sites with low turbidity and siltation, high dissolved oxygen and water flow, and clear watercolor. Black Creek crayfish occurrence in Alligator Creek and its tributaries on the south post of CBJTC documents a range extension for the species outside of the Black Creek Drainage, and into the Half Moon Lake Outlet drainage. See **Appendix C** for aquatic macroinvertebrate species documented on CBJTC.

### **Mammals**

Approximately 45 mammal species have been observed at CBJTC (Bio-tech 2009, Finn 2008, Finn 2001, FLMNH 1996a). A number of legal game mammals are hunted at CBJTC, including large and small game (see **Section 4.6.4**).

Eleven bat species have the potential to occur within CBJTC, but resident populations are unlikely for two migratory species, Hoary bat (*Lasiurus cinereus*) and silver-haired bats (*Lasionycteris noctivagans*). Six of the nine species with the potential to reside on CBJTC were captured or found roosting during a 2001 survey (Finn 2001), while all nine species were acoustically documented during the 2008 survey (Finn 2008). A list of mammal species is provided in **Appendix C**.

### **Lepidoptera (Butterflies)**

A lepidopteran survey at CBJTC was conducted in 1995 (Eco-Cognizant 1996b). A total of 81 species of butterflies were found during the survey, which included 38 skippers (Hesperiidae), 7 swallowtails (Papilionidae), 8 sulfurs and whites (Pieridae), 8 hairstreaks and blues (Lycaenidae), 1 metalmark (Riodinidae), and 19 brushfoots (Nymphalidae). Rare or uncommon Florida butterflies found at CBJTC were: cobweb little skipper (*Amblyscirtes aesculapias*), southern swamp skipper (*Poanes yehi*), Zabulon skipper (*Poanes zabulon*), dotted skipper (*Hesperia attalus*), Meske's skipper (*Hesperia meskei*), gemmed satyr (*Cyllopsis gemma*), brown broken dash (*Wallengrenia egeremet*), Cofaqui giant skipper (*Megathymus cofaqui*), and yucca giant skipper (*Megathymus yuccae*).

Butterfly diversity was greatest in late spring/early summer and fall. Similarly, butterfly abundance was greatest in March/April and August through December, with about three times as many individuals occurring during the fall than other seasons. Overall, phaon crescent (*Phyciodes phaon*) was the most abundant species. At least 120 species of plants are utilized for nectar and larval hosts at CBJTC. See **Appendix C** for butterfly species documented on CBJTC.



### 2.3.4 Threatened and Endangered Species

Federal status as a threatened or endangered species is derived from the ESA (16 USC §1531 *et seq.*) and is administered by USFWS. They maintain a current list of federally endangered and threatened species, candidate species, and species of concern. Candidate species and species of concern designated by USFWS receive no statutory protection under the ESA. The Florida Endangered and Threatened Species Act (Chapter 379.2291, F.S.) further conserves and protects federal and state listed fish and wildlife. FFWCC maintains the state list of animals designated as federally endangered or threatened, state threatened, or state species of special concern in accordance with rules 68A-27.003 and 68A-27.005 FAC, respectively. Florida Department of Agriculture and Consumer Services (FDACS) Division of Plant Industry administers and maintains a list of endangered, threatened, and commercially exploited plants in accordance with chapter 5B-40, FAC. FNAI maintains a list of species and natural communities documented by location. However, it should be noted that the FNAI database is not a comprehensive list as it is dependent on reported occurrences.

In accordance with AR 200-1 and DoDI 4715.03, FLARNG has conducted surveys for federally threatened and endangered species, federal species of concern and candidate species, and state listed species at CBJTC (e.g., FLMNH 1996a, FLMNH 1996b, Bio-tech 2009). Currently, FFWCC lists 46 federally endangered animal species, 20 federally threatened animal species, 1 federal experimental population, 21 state-designated threatened animal species, and 43 state species of special concern (Gruver and Montero 2018). Of these 131 listed animal species in Florida, 19 are known to occur at CBJTC (see **Table 9**). The bald eagle (*Haliaeetus leucocephalus*) was removed from the federal ESA list in June 2007 and is not state listed. However, protections under the Bald and Golden Eagle Act are still in effect. Bald eagle nests have been found in several places on the installation. No federally designated critical habitat occurs within CBJTC. FDACS currently lists 440 endangered plants – 117 threatened plants and 8 commercially exploited planted species (Weaver and Anderson 2010). Of these 565 listed plant species in Florida, 25 are known to occur at CBJTC (see **Table 10**).

For wildlife species with a calculated climate change vulnerability index (CCVI), the status is included in **Table 9** (see **Section 3.4** for more details). A CCVI is not available for any of the plants.

Field guide excerpts from Hipes et al. (2000) and Chafin (2000) for listed species known to occur on-site and species specific management plans developed for CBJTC, when available, are included in **Appendix E**. **Tables 9** and **10** provide information regarding CBJTC's management priority for each of the rare animal and plant species, respectively, known to occur or with the potential to occur at CBJTC. For additional information, refer also to Bio-tech's (2009) *Threatened and Endangered Species Survey Report for Camp Blanding Joint Training Center*. Management priorities and recommendations are discussed in **Section 4.7**.

The RCW is the only federally listed species at CBJTC with a BO for the DoD. USFWS issued a BO for the RCW on Army Installations in 2007 (Costa 2007). A revision to this BO was made in 2008 (Hankla 2008) for CBJTC based on FLARNG's ESMC Update for Incidental Take (Robinson 2008). For a copy of the above listed documents and other information related to the RCW at CBJTC, refer to **Appendix D**.

Table 9. Federal and State Listed Animal Species Documented on CBJTC or with the Potential to Occur in Clay County										
Scientific Name	Common Name	Known to Occur at CBJTC	Federal / State Listing Status	CCVI	CBJTC Management Priority	Habitat				
						Pinelands	Flatwoods	Sandhill	Scrub	Wetlands
Birds										
<i>Aphelocoma coerulescens</i>	Florida scrub-jay	✓	FT	-	High				✓	
<i>Aramus guarauna</i>	Limpkin		ST	PS	Low					✓
<i>Egretta caerulea</i>	Little blue heron	✓	ST	-	Low					✓
<i>Egretta tricolor</i>	Tricolored heron	✓	ST	-	Low					✓
<i>Falco sparverius paulus</i>	Southeast American kestrel	✓	ST	-	Medium	✓		✓		
<i>Grus canadensis pratensis</i>	Florida sandhill crane	✓	ST	-	Low					✓
<i>Mycteria americana</i>	Wood stork	✓	FT	-	Low					✓
<i>Picoides borealis</i>	Red-cockaded woodpecker	✓	FE	-	High	✓	✓	✓		
Crustaceans										
<i>Procambarus pictus</i>	Black Creek crayfish	✓	ST	-	Low					✓
Mammals										
<i>Perimyotis subflavus</i>	Tricolored bat		ST			Variety				
<i>Puma concolor coryi</i>	Florida panther		FE	PS	N/A	Variety				
Reptiles										
<i>Alligator mississippiensis</i>	American alligator	✓	FT (S/A)	-	N/A					✓
<i>Crotalus adamanteus</i>	Eastern diamondback rattlesnake					Variety				

**Table 9. Federal and State Listed Animal Species Documented on CBJTC or with the Potential to Occur in Clay County**

Scientific Name	Common Name	Known to Occur at CBJTC	Federal / State Listing Status	CCVI	CBJTC Management Priority	Habitat				
						Pinelands	Flatwoods	Sandhill	Scrub	Wetlands
<i>Drymarchon couperi</i>	Eastern indigo snake	✓	FT	-	High	Variety				
<i>Gopherus polyphemus</i>	Gopher tortoise	✓	FC / ST	-	High	✓	✓	✓	✓	
<b>STATUS:</b> FE – Federally Endangered; FT – Federally Threatened; FT (S/A) = Federally Threatened due to Similarity of Appearance; FC – Federal Candidate; ST = State Threatened <b>CCVI:</b> HV = Highly Vulnerable = Abundance and/or range extent within geographical area assessed is likely to decrease significantly by 2050; PS = Not vulnerable / Presumed Stable = Available evidence does not suggest that abundance and/or range extent within the geographic area assessed will change by 2050; however, actual range boundaries may change. * FFWCC is in the process of updating their species listings. The SSC category is being maintained until all the species have been reviewed, and those species are either designated as a state threatened species or given a management plan and removed from the list. <b>Source:</b> USFWS 2019, Gruver and Montero 2018, DuBois et al. 2001, Weaver and Anderson 2010, Bio-tech 2009, FLMNH 1996a, Hall 1994a, Christman and Means 1992, Godley 1992, Layne 1992, Kantola 1992, Maehr 1992, and Franz 1992										

**Table 10. Federal and State Listed Plant Species Documented on CBJTC or Known to Occur in Clay County**

Scientific Name	Common Name	Observed at CBJTC	Federal / State Listing Status	CBJTC Management Priority	Habitat						
					Mixed	Flatwoods	Pinelands	Sandhill	Scrub	Floodplains	Wetlands
<i>Agrimonia incisa</i>	Harvest-lice		SE	Low	✓		✓	✓			
<i>Arnoglossum diversifolium</i>	Indian plantain		ST	Low						✓	✓

**Table 10. Federal and State Listed Plant Species Documented on CBJTC or Known to Occur in Clay County**

Scientific Name	Common Name	Observed at CBJTC	Federal / State Listing Status	CBJTC Management Priority	Habitat						
					Mixed	Flatwoods	Pinelands	Sandhill	Scrub	Floodplains	Wetlands
<i>Andropogon arctatus</i>	Pinewoods bluestem		ST	Low		✓					
<i>Asclepias curtissii</i>	Curtiss' milkweed	✓	SE	Medium					✓		
<i>Asclepias viridula</i>	Green milkweed		ST	Low		✓	✓				
<i>Athyrium filix-femina</i>	Southern lady fern	✓	ST	Low						✓	
<i>Balduina atropurpurea</i>	Purple balduina		SE	Low			✓				✓
<i>Baptisia calycosa</i>	Canby's wild-indigo		SE	Low		✓		✓			
<i>Brickellia cordifolia</i>	Flyer's Brickell-bush		SE	Low	✓						
<i>Calopogon multiflorus</i>	Many-flowered grass pink		SE	Low			✓				
<i>Carex chapmanii</i>	Baltzell's sedge		ST	Low	✓						
<i>Centrosema arenicola</i>	Sand butterfly-pea		SE	Low	✓						
<i>Cleistes bifaria</i>	Spreading pogonia	✓	ST	Low							
<i>Cleistes divaricata</i>	Spreading pogonia		ST	Low			✓				✓
<i>Ctenium floridanum</i>	Florida toothache grass	✓	SE	Low			✓	✓			
<i>Drosera intermedia</i>	Water sundew	✓	ST	Low							✓
<i>Epidendrum conopseum</i>	Green-fly orchid	✓	CE	Low							✓
<i>Garberia heterophylla</i>	Garberia		ST	Low					✓		
<i>Hartwrightia floridana</i>	Florida hartwright	✓	ST	Low		✓					
<i>Helianthus carnosus</i>	Flatwoods sunflower		SE	Low		✓					
<i>Lilium catesbaei</i>	Catesby lily	✓	ST	Low		✓					



**Table 10. Federal and State Listed Plant Species Documented on CBJTC or Known to Occur in Clay County**

Scientific Name	Common Name	Observed at CBJTC	Federal / State Listing Status	CBJTC Management Priority	Habitat						
					Mixed	Flatwoods	Pinelands	Sandhill	Scrub	Floodplains	Wetlands
<i>Linum westii</i>	West's flax		SE	Low		✓					✓
<i>Litsea aestivalis</i>	Pond-spice		SE	Low							✓
<i>Lobelia cardinalis</i>	Cardinal flower		ST	Low						✓	
<i>Marshallia ramosa</i>	Southern Barbara's buttons		SE	Low	✓						
<i>Matelea floridanum</i>	Florida spiny-pod	✓	SE	Medium				✓			
<i>Matelea pubiflora</i>	Florida spiny-pod	✓	SE	Medium							
<i>Osmunda cinnamomea</i>	Cinnamon fern	✓	CE	Low							✓
<i>Osmunda regalis</i>	Royal fern	✓	CE	Low							✓
<i>Pinckneya bracteata</i>	Hairy fever-tree	✓	ST	Low							✓
<i>Pinguicula caerulea</i>	Blue butterwort	✓	ST	Low							✓
<i>Pinguicula lutea</i>	Yellow butterwort	✓	ST	Low							✓
<i>Platanthera blephariglottis</i>	White-fringed orchid		ST	Low							✓
<i>Platanthera ciliaris</i>	Yellow fringed orchid	✓	ST	Low		✓					
<i>Platanthera cristata</i>	Golden fringed orchid	✓	ST	Low							✓
<i>Platanthera flava</i>	Gypsy-spikes		ST	Low						✓	✓
<i>Platanthera nivea</i>	Snowy orchid		ST	Low						✓	✓
<i>Pogonia ophioglossoides</i>	Rose pogonia	✓	ST	Low		✓					
<i>Pteroglossapsis ecristata</i>	Giant orchid	✓	ST	Low		✓					
<i>Pycnanthemum floridanum</i>	Florida mountain-mint		ST	Low			✓	✓			

**Table 10. Federal and State Listed Plant Species Documented on CBJTC or Known to Occur in Clay County**

Scientific Name	Common Name	Observed at CBJTC	Federal / State Listing Status	CBJTC Management Priority	Habitat						
					Mixed	Flatwoods	Pinelands	Sandhill	Scrub	Floodplains	Wetlands
<i>Rhapidophyllum hystrix</i>	Needle palm	✓	CE	Low						✓	
<i>Rhododendron canescens</i>	Pink azalea	✓	CE	Low	✓						
<i>Rhododendron chapmanii</i>	Chapman's rhododendron	✓	FE / SE	High		✓					
<i>Rudbeckia nitida</i>	St. John's black-eyed susan	✓	SE	Medium		✓					
<i>Ruellia noctiflora</i>	Night-flowering wild petunia		SE	Low		✓					
<i>Salix floridana</i>	Florida willow		SE	Low						✓	✓
<i>Sarracenia minor</i>	Hooded pitcher plant	✓	ST	Medium		✓					
<i>Sideroxylon alachuense</i>	Clark's buckthorn		SE	Low	✓						
<i>Sideroxylon lycioides</i>	Gopherwood buckthorn		SE	Low						✓	
<i>Sphenostigma coelestinum</i>	Bartram's ixia	✓	SE	Medium		✓					
<i>Spiranthes tuberosa</i>	Little ladies'-tresses	✓	ST	Medium					✓		
<i>Stylisma abdita</i>	Hidden stylisma		SE	Low			✓		✓		
<i>Zephyranthes atamasco</i>	Atamasco-lily	✓	ST	Medium						✓	
<i>Zephyranthes treatiae</i>	Treat's zephyr-lily		ST	Low		✓					
Key: FE – Federally Endangered; SE – State Endangered; FT - Federally Threatened; ST = State Threatened; CE – Commercially Exploited											
Source: FNAI 2020, Gruver and Montero 2018, Weaver and Anderson 2010, Bio-tech 2009, FLMNH 1996a											

### 3.0 MISSION SUSTAINABILITY


#### 3.1 Integrating Natural Resources Management and Military Mission


An effective INRMP integrates aspects of natural resources management into the military mission. As such, it becomes the primary tool for ecosystem management at CBJTC while ensuring the successful, efficient accomplishment of the military mission. A multiple-use ecosystem management approach will be implemented to accommodate mission-oriented activities and provide for good stewardship, thereby maintaining and improving the quality, aesthetic values, and ecological relationships of the environment.

Specific military missions and training requirements are fluid and change from time to time with realignments, transformations, and changes in equipment and tactics. This requires the establishment of basic underlying natural resource management principles and practices that have broad application and can be adapted for multiple situations. Implementation of this INRMP will successfully promote adaptive stewardship practices that protect and enhance natural resources for multiple use, sustainable yield, and biological integrity, while supporting the military mission.

As part of implementing this approach, there are two interrelated programs that are used: ITAM and Environmental Programs. ITAM and Environmental integrate the military mission and natural resources in different ways and together ensure sustainable use of training lands while providing strong consideration for environmental and public concerns.

The purpose of the CBJTC is to ***maintain sustainable natural resources as a critical training asset*** upon which to accomplish the FLARNG mission. To accomplish this goal, natural resource managers need to:

 Ensure ***no net loss*** in capability to support existing and projected military training.

 Maintain ***quality training lands*** through monitoring, minimizing damage, mitigation, and rehabilitation.

##### 3.1.1 Operations Planning & Review

Projects, activities, new development, and mission changes are typically reviewed by multiple entities within FLARNG including CBJTC-DPW and CBJTC-ED. New construction projects and work orders are reviewed every other Monday by CFMO, FMO-ENV, and CBJTC-DPW. Larger scale projects are also reviewed by the Environmental Quality Control Committee (EQCC) (see **Section 1.3.1**). If there is potential for environmental impacts, the NEPA process is started, as described in **Section 3.3**. If there are additional environmental compliance requirements, CBJTC-ED or FMO-ENV facilitates any required consultation or permit applications, as described in **Section 3.2**.

##### 3.1.2 Natural Resources Management Actions

There are two primary areas of potential impacts to natural resources from the military mission on CBJTC: wildland fire and listed species. In addition, there are significant requirements for management of vegetation and water resources to support the military mission, although the military mission does not generally impact them directly. The military mission can result in wildfires; therefore, managing wildland fire risk and fuel loads is an important part of the natural resources management program on CBJTC. There are also a number of listed species present on CBJTC. While some of them benefit from the effects of the military mission, there are still regulatory requirements and a general contribution to the recovery of listed species

to meet as required by the ESA for all federal agencies. In addition to the impacts from the mission on natural resources, the active management of vegetation (see **Section 3.1.4** below) is a critical and necessary component of natural resources management on CBJTC. Furthermore, despite the fact that water resources are in good to excellent condition on CBJTC, they could be put at risk without the current natural resources management program.

The ultimate goal of this INRMP, as well as its subsequent updates or revisions, is to ensure long-term capability for FLARNG to meet their missions and training requirements, while managing for sustainable natural resources at CBJTC. The development and implementation of an active natural resources management program will accommodate the military mission, while emphasizing integrated, adaptive management that focuses on maintaining ecosystem function and stability.

All the landscapes at CBJTC are important in supporting training activities. Realistic training is dependent upon an intact natural setting. Degradation of natural resources can result in unintended impacts to the military mission, impaired readiness, and funds spent on natural resources crisis management and interventions rather than the military mission. FLARNG needs the land and its natural resources to function together in a healthy ecosystem to support the military mission. Management activities in this INRMP are designed to support the desired habitats and ecosystem functions.

### **3.1.3 Environmental Awareness**

The primary means of environmental awareness for CBJTC is the ITAM program (see **Section 1.5.7**). For military users of CBJTC, a core component of the ITAM program is Environmental Awareness aimed at minimizing environmental impacts. The ITAM program provides day-to-day environmental awareness for CBJTC through soldier cards and handbooks developed with input from CBJTC-ED. Environmental Compliance Officer (ECO) Training provides another opportunity to discuss natural resources and other environmental resources on CBJTC. CBJTC-ED also maintains an entrance room on the way to Range Control with brochures, animal displays, and other educational materials that provide an opportunity for soldiers and other site users to familiarize themselves with natural resources at CBJTC.

## **3.2 Consultation Requirements**

FLARNG has multiple natural resources consultation requirements in addition to the INRMP development and review requirements identified in the SAIA (see **Section 1.0**). Federally listed threatened and endangered species management requires ESA Section 7 consultation with USFWS. State listed rare species management and game species management requires consultation with FFWCC. Actions that fall under the jurisdiction of Section 404 or 401 of the CWA necessitate permitting from USACE, FDEP and St John's River WMD. In addition to natural resources consultation requirements, there are National Historic Preservation Act (NHPA) and tribal consultation requirements, which are presented in full in the ICRMP for CBJTC (**Appendix P**).



### 3.3 NEPA

CBJTC follows the process established in the 2011 *ARNG NEPA Handbook, Guidance on Preparing Environmental Documentation for Army National Guard Actions in Compliance with the National Environmental Policy Act of 1969* (ARNG 2011). The initial step in compliance with NEPA for any activity that might impact the environment by FLARNG is to complete a *REC and Check Form*. The form is prepared to aid in the development of the assessment; it provides information on the proposed action and its alternatives, purpose, and potential environmental effects. This allows the proponent to identify potential environmental impacts early and facilitates making a determination about whether an EA or Environmental Impact Statement (EIS) might be required for a specific action. Some sections are prepared by the proponent and other sections are prepared by CBJTC-ED or FMO-ENV. For activities where a REC and Check is sufficient, CBJTC-ED completes and/or reviews the REC and Check. For activities where additional NEPA analysis is required, FMO-ENV prepares and manages the analysis.

If the action is not covered by a categorical exclusion, then an EA is prepared to determine if there are potential significant impacts. If potential significant impacts are identified while completing the REC and Check or during the EA, then an EIS is prepared. The majority of natural resources management actions are covered by categorical exclusions.

### 3.4 Encroachment Management

CBJTC has been partnering with ARNG G-9 and the State of Florida through the Florida Forever program since 2003 to establish a three-mile compatible use buffer around the installation. This effort is known as the Camp Blanding Forever Initiative (CBFI) and helps prevent development of lands adjacent to CBJTC and encroachment from becoming an impediment to training and natural resource management. By securing a buffer, CBJTC can continue to provide critically important high quality military training and operations to ensure combat readiness. Efforts to support CBJTC through the combination of CBFI and Florida Forever also contribute to a regional conservation corridor and regional coordination among all participating entities for land management success. At this time there are no plans to acquire additional acreage that increases the size of the training center; however, these efforts have added state land and conservation easements around CBJTC. See the Florida Forever website at [http://www.dep.state.fl.us/lands/fl\\_forever.htm](http://www.dep.state.fl.us/lands/fl_forever.htm) for more information about the state agencies involved and the planning and prioritization efforts that support this initiative.

### 3.5 Beneficial Partnerships and Collaborative Resource Planning

FLARNG is working with FDEP and St. John's River WMD to utilize some of the lands acquired as part of the CBFI program for conducting off-site wetland mitigation. Once the conditions and mitigation credits are established, FLARNG will be able to utilize this land for wetland mitigation requirements associated with CBJTC construction projects.

In addition to the CBFI and Florida Forever programs, there are other regional planning efforts that support CBJTC and resource management in the area. The State of Florida in §163.3175, F.S. (2011) recognized that certain military installations have a potential for experiencing compatibility and coordination issues. For

CBJTC, Clay, Bradford, and Putnam Counties were identified as affected local governments and each county has included CBJTC into their Comprehensive Plan.

Furthermore, the State of Florida finds that incompatible development of land close to military installations can adversely affect the ability of an installation to carry out its mission, public safety, and economic viability of a community if military operations and missions must relocate due to incompatible urban encroachment. In particular, the *2025 Clay County Comprehensive Plan* was amended pursuant to Ordinance No. 2009-65 to include objectives and policies to protect the current long-term viability of CBJTC from future land development (Clay County 2009), and the *2016 Bradford County Comprehensive Plan* has incorporated a CBJTC military zone on their 2016 future land use plan map (Bradford County Board of County Commissioners 2006). Currently, CBJTC maintains non-voting representation on the Zoning Board for Clay County to ensure that any impacts to CBJTC are articulated to the Zoning Board.

Camp Blanding has an approved Army Compatible Use Buffer (ACUB) and has been receiving funds through the Readiness and Environmental Protection Integration program (REPI) since 2003. Cooperative agreements have been signed with partners to execute the funding for this program. These agreements include the following:

- **Department of Environmental Protection – Division of State Lands (DEP)** - this agreement was signed in 2003 and 2009 and expired in 2019. During the agreement period, acquisitions included 6,269 acres of conservation easement and 21,685 acres in fee.
- **North Florida Land Trust** – this agreement was signed in 2019. To date, acquisitions have included 119 acres of conservation easement and 777 acres in fee.

These acquisitions have protected the installation in a variety of ways. The 28,850 acres acquired to date have prevented development impacts to the installation. These protected acres also protect the rare and imperiled species found in these habitats to include gopher tortoise, indigo snake, striped newt, and many others. Some parcels offer additional benefits to CBJTC and include:

- A total of 13,417 acres purchased in fee under this agreement were added to, or created, a new state forest managed by the Florida Forest Service.
- Two planned developments (Crapps & 1621 Venture) were paused during the 2006 economic downturn. The two landowners decided to sell much of their property during this downturn, which prevented 6,873 acres from being developed.
- Two parcels (Crapps #1 and #2) were purchased in fee and will be managed by the Florida Forest Service. A Regional Offsite Mitigation Area (ROMA) was signed with the Saint Johns River Water Management District that provided state wetland credits due to the wetlands protected with this acquisition. The value of these credits in 2021 is approximately \$9,000,000 and can and have been used for construction and range projects on CBJTC.
- The Upchurch parcel is managed by the FL Department of Military Affairs and has been approved for a gopher tortoise restocking site through the Florida Fish & Wildlife Conservation Commission where tortoises can be moved that conflict with various construction activities on CBJTC. This will save CBJTC tens of thousands of dollars in recipient site fees over the life of the site.

Future acquisitions for the ACUB program will continually investigate opportunities of secondary benefits to the installation to prevent the internal encroachment due to rare and imperiled species and various permitting requirements.

As discussed in **Section 2.2**, approximately 56,200 acres of CBJTC is also known as Camp Blanding WMA; through MOA, hunting, fishing, and recreation are allowed during certain times of the year. A MOA also exists between FFWCC and FDMA for public use of Lowry Lake and Magnolia Lake for fishing. FFWCC manages the WMA. FFWCC retains all funds associated with hunting activities and in turn provides FLARNG with assistance with wildland fires, rare species management, fish and wildlife management, and other activities. FFWCC and FLARNG have had this collaborative arrangement since 1956. A copy of the MOAs is provided in **Appendix I**. Additional information pertaining to fish and wildlife management at CBJTC is included in **Section 4.6**.

The Florida Armory Board has recently entered into an agreement with the USFWS, and the FFWCC, the CBJTC Candidate Conservation Agreement with Assurances for Multiple At-Risk Species in North Florida (CCAA). The purpose of the CCAA is to undertake actions that will remove or reduce threats to candidate and other at-risk species. The agreement includes portions of CBJTC that support natural habitat for candidate and at-risk species' and are not at risk of future development or intensive military operations. Conservation objectives and multiple conservation actions are presented in the Agreement to accomplish this goal (see **Appendix I**). Annual CCAA reports will be added to **Appendix S**, the 2018-2019 report is currently included.

CBJTC has both formal and informal agreements in place for wildland fire suppression and management activities, as described in the IWFMP for CBJTC (see **Appendix G**). Agreements include:

- **North Central Florida Prescribed Fire Working Group Memorandum of Understanding (MOU)** – this formal agreement entails the sharing of personnel and resources between the following agencies and municipalities: Alachua County, CBJTC, the City of Gainesville, Florida Forest Service (FFS), Florida Park Service, FFWCC, St. John's River WMD, Suwannee River WMD, US Forest Service (USFS), The Nature Conservancy, University of Florida Board of Trustees, and USFWS. A copy of this agreement is found as an appendix to the IWFMP (see **Appendix G**).
- **Informal Working Partnership with FFWCC** – FFWCC staff located at CBJTC, when called upon, can assist with prescribed fire and wildfire events. FFWCC staff are located on-site due to the MOA for Camp Blanding WMA discussed above.
- **Informal Partnership with the FFS Jacksonville District** – this working mutual aid agreement allows for CBJTC to call on FFS resources for aid and vice versa if there is an immediate wildland fire concern.

At this time, CBJTC does not have an agreement with the National Wildfire Coordinating Group (NWCG) to supply personnel or equipment to federal fires. However, should that opportunity become available in the future, personnel and equipment would be sent off-Post at the Installation Wildland Fire Manager's discretion and related to the level of fire danger. Additional information pertaining to wildland fire management at CBJTC is included in **Section 4.5**.

The 650-acre Brooklyn Lake, located south of CBJTC in the City of Keystone Heights, has experienced a large decline in water levels (see **Section 2.2.6**). CBJTC, along with numerous other agencies and state

and local representatives, has been actively involved with the City of Keystone Heights since 1997 to help find a way to restore lake levels.

### 3.6 Public Access and Outreach

CBJTC offers a variety of recreational and public access opportunities throughout the Post. However, the Impact Area is restricted due to safety concerns associated with UXO. No recreational activities or public access are authorized within the Impact Area.

As discussed above, the approximately 56,200 acres of CBJTC that is a WMA is open to hunting, fishing, wildlife viewing, and hiking during certain times of the year. Dogs are prohibited for purposes other than hunting. Public access is allowed during periods open to hunting. Fishing is allowed on Lowry Lake and Magnolia Lake per the Camp Blanding FMA MOA between FDMA and FFWCC. Scouting is prohibited prior to hunting seasons.

Camp Blanding Road and Gun Club, in conjunction with Range Control, manages hunting in areas not covered under FFWCC WMA. Hunting areas managed by this club represent areas of CBJTC where general public access is restricted. Hunting in these areas is open to National Guard members, retired military, and state employees. Hunting access is much more restrictive within these areas (i.e., availability of these areas can be canceled with short notice if they are needed for training). The club retains the funds generated from hunting, but uses it for public outreach activities that benefit the installation (e.g., Wounded Warrior, Beast Feast, etc.). More details on the hunting and fishing activities are provided in **Section 4.6**.

A portion of the Florida National Scenic Trail runs through the southern portion of CBJTC and is governed by a MOA with the Florida Trail Association (FTA). The trail can be rerouted around the installation when the area is needed for training. FLARNG helps maintain the trail on CBJTC in conjunction with the FTA. A kiosk is located at the trail entrances within CBJTC to provide information on trail closures and any revised routes. Hiking and biking are allowed when the trail is open.

CBJTC-ED also regularly conducts local public outreach activities with Audubon, Boy Scouts, local schools, etc. Public outreach activities vary annually and typically center around natural resources awareness activities.

### 3.7 State Wildlife Action Plan

During the INRMP development process, FLARNG consulted the draft *Florida's Wildlife Legacy Initiative: Florida's State Wildlife Action Plan* (FFWCC 2018), as well as *Florida's Wildlife Legacy Initiative: Comprehensive Wildlife Conservation Strategy* (FFWCC 2019) to ensure INRMP goals, objectives, and strategies are consistent with Florida's overall statewide and habitat-specific plans. Florida's SWAP is a strategic vision of the integrated conservation efforts needed to sustain the broad array of wildlife in the state. The purpose of Florida's SWAP is to serve as a starting point for building a common framework for Florida's numerous wildlife conservation partners. Florida's SWAP is available at <http://myfwc.com/conservation/special-initiatives/fwli/action-plan/download/>.

The goals of Florida's SWAP are:



- Use Florida's Wildlife Legacy Initiative framework to coordinate natural resource conservation by (1) implementing and revising the 2005 State Wildlife Action Plan; (2) developing and maintaining partnerships; and (3) managing the State Wildlife Grants Program.
- Facilitate habitat conservation efforts on the following high-priority habitat categories to improve their health and resiliency and to achieve their long-term ecological sustainability statewide: sandhill, scrub, softwater stream, spring and spring run, coral reef, and seagrass.
- Obtain information on the life history, status, trend, population dynamics and management, and needs for Species of Greatest Conservation Need (SGCN).
- Enhance monitoring of priority species and habitats by developing a tracking system for species and habitats identified in the SWAP.
- Develop a GIS application that identifies the most important cooperative conservation focal areas for Florida's terrestrial, freshwater, and marine ecosystems. Merge the various existing GIS planning applications in order to generate an integrated land and water cover map for Florida. Make it available on Arc Internet Mapping Service.

Key statewide threats include alterations of the physical environment, degradation of water resources, incompatible fire management, and introduced plants and animals. Key conservation challenges include public awareness, information management, data gaps, and partnerships. While all INRMP goals, objectives, and strategies were found to be consistent with Florida's SWAP, not all of them contribute specifically to one of the SWAP's goals or conservation actions. The SWAP identifies very high, high, medium and low priority conservation actions and habitat types for Florida.

Very high priority habitats present on CBJTC include freshwater marsh-wet prairie, natural pinelands, sandhills, and scrub. High priority habitats present on CBJTC include bay swamp, cypress swamp, grassland/improved pasture, hardwood hammock, and hardwood swamp/mixed wetland forest. The Lower St John's River Basin is one of the highest ranking enhancement basins for watersheds within Florida's SWAP.

The SGCN list identifies the broad range of Florida's animal species that are imperiled or at risk of becoming imperiled in the future. After assessing all native freshwater, marine, and terrestrial wildlife species known to occur within Florida, 1,036 SGCN were identified, including 21 amphibians, 52 mammals, 56 reptiles, 161 birds, 78 fish, and 668 invertebrates. SGCNs include federal and state listed species as well as species that met the SWAP's definition of rare (10,000 or fewer individuals) or biologically vulnerable (vulnerable to extinction). SGCN also include keystone species that play a critical role in maintaining the structure of an ecological community, and taxa of concern that have at least a moderate risk of extinction in the future. Numerous SGCN occur within CBJTC that benefit from the natural resources program. Fish and wildlife management and rare species management are discussed in **Sections 4.6** and **4.7**, respectively. For a complete list of Florida SGCN, refer to the SWAP. Animal species known to occur within CBJTC are listed in **Appendix C**.

### 3.8 INRMP Implementation Analysis

The primary measure of INRMP effectiveness is whether it helps prevent net loss in the capability of military lands to support the military mission. FLARNG is preserving CBJTC's capability to support training through its natural resources management practices outlined in the 2014 INRMP and in this update. Long-term management effectiveness is also evaluated through periodic inventories of species populations, habitat quantity and quality, and habitat values through the recurring Planning Level Surveys (PLS). Trends can be used to indicate the degree of success. FLARNG will evaluate these recurring data as they become available.

A practical evaluation of INRMP implementation includes reviewing whether planned projects have been accomplished. An analysis of the FY 2013-2019 projects and their implementation status is included in **Table 11**.

Overall, CBJTC has benefited from the INRMP as a management tool. The program and goals in the 2014 INRMP are being addressed through implementation of management actions. Most of the specific management actions have been implemented through projects, while some have been in-house activities. A large number of the projects are recurring actions that are continued in this INRMP. See **Section 4.0** for topic-specific goals and objectives and **Section 5.0** for a complete summary of goals, objectives, and associated projects and activities.

Table 11. Implementation Status of the 2007 INRMP

Program / Funding Category	Funding Source*	Project Description	Implementation Status	Included in Updated INRMP
<b>CBJTC Natural Resources Personnel</b>	Env	Training Site Environmental Manager	Ongoing	Modified
	CBMTF	Forest Area Supervisor	Ongoing	Modified
	Env	Endangered Species Biologist	Ongoing	Modified
	CBMTF	Forester	Ongoing	Modified
	Env	Natural Resources Manager	Remove	Modified
	Env	Forest/Wildlife Tech	Annual	Modified
	Env	Administrative Assistant	Ongoing	Modified
	Env	Environmental Specialist 1	Ongoing	Modified
	CBMTF	4 Forest Rangers	Ongoing	Modified
	ITAM	RTLA Biologist	Remove	Modified
	Env	Professional Training & Education	Ongoing	Modified
	Env	GIS Systems Analyst	Ongoing	Modified
	FFWCC	Manage hunting and fishing program	Ongoing	Yes
	ITAM	RTLA Crews Salaries		No
	ITAM	LRAM Coordinator Salary		No
	ITAM	GIS Technician Salary		No
<b>RTLA Program</b>	ITAM	RTLA Database Management		No
	ITAM	Data Collection	Annual	Yes
	ITAM	RTLA Plot Management		No
	ITAM	Non-GIS Equipment		No

Table 11. Implementation Status of the 2007 INRMP

Program / Funding Category	Funding Source*	Project Description	Implementation Status	Included in Updated INRMP
RTLA continued	ITAM	GPS Equipment		No
	ITAM	Production/Imagery		No
	ITAM	Digital Video Camera		No
	None	Impact Area Assessment		No
GIS Program	ITAM	GIS External Support		No
	ITAM	GIS Equipment		No
	ITAM	Imagery Acquisition		No
	ITAM	Data Collection		No
	ITAM	GPS Equipment		No
	ITAM	GIS Operator		No
TRI Program	ITAM	TRI Management		No
	ITAM	TRI ADP (Communication) Equipment		No
	ITAM	TRI Training		No
	ITAM	TRI Equipment		No
	ITAM	TRI Imagery Equipment		No
LRAM Program	ITAM	Fencing		No
	ITAM	LRAM Project Design		No
	ITAM	Soil Rehabilitation		Yes
	ITAM	Non-GIS Equipment		No



Table 11. Implementation Status of the 2007 INRMP

Program / Funding Category	Funding Source*	Project Description	Implementation Status	Included in Updated INRMP
<b>LRAM continued</b>	ITAM	LRAM Equipment		No
	ITAM	Hydro Seeder		No
	ITAM	LRAM Equipment - Seeder/Drill		No
	ITAM	LRAM Equipment - Skid Unit		No
	ITAM	Equipment Maintenance/Repair		No
	ITAM	Helicopter Erosion Control		No
<b>Environmental Awareness Program</b>	ITAM	EA Video/Automation		No
	ITAM	EA Signs		Yes
	Env	Taxidermy	Partially Complete	No
	Env	EA Training	Ongoing	Yes
	ITAM	EA Printing		No
<b>Ecosystem Management</b>	Env	Endangered Species Management Plan Implementation	Annual	Yes
	CBMTF/Env	Implement INRMP	Ongoing	Yes
	CBMTF/Env	Prescribe burning and thinning for endangered species habitat	Ongoing	Yes
	Env/FFWCC	Application for Prescribed Fire (Helicopter)	Annual	Yes
	Env	Threatened, Endangered Species monitoring	Annual	Yes
	Env	Update INRMP (existing staff)	Annual	Yes
	Env	RCW ecological research	Annual	Yes
	Env	Control/eradicate alien and exotic plant species	Partially Complete	Yes

**Table 11. Implementation Status of the 2007 INRMP**

<b>Program / Funding Category</b>	<b>Funding Source*</b>	<b>Project Description</b>	<b>Implementation Status</b>	<b>Included in Updated INRMP</b>
<b>Ecosystem Management continued</b>	Env	Conduct Planning Level Surveys for fauna	As Needed	Yes
	Env	Conduct Planning Level Surveys for flora	Partially Complete	Yes
	Env/DPW	Implement IPMP	Annual	Yes
	Env/DPW	Conduct wetlands delineation	As Needed	Yes
	Env	GIS hardware and software	As Needed	No
	Env	Aquatic communities Planning Level Survey	Partially Complete	Yes
	All	Develop GIS layers for Natural and Cultural Resources, using existing staff	Ongoing	Yes
	CBMTF/Env	Prescribed Fire Materials	Annual	Yes
	CBMTF/Env	Mining dune restoration	Partially Complete	Yes
	All	Brooklyn Lake Assistance	As Needed	Yes
<b>Forestry Program</b>	CBMTF/Env	Wildland fire training	As Needed	Yes
	CBMTF	Fire break maintenance	Ongoing	Yes
	CBMTF/Env	Stand site prep and planting	Annual	Yes
	CBMTF	Stand Fertilization	As Needed	Yes
*Key: CBMTF = Camp Blanding Management Trust Fund, Env = Environmental Funds, DPW = Department of Public Works				

## 4.0 NATURAL RESOURCES PROGRAM MANAGEMENT

The guiding philosophy of this INRMP is to take an ecosystem approach to managing the natural resources present on CBJTC (see **Section 1.5.3**). Ecosystem management provides a framework to link the military mission to local, regional, and global ecological integrity. Sustaining ecosystem integrity is the best way to protect and enhance biodiversity, ensure sustainable use, and minimize the effort and cost of management.

Ecosystem management is based on clearly stated goals and objectives, and associated activities and projects. This INRMP identifies goals and objectives, and presents the means to accomplish them as well as the methodologies to monitor results. Activities generally refer to in-house, no-cost actions undertaken by FLARNG and CBJTC personnel. Projects generally refer to actions that are performed by others, usually under contract or other agreement. In addition, projects can be performed using non-DoD funds or by volunteers. See **Section 5.3** for more details about funding.

This chapter summarizes each technical area of natural resources management. In a given section, relevant management strategies, practices, guidelines, best management practices (BMPs), and priorities will be presented, as applicable to the technical topic. Goals and objectives are presented below by section. Activities (i.e., recurring, in-house tasks) and projects (i.e., discrete and/or contracted tasks) associated with those goals and objectives are presented in **Tables 15 and 16** respectively in **Section 5.0**. Laws and regulations are not summarized in each sub-section, although primary legal drivers are identified. A summary of relevant laws, regulations, EOs, and policies is provided in **Appendix J**.

The following management sections are not included in this INRMP because they do not apply at CBJTC:

- Coastal/Marine Management – No coastal or marine habitat occurs within CBJTC.
- Agricultural Outleasing – CBJTC does not currently have cropland, hay, or grazing leases.

### 4.1 Natural Resources Program Development

**GOAL PM:** Manage natural resources in a manner that is compatible with and supports the military mission while complying with applicable federal and state laws and DA regulations and policies.

- OBJECTIVE PM1: Initiate and/or continue programs and projects that enhance the training land and training opportunities and result in no net loss of training land availability.
- OBJECTIVE PM2: Use adaptive, ecosystem management as the primary natural resources management paradigm.
- OBJECTIVE PM3: Continue internal environmental awareness activities to minimize impacts to natural resources from FLARNG and visiting personnel.
- OBJECTIVE PM4: Continue public outreach activities in coordination with other regional entities as appropriate.
- OBJECTIVE PM5: Continue cooperating with other agencies to provide outdoor recreation opportunities, without impacting military mission or ecological health.

- OBJECTIVE PM6: Continue to cooperate with other agencies and local landowners on regional land and natural resources management efforts.
  - OBJECTIVE PM7: Maintain and improve GIS data and access to that GIS data.
- 

Programmatic management includes the overall program elements to implement a comprehensive natural resources management program. Elements included in this section generally include areas that intersect with all or most components of the program, such as environmental awareness, public outreach, GIS data management, natural resources law enforcement, INRMP annual reviews, adaptive management, and other objectives relating to implementing a natural resources management program.

**Primary Regulatory Drivers**

- SAIA
- DoDI 4715.03
- AR 200-1

#### **4.1.1 Environmental Awareness and Public Outreach**

There are several organizations within FLARNG that undertake environmental awareness and public outreach activities, including some specific to environmental and natural resources management. The ITAM program includes an Environmental Awareness component that has two target audiences: military users of CBJTC and non-military users of CBJTC. The ITAM Environmental Awareness program is designed to improve their understanding of the effects of CBJTC mission, training, and activities on the natural resources of CBJTC. The ITAM Environmental Awareness program can also serve as a public outreach tool to educate the public and garner their support by effectively communicating the military mission at CBJTC and the level of success of natural resources management at the installation. When military users and the public are informed and educated about management practices and their benefits, they tend to lend support to the practice even if those practices are controversial.

One of the keystone pieces of this program is the *Field Card* for military users. CBJTC maintains a small museum exhibit in the Land Management Center that showcases some of the plants and animals present on CBJTC. Presentations are also provided to various groups about CBJTC and the natural resources present. Additional information on environmental awareness, beneficial partnerships, and public outreach is in **Section 3.0**.

#### **4.1.2 Outdoor Recreation**

CBJTC has extensive outdoor recreation opportunities, ranging from fishing and boating to camping, hiking, and hunting. The fishing and hunting program is described under fish and wildlife management (see **Section 4.6.2**). A portion of the Florida National Scenic Trail runs through the southern portion of CBJTC, and provides hiking, biking, and wildlife viewing opportunities.

All-terrain vehicles (ATVs) have great potential for damage to natural resources. No off-road driving for recreational purposes is permitted on CBJTC. Trespass by motor vehicle (includes an automobile, truck, van, bus, recreational vehicle, camper, motorcycle, motor bike, moped, go-cart, all-terrain vehicle, dune buggy, and any other vehicle propelled by motor) is covered under Section 375.251 FAC.



### 4.1.3 Public Access

AR 200-1 provides guidance for access to military lands and waters by recreational users. Based on this regulation, public access will be within manageable quotas subject to safety, military security, threatened or endangered species restrictions and cannot impair the natural resources. Limitations on public access will be enforced during training exercises to minimize safety risk.

Limitations on public access have been set in certain areas, particularly the Impact Area due to the presence of hazards related to training activities. Some possible threats to public safety related to training activities include active range use, UXO, and training infrastructure. For this reason, secured gates strictly control access to the Impact Area. As mentioned above, the Florida National Scenic Trail runs through the southern portion of CBJTC and is open to the public. When this area needs to be closed for training, the kiosk at the beginning of the trail is used to provide information on trail closures and any revised routes.

### 4.1.4 Natural Resources Law Enforcement

Many aspects of natural resources management require effective enforcement if they are to be successful. Such features as hunting/fishing harvest controls, protection of wetlands, water pollution prevention, rare species protection, and others are very dependent on law enforcement. At CBJTC, FFWCC law enforcement officers provide conservation and trespassing enforcement support. Military police and Range Control conduct routine patrols, observe all activities on the training site, and notify CBJTC-ED when environmental concerns are observed within CBJTC.

### 4.1.5 GIS Data Management

CBJTC has a significant amount of site-specific natural resources data. There is a dedicated GIS position for managing and maintaining environmental data at CBJTC. Access to maps generated from accurate and usable GIS data is essential for efficient natural resources management. In addition, it facilitates accurate analysis of potential effects of all future projects and activities. **Table 12** provides a summary of GIS data currently available for CBJTC.

Table 12. Summary of GIS Data Available for CBJTC		
GIS Data	Source	Needs updating?
Boundary and training areas	CIP	No
Buildings	CIP	No
Fences & Gates	CIP	No
Transportation (pedestrian, roads, airfields, railroad, water docks)	CIP	Yes, helicopter landing zones
Utilities (electric, fuel, sewer, wastewater, utility poles, water hydrants, and tanks)	CIP	No
Communication (antennas)	CIP	No

Table 12. Summary of GIS Data Available for CBJTC		
GIS Data	Source	Needs updating?
Recreation (improved areas)	CIP	No
Elevations	CIP	No
Streams, lakes, watersheds, and other open water	National Hydrology Dataset	No
Wetlands	NWI	Yes
Floodplains	FEMA	No
Soils	NRCS	No
Natural Communities	FNAI	No
Rare species locations and areas	Biotech 2009, Nelson and Floyd 2011, and FLNG	Yes; periodically (as needed)
Aerial Imagery	Multiple Sources	Multiple years are available
Forest management (timber actions and planting activities)	FLNG	Yes; periodically (as needed)
Invasive species management (herbicide application, torpedo grass area)	FLNG	Yes; periodically (as needed)
Fire management (Including RxFire and firebreaks)	FLNG	Yes; periodically (as needed)
CIP = Common Installation Picture		

#### 4.1.6 Operational Noise Management Plan

Army Regulation 200-1 describes the facets of an “Environmental Noise Program.”. Provides a plan to manage this environment through land use planning and being a responsible neighbor. In addition to noise assessment, the plan includes education of both installation personnel and surrounding residents, management of noise complaints, mitigation of the noise and vibration, and noise abatement procedures. The Florida Army National Guard Statewide Operational Noise Management Plan details the working operations and procedures for noise abatement and monitoring at Camp Blanding (**Appendix R**).

## 4.2 Soil Conservation and Sediment Management

**GOAL SO:** Manage soil to minimize sediment loss and erosion, while protecting water quality.

OBJECTIVE SO1: Maintain roads and parking areas to minimize the potential for erosion and sedimentation and to minimize establishment of invasive species.

OBJECTIVE SO2: Implement BMPs to minimize erosion, soil loss, and sediment deposition.

OBJECTIVE SO3: Maintain vegetation cover using native species.

OBJECTIVE SO4: Minimize nutrient and sediment inputs from soil to protect water quality.

OBJECTIVE SO5: Implement stabilization and recovery measures for areas not revegetating spontaneously.

Surface water and groundwater quality is directly related to land management practices that affect stormwater runoff. Stormwater runoff is produced when rainfall during a storm exceeds the infiltration capacity of the soil or encounters an impervious surface. Stormwater runoff can be a significant source of pollutants as well as sediments to surface waters, especially in areas with impervious surface cover or where groundcover has been disturbed. Water quality also may be negatively impacted by disturbances causing increased sedimentation to wetlands and stream channels. Sources of stormwater runoff and pollution could originate from operational, maintenance, and/or administrative areas. Stormwater runoff from impervious surfaces has a high potential to carry pollutants into wetlands, surface waters, and groundwater. Impervious surfaces include roads, parking lots, taxiways, and buildings. On CBJTC, these areas are generally limited to the cantonment area and a few small areas with training infrastructure.

### **Primary Regulatory Drivers**

- Clean Water Act
- Florida Water Resources Act of 1972 (Chap 373 of F.S.)
- Section 403.0885 of F.S. (NPDES Program)

Two main types of soil erosion exist: wind erosion and water erosion. Several factors affect water erosion. These factors include rainfall, slope steepness and length, soil texture or erodibility, cover protecting the soil, and special practices such as terracing or planting on the contour. Sediment resulting from erosion affects surface water quality and aquatic organisms. These types of erosion can occur throughout CBJTC and can be a significant management concern, particularly in areas that have been disturbed for any reason. Erosion resulting from non-training activities is managed by either CBJTC-DPW or CBJTC-ED and erosion resulting from military training is managed by the ITAM program.

### 4.2.1 Regulatory Authority and BMPs

FDEP implements the National Pollutant Discharge Elimination System (NPDES) program in the State of Florida in accordance with Section 403.0855, F.S. The NPDES stormwater program regulates point source discharges of stormwater into surface waters of the State of Florida from certain municipal, industrial, and construction activities. As the NPDES stormwater permitting authority, FDEP is responsible for promulgating rules and issuing permits, managing and reviewing permit applications, and performing compliance and enforcement activities.

Stormwater management could be a concern at CBJTC; however, there are a number of mechanisms in place to protect water quality and soils from negative impacts from stormwater. CBJTC maintains a SWPPP and SPCCP in compliance with Florida requirements (FLARNG 2012, FLARNG 2000). The SWPPP describes the programs, BMPs, monitoring and other measures already used on CBJTC. There are also dedicated conservation areas within the Cantonment Area that are designed specifically to protect the water resources that occur within the Cantonment Area.

In addition to compliance with requirements associated with existing SWPPP activities, construction or other land-disturbing activity that results in soil disturbance (e.g., clearing, grading or excavating) of 1-acre or more must be permitted by FDEP under the NPDES permit program. The NPDES permit establishes the required erosion control and revegetation standards.

USEPA and FDEP are good sources for stormwater BMPs. The FDEP's *Florida Stormwater Erosion and Sedimentation Control Inspector's Manual* (FDEP 2018), and the USEPA's *Developing your Stormwater Pollution Prevention Plan: A Guide for Construction Sites* (USEPA 2007) are both useful references. FDEP also offers a suite of additional resources for specific activities related to nonpoint-source management at <http://www.dep.state.fl.us/water/nonpoint/pubs.htm>.

Due to the extensive forestry program, silviculture BMPs are also applicable across most of CBJTC. The FDACS developed the *Silviculture BMPs Manual* (FDACS 2008b). One of the key BMPs is the establishment of SMZs associated with water resources. CBJTC established SMZs around all water resources in the 1990s using the most protective buffers (see **Section 4.3.3** for additional discussion on SMZs). A copy of the FDACS manual can be found at: <http://www.floridaforestservice.com/forest.html>.

#### **4.2.2 ITAM Program**

A core component of the ITAM program is LRAM, which is specifically focused on preventing and recovering damage to vegetation and soils. CBJTC ITAM program representatives spend the majority of their time revegetating disturbed land (see **Section 4.2.4** and **Appendix O**) and monitoring the training site for potential erosion or sedimentation concerns. To a lesser degree, they also conduct trail stabilization and install low water crossings, when needed. Previously, cable concrete trail crossings were installed at various locations, which have reduced the amount of silt added as a result of routine traffic.

#### **4.2.3 Erosion Control Guidelines**

Improper erosion control can lead to CWA violations, thus potentially resulting in fines and other penalties, which may ultimately compromise the integrity of CBJTC as a viable training installation. Regardless of regulatory compliance, appropriate soil conservation and erosion control are vital to the military mission. Unmanaged and extensive soil erosion can threaten the military mission and require diversion of funds from other priorities. Delays in managing the erosion can increase the cost to repair by several orders of magnitude. Some examples of the potential effects of poor soil and erosion management include:

- Undermining of roads
- Loss of topsoil and vegetation, which further accelerates erosion
- Impacts to streams or other aquatic habitats, potentially resulting in water quality impairment



- Creation of unusable areas due to erosion.

As discussed in **Section 2.2.4**, soils at CBJTC are generally sandy with a high potential for erosion. However, in general, soil erosion at CBJTC is rather limited because slopes are generally minimal, tracked and wheeled vehicle usage is low, and revegetation of bare areas is relatively easy due to an abundance of rainfall and warm temperatures (Hall et al. 1997). Only 1 percent of CBJTC soils require very careful management due to risk of erosion (Albany fine sand, 0 to 5 percent slopes), but most soils on the training center require special treatment and consideration when planning for land use and rehabilitation, especially regarding wetness (see **Table 6** and **Map 4**). These sandy soils dry out rapidly and are generally nutrient poor, which strongly favors native plants adapted to those conditions. Sandy soils are also more likely to allow pollutants to leach into groundwater and water resources, so maintenance of vegetation buffers is essential to minimize this risk.

FLARNG will assess the potential erodibility of a site during planning of new development, training, and other land uses. FLARNG will continue soil erosion management practices including institutional, structural, and vegetative practices.

- **Institutional practices** are procedures, policies, or regulations that ensure operations are conducted in a manner that minimizes their impact.
- **Structural practices** include permanent construction to install erosion-resistant surfaces, stabilize drainage, and modify slopes to reduce runoff velocity and trap sediments on-site.
- **Vegetative practices** consist of establishing live plants on erosive or exposed surfaces. Plants stabilize slopes by binding soils with their roots, shielding soils from rainfall impact, interrupting surface runoff by roughening the surface, allowing more water to infiltrate rather than run off over the surface, trapping sediments in runoff, and wicking moisture out of soils by evapotranspiration. In addition, vegetative practices are self-regenerating and relatively maintenance free.

#### 4.2.4 Revegetation Management Guidelines

Success in revegetating disturbed sites depends on the chemical and physical properties of the soil. Correct pH, phosphorus levels, and nitrogen fertilization are necessary for degraded lands to be re-vegetated. Application procedures should include soil analysis to determine proper nutrient application levels. Other factors to consider are soil moisture, soil organic matter, and weather patterns.

Generally, revegetation using native plants does not require fertilizer, which can favor non-native species. If fertilizer is applied, choose and apply fertilizer according to the soil test results. Fertilizers should be incorporated as appropriate for the plants being used, and should not be applied when soils are wet. In wet soils, salt forms from the fertilizer, which can significantly reduce the percentage of seed germination, especially with grasses.

Specific recommendations concerning revegetation at CBJTC are as follows.

- Maintain existing vegetation buffers around water resources.
- Generally, CBJTC will revegetate itself as long as the soil is stable. Mulch or other soil stabilization method can be used to stabilize soils until plants germinate.
- If an area does not revegetate readily, conduct a soil test and incorporate the minimum soil amendment necessary.
- If an area still does not revegetate spontaneously, only use native genotypes during restoration and landscaping projects. A list of native plants suitable for landscaping is available at and discussed in **Section 4.4.9**.
- Plants prohibited by FDEP or US Department of Agriculture (USDA) will not be used on CBJTC.

### 4.3 Water Resources Management

**GOAL WA:** Maintain water resources so they remain resilient, functional, and with no net loss of acreage.

OBJECTIVE WA1: Minimize impacts to water resources, including wetlands, and comply with all laws pertaining to water resources.

OBJECTIVE WA2: Minimize nonpoint-source pollution through implementation of BMPs and following existing spill prevention and hazardous materials management protocols.

OBJECTIVE WA3: Maintain or enhance vegetation buffers around water resources.

CBJTC has numerous and significant water resources, including wetlands, perennial streams, and perennial lakes. For a complete summary of water resources on CBJTC see **Section 2.5**. Wetlands are some of the most productive habitats, and often provide migration corridors for a variety of species. In addition to the goal, objectives, and management strategies presented here, those presented in **Section 4.2** also contribute to the management of water resources.

As described in **Section 3.5**, climate change is likely to increase the variability of precipitation and increase water temperature in Florida. Depending on how things change, water resources could be significantly impacted, either be expanding or shrinking. While water resources are highly likely to be impacted, it is impossible to determine at this time how they will be impacted.

#### **Primary Regulatory Drivers**

- Clean Water Act
- AR 200-1
- EO 11990
- EO 11988
- Florida Water Resources Act of 1972 (Chap 373 of F.S.)
- Section 403.088 and 403.0885 of F.S. (NPDES Program)
- FAC 62-621.300

### 4.3.1 Regulatory Requirements

The USACE regulates the discharge of dredged or fill material into “waters of the United States”, including wetlands, under Section 404 of the CWA. Even an inadvertent encroachment into waters of the US resulting in a displacement or movement of soil or fill material has the potential to be viewed as a violation of the CWA if an appropriate permit has not been issued by the USACE. Waters of the US are defined under 33 CFR 328.3(a) and referred to as jurisdictional waters. Jurisdictional waters may include coastal and inland waters, lakes, rivers, ponds, streams, intermittent streams, vernal pools, wetlands, and other waters, that if degraded or destroyed could affect interstate commerce. Section 401 of the CWA gives the State of Florida the authority to regulate, through the state water quality certification program, proposed federally-permitted activities that may result in a discharge to water bodies, including wetlands.

For an area to be classified as a delineated wetland, three conditions must be present: (1) wetland hydrology; (2) hydric soil; and (3) hydrophytic vegetation. Areas that may be periodically wet, but that do not meet all three criteria, are not classified as “delineated” wetlands. Once a delineation is complete, then a jurisdictional determination can be made, which is dependent upon the relationship of the wetland to waters of the US.

Chapter 373 of F.S. mandates the state agency to implement the State’s surface water regulatory program, which covers virtually any movement of soil surface or construction anywhere in the peninsula of Florida, from coast-to-coast, including uplands and wetlands. Pursuant to the environmental provisions of F.S. 373.414, the State has jurisdiction over those areas that are delineated as wetlands, including all isolated wetlands, under the State methodology. The Florida Water Resources Act established five WMDs within the State of Florida to assist in the management of state waters. Clay County is located in the St. John’s River WMD, which encompasses 18 counties in north central Florida. The St. Johns River WMD is responsible for managing the ground and surface water supplies of the region. Duties of the District include permit issuance, land acquisition, water quality and quantity research, ground and surface water mapping, and outreach and public education. Each of the five districts maintain a separate operating agreement with FDEP that outlines which agency will process Environmental Resource Permits (ERPs) for particular projects. The Florida ERP combines the former dredge and fill permit issued by FDEP (i.e., Section 401 CWA) and the management and storage of surface waters permit issued by the WMDs.

Management of wetlands on federal lands and military installations is further indicated by EO 11990 and DoDI 4715.03, respectively. Under those instructions, wetlands are required to be managed for “no net loss” on federal lands, including military installations. In support of these policies, long- and short-term adverse impacts associated with the destruction or modification of wetlands and support of new construction in wetlands should be avoided to the maximum extent possible.

FEMA-designated floodplains are protected under EO 11988 – *Floodplain Management*. The purpose of EO 11988 to reduce the risk of flood loss, minimize the impacts of flooding, and restore and preserve the natural and beneficial values of floodplains when acquiring, managing, or disposing of federal lands.

### 4.3.2 Permitting

As discussed above, USACE, FDEP and St. John's River WMD have jurisdiction over water resources. The USACE issues Nationwide Permits (NWP) and a State Programmatic General Permit (SPGP) that cover many routine or minor projects. The USACE issues Individual Permits for larger projects, or those that do not meet the requirements of an NWP or SPGP. The USACE and Florida have adopted joint ERP and wetland resource application. Under the Operating Agreement between USACE Jacksonville District, FDEP and St. John's River WMD, all applications should be submitted to FDEP or WMD, as applicable. If the project does not qualify for a SPGP, the application will be forwarded to USACE by FDEP or WMD. The ERP Program regulates activities involving the alteration of surface water flows. This includes new activities in uplands that generate stormwater runoff from upland construction, as well as dredging and filling in wetlands and other surface waters.

Permitting requirements vary depending on type, location, and extent of disturbance. Prior to initiating projects or activities (e.g., dredging, filling, work in and around a stream or wetland) occurring within or with the potential to affect a floodplain, wetland, or other water body, the appropriate agencies (USACE, FDEP or St. John's River WMD) should be consulted to determine permitting requirements.

NPDES permits for construction are not integrated into the ERP permit, and are issued separately. Construction related NPDES permits are discussed in **Section 4.2.1** and the new NPDES Florida Pesticide Generic Permit is described below.

As a result of new USEPA ruling, FDEP has issued a new permit through its NPDES Program under the provisions of Section 403.088 and 403.0885, F.S. The new NPDES Florida Pesticide Generic Permit pertains to pesticide applications on waters of the state and land areas adjacent to waters of the state, and is consistent with the USEPA pesticide general permit requirements published under 40 CFR 122. This NPDES general permit is applicable to all persons who discharge pesticides to waters of the state from the application of biological pesticides or chemical pesticides, which leave a residue of the pesticide or its degradants. The following categories of pesticide discharges are covered under this general permit: (1) mosquitoes and other flying insect pest management, (2) aquatic weed and algae control, (3) aquatic nuisance animal control, and (4) forest canopy pest control. Waters that are designated as Outstanding National Resource Waters (ONRWs) or on the CWA 303(d) list do not qualify for this permit. No surface waters within CBJTC are currently classified as an ONRW or 303(d) water.

The submission of a notice of intent (NOI) and development of a Pesticide Discharge Management Plan under this general permit are required for certain operators in Florida pursuant to subsection 62-621.300(8)(b), FAC. Operators required to complete an NOI include mosquito control programs and districts, WMDs, USACE, USFWS, FFWCC, FDACS, USDA, USFS, and US National Park Service. A complete list of operators and other permit provisions are provided in 62-621.300, FAC.

### 4.3.3 Riparian Zones and SMZs

Riparian zones are lands adjacent to streams, rivers, lakes, and wetlands. They are important features within CBJTC as they intercept overland drainage, reduce streambank erosion, help trap sediments and



nutrients, filter water and replenish groundwater reserves, and help to moderate flooding. See **Section 4.4.7** for vegetation management guidelines associated with riparian zones.

A SMZ is a BMP that is designated and maintained during silviculture operations to protect water quality within nearby streams, lakes, and other waterbodies. The SMZ width is based on the size and type of the waterbody and the local soils type and percent slope, which include the likelihood of erosion and sedimentation concerns. In the 1990s, SMZs were designated around streams, lakes, and other waterways within CBJTC. The sizes of the SMZs were defined based on field observations and the criteria set forth in the *Silviculture BMPs Manual* (FDACS 2008b). Wherever timber cruise lines cross a waterway, the stream width and the slope of the adjacent banks were measured and recorded. The highest value for width and slope along major stretches of each creek or tributary were used as the values for the full length of that stream or tributary. This conservative approach to SMZ delineation will assure maximum protection for the waterways.

SMZ widths range from 60 feet on each side on many streams (e.g., North and West branches of Bull Creek, all branches of South Fork Black Creek, and waters in the east unit and southeast corner of CBJTC) up to a maximum of 300 feet on each side of several streams with steep slopes (South branch of Bull Creek, South Fork Black Creek, Lowry Lake, Magnolia Lake, and streams between lakes). SMZ width was set at 200 feet throughout the drainage of the North Fork Black Creek, which has been designated as an OFW. SMZs were also delineated around each of the lakes at the south end of CBJTC as well as a small portion of the south shore of Kingsley Lake.

In most cases, the SMZs include both primary and secondary SMZs, which vary in the types of operations that are allowed or not allowed in them (see management criteria below). Primary zones are applied to OFWs, ONRWs, Class I Waters, wetlands (in some cases), and perennial streams, lakes and sinkholes. Primary zone widths range from 35 to 200 feet on either side of the waterbody, and have significant timber harvesting restrictions. Secondary zones are applied to intermittent streams, lakes, and sinkholes; they can also be added along primary zones for added protection. The secondary zone is always a minimum of 35 feet wide on each side of the waterbody and can be as much as 300 feet.

A brief summary of the primary and secondary management criteria is provided below. For more information on SMZ management criteria, refer to FDACS's (2008) *Silviculture BMPs Manual*.

#### **Primary Zone Management Criteria**

- Clearcut harvesting is prohibited except for special conditions described in the *Silviculture BMP Manual*. Clearcut harvesting is always prohibited within 35 feet of all perennial waters and within 50 feet of all waterbodies designated as an OFW, ONRW, or Class I Water.
- Selective harvesting may be conducted to the extent that 50 percent of a fully stocked stand is maintained. The residual stand should conform to the specific criteria in the *Silviculture BMP Manual*.
- Trees within stream channels or on the immediate stream bank should not be harvested.
- Special emphasis should be given to protection of very large trees and/or old trees, snags, cavity trees, and trees where any part of the canopy overhangs the water.

- The following are prohibited: mechanical site preparation; loading decks or landings and log bunching points; main skids or new road construction except to approach a designated stream crossing; aerial application or mist blowing of pesticide; cleaning spray equipment or discharging rinse water from pesticide or fertilizer applications; site preparation burning on slopes greater than 18 percent; and no plowed pre-suppression fire lines.

#### **Secondary Zone Management Criteria**

- No timber harvesting limitations exist within the secondary zone.
- The following are prohibited: mechanical site preparation; main skids or new road construction (except for stream crossing), loading decks or landings; site preparation burning on slopes greater than 18 percent; and no plowed pre-suppression fire lines.

#### **4.3.4 Management Guidelines**

In general, water resources are managed through conservation and impact avoidance. Although water quality monitoring is not required, it is a good way to measure ecosystem health. Land-based environmental degradation eventually affects water quality and aquatic ecosystems. The following strategies are implemented to ensure compliance with regulations and to protect and enhance water resources at CBJTC.

- Maintain riparian zones and SMZs around water resources in accordance with FDACS's (2008) *Silviculture BMPs Manual* (see **Section 4.3.3** above).
- Adhere to BMPs for construction and forestry activities as described in applicable manuals and CBJTC SWPPP and SPCCP (see **Section 4.2.1**).
- Do not allow vehicles within known wetland areas, unless on established roads and crossings.
- Restrict vehicles from within 30 feet of water resources except where established crossings and roads exist.
- Review operations and maintenance programs that potentially affect water resources, and develop procedures and guidelines to avoid the loss of function.
- Consult with CBJTC-ED prior to initiating projects with the potential to disturb water resources as far in advance as possible; permits are necessary for projects that result in temporary and/or permanent impacts (see **Section 4.3.2**).
- Avoid the net loss of size, function, or value of wetlands and modification of floodplains and wetlands where there are practicable alternatives. Where no practicable alternatives exist, obtain an ERP and mitigate unavoidable impacts on wetlands and water resources functions.
- Minimize the amount of impervious surfaces in newly developed areas.
- Manage invasive species to promote desirable native species.
- Minimize the use of pesticides and herbicides, and adhere to the NPDES Florida Pesticide Generic Permit (see **Section 4.3.2**).

## 4.4 Vegetation Management

**GOAL VE:** Manage vegetation to provide a variety of habitats to support the military mission, maintain native species, provide a sustainable forestry program, and enhance wildlife habitat

OBJECTIVE VE1: Provide a balanced and continuous array of forest types for both military training purposes, rare species, and wildlife habitat, including natural and plantation pine stands with open understories, natural mixed hardwood and pine-hardwood uneven-aged stands, and sandhill communities (from FRMP).

OBJECTIVE VE2: Maintain sustainable and even-flow revenue from harvest of forest products and other resource uses, primarily from the land base that already exists as plantations and natural stands that are in the process of being converted to plantations (from FRMP).

OBJECTIVE VE3: Maintain and enhance stand conditions favorable for RCW cluster sites and foraging habitat and for other threatened and endangered species (from FRMP).

OBJECTIVE VE4: Restore formerly mined lands that DuPont has returned to CBJTC (from FRMP).

OBJECTIVE VE5: Practice preservation management in ecosystems along, and around, waterways, with SMZs that meet or exceed Florida standards for BMPs (from FRMP).

OBJECTIVE VE6: Maintain and restore riparian and wetland habitat to benefit rare species, wildlife, and water quality.

OBJECTIVE VE7: Maintain and restore scrub habitat to benefit rare species, wildlife, and soil stabilization.

OBJECTIVE VE8: Conduct a vigorous prescribed burning program, as the weather allows, that will reduce wildfire hazards, enhance and improve military training, promote natural ecological processes and functions, improve wildlife habitat primarily for sensitive, and support continued recreational hunting (from FRMP).

OBJECTIVE VE9: Monitor the results of habitat management efforts, appropriate to the management objectives and projects completed for a given area.

OBJECTIVE VE10: Manage and, preferably, eradicate invasive, non-native plants to minimize their impact on CBJTC native species and ecological integrity.

OBJECTIVE VE11: Maximize native plants and avoid invasive non-native plants in landscaping and revegetation projects.

OBJECTIVE VE12: Minimize chemical and maintenance inputs during grounds maintenance.

Vegetation management includes riparian and forest management, fish and wildlife habitat management, and rare species habitat management. There is a significant overlap in the objectives and management strategies within this section and all other sections within the INRMP, which is indicative of the essential role vegetation plays in ecosystems and in natural resources management. The ecosystem

### ***Primary Regulatory Drivers***

- SAIA
- AR 200-1

management approach used at CBJTC incorporates multiple techniques including prescribed fire (see **Section 4.5**), forestry, and invasive plant control (see **Section 4.8**) to help maintain the habitat mosaic.

The majority of vegetation on CBJTC includes dense forests of wetland hardwoods that gradually change to extensive flatwoods of natural and planted pine, which ultimately grade into deep sandhill habitats dominated by longleaf pine or turkey oak. The desired future condition of CBJTC is to have vegetation appropriate to the soils and hydrology found within the natural ecosystem. All river, lake, and creek systems will be surrounded by functioning riparian zones, continuous throughout a watershed and connected to other watersheds by mixed species corridors. Pinelands will be a mosaic of mature flatwoods, mixed hardwoods stands, and pine plantations. Some existing plantations around RCW or other critical habitat zones will be restricted to only thinning, with a larger average diameter. Xeric habitats, primarily sandhill, will include both open longleaf pine and mixed pine-oak stands, with a substantial reduction in the moderately high densities of turkey oak that currently occupy many areas. Existing sand pine plantations will slowly be phased out and replanted with longleaf pine. The driest habitats will be scrub. Fire will be regularly applied throughout these habitats, as well as in many of the pineland and upland stands. See **Section 2.3.2** for a detailed discussion of vegetation communities on CBJTC. Rare communities found on CBJTC include sandhill (GS/S2), scrub (G2/S2), upland mixed woodland (G2/S2), and wet prairie (G2/S2).

#### **4.4.1 Historic Vegetation**

Following the clearing of most of the original forests in northern Florida in the late 1800s and early 1900s, repeated burning, extensive grazing, and turpentine operations kept much of the land open for extended periods of time (FLNG 2005). Eventually, natural regeneration produced the extensive secondary forests that covered CBJTC when it became a training site in the 1940s. In the decades that followed, many of the second growth stands developed into the older natural stands that cover much of CBJTC today.

Beginning in 1952, timber harvesting again became a major management activity at CBJTC with products including fence posts, hardwood timber, veneer, pulpwood, sawlogs, and poles. In 1962 the first documented forest management plan for CBJTC was developed for projected activities and levels of harvest that would likely be necessary for a sustained yield of forest products. Those levels were generally followed over the last 50 years, except for large harvests in 1967, 1968, 1983, and the early 1990s. Revenue from past timber cuts has supported many CBJTC operations, and sustained yield in forest products revenue is important for the continued support of these operations.

Since the early 1950s, harvesting has been conducted almost completely in naturally regenerated stands, and cutover sites have been historically restored with plantations of slash pine, but are now being restored with longleaf pine. Various combinations of broadcast seed or natural regeneration from seed trees or shelterwood overstories have also been used on several sites.

#### **4.4.2 Forestry Program**

There is an active forestry program on CBJTC, which is presented in detail in the FRMP (FLNG 2005) included as **Appendix F**. For planning purposes, CBJTC is divided into four management units (North, East, Kingsley, and South) and 119 composite stands. Timber management is concentrated in forest types with a substantial pine component (for economic efficiency) and avoids both the very poorly drained (for



water protection) and very well drained (because of low productivity) habitats. Timber production for commercial harvest is concentrated on slightly more than 12,000 acres that are currently covered by slash pine and longleaf pine plantations, or have been recently regenerated using seed tree methods. Locations of these plantation areas, as well as all other stands, are presented in the FRMP. The current plantation acreage will remain roughly the same in the future with slight adjustments to allow the conversion of certain plantations back to natural stands and still maintain constant plantation acreage. There are certain plantation acreages that are being shifted to new areas to allow those plantations to be thinned and converted into pseudo-natural stands for the RCW.

Plantation management is based on 40-year rotations with intermediate thinning at roughly 20 and 30 years into the rotation. Management practices include site preparation that relies on chopping, burning, and herbicide control of competing vegetation rather than the more intensive bedding practice used in much of northeastern Florida. FLARNG attempts to use prescribed fire and other non-chemical techniques as a first priority. However, occasionally herbicide application is necessary as a forestry management technique for pine release. Herbicide is only used to reduce competing vegetation as a last resort. Some years no herbicide usage is necessary for pine stand management, while during other years larger blocks of land may undergo herbicide application.

Regular prescribed burning schedules will reduce the dense understory that has developed in many forest stands. Slash pine plantations on suitable sites will be selectively harvested to maintain a base longleaf pine residual stand, and then underplanted with longleaf pine to restore native vegetation. Revenue from other forest management activities such as thinning hardwoods in RCW foraging habitat, or salvage harvest will be considered supplemental to the basic timber management plan. All other stands (approximately 70 percent of the forests) will be regenerated naturally and will be the primary resource for meeting forest management objectives, such as thinning natural pine and mixed pine-hardwood stands to enhance RCW habitat, improving military training functions, implementing salvage operations to limit fire damage or beetle outbreaks, or converting turkey oak dominated sandhills to longleaf pine ecosystems.

In general, longleaf pine is the species of choice for timber on CBJTC. This is due to several reasons. Longleaf pine was the dominant native pine species on CBJTC, and it has a higher resistance to prescribed fire and bug damage. Stands will be evaluated on a site by site basis for species recommendations in replanting. There are conditions when other species are more appropriate.

#### **General Guidelines for Forestry Program**

- Implement *Silviculture BMPs Manual* (FDACS 2008b) during all forestry operations.
- Minimize soil erosion during harvesting by using selective harvesting as a primary harvesting method.
- Clearcut harvests in individual stands will be limited to a maximum size of 100 acres in almost all situations (the only exception being some specific sand pine harvests). Where stands are larger than 100 acres, they will be either subdivided into smaller cutting units by leaving residual buffer strips between cutting units, or they will be split into smaller units for harvesting.
- Do not clearcut outside plantation areas or where there are multiple habitat types
- Avoid wetland firebreaks when possible.

- Do not suppress fires in wetlands unless the organic matter poses a risk of long-term smoldering and smoke management.
- When fireflow lines must be used, reworking harrowing will lessen the impact to the landscape.
- Prevent conflicts between forest management and training activities by yearly coordination of forest management activities and training activities.
- Create connections or linkages between isolated wooded areas using riparian corridors, shelterbelts, and by planting trees in open areas surrounding forest patches.
- Minimize permanent clearings within existing large forest patches, and locate roads where they will not disconnect adjacent tracts of forest or impact riparian zones and streams.

#### **Guidelines for Forestry to Benefit RCW (see Section 4.7)**

- In all clearcut areas near RCW cluster sites or within foraging ranges, small clumps of mature trees will be retained in scattered locations to provide large, older trees within the stand for possible future RCW colonization.
- Plantations that provide RCW foraging habitat will only be periodically thinned and will gradually be converted to mixed-age stands. Approximately 2,000 plantation acres will be removed from the timber production base for this purpose, and will be replaced with conversion of 1,900 acres of mixed pine and pine hardwood stands to plantations. These conversions are located outside all RCW cluster buffer zones of ½ mile (500 acres). Natural pine stands in some of the RCW management areas provide sufficient foraging habitat and plantations within those RCW circles will continue to be managed as plantations.
- As long as an RCW cluster has 200 acres of high quality forage within the ½-mile buffer zone (500 acres), the remainder of the buffer zone can be actively managed for wood production using a modified clearcut harvest. A modified clearcut involves a heavy thinning to 25 – 35 square feet of basal area. The harvest will be accomplished in the form of a low thin, removing first the smaller diameter trees, but leaving the residual trees mainly in longleaf pine. This procedure is similar to a slightly less intense shelterwood cut. The remainder of the trees will be high quality, large diameter trees of a basal area still suitable for RCW forage. After a year, a light site preparation involving mainly raking is undertaken and the stand is underplanted with longleaf pine at around 300 to 500 trees per acre.

#### **4.4.3 Restoration and Management of Longleaf Pine in Flatwoods**

Due to the history of harvesting, overharvesting, and replanting with unsuitable pine species, CBJTC is currently undergoing a long-term, large-scale restoration of longleaf pine forest over more than 50 percent of the facility. Restoration is primarily occurring in the flatwoods (approximately 15 percent of CBJTC) and sandhills (approximately 20 percent of CBJTC) areas, although some will also occur on the former DuPont mining leases (TAs MA1, MA2, S11, S12 and S13). While there is still some longleaf pine throughout the flatwoods, some stands will require more significant input to restore longleaf pine as the dominant tree species, while others may only require minor, but strategic efforts (e.g., prescribed fires) to encourage natural recovery.

- **Natural Stands:** Composite stands that are predominately of natural origin will be maintained with their natural uneven-age or several-age structure. At cutting cycles of approximately 25 years, stand density will be reduced to basal areas between 60 and 80 square feet (sq-ft) per acre. These periodic removals will be used to maintain favorable densities for RCW foraging habitat where necessary, and to open all stands sufficiently for development of some natural regeneration. There are currently very few natural stands with average densities above 70 sq-ft of basal area, so these uneven age cutting cycles will not provide any substantial supplemental revenue in the near future. Removals should be across the range of stand diameters and species, except where RCW requires retention of large diameter trees or other objectives call for favoring particular species, such as longleaf pine. Specific guidelines will be developed for each composite stand based on stand-specific inventory information. Prescribed fire will be used on approximately 3- to 5-year cycles.
- **Plantations:** Most existing plantations will continue to be managed as even-age stands for timber production with a rotation age of around 40 years. This provides the opportunity for intermediate thinning (at ages 20 and 30 years), which will favor production of higher value trees for final harvest than in typical pulpwood rotations. Stands with large trees will also provide longer periods of tree cover between clearcuts than with short rotation pulpwood management. The open stand structure with large trees will benefit wildlife species that favor overhead tree canopies for cover or foraging as well as military training exercises that require such conditions.

#### 4.4.4 Restoration and Management of Longleaf Pine in Sandhills

Approximately 32 percent of CBJTC has well-drained to very well-drained sandy soils characteristic of higher points on the central Florida ridge, which support upland plant communities varying from longleaf pine-turkey oak-wiregrass to sand pine to xeric oak scrub. Due to the absence of fire and historical overharvesting of longleaf pine, turkey oak now dominates many of these sandhill areas.

On the North, Kingsley, and East Management Units much of this restoration will occur concurrent with regeneration in adjacent stands. The South Post of CBJTC will be the main focus for large scale longleaf pine restoration. Recent clearing of large sand pine stands in southern CBJTC has allowed for restoration of longleaf pine. A systematic reduction of turkey oak on South Post through natural, chemical, and harvest methods whenever possible will be undertaken. This will decrease the hardwood competition in these stands and allow for a release of the current stock of longleaf seedlings and saplings present. Underplanting will be used where necessary to boost the number of longleaf trees per acre to acceptable stocking levels. Fire will be used to control future hardwood resurgence and resprouting from the remaining root stock.

##### Strategies for Sandhills Restoration

- **Sand Pine Stands:** Harvest and remove on a large scale existing sand pine stands while retaining any volunteer or original longleaf pines. This operation is dependent upon market fluctuations and may not always be a viable option. After a harvest there is generally 10 to 40 longleaf pines left per acre. Stands will sit for two to three years to allow the sand pine to recolonize. The stands will then be burned and/or chopped, and finally replanted with containerized longleaf pine.
- **Turkey Oak Stands:** Harvest turkey oak dominated stands. This operation is again largely dependent upon the available markets and may not be an option. These stands are generally

underplanted with containerized longleaf pine seedlings if natural regeneration is less than 200 longleaf pine seedlings per acre. Combinations of fire and herbicides (primarily hexazinone, spot applied to control turkey oak sprouts) will be used either for site preparation or after planting to ensure seedling establishment. As mentioned above, herbicide applications are only used as a last resort when fire or other nonchemical methods do not sufficiently control competing vegetation.

- **Other Areas:** Areas where a certain amount of canopy is necessary at all times allows for a higher tree per acre underplanting of containerized longleaf pine. As the longleaf pine seedlings begin to grow and form an independent canopy, the original stand of turkey oak or sand pine will be controlled by whichever method is the most efficient, with a priority placed on nonchemical methods first: harvest, fire, or herbicide.

#### 4.4.5 Restoration of Former DuPont Mining Lease

Mining activities on CBJTC began in the late 1940s and have been concentrated on the western boundary of the property (TAs MA1, MA2, S11, S12 and S13). E.I. du Pont Nemours and Company (DuPont) renewed earlier lease agreements in 1968 for mineral sand mining and most recently for mineral extraction. Mining activities at CBJTC ceased in 2008. As DuPont finished mining an area, they conducted reclamation to the level required by regulators at the time, which varied depending on when the original mining occurred. Some of these areas were not rehabilitated at all and are essentially sand dunes. Other areas are still being rehabilitated by DuPont, primarily with slash pine. With the expiration of these leases, CBJTC has taken on a significant management effort to complete restoration of these areas to longleaf pine over the long term (i.e., 40 or more years). It is unreasonable to expect that pre-mining conditions can be obtained without the re-creation of a hardpan and the moisture properties that a broad, relatively impervious soil horizon gives to the environment.

Beginning in 2004, CBJTC undertook a program to restore the ecologically sterile areas from the rehabilitated DuPont mining lease known as the DuPont Dunes. Taking advantage of abundant organic material after the hurricanes in 2004 and 2005, CBJTC placed chipped organic debris on the dune areas. The long-term goal is to create pine plantations in most of these areas. Depending on the rate the mulch breaks down, this may take as long as 10 years. These new plantations could eventually replace acreage lost to RCW management in other areas of CBJTC. Currently some areas are planted in unsuitable pine species; species selection for new plantation areas will take into account soil condition and hydrology.

These severely disturbed lands should also be considered a suitable choice for high impact activities such as tracked vehicle operations, rather than disturbing other areas.



**Guidelines for Restoration of DuPont Mining Leases**

- Place 18 to 24 inches of organic mulch and periodically disk into the sand to rebuild organic content and begin plant colonization process.
- Annually monitor areas with applied mulch for invasive plant infestation.
- Once soil condition has improved, introduce wiregrass and other herbaceous plants to assist with reestablishing a fire regime.
- Plant pine species suitable for the soil condition and hydrology, with an emphasis on longleaf pine.
- Evaluate the utility of mimicking scrub habitat in some of these areas to stabilize soil and provide wildlife habitat.
- Evaluate the utility of saw palmetto in the restoration and management of these areas.
- Once sufficient vegetation is established, initiate prescribed fire program to further natural regeneration.

**4.4.6 Scrub Management**

Scrub habitat covers approximately 3 percent of CBJTC. Scrub habitat on CBJTC is the northernmost example of interior scrub, an endangered plant community that is endemic to peninsular Florida. Three species, in particular, are dependent on the scrub ecosystem: the Florida scrub-jay, Curtiss' milkweed, and little ladies'-tresses, as well as many lichens and bryophytes.

The scrub vegetation community is usually dominated by shrubby oaks and/or Florida rosemary, often with an overstory of scattered sand pine. This habitat occurs at higher elevations, on well-drained, infertile, sandy soils. Scrub is a fire-dependent ecosystem that is adapted to periodic destruction by fire only to increase in stature until the next fire. Its physical structure and appearance varies with the length of time since the last fire. Infrequent fires, occurring once every 5 to 100 years, maintain scrub habitat.

**Guidelines for Scrub Management**

- Use prescribed fire and mowing for maintenance of scrub habitat. Conduct prescribed burns (from February to July) in selected units to deter the invasion of off-site plants. Target burn parameters so as to encourage a mosaic effect. Never mow or burn the same area two years in a row.
- Allow prescribed head fires to burn into wetlands and die out naturally. This will maintain the natural variability. Head fires leave some areas intensely burned, some areas lightly burned, and some unburned, creating the habitat mosaic that ensures the survival of all scrub species.
- Monitor indicator species (i.e., Florida scrub-jay, Curtiss' milkweed) annually in scrub habitat in coordination with FFWCC.
- Manage, and eradicate if possible, invasive non-native plant and animal species.

#### 4.4.7 Riparian and Wetland Management

Approximately 22 percent of CBJTC is covered by wetland and riparian habitat. Riparian zones are also important habitats for wildlife because the vegetation they support is often unique and very diverse. Due to the linear nature of riparian zones, they also tend to be used as travel corridors by wildlife. Composite stands that occupy cypress domes, hardwood or bay swamps, very poorly-drained pine-bay habitats, or other wetland habitats will be managed for protection of water resources and wildlife that occupy those habitats.

At CBJTC, SMZs have been designated around streams, lakes, and other waterways (see **Section 4.3.3**). The SMZs essentially protect riparian and wetland habitat on CBJTC during forestry operations. Military activities are also generally limited in these areas. Refer to **Section 4.3** for more details on water resources protection and management, including guidelines for protecting water quality. The guidelines presented here are specific to the vegetation management in these areas.

##### **Guidelines for Riparian and Wetland Habitat Management**

- Prescribed burning in adjacent stands will be allowed to burn into pine-bay stands whenever possible in order to reduce the extensive fuel loads and dense understories that have developed in those transitional communities in the absence of fire.
- Harvesting will only be used to meet objectives other than timber production, and in those situations it will be conducted as partial harvests followed by natural regeneration.
- Mechanized operations will be prohibited from causing adverse impacts, such as sediment loading in adjacent wetlands and watercourses.

#### 4.4.8 Vegetation Management in Direct Support of Military Training

As described in the Range Complex Master Plan (FLNG 2011b), there are some vegetation management requirements specific to certain types of military training infrastructure. Vegetation management for these purposes is primarily accomplished through the ITAM Program. In general, key training areas should be maintained as open areas with little to no encroachment of woody species. The condition of training infrastructure is monitored by the ITAM program.

##### **Guidelines for Vegetation Management for Military Training**

- **Artillery Firing Points (AFPs):** AFPs requiring re-vegetation will need to be planted in either the winter or spring of the designated year, depending on the type of seed (native vs. non-native). If a firing point needs to be enlarged, ITAM personnel will coordinate with CBJTC-ED for the protection of the listed imperiled species. Enlargements are also coordinated with forestry operations to clear harvestable timber from the area.
- **Landing Zones (LZs) and Weinberg Drop Zone (DZ):** LZs and the DZ should remain fairly level without eroded pits from rotorwash. Woody species should be removed with herbicide treatment when uptake of the chemical by the plants is at its highest rate (during the summer months, typically May-July). LZ's requiring revegetation will need to be planted in either the winter or spring of the

designated year, depending on the type of seed (native vs. non-native). Topsoil is generally spread in rotor wash created cavitations during the winter months when heavy equipment is more readily available.

- **Dismounted Training Areas:** Established pine stands should be burned on a 3 to 5-year rotation to maintain an open understory for military training (see **Section 4.5** for more on the wildland fire program). Where practical and necessary, treatments such as mechanical thinning and herbicide treatment may be used to reduce the understory.
- **Trails:** Trails should be maintained so as not to become soft and should remain relatively free of potholes. Trails maintained by the ITAM program have a firm surface to reduce the frequency of mired vehicles, using limerock and similar substrates. Potholes and undercut areas should be maintained regularly for safety and to prevent degradation of trails.

#### 4.4.9 Landscaping and Grounds Maintenance

Landscaping and grounds maintenance on CBJTC are limited to the Cantonment Area, with some grounds maintenance within range areas. All landscaping and ground maintenance activities must follow the IPMP (FLARNG 2017). The following recommended landscaping practices should benefit the environment and generate long-term cost and maintenance time savings. The use of native plants not only protects biodiversity and provides wildlife habitat, but it can also reduce demands for fertilizer, pesticides, and irrigation and their associated costs.

##### **Guidelines for Landscaping and Grounds Maintenance**

- Plant shelterbelts of trees around the borders of parking lots and near buildings. Shade trees will decrease energy use by the facilities and lessen heat island effects of large parking lots. Choose shrubs and trees that provide food and cover for wildlife, with preference for native species. Shrubs should be spaced about 4 to 6 feet apart; and trees approximately 10 feet apart. To create shelterbelts, plant several rows of larger trees, smaller trees, and shrubs with rows about 15 feet apart.
- Where possible and when installing new landscaping, select native plants suitable to the site. Native plants suitable for planting in Florida are available at <http://www.fnps.org/plants> and additional guidance is available in *The Florida Yards & Neighborhoods Handbook* (IFAS Extension 2015) [floridayards.org/landscape/The\\_Florida\\_Yards\\_and\\_Neighborhoods\\_Handbook\\_Web.pdf](http://floridayards.org/landscape/The_Florida_Yards_and_Neighborhoods_Handbook_Web.pdf).
- Follow the nine Florida-Friendly Landscaping Principles (<http://fyn.ifas.ufl.edu/>): (1) Right Plant, Right Place, (2) Water Efficiently, (3) Fertilize Appropriately, (4) Mulch, (5) Attract Wildlife, (6) Manage Yard Pests Responsibly, (7) Recycle, (8) Reduce Storm Water Runoff, and (9) Protect the Waterfront.
- Maintain the nature trail in the Cantonment Area to minimize erosion and vegetation encroachment and provide for non-vehicular access between different areas.
- Maintain designated conservation areas to protect wetlands, endangered species, and cultural resources.

## 4.5 Wildland Fire Management

**GOAL FI:** Implement a wildland fire program that minimizes safety concerns and wildfire risk, enhances the military mission, benefits rare species, protects cultural resources, and maximizes habitat management and ecological benefits.

OBJECTIVE FI1: Implement all protocols and requirements of the IWFMP.

OBJECTIVE FI2: Ensure no deaths, injuries, property losses, or road closures occur because of wildland smoke or fire, including off-post property damage (from IWFMP).

OBJECTIVE FI3: Maintain or improve quality of training lands (from IWFMP).

OBJECTIVE FI4: Manage fuel loads by implementing dormant season burns in units with high fuel loads and conducting maintenance burns during the growing season (from IWFMP).

OBJECTIVE FI5: Coordinate and cooperate with other federal, state, local agencies, and directorates within the installation as needed (from IWFMP).

OBJECTIVE FI6: Use wildland fire to manage habitat for rare species, in particular the RCW.

OBJECTIVE FI7: Maintain and restore habitat using appropriate fire return intervals and growing season prescribed fire.

Fire is a natural process in Florida's vegetative communities and has been a major factor in ecosystem and vegetation development at CBJTC. Recurrent wildland fire is important for maintaining the majority of Florida's habitats including the longleaf pine/wiregrass, sandhill, flatwood, and scrub habitats on CBJTC, which are critical for many rare species. The IWFMP (FLNG 2011a) is the primary planning tool for the wildland fire program and presents the program in detail. This section of the INRMP is meant to integrate with the rest of the natural resources program and provide a summary of the wildland fire program, particularly fire ecology and prescribed fires, and associated guidelines.

### ***Primary Regulatory Drivers***

- SAIA
- AR 200-1
- Florida Prescribed Burning Act (Section 590.125 of F.S.)
- FAC 5I-2 (Open Burning)

The IWFMP lays out specific guidance, procedures, and protocols for the prevention, detection, and suppression of wildfires and the planning and operating procedures involved with prescribed burning on CBJTC. Its purpose is to convey the methods and protocols necessary to minimize wildfire frequency, severity, and size, while conducting beneficial prescribed burns and supporting the military mission. The IWFMP also defines the responsibilities of all offices, departments, and agencies involved. FFWCC plays a significant role in the wildland fire program, as well as managing wildlife, on CBJTC. A copy of CBJTC IWFMP is included as **Appendix G**.

Wildfires are typically controlled across most of CBJTC, although they are allowed to burn through the Impact Area due to the presence of UXO. Prescribed fires are used for fuel reduction to prevent intense wildfires, reduce hardwood competition, enhance wildlife forage, and promote native rare species habitat.



### 4.5.1 Fire Ecology

Approximately 63,200 acres or 85 percent of CBJTC is covered by natural vegetation communities and other land cover types (e.g., pine plantations) that require frequent prescribed fire to maintain vegetation composition and structure and to reduce fuel loads for protection against large, intense wildfires (see **Table 13**). Additionally, 655 acres or 1 percent of CBJTC requires rare to occasional prescribed fire. Historically, most wildfires occurred during the dry summer months, usually from May to early July. The most common natural source of ignition was lightning from summer thunderstorms.

<b>Table 13. Fire Intervals for Vegetation Communities Requiring Regular Fire within CBJTC</b>			
<b>Community / Land Cover Type</b>	<b>Natural Fire Frequency</b>	<b>Acres</b>	<b>Percent Cover</b>
Sandhill	Frequent fire (1 to 3 years)	14,997	20
Mesic Flatwoods	Frequent fire (2 to 4 years)	8,134	11
Upland Mixed Woodland	Variable fire interval (2 to 20 years).	9,418	13
Dry Prairie	Frequent fire (1 to 3 years)	2,041	3
Scrub	Rare to occasional fire (5 to 100 years)	340	0.5
Wet Flatwoods	Frequent fire (2 to 4 years) for grassy wet flatwoods and 5 to 10 years for shrubby wet flatwoods	10,480	14
Wet Prairie and Bog	Frequent fire (2 to 3 years)	1,175	1.5
Tree Plantations	Frequent fire (3 to 5 years)	85	22
<b>Total Land Requiring Regular Fire</b>		<b>63,207</b>	<b>85</b>
<i>Note:</i> CBJTC GIS Boundary equals approximately 73,764.			
<i>Source:</i> FNAI 2010a, 2010b			

Approximately 64,000 acres of CBJTC require prescribed fire at varying intervals. However, the majority of CBJTC, which includes established pine stands, sandhill, and flatwoods, should be burned on 3 to 5-year fire return intervals. To maintain this schedule, 11,000 to 18,000 acres must be burned annually, preferably in large blocks for efficiency. This is accomplished by burning with aerial ignition and including 8 to 10 personnel from multiple CBJTC offices and FFWCC. This burning schedule has been frequently disrupted by drought conditions or by intense hurricane activity. In general, fuel models present on CBJTC include (see **Appendix G** for fuel model descriptions):

- Fuel Model 1 – short grass--- prairie or savanna
- Fuel Model 2 - grass under timber—grass with some small shrub component with pine overstory
- Fuel Model 3 – high grass—cogongrass
- Fuel Model 4 - heavy rough—high shrub with dead limb wood, scrub
- Fuel Model 6 – brush with slash --- hardwood shrub with pine slash residues
- Fuel Model 7 - southern rough—Palmetto/gallberry under pine overstory

- Fuel Model 9 - blowy leaf—loose hardwood litter under closed canopy
- Fuel Model 10 – light logging slash --- timber decks

Fuel levels were estimated during the 2009 growing season. A fuel level map is provided in Figure 7 of the IWFMP (see **Appendix G**).

#### **4.5.2 Wildland Fire History on CBJTC**

Historically, the only fire management on CBJTC was fire suppression with little to no prescribed fire. As a result, a large build-up of fuels occurred over much of CBJTC. This fuel build-up still poses a problem for the wildland fire program on CBJTC. Heavy fuels not only make prescribed fires more difficult, but create much more dangerous wildfires when they inevitably occur. When CBJTC was formed and the military began to train, human fires became another common source of wildfire ignition. The military uses many pyrotechnic devices that can be ignition sources. CBJTC is a year-round training facility and wildfire starts can occur during the entire year. Annual Training events have a marked increase in troop activity, typically in the summer, and therefore a marked increase in military started wildfires. Beginning in the early 1990s, a prescribed burn program was implemented with the goal of returning the historic fire return interval to CBJTC. While the initial efforts focused on dormant season burns to reduce fuel loads, growing season burns have become a larger part of the program. In the last ten years, there are typically 5,500 to 14,000 acres burned each year.

#### **4.5.3 Prescribed Fires**

The single most important tool for managing the natural resources at CBJTC is prescribed fire. Most CBJTC habitats need regular prescribed burning to maintain forest composition and structure, and to reduce fuel loads for protection against large, intense wildfires. Prescribed fire is also essential for RCW management. The objective of the fire management program is to eventually conduct most prescribed burning during the growing season, except where winter burns may meet other objectives. Winter burns will be necessary initially to reduce thick understories and high fuel loads, and to meet annual burning targets. Growing season burns will be favored on sites where understory fuel loads are low enough to avoid intense fires and mortality in the mature pines. Objectives for prescribed fires include:

- |   |                                   |
|---|-----------------------------------|
| • Ecological Management                                 | • Improvement of Wildlife Habitat |
| • Fuel Reduction for Wildfire Protection                | • Training                        |
| • Maintenance and Restoration of Fire Dependent Species | • Research                        |
| • Control of Forest Diseases and Insects                | • Enhance Appearance              |
| • Site Preparation for Reforestation                    | • Improve Access for Military     |
| • Piles (Logging Debris)                                | • Military (Ranges)               |

The first priority for prescribed fire is all composite pine stands, natural or plantation, which fall within RCW foraging habitat. The primary burning objectives are reduction of understory vegetation and the promotion of diverse herbaceous groundcover. In stands that have experienced a recent fire, growing season burns will be favored once dense palmetto and other shrubby vegetation is maintained at low densities and less than 3 feet in height. Burns in late spring and early summer also serve to encourage desirable groundcover

vegetation such as wiregrass. Burning in RCW areas will require special protection of cavity trees by mowing around and/or raking fuels away from each tree and igniting around the cavity tree prior to the fire's arrival. Thus, causing the fire to burn away from each tree when it is low intensity, rather than burning to the tree with high intensity and igniting the pitch on the side of the trees.

The second priority for understory burning will be those stands that were thinned during the previous year. The primary objective is to reduce brush that sprouts after thinning and residual slash left from the thinning.

Burning will generally be prescribed for large blocks that contain several complete or partial composite stands rather than for single composite stands. Although most blocks will be ignited with conventional drip torches (hand-held or mounted on 4-wheel drive vehicles), very large blocks may also be burned with helicopter ignition using delayed aerial ignition devices ("ping-pong" balls).

There are 49 burn units on CBJTC designed to facilitate burn planning, mapping, and record keeping. Additional consideration was given to delineating burn units according to fuel conditions, natural community types, existing roads, and natural firebreaks (mostly creeks and bayheads). To support the burn units, each forestry stand was assigned a subjective burn priority ranging from one to four, with one being the most urgent, with a target of a four-year rotation among units. Overall, 60 composite stands are ranked as Priority 1 stands; 82 are Priority 2 stands; 44 are Priority 3 stands; and 23 are Priority 4 stands.

Roads, natural barriers such as streams, and existing fire lines are used as primary fire lines, but new lines are also plowed where necessary to protect other stands or features, or to enhance burning logistics. Although plows may be necessary to initially create new lines, all plowed fire lines are maintained with discs rather than plows to avoid disrupting any natural drainage patterns. For prescribed fire, all considerations are made to use existing firebreaks. During a wildfire event, there are no restrictions of fire line placement. Placement is based upon urgency of suppression and actual fire behavior. If a new fire line is created it will be rehabilitated in a timely manner.

#### **4.5.4 Smoke Management**

Smoke is a significant constraint to the prescribed burn program on CBJTC. The greatest negative impact caused by prescribed burning is the potential for acute smoke impacts to the military and public, as well as regional impacts caused by releasing too much smoke into the airshed on a given day. Large quantities of smoke can cause health issues or visibility issues on major roads. State or county highways run along the edge of CBJTC on the east and south sides and are a major concern when affected by smoke created from a prescribed burn. Refer to Figure 3 of the IWFMP for smoke management concern areas within the vicinity of CBJTC (see **Appendix G**).

#### **4.5.5 Management Guidelines**

The following general wildland fire management guidelines should be implemented at CBJTC:

- Train at least four CBJTC personnel in habitat management prescribed fire techniques and maintain a sufficient crew of trained personnel.
- Allow patchiness (allow unburned areas to remain unburned) within burn units.

- Conduct prescribed burns during the growing season under low-humidity conditions.
- Coordinate the yearly aerial burn schedule and training activities with FFWCC in advance of each burn season.
- Conduct prescribed fires normally during the growing season and at least once every three years as weather, fuel conditions, and training area access allow. Missed burns will be scheduled in the growing season as soon as possible, but may require a return to dormant season burning until fuels are sufficiently reduced.
- RCW clusters are clearly marked by double white bands on each cavity tree and a plan should always be in place for their protection before a cluster can be burned. Flame length and fire intensity should be closely managed and monitored in the area around each cavity tree.
- When reasonable, allow wildfires to burn-out to existing lines
- The Impact Area sustains approximately one hundred wildfires a year. Several areas within the Impact Area are deemed too dangerous for direct suppression and therefore indirect attack and/or limited-action burns are used to contain these wildfires. When reasonable, prescribed fire is applied to “box-in” areas too dangerous for human entry to pre-contain potential wildfires.

#### 4.6 Fish and Wildlife Management

**GOAL FW:** Maintain fish and wildlife populations while minimizing potential impacts to the military mission.

OBJECTIVE FW1: Manage wildlife using a systematic approach that includes inventory, monitoring, management, and assessment.

OBJECTIVE FW2: Maintain populations of wildlife by providing healthy, diverse habitat types and corridors for movement between those habitats.

OBJECTIVE FW3: Maintain a sustainable wildlife harvest program using adaptive, ecosystem management.

OBJECTIVE FW4: Maintain fish species and suitable habitat in appropriate lakes.

OBJECTIVE FW5: Minimize wildlife-related health risks, safety risks, and environmental damage.

Fish and wildlife management at CBJTC is focused on maintaining and restoring natural habitats favorable for indigenous fish and wildlife in a manner consistent with the military mission and all applicable laws and regulations. There is sufficient habitat to support a healthy diversity of wildlife on CBJTC. The vegetation communities present on CBJTC and the active prescribed fire program support a high diversity of native wildlife and rare species (see **Section 4.7**). For a detailed summary of wildlife species and rare species, refer to **Sections**

##### ***Primary Regulatory Drivers***

- SAIA
- Migratory Bird Treaty Act
- AR 200-1
- FAC 68A (Freshwater Fish and Wildlife)
- Chapter 379, F.S. (Fish and Wildlife Conservation)



**2.3.3** and **2.3.4**, respectively. This section of the INRMP provides a summary of the hunting and fishing program and wildlife and game species management.

#### **4.6.1 Migratory Bird Birds**

The Migratory Bird Treaty Act (MBTA) prohibits, unless permitted by regulations, the pursuit, hunting, take, capture, killing or attempting to take, capture, kill, or possess any migratory bird included in the Migratory Bird Treaty, including any part, nest, or egg of any such bird (16 USC §703). The DoD has a MOU with USFWS pursuant to EO 13186 (*Responsibilities of Federal Agencies to Protect Migratory Birds*), which outlines a collaborative approach to promote the conservation of migratory bird populations. This MOU specifically pertains to natural resource management activities, including, but not limited to, habitat management, erosion control, forestry activities, invasive weed management, and prescribed burning. It also pertains to installation support functions, operation of industrial activities, construction and demolition activities, and hazardous waste cleanup. In February 2007, USFWS finalized regulations for issuing incidental take permits to the DoD for military readiness purposes. If any of the Armed Forces determine that a proposed or an ongoing military readiness activity may result in a significant adverse effect on a population of migratory bird species, then they must confer and cooperate with USFWS to develop appropriate and reasonable conservation measures to minimize or mitigate identified significant adverse effects (50 CFR Part 21).

DoD's policy is to promote and support a partnership role in protection and conservation of migratory birds and their habitat by protecting vital habitat, enhancing biodiversity, and maintaining healthy and productive natural systems on DoD lands consistent with the military mission. The Partners in Flight program is an umbrella network of which DoD's bird conservation program is a vital part. DoD works with the National Fish and Wildlife Foundation to develop cooperative programs and projects with other Federal, State, and non-governmental organizations. FFWCC is Florida's lead agency for the Partners in Flight Program. Migratory birds include species with at least some populations breeding in the continental United States and/or Canada, for example songbirds, shorebirds, waterbirds, and waterfowl. Attention has centered on migrants, since this group is experiencing steep rates of population decline. However, decreasing populations have also been observed in resident bird species, which do not migrate, and temperate-zone migrants, which only migrate within North America.

Camp Blanding includes several of the DoD Mission-Sensitive Species as residents or migrants, these species are managed under general policy and included in the CCAA.

DoD Mission-Sensitive Species relevant to Blanding:

Year-round residents:

- Bachman's Sparrow
- Northern Bobwhite
- Southeastern American Kestrel
- Least Tern Atlantic Coast Population

Winter (non-breeding) residents:

- Henslow's Sparrow
- Rusty Blackbird

Migrant:

- Golden-winged Warbler

#### 4.6.2 Hunting and Fishing at CBJTC and Public Access

##### **Camp Blanding WMA**

FFWCC manages approximately four million acres of public hunting land throughout the state of Florida. In 1956, FFWCC entered into an agreement with FDMA, which established Camp Blanding WMA. This MOA was renewed in 2006 (see **Appendix I**). As described in **Section 3.6**, approximately 56,200 acres of CBJTC is managed by FFWCC as Camp Blanding WMA. FFWCC receives all revenues obtained from permits issued to hunt and fish on Camp Blanding WMA. In exchange, FFWCC provides assistance to CBJTC with prescribed burning activities, management of public hunts, operating hunter check stations to monitor harvests and collect biological data, assistance with rare species management, removal of litter from hunting areas, technical assistance regarding fish and wildlife, and hunting and fishing law enforcement.

Annually, FFWCC provides CBJTC with actual hunting dates and quotas for that year and projected hunting dates for a five-year period. Range Control works closely with FFWCC to try to accommodate these schedules. However, areas are subject to closure for military training activities at any time if deemed necessary to meet the military mission.

Each year, hunting recommendations for the area are made based on population levels and trends, habitat indices, and past harvests. Camp Blanding WMA regulations summary and map are updated annually by FFWCC. The hunting season regulations summary and area map brochure for 1 July 2012 to 30 June 2013 is available at <http://myfwc.com/hunting/wma-brochures/nc/camp-blanding/>. The permit, license and stamp requirements; hunting seasons; permit schedules; and general hunting and fishing regulations for CBJTC are the same as established for the State of Florida and WMAs generally. The Wildlife Code of the State of Florida (FAC 68A) is the final authority on hunting and fishing laws.

Hunting areas are designated within Camp Blanding WMA with different allowed activities and regulations: archery-only, still hunt area 1 and 2, and a dog hunt area. All hunting is by quota permits only (no cost) and offers big game, small game, and waterfowl hunting. Trapping is allowed in the still hunt areas. Quota permits are available by entering a FFWCC lottery in June for certain types of hunts (e.g., turkey hunts), while other quota permits are available on a first-come first serve basis at the designated check station on a daily basis. All quota permits are no cost. Hunter demand is measured by the number of quota hunt permits issued for the first four days and the second five days of the general gun season.

Hunter Check Stations are open and staffed during all deer and turkey hunts. Check station hours are one hour before sunrise to one hour after sunset during the archery, supervised youth, muzzle loading gun and general gun seasons. During spring turkey season the check station is open at 5 a.m. and closes at 1 p.m. The purpose of check stations at CBJTC is to collect biological data from harvested animals (weights, other measurements, etc.), record hunter pressure, distribute information such as hunt maps and brochures, and check hunters for proper permits upon entering the WMA. Because hunters must enter through designated gates, an absolute count of hunters using the area and game harvested is obtained. Check station operators do not have any law enforcement powers or duties.

The following public access requirements are in place when Camp Blanding WMA is open:

- When the area is open, hunting, fishing, wildlife viewing, and hiking are allowed. For purposes other than hunting, dogs are prohibited.
- Scouting is prohibited prior to open hunting seasons.
- Public access is prohibited in the artillery impact area and areas not open for hunting.
- Camping and the use of ATVs are prohibited.
- Vehicles may be operated only on named or numbered roads and only during periods open for hunting.
- Parked vehicles may not obstruct a road, gate, or fire line.
- No motor vehicle shall be operated on any part of any WMA that has been designated as closed to vehicular traffic.
- A marked footpath called the Florida Trail traverses the area. Persons accessing this trail must complete and return a no-cost daily trail permit at a trail entrance kiosk upon entering and leaving the trail (see **Section 3.7**).

#### ***Quota Permits for Camp Blanding WMA for Hunting Seasons***

Quota permits generated through FFWCC lottery

- Muzzleloading Gun – 200 for each of 2 hunts.
- Supervised Youth – 40 (no exemptions) for each of 2 hunts.
- General Gun Still Area 1 (first 9 days) – 200 for each of 2 hunts.
- General Gun Still Area 2 (first 9 days) – 200 for each of 2 hunts.
- General Gun Dog – 320 for each of 2 hunts.
- Youth Turkey – 35 (no exemptions).
- Spring Turkey – 35 for each of 2 hunts.
- Hog Dog Hunt – 60 for each of 2 hunts.

Daily quota permits offered on a first-come, first serve basis at the WMA check station

- Archery-only Area – 150, each day of the season.
- General Gun Still Area 1 (after first 9 days) – 200.
- General Gun Still Area 2 (after first 9 days) – 200.

- Unless exempted, all hunters on this wildlife management area must have the following in their possession and display them upon request: 1) Hunting License, 2) WMA Permit, and 3) Quota Hunt Permit.

### **Camp Blanding FMA**

Under a MOA between FFWCC and FDMA, Lowry and Magnolia lakes are open to the public for fishing (see **Appendix I**). Magnolia and Lowry Lakes are open on Sundays, Mondays, and all days that Still Hunt Area 2 is open for hunting from 30 minutes before sunrise to 30 minutes after sunset, except when closed for military training activities. Access to Magnolia and Lowry Lakes for fishing only shall be on Treat Road only, when allowed by CBJTC Range Control. A valid fishing license stamp is required for state residents between the ages of 16 and 65 when fishing on CBJTC. See FFWCC's current Freshwater Sport Fishing Guide and Regulations Summary at [www.fwc.com](http://www.fwc.com) for rules concerning exemptions and non-resident licenses, bag limits, and specific fish management area regulations.

The following public access requirements are in place when Camp Blanding FMA is open:

- All restrictions noted above for the WMA apply.
- All anglers will be required to check into and out of the area at a manned check station.
- Boat launching is permitted only at designated areas.
- Frogging is prohibited.
- All watercraft shall be operated at idle speed only.

### **Camp Blanding Rod and Gun Club**

Camp Blanding Rod and Gun Club, Inc. (Club) in coordination with CBJTC Range Control operates and maintains 21 hunting areas on CBJTC that are not included in Camp Blanding WMA. The Club is responsible for posting signs on all hunting area boundaries. All areas are open to hunting by Honorary Members and Registered Paying Members with spouses and immediate family members as identified in the current By-laws of the Club. The Club is also approved for fishing in the following areas: Blue Pond, Perch Pond, OP Pond, Capps Pond, and Long Pond. The Club ensures that hunting, fishing, and plot preparation only occur during those times as published in the MOA and during prescribed seasons as published by FFWCC.

## **4.6.3 Wildlife Habitat Management**



FFWCC is an important cooperating partner for wildlife management primarily as a result of the MOA that governs Camp Blanding WMA. FFWCC produces an annual report detailing wildlife management activities on CBJTC. FFWCC biologists: (1) develop, maintain, and analyze databases; (2) monitor selected species; (3) conduct and/or recommend habitat management activities that preserve or enhance the quality of these lands; and (4) recommend regulations to ensure perpetuation of game species. CBJTC personnel coordinate all wildlife management activities with FFWCC personnel.

***FFWCC Annual Report Data / Information***  
(see Annual Report for detailed information)

- A summary of rule changes from the establishment of the WMA in 1956 to the present.
- Annual hunting season summary including areas hunted within the installation, types of hunts, and harvest data.
- Wildland fire support summary includes acres burned by method and purpose (e.g., aerial burns, RCW management).
- Wildlife management support summary includes the number and type of nest boxes, RCW artificial inserts, and bat houses developed, cleaned and maintained; the acreage of wildlife openings planted in the spring and fall; and other assistance provided throughout the year (e.g., assistance with species surveys or studies on CBJTC).

Principal management tools used by FFWCC and CBJTC-ED are game and wildlife regulations and habitat enhancement. Annual surveys are conducted for deer, turkey, and RCWs. Formal bald eagle surveys are conducted by FFWCC periodically. Informal bald eagle surveys are conducted during prescribed burning aerial ignitions by CBJTC-ED staff when conditions allow. Habitat management includes prescribed fires, maintenance of wildlife openings, and placement of nesting structures. An RCW survey is conducted annually to determine the activity of each cluster, each cavity tree, and to identify the nest trees.

Wildlife management involves manipulating various aspects of an ecosystem to benefit chosen wildlife species. Management of these habitats is focused to benefit indigenous species, particularly threatened and endangered species, and game species. FLARNG will continue to manage the wildlife and its habitats at CBJTC, in conjunction with FFWCC, by implementing the strategies listed below.

- Leave snags, den trees, and fallen logs undisturbed unless they are a safety hazard. Snags are standing dead trees, while den trees are live trees with cavities in them.
- Protect large, unfragmented quality habitat as territory for viable wildlife populations. Configuration of protected habitats should conform to shapes that minimize edge-to-area ratios. Circular shapes are preferable in achieving this goal. Narrow, linear, or small-acreage habitats should be avoided if possible.
- Use prescribed fire to restore sandhill, flatwoods, and other natural and rare communities dependent on a regular fire interval for indigenous and rare species (see **Sections 4.4 and 4.5**).
- Allow some unburned areas to remain unburned. This increases diversity and benefits terrestrial carnivores (bobcat, fox, and black bear).
- Minimize continually burning areas in the dormant season. Frequent dormant season burns can reduce valuable cover. Growing season burns provide the best benefits for terrestrial

carnivores (bobcat, fox, and black bear) that use dense brush (palmetto) as den sites, foraging, and rest areas (Maehr et al. 2001)

- Maintain corridors between wetlands, lakes, and other waterbodies to provide for wildlife movement between areas.
- Minimize habitat fragmentation by minimizing land clearing, new road construction, and expansion of firebreaks and plow lines.
- Minimize the amount of herbicide used for invasive species control, particularly in or around surface waters and wetlands, by using mechanical methods to the extent possible avoiding impacts to fish and wildlife habitat.
- Limit mowing only to areas where it is necessary to implement the training mission.
- Conduct periodic surveys to assess native fauna populations.
- Maintain wildlife openings. FFWCC manages food plots throughout the installation; some of these openings were created naturally as a result of prescribed fire activities. FFWCC will sometimes plant native vegetation for wildlife in these openings after a burn. The military mission also generates natural wildlife openings through regular maintenance of open areas for training (e.g., LZs, AFPs, and the DZ).
- Clean and maintain nesting wood duck, eastern blue bird, and southeast American kestrel, boxes prior to the nesting season and monitor reproductive success periodically.
- Ensure problematic organisms are not transferred between waterbodies by research and management activities.

Additionally, a Candidate Conservation Agreement with Assurances with the USFWS and FFWCC for Multiple At-Risk Species in North Florida (CCAA) on portions of CBJTC that support natural habitat for candidate and at-risk species' and are not at risk of future development or intensive military operations. Through this agreement Camp Blanding monitors at risk species and their habitat annually (**Appendices I and S**).

### **Florida Black Bear**

The Florida Black Bear was listed as a State-designated Threatened Species in 1974 because of low population numbers and restricted range. Due to the conservation efforts of state and federal agencies, local governments, non-profit groups, residents, and businesses, the Florida black bear has recovered and was officially removed from the list of State-designated Threatened Species in 2012. Currently the Florida Black Bear is managed by the FFWCC as a game species and protected through various Florida rules, including the Bear Conservation Rule (F.A.C. 68A-4.009).

Black bears in Florida den in January and February, typically in wetland edges that haven't burned in at least ten years. Camp Blanding takes precautions against generating negative impacts to the species regarding denning and forage availability. While the installation's fire management objectives do not specifically seek to leave zones unburned for bears and other species that require the heavy understory and high vegetation of ten-year rough, the physical and operational realities of the program result in no

shortage of these types of areas. Additionally, Northcentral Florida's native palmetto fruits in early autumn and many species, including bears, rely on this food source. In recent years, the market in Florida for palmetto berries has been vibrant enough to warrant commercial harvesting. Recognizing the importance of palmetto berries to the local fauna, Camp Blanding conducts its harvest in such a way as to minimize negative impacts that could result from such a harvest. The full process is articulated in the Forest Resource Management Plan (**Appendix F**).

#### **4.6.4 Game Species Management**

As discussed above, FFWCC is an important cooperating partner for wildlife management, particularly for game species management. FFWCC manages all quota hunts and fishing within Magnolia and Lowry lakes at CBJTC, and sets bag limits. Each year, hunting recommendations for the area are made based on population levels and trends, habitat indices, and past harvests. As a result, much of the data and management activities summarized here are the result of efforts by FFWCC personnel.

CBJTC is a major source of recreational use for hunting and fishing in north central Florida (see **Section 4.6.2**). Hunting alone attracts 10,000 to 13,000 man-days of use annually. These hunts determine population densities for the game species and provide outdoor recreation opportunities for Florida citizens and military personnel. A number of legal game mammals are hunted at CBJTC, including white-tailed deer, turkey, bobcat (*Lynx rufus*), and river otter (*Lutra canadensis*); these species have relatively low bag limits. Gray squirrel, northern bobwhite (*Colinus virginianus*), and rabbits have moderate bag limits. Feral hogs, Virginia opossum (*Didelphis virginianus*), raccoon (*Procyon lotor*), beaver (*Castor canadensis*), coyote (*Canis latrans*), nine-banded armadillo (*Dasypus novemcinctus*), striped skunk (*Mephitis mephitis*), and nutria (*Myocastor coypus*) may be taken during the general gun, archery, and muzzle-loading gun seasons and have no bag limits. Migratory game birds follow the state bag limits and include rails, common moorhen, mourning dove, white-winged dove (*Zenaidura macroura*), snipe, duck, geese, coot, woodcock, and crows. Fish occur primarily in Kingsley, Lowry, and Magnolia Lakes and FMA and state bag limits for game fish apply (Camp Blanding WMA Brochure contains current harvest limits and guidelines). See FWC's Camp Blanding WMA Annual Report for harvest data.

Deer are the preferred game species, although turkeys are also popular. Squirrel and hog hunting pressure is moderate. Quail were once harvested in large numbers, but are now seldom taken. Feral hogs are a non-native invasive wildlife species that can cause tremendous damage, especially in riparian and wetlands areas. For the long-term health of CBJTC, it is crucial to encourage feral hog harvesting.

White-tailed deer and wild turkey are monitored annually by FFWCC (see below). Annual quail call surveys were previously conducted during May. However, due to declining habitat quality caused by lack of prescribed burning for many years, the quail population dipped to extremely low levels and FFWCC ceased conducting these surveys. Hunter interest has paralleled the declining population because of poor success rates in finding birds. The quail population on CBJTC does seem to be improving but there are no recent estimates of population size. Habitat has notably improved and hunter success will provide one indicator of population response. A brief discussion on deer, turkey, and feral hog population monitoring at CBJTC is provided below.

##### **White-Tailed Deer**

The deer population is monitored by track counts and distance sampling by spotlight. These methods provide a population index. Data is also collected from hunter-harvested deer that provides age structure, mean weights, and antler parameters. Track counts are conducted on 11 miles of unpaved transect roads. Individual deer crossings are counted 12-15 hours following either dragging the road or a heavy rain. The population index typically ranges from 20 to 50 acres per deer. FFWCC established the requirement for a legal buck in the still hunt areas to have at least one antler with three or more points in 2004, in order to improve the overall quality of harvested buck deer. In the dog hunt area, a legal buck must have at least one antler measuring no less than 5 inches.

The existing hardwood forest provides adequate forage for quality white-tailed deer during years of good mast production. Forage plants available in hardwood and pine forests, combined with grasslands and agricultural food plot residues, adequately meet the needs of the present population. Wildlife habitat improvements resulting from planned forest management activities such as prescribed burning, timber stand improvement operations, and timber harvesting operations will upgrade the quality and quantity of forage that is now present.

Hunting on CBJTC mimics the effects that natural predators have on deer populations. Large predators, such as panthers, bobcats, and wolves preyed on deer and other game in pre-settlement times and are no longer as abundant in Florida. Without predation, deer populations may increase to the point where they are damaging habitat for other species in their search for food. The optimum carrying capacity for deer on CBJTC is approximately 1 deer per 20-50 acres based on many years of monitoring data.

### **Turkey**

Surveys have been conducted annually in late summer along transect routes, with approximately 23 mobile bait stations since 1989. Bait stations are located in good turkey habitat and are a minimum of one mile apart. Stations are pre-baited for one week and then surveyed daily, by vehicle, for two weeks. The average number of turkeys per bait station is the index used for annual comparisons of the population. The index has ranged from 2.1 to 10.4 turkeys at a bait station per visit. Camp Blanding WMA has one of the highest turkey densities of all Florida WMAs.

The existing hardwood forest adequately meets the hard mast requirements for turkeys. The combined hardwood and pine forests adequately meet roosting requirements. Wildlife habitat improvements from planned forest management activities such as prescribed burning and thinning operations in pine plantations will increase the present brood range by providing a variety of age classes in the herbaceous cover. This herbaceous cover will attract a variety of insects that are an important source of protein for young turkey poults. The management of grass openings for a variety of successional stages of vegetation will increase the availability of insect and herbaceous food as well as nesting cover.

### **Feral hogs**

Feral hog harvest tends to parallel hog population trends; and therefore, may fluctuate from year to year. Hog densities have varied within CBJTC from moderate to low levels. There are no bag or size limits. Allowing dog hunting generally on CBJTC likely helps reduce damage from feral hogs even if they do not remove a large number of hogs; feral hogs generally respond to the presence of hunting dogs by moving around more and causing less damage in one place.



#### 4.6.5 Nuisance Wildlife

As discussed above, feral hog harvesting is crucial to the long-term health of CBJTC as they have the ability to cause large-scale damage to wildlife habitat. Feral hogs are not currently a major problem, but should be closely monitored particularly in the northern portion of the installation where wetlands and other riparian areas are more abundant.

Bats have recently become a problem as they are roosting in buildings and the south MOUT site. In hopes of relocating the bats, FLARNG has installed bat houses. However, it is unclear at this time if this is helping or if this is creating additional bat habitat. FLARNG will continue to monitor this situation. Further efforts may be necessary to minimize negative impacts from bats within buildings and other training infrastructure.

Nuisance wildlife problems will be evaluated in conjunction with USFWS and FFWCC personnel, as appropriate. Any solutions to nuisance wildlife problems will follow the IPMP (see **Section 4.8; Appendix Q**).

Diseases affecting fish and wildlife may occur on the installation. As outlined in AR 200-1, installation natural resources personnel will consult with appropriate Army Veterinary Corps personnel and, if appropriate, USFWS and FFWCC regarding large-scale fish and wildlife deaths and unnatural behavior occurring on the installation.

## 4.7 Threatened and Endangered Species Management

**GOAL TE:** Manage rare species using an ecosystem approach, while maintaining the military mission at CBJTC

OBJECTIVE TE1: Conduct flora and fauna surveys as needed particularly for federal and state special status species where potential habitat exists.

OBJECTIVE TE2: Maintain diversity of habitat patches to provide a variety of disturbance regimes and habitat types to support a variety of rare species.

OBJECTIVE TE3: Use prescribed fire to maintain natural vegetation communities at CBJTC as numerous rare species at CBJTC benefit from a regular fire disturbance interval.

OBJECTIVE TE4: Maintain populations of RCW, eastern indigo snake, and other rare species by managing for large tracts of forest.

OBJECTIVE TE5: Sustain the RCW population at 25 potential breeding groups (PBGs) or more to avoid re-implementation of all military training restrictions.

OBJECTIVE TE6: Maintain populations of Florida scrub-jay, Curtiss' milkweed, little ladies' tresses, and other rare species by managing scrub habitat.

OBJECTIVE TE7: Maintain populations of Florida sandhill crane, little blue heron, Florida black bear, black creek crayfish, bald eagle, and other rare species by protecting riparian and wetland habitats.

This section presents information about the management of threatened, endangered, and other rare species that are documented on CBJTC. FLARNG is required to manage federally and state listed threatened and endangered species. Failure to protect federally listed species could lead to an ESA violation, which could negatively impact training land availability. A complete summary of rare species is provided in **Section 2.3.4.**

### ***Primary Regulatory Drivers***

- Endangered Species Act
- Bald and Golden Eagle Protection Act
- Florida Endangered and Threatened Species Act (Chapter 379.2291, F.S.)
- FAC 68A-27.003 and 68A-27.005
- FAC 5B-40

In accordance with AR 200-1 and DoDI 4715.03, FLARNG has conducted surveys for federally threatened and endangered species, federal candidate species, and state listed species at CBJTC (e.g. FLMNH 1996a, FLMNH 1996b, Bio-tech 2009). Of the 113 listed animal species and 561 listed plant species in Florida, 34 species protected under the ESA and/or Florida law are known to occur at CBJTC and eight are considered "high priority" management species. Species include 1 amphibian, 7 birds, no mammals, 3 reptiles, and 25 plants. The bald eagle is no longer federally or state listed; however, protections under the Bald and Golden Eagle Act are still in effect. Historically bald eagle nests have been found in several locations on Camp Blanding, though at present none are active.

No federally designated critical habitat occurs currently within CBJTC. The 2004 amendments to the ESA included provisions to exclude critical habitat designations on DoD lands. Section 4(a)(3)(B) is not discretionary and mandates that the Secretary of Interior exclude designating critical habitat on “any lands or other geographical areas owned or controlled by the DoD, or designated for its use, that are subject to an INRMP prepared under section 101 of the SAIA, if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation.” Installations should request exclusion from critical habitat initially through ARNG G-9 for review and concurrence and then to the appropriate USFWS office.

Camp Blanding maintains a CCAA with US and Florida wildlife regulators that covers all species not currently listed as imperiled, this includes all federal and state candidate species. As the CCAA includes all non-listed species found within Camp Blanding, the only way a species can be “added” to the document is if it becomes de-listed by either or both the USFWS and FWC.

This section of the INRMP focuses on the management requirements of rare species identified as ‘high priority’ management species on CBJTC in **Tables 9** and **10** (see **Section 2.3.4**). Species-specific management plans and fact sheets for several of the listed species, when available, are included in **Appendix E** for additional information. Furthermore, a brief section on managing nonvascular plants (bryophytes and lichens) is provided below due to several rare and noteworthy species occurring on CBJTC and their dependence on a variety of habitats (see **Section 2.3.2**).

High priority was given to federally listed species known to occur at CBJTC. Florida panthers were not documented directly or indirectly during the most recent survey (Bio-tech 2009). According to USFWS, a single wild population in south Florida of 100-160 adult panthers is all that remains of this species, which had previously been found in most of the southeastern US (Godsea 2020). High priority management species include:

- federally endangered RCW
- federally endangered wood stork
- federally endangered Chapman’s rhododendron
- federally threatened Florida scrub-jay
- federally threatened Eastern indigo snake
- federally threatened (due to similarity of appearance) American alligator
- federal candidate and state threatened gopher tortoise

#### **4.7.1 Federally Endangered Species**

**Red-cockaded Woodpecker:** RCWs occur in association with mature, open-canopied pine forests dominated by longleaf pine, slash pine, loblolly pine (*Pinus taeda*), shortleaf pine (*Pinus echinata*), and occasionally other pine species. RCWs construct nest and roost cavities in live, old-growth pine trees, often infected with red-heart fungus, which enables the birds to excavate the cavities with greater ease. Additionally, pine stands and pine trees are the preferred foraging habitat and substrate. As of the end of the 2020 breeding season, CBJTC had 36 active RCW clusters and 27 potential breeding groups within the

installation boundary. RCW clusters are found north and east of the Cantonment Area. See **Map 8** for 2020 RCW cluster locations and **Appendix D** for more information on RCW populations at CBJTC.

CBJTC has been designated as an “essential support” population in the USFWS (2003) *RCW Recovery Plan, 2<sup>nd</sup> Revision*. The future expansion of foraging and cluster habitat will be dependent upon habitat restoration regarding hardwood removal, plantation thinning, and time for the existing tree stands to mature to a suitable size for RCW cavity construction. Expansion will be a slow process as the Post is currently near carrying capacity. However, there is potential to establish cluster sites in additional areas once restoration is complete and the tree stands age. Habitat management at CBJTC includes habitat restoration, wildland fire use, hardwood removal, and plantation thinning. Banding RCWs for translocation and group composition monitoring are also major components of RCW management.

*Management Guidelines:* The primary documents that outline the management requirements and training restrictions associated with the RCW at CBJTC include the *USFWS Biological Opinion (BO) on the US Army’s “Biological Assessment of the Effects of the Proposed Revision of the 1996 Management Guidelines for the Red-cockaded Woodpecker on Army Installations”* (Costa 2007), *Management Guidelines for the Red-cockaded Woodpecker on Army Installations* (US Army 2007), *Biological Evaluation for Incidental Take in the RCW ESMC Update for the INRMP 2007-2012 for Florida Army National Guard (FLARNG) - CBJTC* (Robinson 2008), and the USFWS letter that modifies the BO by Costa (2007) and allows incidental take in accordance with the ESMC update (Hankla 2008). These documents were prepared in accordance with the *USFWS RCW Recovery Plan, 2<sup>nd</sup> Revision* (USFWS 2003), and a copy of them is included in **Appendix D**.

US Army (2007) guidelines establish baseline standards for Army installations in managing the RCW and its habitat, and recommend the development of an installation RCW ESMC to supplement these guidelines. FLARNG updated their ESMC to establish incidental take guidelines for CBJTC based on the new guidance documents. The amended ESMC establishes the removal of all training restrictions from RCW clusters that are not necessary to maintain CBJTC’s recovery goal of 25 PBGs. For example, if 30 clusters are required to maintain the 25 PBGs, then all 30 clusters will continue to be under the “protected” status in accordance with the RCW BO and management guidelines. In this example any cluster above the amount required to maintain the 25 PBGs (i.e., clusters >30) would go into the “unrestricted” status. The “unrestricted” clusters would be invisible to military personnel training in the field except for the nest tree during the breeding season (April – July), which will remain temporarily marked and considered “protected” (Robinson 2008). USFWS concurred on 3 December 2008 with the ESMC update for incidental take at CBJTC (Hankla 2008). CBJTC has currently met its recovery goal of 25 PBGs. The following management measures will be implemented for RCWs at CBJTC:

- Continue to implement habitat restoration efforts for the RCW to allow for the expansion of foraging and cluster habitat to the extent possible through the forestry and wildland fire management programs (see **Sections 4.4** and **4.5**).
- Manage and monitor flame length and fire intensity in the area around each cavity tree. In addition, all cavity trees should be cleared around before the fire and pre-lit if possible, during the day of the burn.



- Continue to participate in the Southern Range Translocation Cooperative. Translocations of RCWs are critical to achieve recovery (Costa 2007).
- Prohibit training activities within “protected” RCW cluster sites and “protected” nest trees in “unrestricted” clusters in accordance with the *Management Guidelines for the RCW on Army Installations* (US Army 2007) (see **Appendix D**).
- Allow **all** types of training within “unrestricted” clusters in accordance with the ESMC update for incidental take at CBJTC (Robinson 2008) and USFWS’s BO revision (Hankla 2008), with the exception of “protected” nest trees that will be temporarily double banded every year during the breeding season (April-June).
- Continue to identify all “protected” clusters by signs where roads and trails intersect cluster boundaries and double white tree banding on all start and cavity trees.
- Re-implement **all** training restrictions if CBJTC falls below the recovery goal of 25 PBGs, and contact the USFWS Jacksonville Field Office.

**Wood Stork:** Although previously observed, no wood storks were documented in the most recent rare species survey at CBJTC. The southeast US population of wood storks is believed to be a single population that responds to environmental changes and relocates its rookery sites accordingly. Although the federally threatened wood stork could potentially be found onsite foraging, it is unlikely that wood storks inhabit CBJTC because typical nesting and roosting habitat are not present. Furthermore, no roosting sites are known within 20 miles of the installation (Bio-tech 2009).

**Management Guidelines:** No specific management measures for the wood stork are included as this species would likely only be using CBJTC as a stopover location due to the lack of nesting and roosting habitat. Wetland and riparian habitat management will benefit this species (see **Section 4.4.7**) along with other state listed wading birds (e.g., snowy egrets, little blue herons).

**Chapman’s rhododendron:** Chapman’s rhododendron is endemic to Florida (Chafin 2000) and is known to occur currently within two areas of the panhandle and at CBJTC (Bio-tech 2009). This plant is found in pinelands that are favorable for commercial production and borders of bay swamps (Chafin 2000). Approximately 30 clumps of Chapman’s rhododendron are located just east of Avenue B between Jacksonville Street and Arcadia Street (Bio-tech 2009).

**Management Guidelines:** Timber harvesting, site preparation and pine planting will harm this plant. To protect and enhance this species at CBJTC, the following management actions are recommended in areas where this species is known to occur:

- Use prescribed fire to stimulate the flowering and sprouting of this plant.
- Avoid tree planting, soil disturbance, and other land clearing activities (Chafin 2000).

#### **4.7.2 Federally Threatened Species**

**Florida Scrub-Jay:** The Florida scrub-jay generally inhabits fire maintained oak scrub on well-drained, sandy soils in open areas without a dense canopy. Saw palmetto, sand pine, and rosemary generally occur

within their desired habitat. (Hipes et al. 2000, Bio-tech 2009). Though located at the northern limits of the Florida scrub-jay's current population range, CBJTC does contain several hundred acres of scrub habitat previously occupied by the bird. An isolated population of three jays occurred on Camp Blanding's Cantonment Scrub as late as 2004, though sightings dwindled sharply in that scrub with rare single bird sightings until 2006. A single Florida scrub-jay was documented eight miles south in Camp Blanding's Lowry Scrub in 2012, where it was inconsistently sighted until 2015; this is the last sighting of the species on-post.

The nearest population of significant size is nearly 25 miles south of CBJTC in the Ocala National Forest (McMillian et al. 2010), though in 2020 and again in 2021 a single individual was photographically documented in the scrub of the adjacent Goldhead Branch State Park.

Experts suggest it is unlikely, even with the enhancement of scrub habitat on the installation, that a migration and substantial increase in population will occur due to CBJTC's distance from any significant populations making natural colonization unlikely (McMillian et al. 2010). Following consultation with regulators and the Florida Scrub-Jay Working Group, Camp Blanding Environmental maintains a policy to monitor the various scrubs on Camp Blanding for Florida scrub-jays on a three-year rotation

*Management Guidelines:* Population declines of the Florida scrub-jay are the result of habitat loss from agriculture, development, and fire suppression. Although a large-scale increase in population may not be possible, the following management actions are recommended to maintain and/or enhance suitable habitat for this species at CBJTC:

- Monitor the status of this species as its status could change rapidly.
- Maintain existing scrub habitat at CBJTC through the use of prescribed fire (see **Section 4.4.6**). Prescribed fire every 8 to 15 years that burns patchily, where few territories are burned completely, is most favorable (Hipes et al. 2000).
- Consider expanding potential habitat by managing overgrown patches of sand pine scrub or establishing habitat in the former mining area assuming sufficient acreage is available. See **Section 4.4.5** for vegetation management within the mining area.
- Consider surrounding habitats before implementing measures to enhance Florida scrub-jay habitat and ensure sufficient buffers exist (e.g., minimum of 1,000 feet). For example, this species will not use scrub areas within 300 feet of heavily forested areas because avian predators are more likely to occur.

***Eastern Indigo Snake:*** The eastern indigo snake uses a wide range of habitats including scrub, sandhill, and wetland habitat. However, this snake requires large tracts of land to survive. This snake is known to use gopher tortoise burrows (see below) as a refuge from the elements, including cold temperatures and fire, but is also known to take refuge in stump holes. In northern Florida, it winters mostly in gopher tortoise burrows (Hipes et al. 2000). Eastern indigo snakes have been documented in sandhill habitat, scrub, pine flatwoods, pine plantations, and near gopher tortoise burrows at CBJTC (Bio-tech 2009, FDMA 2011).

*Management Guidelines:* Eastern indigo snakes are threatened due to habitat loss and degradation resulting from land clearing activities, vehicular traffic, and other development. CBJTC contains a large amount of suitable habitat; however, FLARNG has limited information on indigo snakes locations and

distributions as only a few have been observed during previous surveys (FDMA 2011, Bio-tech 2009).

The following management actions are recommended for this species at CBJTC:

- Obtain a better understanding of overall population abundance and distribution within CBJTC by implementing a multi-year survey and the new USFWS survey protocols for eastern indigo snakes.
- Protect large areas of suitable habitat (i.e., more than 5,000 acres).
- Avoid construction of new roads within unfragmented habitat.
- Maintain gopher tortoise populations, and protect gopher tortoise burrows and dead stumps as they are used as den habitat.
- Implement forest management strategies discussed in **Section 4.4**.
- Educate site users to prevent collection or harm to these snakes.
- Partner with the DOD/DOI Recovery and Sustainment Partnership Initiative and other similar cooperative scientific efforts targeting eastern indigo snakes to continue and improve survey techniques.

**American Alligator:** The American alligator is listed as threatened by USFWS due to its similarity in appearance to the federally endangered American crocodile (*Crocodylus acutus*). The American alligator inhabits fresh and brackish marshes, ponds, lakes, rivers, swamps, bayous, and large spring runs. CBJTC contains habitat typically used by the alligator and was observed in several locations within South and East Post (Bio-tech 2009).

**Management Guidelines:** Although this species was once in danger of extinction, it was declared fully recovered in 1987. Because some related animals (e.g., crocodile and caimans) are similar and a concern, USFWS continues to regulate the harvest and trade of alligators (USFWS 2008). The American alligator will benefit from wetland and riparian habitat management (see **Section 4.4.7**).

#### **4.7.3 Federal Candidate Species**

**Gopher Tortoise:** The gopher tortoise is a federal candidate species for listing as a threatened species and a state-listed threatened species that is typically found in dry upland habitats, such as sandhill, scrub, and pine flatwoods. Gopher tortoises excavate deep burrows for refuge from predators, weather, and fire (Hipes et al. 2000). The gopher tortoise is considered a keystone species because their burrows provide refuge for more than 300 animal species that neither harm nor benefit the gopher tortoise, including the eastern indigo snake, Florida pine snake, Florida mouse, and gopher frog (FDMA 2011). The gopher tortoise population is thriving at CBJTC; the installation has been used in the past for the relocation of gopher tortoises displaced by development in northeastern Florida.

Through appropriate habitat management, CBJTC will manage existing high quality habitat as well as improve and restore degraded habitat in xeric uplands and natural communities that support the gopher tortoise (see **Sections 4.4.3, 4.4.4, and 4.4.6**). Frequent prescribed fire will be the primary tool, but other treatments, such as mechanical and chemical removal of hardwoods, replanting longleaf pine or native

grasses and other ground cover in appropriate areas, and plantation thinning will be used when necessary. Maintaining these communities in a manner that replicates their natural form and function helps ensure they meet the needs of the gopher tortoise and the other species dependent on these communities.

*Management Guidelines:* Gopher tortoises are vulnerable to several threats within their range, including habitat degradation and loss (FFWCC 2012). The following management actions are recommended.

- Maintain a 25-foot boundary around all gopher tortoise burrows within the vicinity of projects and military training that have the potential to collapse burrows.
- Identify these burrows with high visibility signs indicating the 25-foot boundary where gopher tortoises will not be relocated during a project or military training.
- Manage fuel loads by implementing dormant season burns in units with high fuel loads and conduct maintenance burns during the growing season on a 1-3 year rotation.
- Natural stands will be maintained with their uneven-age or several-age structure. At cutting cycles of approximately 25 years, and stand density will be reduced to basal areas between 60 and 80 square feet (sq-ft) per acre.
- Underplant turkey oak stands with containerized longleaf pine seedlings if natural regeneration is less than 200 longleaf pine seedlings per acre. Where practical and necessary, treatments such as mechanical thinning and herbicide treatment may be used to reduce the hardwood midstory.
- Harvest and remove on a large scale existing sand pine stands while retaining any volunteer or original longleaf pines. After 2-3 years the stands will then be burned and/or chopped, and replanted with containerized longleaf pine.
- Control invasive and exotic species and noxious weeds through early detection, isolation of infested areas, and control of individual plants with physical, chemical, or mechanical means, depending on the species.

*Permitting:* In addition to its status as a federal candidate species, the gopher tortoise is listed by the state of Florida as threatened. Because gopher tortoise habitat can overlap lands used by people for agriculture, industrial, or residential purposes, the FFWCC has created a permitting process for the relocation of gopher tortoises from locations where scheduled operations could endanger the animal or its burrows.

Military training and readiness activities on-post often develop rapidly, shift quickly, and bear unique mission requirements. This fact necessitated the development of a set of guidelines for CBJTC to successfully maintain its training mission while complying with the FFWCC's gopher tortoise permitting and management requirements. In order to sustain no net loss to training while maintaining gopher tortoise habitat and population numbers on the installation, Camp Blanding and FFWCC collaborated to develop in-depth parameters to comply with the Gopher Tortoise Permitting Guidelines, April 2008 – Revised September 2012. The details of this agreement and the data collected to support it can be found in **Appendix N**.

#### **4.7.4 General Management Strategies**

The following general guidelines will be followed to facilitate the military mission and natural resources management objectives while minimizing negative impacts on rare species and their habitats:



- Conduct military training and natural resources management in accordance with the current RCW BO (Costa 2007), RCW management guidelines for Army installations (US Army 2007), CBJTC ESMC update for incidental take (Robinson 2008, Hankla 2008) (see **Appendix D**). If PBGs fall below the recovery goal of 25, all training restrictions must be re-implemented and CBJTC-ED will notify USFWS.
- Maintain a habitat mosaic using an ecosystem management approach that incorporates prescribed fire, forestry, and invasive species control to support a diversity of rare species.
- Continue to manage for large tracts of forest.
- Use prescribed fire to restore sandhill, flatwoods, and other natural and rare communities dependent on a regular fire interval for indigenous and rare species (see **Sections 4.4 and 4.5**).
- Minimize the amount of herbicides used for invasive species control.
- Maintain corridors between wetlands, lakes, and other waterbodies to provide for wildlife movement between areas.
- Update biological inventories as needed as the occurrence of threatened and endangered species is subject to change over time as a result of either recruitment, identification of additional protected species, or the change in status of species currently present at CBJTC.
- Implement a 1,500-foot radius protection zone around active bald eagle nests. If new land disturbing activities are proposed within 660 feet of a bald eagle nest, refer to FFWCC's (2008) *Bald Eagle Management Plan* which is included in **Appendix E**.
- Continue to coordinate and work with FFWCC on rare species management.
- Incorporate information on rare species protection and any related restrictions in environmental awareness documents and briefings to educate site users and prevent incidental take.

## 4.8 Invasive Species and Integrated Pest Management

**GOAL IN:** Minimize impacts of invasive and pest species, while minimizing use of chemicals to manage those species, utilizing an integrated pest management approach.

OBJECTIVE IN1: Control and minimize the impact of invasive plant and animal species.

OBJECTIVE IN2: Limit connectivity between disturbed sites to minimize spread of invasive species and pests.

OBJECTIVE IN3: Monitor low priority invasive species for their presence and/or spread and modify their priority as needed.

Invasive and exotic species may include plants, insects, or animals. An **invasive** species is defined as “any native or alien species whose lack of control or introduction does or is likely to cause economic or environmental harm or harm to human health.” An alien (or **non-native**) species is defined as a “species including its seeds, eggs, spores, or other biological material capable of propagating that species that is not native to that ecosystem (EO 13112).” Because of their invasive capacity, many exotic species have the ability to spread rapidly through ecosystems since their natural predators are often not present. Such species often retard natural succession and reforestation and generally cause a reduction of biological diversity in natural ecosystems.

### **Primary Regulatory Drivers**

- Federal Noxious Weed Act
- Federal Insecticide, Fungicide & Rodenticide Act
- National Aquatic Invasive Species Act
- AR 200-1
- EO 13112
- FAC 5B-57 (Noxious Weeds)
- FAC 5B-64 (Prohibited Aquatic Plants)

**Noxious weeds** are defined as “any living stage (e.g., seeds and reproductive parts) of any parasitic or other plant of a kind, or subdivision of a kind, which is of foreign origin, is new to or not widely prevalent in the United States, and can directly or indirectly injure crops, other useful plants, livestock, or poultry or other interests of agriculture, including irrigation, or navigation or the fish and wildlife resources of the United States or the public health (Federal Noxious Weed Act of 1974).”

### 4.8.1 Integrated Pest Management

CBJTC has an Integrated Pest Management (IPM) Program implemented by FLARNG IPMP (**Appendix Q**). IPM is the use of multiple techniques in a compatible manner to avoid damage and minimize adverse environmental affects while obtaining control of target pests. The goal of IPM is to utilize non-chemical procedures to control pests, including both invasive and exotic plant and animal species.

Typically a combination of the following IPM techniques is required to resolve a problem on a sustained basis:

- *mechanical control*, which alters environments in which pests live, traps or removes pests (e.g., glue boards in interior settings and live-traps) from where they are not wanted, or excludes pests from where they are not wanted (i.e., screening);
- *cultural control*, which manipulates environmental conditions to suppress or eliminate pests (e.g., removal of food scraps or spreading manure on fields);
- *biological control*, which uses predators, parasites, or disease organisms to control pests; and
- *chemical control*, which relies on pesticides and/or herbicides to kill pest and/or undesirable species of plants.

The IPMP includes pest identification and management requirements, outlines the resources necessary for surveillance and control, and describes the administrative, safety, and environmental requirements of the program. This plan serves as a tool to reduce pesticide use, enhance environmental protection, and maximize the use of IPM techniques. It is the policy of FLARNG to minimize the use of all pesticides, including herbicides, at the installation. CBJTC has no dedicated pest management personnel and meets these requirements by additional duty staffing, use of supervised inmate support, and contracted pest management.

FLARNG IPMP identifies all sites at CBJTC where pest control or pest management operations are conducted, which pests are controlled or have potential for causing pest problems, and areas of responsibility. The IPMP discusses the following priorities of pest control operations in great detail; therefore, information will not be duplicated in this plan:

- Disease Vectors and Public Health Pests: mosquitoes; ticks; widow spiders; fire ants; bees, hornets, yellow jackets, and wasps; scorpions; poisonous snakes; American alligators; skunks, raccoons, bats, stray cats, and dogs.
- Pest of Real Property: subterranean termites; birds and bats roosting in structures; squirrels, rats, and mice.
- Stored Food Product Pests: beetles, moths, and rodents.
- Other Undesirable Vegetation: weeds; oaks and other non-climax forest species.
- Animal Pests: mice and rats; skunks and raccoons; stray dogs, and cats; Bird Aircraft Strike Hazard species.
- Household and Nuisance Pests: rodents, crawling insects, and spiders.
- Ornamental Plant and Turf Pests: insect pests such as southern pine beetle, etc.
- Other Pest Management Requirements: carcass removal, odor control.

A permitting program has been established under Chapter 62C-20, FAC for Aquatic Plant Management. No person or public agency shall control, eradicate, remove, or otherwise alter any aquatic weeds or plants

in waters of the state unless a permit for such activity has been issued by FDEP or unless the activity is in waters expressly exempted by FDEP rule. Before controlling aquatic plants, CBJTC must contact the appropriate regional office to determine if a permit is required.

#### **4.8.2 Guidelines for Invasive Species Management**

Invasive, non-native species, and noxious weeds have the capability to significantly impact native vegetation by changing fuel loads, flammability, and outcompeting native species. A key element of INRMP implementation is to ensure “no net loss” of military training capability. Management of undesirable species is necessary to maintain military training areas in usable condition. In addition, uncontrolled animal pests can significantly damage the pine stands and impact the forestry program and/or become health hazards, which could threaten the military mission.

The task of controlling invasive and exotic species and noxious weeds is often expensive, lengthy, and risky because total eradication is required to prevent reestablishment. However, in accordance with laws and regulations pertaining to the management of these species, FLARNG will work to prevent the introduction of these species and take measures to control them in an economically and environmentally sound manner. General management strategies are as follows:

- Coordinate with local expert authorities to update the lists of Category 1 and 2 invasive species (Florida Invasive Species Council, University of Florida Institute of Food and Agricultural Sciences, FWC, USFWS, etc.)
- Implement BMPs to minimize land disturbances that favor invasion and re-vegetate disturbed areas with native species.
- Local rock/substrate should be used instead of non-indigenous rock when practical for maintenance or construction projects.
- Utilize mulches from CBJTC or certified weed-free sources to facilitate the establishment of native groundcover on impoverished soils.
- Maintain biodiversity and undisturbed habitat to maximize resilience to and competition with invasive species.
- Control invasive and exotic species and noxious weeds through early detection, isolation of infested areas, and control of individual plants with physical, chemical, or mechanical means, depending on the species.
- Favor basal application and spot treatment, to the extent possible, to prevent adverse impacts to native plants and wildlife.
- Avoid herbicide use in and around wetlands and other surface waters (see **Section 4.3**).
- Do not use invasive plant, non-native species in landscaping (see **Section 4.4.9**).

It is important to prevent the initial spread of invasive and exotic species and address the spread of such species as early as possible to reduce the amount of required herbicide applications. CBJTC-ED should evaluate the threat of invasive species as well as the environmental impacts of herbicide usage (if required) to the environment prior to implementing any eradication and/or control program.



One of the most effective ways of preventing new invasive species is to limit all landscaping plants to only native species. Landscaping is limited to the cantonment area on CBJTC. For information about landscaping on CBJTC, refer to **Section 4.4.9**. Native plants suitable for planting in Florida are available at <http://www.fnps.org/plants> and additional guidance is available in *The Florida Yards & Neighborhoods Handbook*: [http://floridayards.org/landscape/The Florida Yards and Neighborhoods Handbook.pdf](http://floridayards.org/landscape/The_Florida_Yards_and_Neighborhoods_Handbook.pdf).

#### 4.8.3 Potential and Known Invasive Species

There have been numerous surveys that have identified non-native plants and animals on CBJTC, including in-house observations during other activities. Of the species documented on CBJTC, three species are on the USDA list for federal noxious weeds. There are eight species on the state noxious weed list (FDACS 2016) and four species that are prohibited aquatic plants (FDACS 2008).

There are numerous sources discussing invasive species in Florida and that indicate county occurrences for invasive species. **Table 14** presents a list of invasive species with the potential to occur in Clay County; the list was compiled from the following sources:

- iMapInvasives geotracking invasive exotic species:  
<http://www.imapinvasives.org/>
- Early Detection and Distribution Mapping System:  
[http://www.eddmaps.org/tools/countyplants.cfm?id=us\\_fl\\_12019](http://www.eddmaps.org/tools/countyplants.cfm?id=us_fl_12019)
- Nonindigenous Aquatic Species:  
<http://nas.er.usgs.gov/queries/SpeciesList.aspx?group=&size=50&sortBy=1&status=0&fmb=0&pathway=0&stcolist=FL%20--%20Clay>
- First Coast Invasive Working Group:  
<http://www.floridainvasives.org/FirstCoast/Distribution/index.html>

**Table 14** also indicates whether the species has been documented on CBJTC and what the management priority and goal is for that invasive species (if there is one). Most of the invasive species that are present are difficult to eradicate, so the focus is on maintaining healthy native habitats resilient to invasion by non-native species, with targeted eradication and control of high priority species.

Table 14. Potential Non-Native Species at CBJTC

Scientific Name	Common Name	Invasive Status	On CBJTC	Management Goal	Priority
<b>Plants</b>					
<i>Albizia julibrissin</i>	Mimosa	FLEPPC1	✓	Monitor	4
<i>Alternanthera philoxeroides</i>	Alligatorweed	PAP1, FLEPPC2	✓		
<i>Ardisia crenata</i>	Coral ardisia	FLEPPC1	✓	Detect & Eradicate	5
<i>Asparagus aethiopicus</i>	Asparagus fern	FLEPPC1			
<i>Begonia cucullata</i>	Wax begonia	FLEPPC2	✓		
<i>Bidens pilosa</i>	Hairy beggarticks		✓		
<i>Broussonetia papyrifera</i>	Paper-mulberry	FLEPPC2	✓		
<i>Casuarina equisetifolia</i>	Australian pine	SNW, PAP1, FLEPPC1	✓	Detect & Eradicate	5
<i>Cinnamomum camphora</i>	Camphortree	FLEPPC1	✓	Monitor	4
<i>Clematis terniflora</i>	Sweet autumn virginsbower	FLEPPC2			
<i>Cnicus benedictus</i>	Blessed thistle				
<i>Colocasia esculenta</i>	Wild taro	FLEPPC1	✓	Control	2
<i>Crotalaria spectabilis</i>	Showy rattlebox		✓		
<i>Cuphea carthagenensis</i>	Tarweed cuphea				
<i>Dactyloctenium aegyptium</i>	Crow-foot grass	FLEPPC2	✓		
<i>Dioscorea bulbifera</i>	Air-potato	SNW, FLEPPC1	✓	Control	3
<i>Eichhornia crassipes</i>	Waterhyacinth	PAP1, FLEPPC1	✓	Monitor	4

Table 14. Potential Non-Native Species at CBJTC

Scientific Name	Common Name	Invasive Status	On CBJTC	Management Goal	Priority
<i>Elaeagnus pungens</i>	Thorny olive	FLEPPC2	✓		
<i>Eleusine indica</i>	Goosegrass		✓		
<i>Emilia fosbergii</i>	Cupid's-shaving-brush				
<i>Eriobotrya japonica</i>	Loquat				
<i>Hedera helix</i>	English ivy				
<i>Hydrilla verticillata</i>	Hydrilla	FNW, PAP1, FLEPPC1			
<i>Hygrophila polysperma</i>	Miramar weed	FNW, PAP2, FLEPPC1			
<i>Imperata cylindrica</i>	Cogongrass	FNW, SNW, FLEPPC1	✓	Eradication	1
<i>Indigofera hirsuta</i>	Hairy indigo		✓		
<i>Kummerowia striata</i>	Common lespedeza		✓		
<i>Lantana camara</i>	Lantana	FLEPPC1	✓	Monitor	4
<i>Ligustrum lucidum</i>	Glossy privet	FLEPPC1			
<i>Ligustrum sinense</i>	Chinese privet	FLEPPC1	✓		
<i>Lonicera japonica</i>	Japanese honeysuckle	FLEPPC1	✓	Detect & Eradicate	5
<i>Ludwigia grandiflora</i>	Water primrose				
<i>Ludwigia peruviana</i>	Primrose-willow	FLEPPC1			
<i>Lygodium japonicum</i>	Japanese climbing fern	SNW, FLEPPC1	✓	Eradicate	1
<i>Lygodium microphyllum</i>	Old world climbing fern	FNW, SNW, FLEPPC1			

Table 14. Potential Non-Native Species at CBJTC

Scientific Name	Common Name	Invasive Status	On CBJTC	Management Goal	Priority
<i>Macfadyena unguis-cati</i>	Catclaw-vine	FLEPPC1			
<i>Medicago lupulina</i>	Black medic		✓		
<i>Melia azedarach</i>	Chinaberry	FLEPPC2	✓	Control	2
<i>Melilotus officinalis</i>	Yellow sweetclover				
<i>Melinis minutiflora</i>	Molasses grass	FLEPPC2	✓		
<i>Melinis repens</i>	Natalgrass	FLEPPC1	✓	Monitor	4
<i>Morus alba</i>	White mulberry				
<i>Myriophyllum aquaticum</i>	Brazilian watermilfoil				
<i>Myriophyllum spicatum</i>	Eurasian watermilfoil	PAP1, FLEPPC2			
<i>Nandina domestica</i>	Sacred bamboo	FLEPPC1	✓		
<i>Nasturtium officinale</i>	Water-cress				
<i>Nephrolepis cordifolia</i>	Narrow swordfern	FLEPPC1			
<i>Orobanche minor</i>	Small broomrape	FNW, SNW			
<i>Paederia foetida</i>	Skunk-vine	SNW, FLEPPC1			
<i>Panicum repens</i>	Torpedo grass	FLEPPC1	✓	Monitor	4
<i>Paspalum urvillei</i>	Vaseygrass		✓		
<i>Pennisetum purpureum</i>	Elephant grass	FLEPPC1	✓	Detect & Eradicate	5
<i>Phalaris canariensis</i>	Canarygrass				
<i>Phyllanthus urinaria</i>	Chamber bitter		✓		



Table 14. Potential Non-Native Species at CBJTC

Scientific Name	Common Name	Invasive Status	On CBJTC	Management Goal	Priority
<i>Phyllostachys aurea</i>	Golden bamboo	FLEPPC2			
<i>Pistia stratiotes</i>	Waterlettuce	PAP2, FLEPPC1			
<i>Plantago lanceolata</i>	Buckhorn plantain		✓		
<i>Polypogon monspeliensis</i>	Rabbitfoot polypogon				
<i>Pueraria montana</i>	Kudzu	SNW, FLEPPC1	✓	Control	3
<i>Ripidium ravennae</i>	Ravennagrass				
<i>Rosa bracteata</i>	Macartney rose				
<i>Ruellia simplex</i>	Britton's wild petunia				
<i>Rumex crispus</i>	Curly dock		✓		
<i>Sacciolepis indica</i>	Glenwoodgrass		✓		
<i>Salvinia minima</i>	Water spangles	FLEPPC1			
<i>Salvinia molesta</i>	Giant salvinia	FNW, SNW, PAP1			
<i>Schinus terebinthifolius</i>	Brazilian pepper tree	SNW, PAP1, FLEPPC1	✓	Detect & Eradicate	5
<i>Senna occidentalis</i>	Coffee senna		✓		
<i>Sesbania punicea</i>	Red sesbania, rattlebox	FLEPPC2	✓	Eradicate	2
<i>Setaria pumila</i>	Yellow foxtail	FNW	✓		
<i>Solanum viarum</i>	Tropical soda apple	FNW, SNW, FLEPPC1	✓	Detect & Eradicate	5
<i>Sorghum halepense</i>	Johnson grass		✓	Detect & Eradicate	5
<i>Tradescantia fluminensis</i>	White-flowered spiderwort				

Table 14. Potential Non-Native Species at CBJTC

Scientific Name	Common Name	Invasive Status	On CBJTC	Management Goal	Priority
<i>Triadica sebifera</i>	Chinese tallowtree	SNW, FLEPPC1	✓	Eradicate	2
<i>Trifolium campestre</i>	Large hop clover		✓		
<i>Urochloa mutica</i>	Para grass	FLEPPC1	✓		
<i>Verbena bonariensis</i>	Tall vervain				
<i>Vernicia fordii</i>	Tungoil tree				
<i>Wisteria sinensis</i>	Chinese wisteria	FLEPPC2			
<i>Xanthosoma sagittifolium</i>	Arrowleaf elephant's ear	FLEPPC2			
<b>Animals</b>					
<i>Canis familiaris</i>	Feral dog		✓	Eradicate	3
<i>Felis catus</i>	Feral cat		✓	Eradicate	3
<i>Mus musculus</i>	House mouse				
<i>Rattus norvegicus</i>	Norway rat		✓	Eradicate from Structures	1
<i>Rattus rattus</i>	Black rat		✓	Eradicate from Structures	1
<i>Sus scrofa</i>	Feral hog		✓	Control	3
<i>Vulpes vulpes</i>	Red fox		✓		
<i>Rhinella marina</i>	Cane toad				
<i>Osteopilus septentrionalis</i>	Cuban treefrog				
<i>Eleutherodactylus planirostris</i>	Greenhouse frog		✓		

**Table 14. Potential Non-Native Species at CBJTC**

Scientific Name	Common Name	Invasive Status	On CBJTC	Management Goal	Priority
<i>Anolis sagrei</i>	Brown anole		✓		
<i>Passer domesticus</i>	House sparrow		✓		
<i>Sturnus vulgaris</i>	European starling		✓		
<i>Xyleborus glabratus</i>	Redbay ambrosia beetle				
<i>Agrilus planipennis</i>	Emerald ash borer				
<p>FNW = Federal Noxious Weed from USDA Animal and Plant Health Inspection Service (USDA 2010)</p> <p>SNW = State Noxious Weed (Rule 5B-57.007 FAC, FDACS 2016)</p> <p>PAP1 = Prohibited aquatic plant, Class 1 (Prohibited from possession; Rule 5B-64.011 FAC; FDACS 2008)</p> <p>PAP2 = Prohibited aquatic plant, Class 2 (Limited possession)</p> <p>FLEPPC1 = Category 1 species identified by the Florida Exotic Pest Plant Council (FLEPPC) (invasive plant altering native communities) (FLEPPC 2019; <a href="https://www.fleppc.org/list/list.htm">https://www.fleppc.org/list/list.htm</a>)</p> <p>FLEPPC2 = Category 2 species identified by the FLEPPC (invasive plant species increasing in abundance but not altering native plant communities)</p> <p>Non-native animals from <a href="http://myfwc.com/wildlifehabitats/nonnatives/">http://myfwc.com/wildlifehabitats/nonnatives/</a>.</p> <p>CBJTC Priority: 1 = programmed eradication, 2 = reasonable control efforts, 3 = opportunistic control, 4 = monitor and evaluate impact annually, 5 = early detection</p>					

#### 4.8.4 Priority Invasive Plant Species

There are two invasive plant species considered very high (Priority 1) and four considered high priority (Priority 2) for management at CBJTC: cogongrass (*Imperata cylindrica*), Japanese climbing fern (*Lygodium japonicum*), Chinese tallow tree (*Triadica sebifera*), red sesbania (*Sesbania punicea*), wild taro (*Colocasia esculenta*) and Chinaberry tree (*Melia azederach*). One of the primary sources of information about managing invasive plants in Florida is *Integrated Management of Nonnative Plants in Natural Areas of Florida* by Langeland et al. (2018) available at <http://edis.ifas.ufl.edu>.

Prescribed fire may be applied as an invasive plant management tool; however, prescribed burning affects whole plant communities, not just the target invasive plant species. Consequently, controlling invasive plants with fire requires strategies that address invasive plant species at the population level in addition to all plant species at the community level. In general, as an invasive species management tool, prescribed fire is used to both reduce the dominance of a target invasive plant species, and to increase the dominance and diversity of desirable plant species. However, the effect of fire on an invasive plant species depends on the biological characteristics of the target species. Furthermore, the immediate and long-term response of plant communities is influenced by pre- and post- fire climate variables, activities of other taxa, management activities, natural and human-caused disturbances, as well as other environmental variables. Available information regarding prescribed fire as a means of invasive species control is provided below for both high and medium priority invasive species.

##### 4.8.4.1 Cogongrass (Priority 1)

Cogongrass, a perennial grass native to Southeastern Asia, has become a serious problem in the southeastern US and is considered one of the worst noxious weeds in the world. It spreads by both seed and rhizomes and can displace other vegetation in forests, rangelands, pastures, roadsides, and natural areas. There is the potential that it will invade areas that are not intensively managed, making it difficult to re-establish native habitat. It is fairly easy to kill the aboveground biomass; however, it is very difficult to get the herbicide to move to the belowground plant parts that are deep within the soil.

There are many sources of information about control methods and recommendations in Florida. The following is a brief list of available resources for cogongrass.

- Cogongrass Biology, Ecology and Management in Florida:  
<http://www.cogongrass.org/WG20200.pdf>
- Biology and Management of Cogongrass (University of Florida):  
<http://edis.ifas.ufl.edu/fr252>
- FFS, Beware of Cogongrass:  
[http://www.floridaforestservice.com/forest\\_management/fh\\_invasives\\_cogon.html](http://www.floridaforestservice.com/forest_management/fh_invasives_cogon.html)
- Cogongrass website: <http://www.cogongrass.org>
- A Cogongrass Management Guide (Conference Proceedings 2007):  
[http://myfwc.com/media/132151/A\\_Cogongrass\\_Management\\_Guide.pdf](http://myfwc.com/media/132151/A_Cogongrass_Management_Guide.pdf)



- Center for Aquatic and Invasive Plants:  
<http://plants.ifas.ufl.edu/node/199>
- FLEPPC:  
[http://www.fleppc.org/ID\\_book/Imperata%20cylindrica.pdf](http://www.fleppc.org/ID_book/Imperata%20cylindrica.pdf)
- FFWCC:  
<http://myfwc.com/wildlifehabitats/invasive-plants/weed-alerts/cogon-grass/>

Management recommendations for cogongrass generally include:

- **Prevention:** Avoid soil disturbance, timber harvest, fire, etc. unless as a part of a specific treatment regime. Always clean equipment after operating in infested areas.
- **Control:** To eliminate cogongrass, the rhizomes must be destroyed to avoid regrowth. An integrated approach that combines burning, tillage (mechanical disturbance) and chemical applications provide the best solution for cogongrass management.
  - Initially, cogongrass should be burned or mowed to remove excess thatch and older leaves. Do not mow when seed heads are present. Do not burn without a follow-up herbicide treatment. This initiates regrowth from the rhizomes, thereby reducing rhizome biomass. It also allows herbicides to be applied to only actively growing leaves, maximizing herbicide absorption into the plant. Ideally, burning should take place in the summer. A one-to-four month regrowth period has been shown to provide a sufficient level of leaf biomass for herbicide treatment. Thus, herbicide applications should be targeted in the late summer/early fall – approximately 1 month prior to the average killing frost. The herbicides glyphosate or imazapyr have been shown to provide the best control.
  - If tillage can be incorporated, then a disking treatment directly following a burn is the best approach. This will further deplete the rhizome reserve through desiccation and increase the number of shoots per given area. A one-to-four month regrowth period before herbicide treatment is also needed with this approach as well.
  - Once good control of cogongrass has been achieved, it is essential to introduce desirable vegetation as quickly as possible to prevent cogongrass from re-infesting the area. However, cogongrass will eventually begin to re-infest, regardless of control. Therefore, diligence and persistence are essential to remove/treat re-infested areas before this grass regains a foothold.
- **Timing:** If you can only do one treatment a year, apply your treatment in the fall before the first frost. Otherwise, re-treat regularly whenever adequate foliar re-sprout has occurred.

#### 4.8.4.2 Japanese climbing fern (Priority 1)

Japanese climbing fern is a non-native, invasive vine which since its introduction around 1900 has become established throughout the southeastern Coastal Plain from the Carolinas to Texas and Arkansas. This fern is native to eastern Asia from Japan and west to the Himalayas, and occurs in sunny or shady locations, usually in damp areas such as the edges of swamps, marshes, lakes, creeks, hammocks, and upland woodlands.

There are many sources of information about control methods and recommendations in Florida. The following is a brief list of available resources for Japanese climbing fern.

- Center for Aquatic and Invasive Plants: <http://plants.ifas.ufl.edu/node/639>
- Biology and Control of Japanese climbing fern: <http://edis.ifas.ufl.edu/fr280>
- FLEPPC: [http://www.fleppc.org/ID\\_book/Lygodium%20japonicum.pdf](http://www.fleppc.org/ID_book/Lygodium%20japonicum.pdf)
- FFWCC: <http://myfwc.com/wildlifehabitats/invasive-plants/weed-alerts/japanese-climbing-fern/>

Management recommendations for Japanese climbing fern generally include:

- **Prevention:** Monitoring is very important in the strategy for the management of these climbing ferns. Constant monitoring can aid in the detection of new populations. Steps to prevent spore movement or formation are the key in controlling climbing fern. Since the microscopic spores are easily transported via clothing, wind, and possibly water, contamination is a constant threat. Control measures should be employed when the fern is not producing spores, which occurs in the late summer/early fall. If control measures must be employed during spore formation and dispersal, then these areas should be treated at a time when workers will not be traveling to other sites in the same day. Take care not to drive equipment through the fern foliage, as this will also help to minimize spore movement.
- **Control:** Fire is not thought to be an effective means for control because the fern re-grows quickly following fires. Chemical control is more effective. Combinations of glyphosate and metsulfuron methyl were generally more effective than combinations of glyphosate and imazapyr. Control of Japanese climbing fern improves linearly as the glyphosate product rate is increased from 1 percent to 4 percent of the spray solution. Be sure to include a non-ionic surfactant at 0.25 percent (10 milliliters or 2 teaspoons per gallon of spray solution). A combination of these herbicides has provided good control when applied in the fall of the year before a killing frost.

#### 4.8.4.3 Chinese tallow tree (Priority 2)

Chinese tallow was introduced to the US from eastern Asia, where it has been cultivated for 14 centuries as an oilseed crop. This tree displaces native species and changes natural community structures on the lands it invades. Aggressive efforts have removed this species from all known localities in CBJTC, but monitoring for new sites and new seedlings sprouting at old sites needs to continue. Periodic visual inspections should be sufficient to monitor Chinese tallow tree populations.

There are many sources of information about control methods and recommendations in Florida. The following is a brief list of available resources for Chinese tallow tree.

- Chinese Tallow Management Plan for Florida 2005: [http://www.fleppc.org/Manage\\_Plans/Tallow\\_Plan.pdf](http://www.fleppc.org/Manage_Plans/Tallow_Plan.pdf)
- Center for Aquatic and Invasive Plants: <http://plants.ifas.ufl.edu/node/399>
- Biology and Management of Chinese Tallow Tree: <http://edis.ifas.ufl.edu/fr251>

- USFS: [http://na.fs.fed.us/fhp/invasive\\_plants/weeds/chinese\\_tallow.pdf](http://na.fs.fed.us/fhp/invasive_plants/weeds/chinese_tallow.pdf)
- FLEPPC: [http://www.fleppc.org/ID\\_book/sapium%20sebiferum.pdf](http://www.fleppc.org/ID_book/sapium%20sebiferum.pdf)
- FFWCC: <http://myfwc.com/wildlifehabitats/invasive-plants/weed-alerts/chinese-tallow/>

Control recommendations for Chinese tallow tree generally includes:

- **Mechanical:** Mature trees should be cut down with a chain saw. The final cut should be made as close to the ground as possible and as level as possible. This will make an herbicide application easier as well as prevent resprouting from the cut. Seedling trees can be mowed or disked when small.
- **Fire:** Fire provides partial control of Chinese tallow tree. Larger, mature trees are not impacted by fire because they have developed thick bark and are tall enough to escape the direct flames of the fire. Smaller, young infestations of tallow tree can be controlled by repeated burning. The fire will kill the above-ground stems, but root systems will re-sprout new growth. Thus, repeated burning every 2 to 3 years will be necessary to manage and eventually eliminate this tree.
- **Chemical:** Foliar applications are effective on smaller trees, but cut-stump or basal bark treatments are commonly utilized. For foliar applications, fall treatments before seed shed is the optimum timing – this coincides with downward translocation of carbohydrates. However, basal bark or cut stump treatments can be performed at any time of the year. Control can be achieved with the use of triclopyr-ester applied in an oil diluent. For basal bark applications, apply an herbicide/oil mixture directly to the bark around the circumference of the tree up to 15 inches above the ground. For trees with stems less than 6 inches in basal diameter, a solution of 5 percent triclopyr with oil can be used.
- For trees over 6 inches in basal diameter a 15-20 percent triclopyr and oil solution should be used. To control resprouting of freshly cut stumps, a 20 percent solution of triclopyr is very effective. The root collar area, sides of the stump, and the outer portion of the cut surface should be sprayed until thoroughly wet, but not to the point of runoff. No more than 1/2 hour should elapse between cutting and applying herbicide. Do not attempt a cut stump or basal bark treatment during seed production (August to early September). This can increase the chance of spreading viable seed.

#### 4.8.4.4 Red sesbania (Priority 2)

Red sesbania or rattlebox is native to South America. All parts of red sesbania are poisonous, particularly the seeds. Red sesbania displaces native vegetation and wildlife by forming dense thickets. The greatest environmental impacts are near water bodies or along river and stream banks. The Center for Aquatic and Invasive Plants is a good source of information for control methods and recommendations for red sesbania in Florida: <http://plants.ifas.ufl.edu/node/418>.

Management recommendations for red sesbania generally include:

- **Prevention:** The first step in preventative control of red sesbania is to limit planting and remove existing plants within the landscape. If possible, removal should occur before seeds are produced.
- **Mechanical:** Cut larger plants and treat stumps with herbicide. Pull young plants by hand or with a weed wrench. Mowing will help but is often not feasible due to wet soil conditions where this species prefers. Mechanical control prior to seed set will be helpful in controlling future infestations, but this must be practiced over a several year period as dormant seeds will continue to germinate.
- **Chemical:** Glyphosate has been unsuccessful in Florida when used alone (1 percent, as a foliar spray) and in combination with triclopyr (1 percent Glyphosate, 1 percent triclopyr).

#### 4.8.4.5 Wild taro (Priority 2)

Wild taro was brought from Africa to the Americas as a food crop for slaves and introduced into Florida and other southern states in 1910 as a substitute crop for potatoes. Wild taro is found in swamps and along stream banks. The large leaves may shade and prevent regeneration of desired species. Wild taro is widespread and can frequently be observed along the shorelines of many central Florida lakes.

There are many sources of information about control methods and recommendations in Florida. The following is a brief list of available resources for wild taro.

- Center for Aquatic and Invasive Plants: <http://plants.ifas.ufl.edu/node/108>
- FLEPPC: [http://www.fleppc.org/ID\\_book/Colocasia%20esculenta.pdf](http://www.fleppc.org/ID_book/Colocasia%20esculenta.pdf)
- FFWCC: <http://myfwc.com/wildlifehabitats/invasive-plants/weed-alerts/wild-taro/>
- University of Florida: <http://plants.ifas.ufl.edu/manage/why-manage-plants/floridas-most-invasive-plants/wild-taro>

Management recommendations for wild taro generally include:

- **Prevention:** The first step in preventative control of elephant ear and taro is to limit planting and remove existing plants within the landscape.
- **Mechanical:** Dig out corms from the soil. Take care when cutting, as the leaves contain oxalic acid, which may cause irritation to exposed skin. Harvest floating mats, but be careful of root fragments that can start new plants.
- **Chemical:** Chemicals with known control are limited. Repeated applications of glyphosate (2 percent solution) with a surfactant may be effective, especially if coupled with other management strategies.



#### 4.8.4.6 Chinaberry tree (Priority 2)

Chinaberry tree was introduced around 1830 as an ornamental in South Carolina and Georgia and widely planted in southern states. It occurs primarily in disturbed areas such as road right-of-ways and fencerows, but has also invaded floodplain hammocks, marshes, and upland woods, particularly in north Florida. The fruits are poisonous to humans and some other mammals. Chinaberry has the ability to grow rapidly and displace native vegetation. Through prolific reproduction via seed as well as vegetative reproduction, it is able to shade out other species by forming a dense thicket. The leaf litter produced by Chinaberry causes the soil to become more alkaline, giving an advantage to those species that fare well in alkaline soils. Chinaberry is also believed to have allelopathic properties, prohibiting other species to colonize the area in close proximity to Chinaberry. Overall Chinaberry reduces the plant diversity in any area in which it grows.

There are many sources of information about control methods and recommendations in Florida. The following is a brief list of available resources for Chinaberry tree.

- Center for Aquatic and Invasive Plants: <http://plants.ifas.ufl.edu/node/266>
- FLEPPC: [http://www.fleppc.org/ID\\_book/melia%20azedarach.pdf](http://www.fleppc.org/ID_book/melia%20azedarach.pdf)

Management recommendations for Chinaberry tree generally include:

- **Prevention:** Controlling Chinaberry is best accomplished when trees are very young, prior to seed production. Because the seed is very hard, it may remain dormant in the soil for several months or years. Therefore, be persistent and visit a clean site several times before declaring it “Chinaberry-free”. Another preventative measure is to control trees along fencerows and neighboring hedges, limiting seed introduction.
- **Mechanical:** Mechanical control is limited to cutting, although mowing prevents seedling establishment in pasture and rangeland settings. It is thought that Chinaberry may be susceptible to fire, but more research must be done to validate this claim. Cutting back Chinaberry must be integrated with chemical control because of its proclivity to resprout.
- **Chemical:** Herbicides prove to be the best method of control for Chinaberry. Foliar applications of glyphosate or triclopyr will be fairly effective on trees less than 10 feet tall. A dilution of triclopyr in water can be used. Be sure to include a non-ionic surfactant at 0.25 percent (10 milliliters or 2 teaspoons per gallon of spray solution). A 2 to 3 percent solution of glyphosate can also be effective. A basal bark application of triclopyr has also been shown to be an effective treatment. Triclopyr can be applied in a 4 to 8-inch band near the base of the trunk in a 15 percent solution. Studies have shown a cut stump treatment of 8 percent triclopyr is almost completely effective in eliminating Chinaberry. Herbicides should be applied before the onset of fruit production to prevent seed production. Repeat applications may also be necessary for complete control.

#### 4.8.5 Priority Invasive Animal Species

The only very high or high priority invasive animal species are European rats – both Norway rats (*Rattus norvegicus*) and black rats (*Rattus rattus*). Both are best managed by trapping and removing, as well as using other IPM techniques to minimize rats in buildings.

## 5.0 PLAN IMPLEMENTATION

### 5.1 Project Development

Management goals and objectives were developed through a thorough evaluation of the natural resources present on CBJTC. In accordance with AR 200-1 and the principles of adaptive ecosystem management, subject areas were identified, and management activities developed by an interdisciplinary team of ecologists, biologists, geologists, planners, and environmental scientists. **Section 4.0** presents the preferred management alternatives based on the professional opinions and information gathered from various FLARNG directorates, CBJTC staff, USFWS, FFWCC, as well as other federal, state, and local agencies and special interest groups with an interest in the management of CBJTC natural resources. Through these evaluations, a set of natural resources management goals and objectives, and implementing activities and projects, have been established based on the current understanding of CBJTC and the framework of adaptive ecosystem-based planning (see **Section 4.0**).

This INRMP will be implemented through the various policies and programs described throughout the document and accomplishment of the goals and objectives as described in **Section 4.0**. The implementation schedule, project and activity lists, and how the projects relate to INRMP implementation are detailed in **Tables 15 and 16**.

This INRMP is a living document that is based on short-, medium-, and long-term planning horizons. Short-term tasks include activities and projects that are planned to occur in less than 5 years, while medium-term tasks include activities and projects in a 6- to 10-year period. Long-term tasks are usually scheduled beyond 10 years. A majority of the tasks discussed in this INRMP are short and medium-term natural resources management tasks. Goals, objectives, and tasks should be revised over time to reflect evolving environmental conditions, adaptive management, and the completion of tasks as the INRMP is implemented. In addition, medium- and long-term tasks should eventually become short-term tasks over time.

#### 5.1.1 Project Implementation

In accordance with Section 4-3(d)(1)(b) of AR 200-1, an INRMP is considered implemented if an installation:

- Actively requests, receives, and uses funds for priority projects and activities.
- Ensures sufficient numbers of professionally trained natural resources management staff are available to perform the tasks required by the INRMP.
- Coordinates annually with cooperating agencies.
- Documents specific INRMP activities and projects undertaken each year.
- Evaluates effectiveness of past and current management activities and adapts appropriately to implement future actions.

Natural resources and land use management issues are not the only factors contributing to the development and implementation of the INRMP. Range management and other seemingly unrelated issues affect

implementation. It is important to the implementation of this INRMP that CBJTC personnel take ownership of the INRMP by providing the necessary resources (i.e., personnel and equipment) and utilizing the appropriate funding to enact the plan. Funding for INRMP implementation is not limited to environmental funds. Responsibilities for funding natural resources management activities are outlined in the Army Sustainable Range/Installation Environmental Responsibilities Matrix, which is clarified in NGB Army Installations Division (ARNG G-9), Memorandum 17 April 2006, *Clarification of Funding Responsibilities*.

**Table 15 (Appendix T)** provides an overview of recurring natural resource management activities. These activities are generally performed in-house by CBJTC-ED and ITAM staff. The implementation schedule and planned projects for this updated INRMP are detailed in **Table 16 (Appendix U)**. Table 16 will be used to develop budget requests and schedule annual project requirements. Funding requests will be submitted in accordance with current ARNG G-9 procedures for conservation projects.

### 5.1.2 Priorities and Scheduling

The Office of Management and Budget considers funding for the preparation and implementation of this INRMP, as required by the SAIA, to be a high priority. However, the reality is that not all of the projects and programs identified in this INRMP will receive immediate funding. Projects need to be funded consistent with timely execution to meet future deadlines. Projects are generally prioritized with respect to compliance. Highest priority projects are projects related to recurring or current compliance, and these are generally scheduled earliest. As such, these projects have been placed into three priority-based categories: (1) high priority projects which are essential for maintaining compliance or for successful natural resources management, (2) medium priority projects with no immediate compliance requirement or less impact on the natural resources, and (3) low priority projects with a natural resource benefit but no legal driver. The prioritization of the projects is based on need, legal drivers, and ability to further implement the INRMP.

Recurring requirements include projects and activities needed to cover the recurring administrative, personnel, and other costs that are necessary to meet applicable compliance requirements (federal and state laws, regulations, Presidential EOs, and DoD policies) or which are in direct support of the military mission. Recurring costs include manpower, training, supplies; hazardous waste disposal; operating recycling activities; permits and fees; testing, monitoring, and/or sampling and analysis; reporting and record keeping; maintenance of environmental conservation equipment; and compliance self-assessments.

Current compliance includes projects and activities needed because an installation is currently or will be out of compliance if projects or activities are not implemented in the current program year. Examples include:

- Environmental analyses, monitoring, and studies required to assess and mitigate potential effects of the military mission on conservation resources.
- Planning documents.
- Baseline inventories and surveys of natural and cultural resources (historical and archaeological sites).
- Biological Assessments, surveys, or habitat protection for a specific listed species.
- Mitigation to meet existing regulatory permit conditions or written agreements.

- Wetland delineations in support of subsequent jurisdictional determinations and consequent permitting.
- Efforts to achieve compliance with requirements that have deadlines that have already passed.
- Initial documenting and cataloging of archaeological materials.

Maintenance requirements include those projects and activities needed that are not currently out of compliance but shall be out of compliance if projects or activities are not implemented in time to meet an established deadline beyond the current program year. Examples include:

- Compliance with future requirements that have deadlines.
- Conservation and GIS mapping to be in compliance.
- Efforts undertaken in accordance with non-deadline specific compliance requirements of leadership initiatives.
- Wetlands enhancement, in order to achieve the executive order for “no net loss” or to achieve enhancement of existing degraded wetlands.
- Public education programs that educate the public on the importance of protecting natural resources.

Lower priority projects include those that enhance conservation resources of the installation mission, or are needed to address overall environmental goals and objectives, but are not specifically required under regulation or EO and are not of an immediate nature. These projects are generally funded after those of higher priority are funded. Examples include:

- Community outreach activities, such as “Earth Day” and “Historic Preservation Week” activities.
- Educational and public awareness projects, such as interpretive displays, oral histories, nature trails, wildlife checklists, and conservation teaching materials.
- Biological Assessments, surveys, or habitat protection for a non-listed species.
- Restoration or enhancement of cultural or natural resources when no specific compliance requirement dictates a course or timing of action, and there is no impact to military mission.
- Management and execution of volunteer and partnership programs.



## 5.2 Cooperative Agreements

Intra- and inter-agency cooperation, coordination, and communication at the federal, state, and local levels (e.g., USFWS and FFWCC) are requisite to the success of the INRMP. USFWS and FFWCC review the INRMP and its implementation. Specialized expertise is required to adequately manage natural resources at CBJTC. Technical assistance will be sought from federal and state agencies, universities, and special interest groups.

The DoD and subcommand entities have MOUs, MOAs, and other cooperative agreements with other federal agencies, conservation and special interest groups, and various state agencies in order to provide assistance with natural resources management at installations across the US. Generally, these agreements allow installations and agencies or conservation and special interest groups to obtain mutual conservation objectives. The DoD agreements applicable to CBJTC include:

- MOU between DoD and USFWS concerning ecosystem-based management of fish, wildlife, and plant resources on military lands.
- Cooperative Agreement between the DoD and The Nature Conservancy for assistance in natural resources inventory.
- MOU between the DoD and the USEPA with respect to IPM.
- MOA for federal Neotropical Migratory Bird Conservation Program and addendum (“Partners in Flight-Aves De Las Americas”) among DoD, through each of the Military Services, and over 110 other federal and state agencies and non-governmental organizations.
- MOU between the DoD and Ducks Unlimited, Inc. to provide a foundation for cooperative development of selected wetlands and associated uplands in order to maintain and increase waterfowl populations and to fulfill the objectives of the North American Waterfowl Management Plan, within the context of DoD’s environmental security and military missions.
- MOU for Watchable Wildlife Programs.
- Candidate Conservation Agreement with Assurances with the USFWS and FFWCC for Multiple At-Risk Species in North Florida (CCAA) on portions of CBJTC that support natural habitat for candidate and at-risk species’ and are not at risk of future development or intensive military operations.
- North Florida Land Trust / Camp Blanding Agreement Number W9133L-19-2-3092. The NFLT is the current execution partner for the installation’s ACUB/REPI with additional support of St. Johns River and Suwannee River WMDs, and Clay and Bradford Counties.

CBJTC has MOAs with FFWCC for hunting, fishing, and outdoor recreation use, with FTA for the Florida National Scenic Trail segment within the installation boundaries (see **Appendix I**), and both informal and formal agreements with various agencies for wildland fire assistance (see **Appendix G**). Beneficial partnerships and cooperative agreements for CBJTC are discussed in greater detail in **Section 3.6**.

## 5.3 Funding

All actions contemplated in this INRMP are subject to the availability of funds properly authorized and appropriated under federal law. Nothing in this INRMP is intended to be nor shall be construed to be a violation of the Anti-Deficiency Act, 31 USC § 1341. The installation requests project validation and funding through FLARNG Environmental Office. Funding sources for specific projects can be grouped into four main categories by source: Forestry Program, ARNG funds, other federal funds, and non-federal funds. This is not an all-inclusive list of funding sources and available sources and criteria can change from year to year. When activities or projects cannot be completed due to lack of funding or other reasons, FLARNG will review the INRMP to determine whether adjustments are necessary.

### **5.3.1 Forestry Program**

CBJTC's Forestry Program provides a major source of funding for the natural resources program. The program is funded through the Camp Blanding Management Trust Fund (CBMTF) established under Public Law 493, which governs royalties derived from timber harvest activities on the installation. Revenue derived from natural resources, such as forestry, is to be used for the management of natural resources at CBJTC and for its maintenance and preservation as a military installation. Annual timber revenues since 1956 are documented in the FRMP (see **Appendix F**).

### **5.3.2 ARNG Funding**

ARNG is the primary source of funding that supports the management of natural resources at the CBMTF through a master cooperative agreement with FLARNG and managed by FLARNG Environmental Program Manager. Environmental funds typically can be used for core natural resources activities and projects and guidance is provided in funding documents issued yearly. Projects paid for with environmental funds should be submitted through the Status Tool for Environmental Programs (STEP) maintained by the ARNG G-9.

In addition to Environmental funds, Installation and ITAM funds can also be used to implement INRMP activities and projects. Installation funds support facilities operation and maintenance, including facility planning, maintenance of roads, vegetation management, wildfire management, pest management, construction, and master planning. All activities have an impact on natural resources. Installation funds can also be used for pest and noxious weed control, invasive species control, facilities vegetation control and controlled burns to manage vegetation and fuels on training areas and ranges. ITAM funds can be used for monitoring, maintenance of trails, vegetation restoration, land management, and water quality improvements related directly to military training.

The following natural resources management areas can be addressed with multiple funding sources: erosion control, invasive species management, and wildland fire. However, the type of funding used for these management areas depends on purpose. Current guidance should be referred to annually to determine the most appropriate source of funding for a specific activity or project.

### **5.3.3 Other Federal Funds**

Cooperative agreements may be made with state or local governments, non-governmental organizations, and individuals for the improvement of natural resources or to foster research on military facilities. USFWS

and FFWCC are cooperators in the development and implementation of the INRMP. In this capacity, they may facilitate access to matching funds and services.

The DoD Legacy Resource Management Program provides financial assistance for natural and cultural resources management efforts on DoD land. Legacy priority projects include regional ecosystem management initiatives, habitat preservation efforts, invasive species control, and/or rare species management. Legacy funds are generally awarded to projects that offer multiple installation applicability.

Readiness and Environmental Protection Integration (REPI) provides additional funding through the ACBU program. These funds are awarded annually to the current approved partner for the acquisition of parcels within the approved ACUB boundary. Up to this point, no REPI funds have been applied to natural resource management projects on the installation or ACUB properties; new opportunities will be explored as funding becomes available.

#### **5.3.4 Non-Federal Funds**

Opportunities exist to use state or local funds or private grants to support INRMP projects, particularly those relating to public access or natural resources education. Examples include:

- Public Lands Day grants are relatively easy to obtain and can be used for signs, native plant landscaping, trail construction, and other similar activities using the assistance of volunteers.
- USFWS Coastal Partners Program works with partners to implement projects supporting a science-based approach to habitat connectivity and ecosystem integrity, imperiled and other priority species conservation and recovery, and conservation partnerships leveraging resources to promote stewardship of wildlife.

Non-federal partnerships are beneficial to natural resources management and protection at CBJTC. Entering into cooperative or mutual aid agreements with states, local governments, non-governmental organizations, and other individuals is also a great source of additional resources.

#### **5.4 Natural Resources Management Staffing**

CBJTC-ED is composed of eight staff, with each individual possessing subject matter expertise in different areas including natural and cultural resources management, environmental compliance, and pollution prevention. Essential duties include assisting trainers, construction, and facilities personnel to ensure compliance with various federal and state laws. The ITAM program also implements portions of the INRMP; it supports five employees who are responsible for daily training area maintenance and rehabilitation activities (**Section 1.5.7**). Additionally, over 20 personnel at CBJTC are trained and available to participate in wildland fire activities.

When FLARNG does not have expertise or staff in-house to complete projects, other agencies and contractors are used, including FFWCC, FNAI, FLMNH, University of Florida, and private contractors.





## 5.5 Monitoring INRMP Implementation

### 5.5.1 CBJTC INRMP Monitoring

Monitoring of INRMP implementation is necessary to facilitate the legal requirements of the SAIA for review for operation and effect (DoDI 4715.03 and see **Section 1.4.2**). These SAIA implementation criteria do not necessarily measure the effectiveness of an INRMP in facilitating mission accomplishment while conserving natural resources. INRMP implementation for CBJTC will be monitored for meeting the legal requirements of the SAIA as well as for other mission and biological measures of effectiveness.

The ultimate successful implementation of this INRMP is realized in no net loss in the capability of CBJTC training lands to support the military mission, while at the same time providing effective natural resources management. Initiation of projects is one measure that is used to monitor INRMP implementation, but it does not give the total picture of the effectiveness of the natural resources management program. Natural resources management is not simply the sum total of projects, interagency coordination, or program funding and staffing. Natural resources management at CBJTC is a program and a philosophy that guides FLARNG's approach to land use. A significant portion of INRMP implementation is done through internal coordination in regard to training site operations and land use decision making. This type of implementation cannot be measured by project implementation or funding levels. It is evidenced by such things as the ability to continually train, sustainable land use, ongoing regulatory compliance, retention of species diversity, retention of surface water quality, and the acknowledgement of sustainable natural resources management by partnering conservation agencies and other interested organizations and individuals.

In order to monitor and evaluate the effectiveness of INRMP implementation, the following will be reviewed as applicable and discussed within the context of the annual review and/or a formal review of operation and effect per DA Memorandum, *Guidance for Implementation of the SAIA*, dated 25 May 2006:

- Impacts to and from the military mission
- Conservation program budget
- Staff requirements
- Program and project implementation
- Trends in species and habitat diversity as evidenced by recurring biological surveys, land use changes, and opinions of natural resource experts
- Compliance with regulatory requirements
- Feedback from military trainers, USFWS, FFWCC, and others

Some of these areas may not be looked at every year due to lack of data or pertinent information. The effectiveness of the INRMP as a mission enabling conservation tool will be decided by mutual agreement of USFWS, FFWCC, and FLARNG during annual reviews and/or reviews for operation and effect.

### 5.5.2 DA and DoD INRMP Monitoring

The Army uses the Environmental Quality Report (EQR) to monitor SAIA compliance throughout the department. EQR is the automated system used to collect installation environmental information for reporting to DoD and Congress. The EQR system moved to the Army Environmental Reporting Online (AERO) portal in February 2005, creating a day-to-day management tool. The Army Equip module under4 WEBCASS is a full update of the Web-based software EQR application used to convey the Army's environmental status to senior Army leadership, DoD, and Congress since 1997.

Established to fulfill a semi-annual requirement to report the status of DoD's Environmental Quality program to Congress, EQR collects information on enforcement actions, inspections, and other performance measures for high-level reports and quarterly reviews. EQR also helps the Army track fulfillment of DoD Measures of Merit requirements.

The module is designed to coordinate information management for conservation, compliance, pollution prevention, and other Army environmental reporting. It can adapt easily to future changes in command structure or measures of merit. Army Equip provides for the collection, review, and retrieval of data in no less than 14 program areas, from enforcement actions to conservation program metrics.

The DoDI 4715.03 updated the natural resources conservation metrics for preparing and implementing INRMPs. Progress toward meeting these measures of merit is reported in the annual EQR to Congress. DoDI 4715.03 reporting requirements currently include:

- Are INRMP projects, including follow-up inventorying and monitoring work, properly identified, developed, and submitted for funding?
- Has project funding been received, obligated, and expended?
- Have projects been completed and do they meet expected objectives?
- Are conservation efforts effective?
- Does the INRMP provide conservation benefits necessary to preclude a critical habitat designation?
- Are species at risk identified and are steps being undertaken to preclude listing?
- Has the INRMP review team (i.e., DoD, USFWS, and FFWCC) been effective in ensuring the INRMP's implementation?
- Are other partnerships needed to meet the INRMP goals?
- Have other partnerships been effectively used to meet INRMP goals?
- Are public recreational opportunities such as hunting, fishing, and wildlife viewing available to base residents and employees?
- Are public recreational opportunities such as hunting, fishing, and wildlife viewing available to the public?
- Is the installation's natural resources team adequately resourced to fully implement the INRMP?
- Is the installation's natural resources team adequately trained to fully implement the INRMP?

- Does the installation encourage retaining existing natural resources personnel to maintain corporate knowledge and manage resources with the most qualified professionals to support the military mission?
- To what extent are the installation's native ecological systems currently intact?
- In what ways are an installation's various habitats susceptible to change or damage from different stressors?
- What stressors affect each habitat type?
- To what degree (i.e., high, medium, or low) is the INRMP and its associated actions supporting the installation's ability to sustain the current and potential future military mission?

## 6.0 REFERENCES

- Annable, M.D., L.H. Motz, D.S. Knapp, and W.D. Beddow II. 1996. *Investigation of Lake and Surficial Aquifer Interaction in the Upper Etonia Creek Basin*. Special Publication SJ96-SP15. Gainesville, FL: Departments of Environmental Engineering Sciences and Civil Engineering, University of Florida.
- ARNG. 2011. *ARNG NEPA Handbook, Guidance on Preparing Environmental Documentation for Army National Guard Actions in Compliance with the National Environmental Policy Act of 1969*. Washington D.C. Army National Guard
- ARNG-ILE. 2011. *Integrated Cultural Resources Management Plan for Installations of the Florida Army National Guard 2011-2015*. Arlington, VA: National Guard Bureau.
- Bailey, R.G., P.E. Avers, T. King, and W.H. McNab. 1995. *Ecoregions and Subregions of the United States (with Supplementary Table of Map Unit Descriptions Compiled and Edited by W.H. McNab and R.G. Bailey)*. Washington DC: US Forest Service. <http://www.fs.fed.us/land/ecosysmgmt/>.
- Bio-tech. 2009. *Threatend and Endangered Species Survey Report for Camp Blanding Joint Training Center*. St Augustine, FL: Bio-tech Consulting, Inc.
- Bradford County Board of County Commissioners. 2006. *Comprehensive Plan 2016 Evaluation and Appraisal Report (EAR) Based Amendments*. Starke, FL: Bradford County, Department of Building and Zoning.
- Burgess, G.H., and J.M. Matter. 1994. *Camp Blanding Ichthyofaunal Survey*. Gainesville, FL: Florida Museum of Natural History, University of Florida.
- CEC. 1997. *Ecological Regions of North American - Toward a Common Perspective*. Montreal, Quebec: Commission for Environmental Cooperation.
- CH2MHill. 1999. *Watershed Assessment of Camp Blanding Training Site*. Tampa, FL: CH2M Hill, Inc.
- Chafin, L.G. 2000. *Field Guide to the Rare Plants of Florida*. Tallahassee, FL: Florida Natural Areas Inventory. <http://www.fnai.org/fieldguide/>.
- Christman, S.P., and D.B. Means. 1992. "Striped Newt: *Notophthalmus Perstriatus* (Bishop)." In *Rare and Endangered Biota of Florida: Volume III Amphibians and Reptiles*, ed. P.E. Moler, 62–65. Gainesville, FL: University Press of Florida.
- Clay County. 2009. *2025 Clay County Comprehensive Plan*. Green Cove Springs, FL: Clay County Board of County Commissioners.
- Costa, R. 2007. *Biological Opinion (BO) on the US Army's Biological Assessment of the Effects of the Proposed Revision of the 1996 Management Guidelines for the Red-cockaded Woodpecker on Army Installations*. Clemson, SC: US Fish & Wildlife Service.



- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. FWS/OBS-79/31. Washington DC: U.S. Department of the Interior.
- Dubois, N.A., A. Caldas, J. Boshoven, and A. Delach. 2011. *Integrating Climate Change Vulnerability Assessment into Adaptation Planning: A Case Study Using the NatureServe Climate Change Vulnerability Index in Florida*. Washington DC: Defenders of Wildlife.
- Eco-Cognizant. 1996a. *Aquatic Macroinvertebrate Fauna of Camp Blanding Training Site, Clay County, Florida*. Gainesville, FL: Eco-Cognizant, Inc.
- . 1996b. *Butterflies of Camp Blanding Training Site, Clay County, Florida*. Gainesville, FL: Eco-Cognizant, Inc.
- Enge, K. M., A. L. Farmer, J. D. Mays, T. D. Castellón, E. P. Hill, and P. E. Moler. 2014. Survey of winter-breeding amphibian species. Final report, Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute, Lovett E. Williams, Jr. Wildlife Research Laboratory, Gainesville, Florida, USA. 136pp.
- Enge, K. M., J. D. Mays, E. P. Hill, and B. B. Harris. 2016. Status assessments of the southern hog-nosed snake, Florida pinesnake, short-tailed kingsnake, and eastern diamond-backed rattlesnake in Florida. Final Report, Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute, Wildlife Research Section, Gainesville, Florida, USA. 93pp.
- Farmer, A. L., K. M. Enge, J. B. Jensen, D. J. Stevenson, and L. L. Smith. 2017. A range-wide assessment of the status and distribution of the striped newt (*Notophthalmus perstriatus*). *Herpetological Conservation and Biology* 12:585–598.
- FDACS. 2016. *Noxious Weed List, Florida Administrative Code Rule 5B-57.007*. Tallahassee, FL: Florida Department of Agriculture and Consumer Services.
- . 2008a. *Prohibited Aquatic Plants, Florida Administrative Code Rule 5B-64.011*. Tallahassee, FL: Florida Department of Agriculture and Consumer Services.
- . 2008b. *Silviculture Best Management Practices*. Tallahassee, FL: Florida Department of Agriculture and Consumer Services.
- FDEP. 2020. *Florida's List of 303(d) Impaired Waters*. Tallahassee, FL: Florida Department of Environmental Protection. <http://www.dep.state.fl.us/water/watersheds/assessment/303drule.htm>.
- FDEP. 2018. *Florida Stormwater Erosion and Sedimentation Control Inspector's Manual*. Tallahassee, FL: Florida Department of Environmental Protection.
- FDMA. 2011. *Eastern Indigo Snake Survey Report*. Starke, FL: Florida Department of Military Affairs.
- FEMA. 2014. *Flood Insurance Rate Maps for Clay County, Panels 1200640100D, 1200640120D, 1200640200D, 1200640225D, 1200640325D, 1200640350D, Effective 17 March 2014*. Washington DC: Federal Emergency Management Agency. <https://msc.fema.gov>

- FFWCC. 2019. *Florida's Wildlife Legacy Initiative: Comprehensive Wildlife Conservation Strategy*. Tallahassee, FL: Florida Fish and Wildlife Conservation Commission.
- . 2012. *Gopher Tortoise Management Plan*. Tallahassee, FL: Florida Fish and Wildlife Conservation Commission.
- . 2018. *Florida's State Wildlife Action Plan*. Tallahassee, FL: Florida Fish and Wildlife Conservation Commission.
- . 2020. "Florida Fish and Wildlife Conservation Commission Cooperative Areas Website." <http://myfwc.com/viewing/recreation/wmas/cooperative/>.
- . 2017. *Gopher Tortoise Permitting Guidelines*. Tallahassee, FL: Florida Fish and Wildlife Conservation Commission.
- Finn, L.S. 2001. *Species at Risk Bat Survey for Florida Army National Guard, Camp Blanding Training Site*. Report to the USGS Florida Cooperative Fish and Wildlife Research Unit. Osteen, FL: Fly By Night, Inc.
- . 2008. *Camp Blanding Bat Survey for Florida Army National Guard*. Osteen, FL: Fly By Night, Inc.
- FLARNG. 2000. *Camp Blanding Training Site Stormwater Master Plan*. Starke, FL: Pitman, Hartenstein & Assoc., Inc.
- . 2006. *Master Plan for Camp Blanding Joint Training Center*. Starke, FL: Florida Army National Guard.
- . 2011. "Personal Correspondence with CBJTC Environmental Staff."
- . 2017. *Integrated Pest Management Plan, 2017-2022*. Starke, FL: Florida Army National Guard.
- . 2012. *Spill Prevention, Spill and Countermeasure Plan for Camp Blanding Joint Training Center*. Starke, FL: Aerostar Environmental Services, Inc.
- FLEPPC. 2019. *List of Invasive Plant Species*. Florida Exotic Pest Plant Council. <http://www.https://www.fleppc.org/list/list.htm>.
- FLMNH. 1996a. *Endangered Animal Species Management Plans*. Gainesville, FL: Florida Museum of Natural History, University of Florida.
- . 1996b. *Endangered Plant Species Management Plans*. Gainesville, FL: Florida Museum of Natural History, University of Florida.
- FLNG. 2005. *Forest Resources Management Plan for Camp Blanding Training Site*. Starke, FL: Florida National Guard.

- . 2011a. *Integrated Wildland Fire Management Plan for Camp Blanding Joint Training Center*. Starke, FL: Florida National Guard.
- . 2011b. *Florida National Guard Range Complex Master Plan Fiscal Year 2011-2012*. Starke, FL: Florida National Guard.
- FNAI. 2010a. *Guide to the Natural Communities of Florida*. Tallahassee, FL: Florida Natural Areas Inventory.
- . 2010b. *Development of a Cooperative Land Cover Map: Final Report, Florida's Wildlife Legacy Initiative Project 08009*. Tallahassee, FL: Florida Natural Areas Inventory.
- . 2020. *Species and Communities: Searchable Tracking List by County*. Tallahassee, FL: Florida Natural Areas Inventory. <http://www.fnai.org/trackinglist.cfm>
- Florida State Parks. 2020. "Mike Roess Gold Head Branch State Park." <http://www.floridastateparks.org>.
- Franz, R. 1992. "Florida Pine Snake." In *Rare and Endangered Biota of Florida Volume III: Amphibians and Reptiles*, ed. P. E. Moler, Gainesville, FL: University Press of Florida.
- Franz, R., and L. L. Smith. 1999. Distribution of the striped newt and Florida gopher frog in peninsular Florida. Florida Fish and Wildlife Conservation Commission Final Report, Tallahassee, Florida, USA. 46pp.
- Godley, J.S. 1992. "Gopher Frog." In *Rare and Endangered Biota of Florida Volume III: Amphibians and Reptiles*, ed. P. E. Moler, Gainesville, FL: University Press of Florida.
- Godsea, K. 2020. *Frequently Asked Questions About the Florida Panther*. Naples, FL: US Fish & Wildlife Service. <https://www.fws.gov/southeast/wildlife/mammals/florida-panther/>.
- Gregory, C. J., R. R. Carthy, and L. G. Pearlstine. 2006. Survey and monitoring of species at risk at Camp Blanding Training Site, northeastern Florida. *Southeastern Naturalist* 5:473–498.
- Griffin, D. 1999. *Bryophyte and Lichen Survey of the Camp Blanding Training Site*. Gainesville, FL: University of Florida.
- Griffith, G.E., J.M. Omernik, and S.M. Pierson. 2011. *Levell III and IV Ecoregions of the Continental United States (revised January 2011)*. Corvallis, OR: US Environmental Protection Agency. [http://www.epa.gov/wed/pages/ecoregions/fl\\_eco.htm](http://www.epa.gov/wed/pages/ecoregions/fl_eco.htm).
- Gruver, B.J., and N. Montero. 2011. *Florida's Endangered and Threatened Species Updated December 2018*. Tallahassee, FL: Florida Fish and Wildlife Conservation Commission. <https://myfwc.com/media/1945/threatend-endangered-species.pdf>.
- Hall, P.M., D. Auth, D. Hipes, and P. Moler. 1994a. *Amphibian and Reptile Species Found on Camp Blanding Joint Training Center*. Starke, FL: Florida Army National Guard.

- Hall, P.M., D. Auth, D. Hipes, and T. Weber. 1994b. *Bird Species Found on Camp Blanding Joint Training Center, Clay County, Florida*. Starke, FL: Florida Army National Guard.
- Hall, P.M., J.K. Hoag, and R.C. Otterson. 1997. *Integrated Training Area Management Program with Special Emphasis on Land Condition Trend Analysis 1992-1996 Installation Report*. Starke, FL: Florida Department of Military Affairs, Camp Blanding Training Site.
- Hankla, D.A. 2008. *Consultation Letter - Modification to the April 27, 2007 USFWS Biological Opinion for Revision of the 1996 Management Guidelines for the Red-cockaded Woodpecker on Army Installations*. Jacksonville, FL: US Fish & Wildlife Service.
- Harris, L.D., and D. McCally. 1995. *Analysis of the Historical Context of the Camp Blanding Training Site*. Gainesville, FL: Florida Museum of Natural History, University of Florida.
- Hipes, D. L., and D. R. Jackson. 1996. Rare vertebrate fauna of Camp Blanding Training Site, a potential landscape linkage in northeastern Florida. *Florida Scientist* 59:96–114.
- Hipes, D., D.R. Jackson, K. NeSmith, D. Printiss, and K. Brandt. 2000. *Field Guide to the Rare Animals of Florida*. Tallahassee, FL: Floriday Natural Areas Inventory. <http://www.fnai.org/fieldguide/>
- IFAS Extension. 2015. *The Florida Yards & Neighborhoods Handbook*. Gainesville, FL: University of Florida, Institute of Food & Agricultural Sciences Extension. [http://floridayards.org/landscape/The Florida Yards and Neighborhoods Handbook Web.pdf](http://floridayards.org/landscape/The_Florida_Yards_and_Neighborhoods_Handbook_Web.pdf)
- Johnson, S.A., and R.D. Owen. 2005. *Status of Historical Striped Newt (Notophthalmus Perstriatus) Locations in Peninsular Florida and Some New Locations*. Lakeland, FL.
- Kantola, A.T. 1992. "Sherman's Fox Squirrel." In *Rare and Endangered Biota of Florida Volume I: Mammals*, ed. S. R. Humphrey. Gainesville, FL: University Press of Florida.
- Langeland, K.A., J.A. Ferrell, B. Sellers, G.E. MacDonald, and R.K. Stocker. 2018. *Integrated Management of Nonnative Plants in Natural Areas in Florida*. SP 242. Gainesville, FL: University of Florida, Institute of Food & Agricultural Sciences Extension. <http://edis.ifas.ufl.edu>.
- Layne, J.N. 1992. "Florida Mouse." In *Rare and Endangered Biota of Florida Volume I: Mammals*, ed. S. R. Humphrey. Gainesville, FL: University Press of Florida.
- Maehr, D.S., T.S. Hactor, L.J. Quinn, and J.S. Smith. 2001. Black bear habitat management guidelines for Florida. Technical Report No. 17. Florida Fish and Wildlife Conservation Commission, Tallahassee, FL.
- Maehr, D.S. 1992. "Florida Black Bear." In *Rare and Endangered Biota of Florida Volume I: Mammals*, ed. S. R. Humphrey. Gainesville, FL: University Press of Florida.
- McMillan, M., R. Boughton, and R. Bowman. 2010. *Scrub Jays at Camp Blanding Joint Training Center*. Venus, FL: Archbold Biological Station.



- Means, R. 2008. *Management Strategies for Florida's Ephemeral Ponds and Pond-Breeding Amphibians*. Tallahassee, FL: Florida Fish and Wildlife Conservation Commission.
- Miller, J.A. 1990. *Ground Water Atlas of the United States: Alabama, Florida, Georgia, and South Carolina*. HA 730-G. Reston, VA: US Geological Survey.  
[http://pubs.usgs.gov/ha/ha730/ch\\_g/index.html](http://pubs.usgs.gov/ha/ha730/ch_g/index.html).
- Morin, K. C. 2005. Herpetofaunal responses to prescribed fire in upland pine communities of northeast Florida. M.S. Thesis, University of Florida, Gainesville, Florida, USA. 77pp.
- Motz, L.H., and J.P. Heaney. 1993. *Upper Etonia Creek Hydrologic Study Phase II*. Special Publication SJ02-SP18. Gainesville, FL: University of Florida.
- Motz, L.H., J.P. Heaney, W.K. Denton, and G. Leiter. 1991. *Upper Etonia Creek Hydrologic Study Phase I*. Special Publication SJ 91-SP5. Gainesville, FL: University of Florida.
- Moulton, M.P., and L.J. Justice. 1996. *Conservation Biology of Potential Indicator Species (Rufous-sided Towhee) at Camp Blanding Training Site*. Gainesville, FL: Department of Wildlife Ecology and Conservation, University of Florida.
- Nelson, E.B., and M.R. Floyd. 2011. *Black Creek Crayfish Baseline Survey at Camp Blanding Joint Training Center*. Gainesville, FL: Fish and Wildlife Research Institute, Florida Fish and Wildlife Conservation Commission.
- NRCS. 2010. *Soil Survey Geographic (SSURGO) Database for Clay County, Florida*. Washington DC: US Department of Agriculture, Natural Resources Conservation Service.  
<http://SoilDataMart.nrcs.usda.gov/>.
- . 2012. *National List of Hydric Soils - April 2012*. Washington DC: US Department of Agriculture, Natural Resources Conservation Service. <http://soils.usda.gov/use/hydric>.
- Robinson, R. 2008. *Biological Evaluation for Incidental Take in the RCW Endangered Species Management Component Update for the INRMP 2007-2012 for FLARNG – CBJTC*. Starke, FL: Florida Army National Guard.
- Scott, T.M. 2001. *Text to Accompany the Geologic Map of Florida*. Tallahassee, FL: Florida Geological Survey.
- Scott, T.M., K.M. Campbell, F.R. Rupert, J.D. Arthur, R.C. Green, G.H. Means, T.M. Missimer, J.M. Lloyd, J.W. Yon, and J.G. Duncan. 2001. *Geologic Map of the State of Florida*. Open-File Report 80. Tallahassee, FL: Florida Geological Survey.
- SERCC. 2012. *National Climatic Data Center Monthly Normals (1971-2000) for Starke, Florida Station #088527*. Chapel Hill, NC: Southeast Regional Climate Center. <http://www.sercc.com/cgi-bin/sercc/cliMAIN.pl?f18527>.
- US Army. 2007. *Management Guidelines for the Red- Cockaded Woodpecker on Army Installations*. US Army.

- . 2009. *Standards in Training Commission (STRAC)*. Pamphlet 350-38. Washington DC: US Army. [http://www.apd.army.mil/pdffiles/p350\\_38.pdf](http://www.apd.army.mil/pdffiles/p350_38.pdf).
- US Census Bureau. 1990. "1990 Census." <http://www.census.gov/main/www/cen1990.html>.
- . 2000. "Census 2000 Gateway." <http://www.census.gov/main/www/cen2000.html>.
- . 2010. "2010 Census." <http://2010.census.gov/2010census/>.
- USDA. 2012. *Federal Noxious Weed List*. Washington, DC: US Department of Agriculture, Animal and Plant Health Inspection Service. [http://www.aphis.usda.gov/plant\\_health/plant\\_pest\\_info/weeds/downloads/weedlist.pdf](http://www.aphis.usda.gov/plant_health/plant_pest_info/weeds/downloads/weedlist.pdf).
- USEPA. 2007. *Developing your Stormwater Pollution Prevention Plan: A Guide for Construction Sites*. EPA Publication 833-R-06-004. Washington D.C. US Environmental Protection Agency.
- USFWS. 2003. *Recovery Plan for the Red-cockaded Woodpecker (Picoides Borealis): Second Revision*. Atlanta, GA: US Fish & Wildlife Service.
- . 2008. *American Alligator Fact Sheet*. Atlanta, GA: US Fish & Wildlife Service. <http://www.fws.gov/endangered/esa-library/pdf/alligator.pdf>.
- . 2010. *National Wetlands Inventory State Data*. Washington DC: US Fish & Wildlife Service. <http://www.fws.gov/wetlands/Data/State-Downloads.html>.
- . 2019. *Federally Listed Species in Clay County, Florida*. Jacksonville, FL: US Fish & Wildlife Service. <http://www.fws.gov/northflorida/CountyList/Clay.htm>.
- Weatherspoon, R.L., E. Cummings, and W.H. Wittstruck. 1989. *Soil Survey for Clay County, Florida*. Washington DC: US Department of Agriculture, Natural Resources Conservation Service.
- Weaver, R.E, and P.J. Anderson. 2010. *Notes on Florida's Endangered and Threatened Plants*. Contribution No. 38, 5th ed. Tallahassee, FL: Florida Department of Agriculture and Consumer Services, Division of Plant Industry. <http://www.freshfromflorida.com/pi/enpp/botany/images/fl-endangered-plants.pdf>.
- Webb, S.D. 1990. "Historical Biogeography." In *Ecosystems of Florida*, Pages 70–100. Orlando, FL: University of Central Florida Press.

**Exhibit F:**  
**Financial Assurances**

SURETY RIDER

To be attached to and form a part of

Bond No. K40153925

dated June 5, 2020  
effective (MONTH-DAY-YEAR)

executed by The Chemours Company FC, LLC, as Principal,  
(PRINCIPAL)

and by Federal Insurance Company, as Surety,

in favor of Florida Department of Environmental Protection  
(OBLIGEE)

in consideration of the mutual agreements herein contained the Principal and the Surety hereby consent to changing

**The Bond Amount from:**

Two Hundred Seventy-three Thousand Nine Hundred Fifty-one & 14/100 (\$273,951.14)

**To:**

Two Hundred Eighty-one Thousand Seventy-three & 87/100 (\$281,073.87)

Nothing herein contained shall vary, alter or extend any provision or condition of this bond except as herein expressly stated.

This rider March 25, 2024  
is effective (MONTH-DAY-YEAR)

Signed and Sealed March 25, 2024  
(MONTH-DAY-YEAR)

The Chemours Company FC, LLC  
(PRINCIPAL)

By: *S. Rast* Interim Treasurer  
(PRINCIPAL)

Federal Insurance Company  
(SURETY)

By: *Cori Wilson*  
Cori Wilson, Attorney-in-Fact



CHUBB

## Power of Attorney

Federal Insurance Company | Vigilant Insurance Company | Pacific Indemnity Company  
Westchester Fire Insurance Company | ACE American Insurance Company

Know All by These Presents, that **FEDERAL INSURANCE COMPANY**, an Indiana corporation, **VIGILANT INSURANCE COMPANY**, a New York corporation, **PACIFIC INDEMNITY COMPANY**, a Wisconsin corporation, **WESTCHESTER FIRE INSURANCE COMPANY** and **ACE AMERICAN INSURANCE COMPANY** corporations of the Commonwealth of Pennsylvania, do each hereby constitute and appoint

Cori Wilson

each as their true and lawful Attorney-in-Fact to execute under such designation in their names and to affix their corporate seals to and deliver for and on their behalf as surety thereon or otherwise, bonds and undertakings and other writings obligatory in the nature thereof (other than bail bonds) given or executed in the course of business, and any instruments amending or altering the same, and consents to the modification or alteration of any instrument referred to in said bonds or obligations.

In Witness Whereof, said **FEDERAL INSURANCE COMPANY**, **VIGILANT INSURANCE COMPANY**, **PACIFIC INDEMNITY COMPANY**, **WESTCHESTER FIRE INSURANCE COMPANY** and **ACE AMERICAN INSURANCE COMPANY** have each executed and attested these presents and affixed their corporate seals on this 10<sup>th</sup> day of March, 2020.

*Dawn M. Chloros*

Dawn M. Chloros, Assistant Secretary

*Stephen M. Haney*

Stephen M. Haney, Vice President



STATE OF NEW JERSEY

County of Hunterdon

SS.

On this 10<sup>th</sup> day of March, 2020 before me, a Notary Public of New Jersey, personally came Dawn M. Chloros and Stephen M. Haney, to me known to be Assistant Secretary and Vice President, respectively, of **FEDERAL INSURANCE COMPANY**, **VIGILANT INSURANCE COMPANY**, **PACIFIC INDEMNITY COMPANY**, **WESTCHESTER FIRE INSURANCE COMPANY** and **ACE AMERICAN INSURANCE COMPANY**, the companies which executed the foregoing Power of Attorney, and the said Dawn M. Chloros and Stephen M. Haney, being by me duly sworn, severally and each for herself and himself did depose and say that they are Assistant Secretary and Vice President, respectively, of **FEDERAL INSURANCE COMPANY**, **VIGILANT INSURANCE COMPANY**, **PACIFIC INDEMNITY COMPANY**, **WESTCHESTER FIRE INSURANCE COMPANY** and **ACE AMERICAN INSURANCE COMPANY** and know the corporate seals thereof, that the seals affixed to the foregoing Power of Attorney are such corporate seals and were thereto affixed by authority of said Companies; and that their signatures as such officers were duly affixed and subscribed by like authority.

Notarial Seal



KATHERINE J. ADELAAR  
NOTARY PUBLIC OF NEW JERSEY  
No. 2316885  
Commission Expires July 18, 2024

*Katherine J. Adelaar*

Notary Public

### CERTIFICATION

Resolutions adopted by the Boards of Directors of **FEDERAL INSURANCE COMPANY**, **VIGILANT INSURANCE COMPANY**, and **PACIFIC INDEMNITY COMPANY** on August 30, 2016; **WESTCHESTER FIRE INSURANCE COMPANY** on December 11, 2006; and **ACE AMERICAN INSURANCE COMPANY** on March 20, 2009:

"RESOLVED, that the following authorizations relate to the execution, for and on behalf of the Company, of bonds, undertakings, recognizances, contracts and other written commitments of the Company entered into in the ordinary course of business (each a "Written Commitment"):

- (1) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise.
- (2) Each duly appointed attorney-in-fact of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise, to the extent that such action is authorized by the grant of powers provided for in such person's written appointment as such attorney-in-fact.
- (3) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to appoint in writing any person the attorney-in-fact of the Company with full power and authority to execute, for and on behalf of the Company, under the seal of the Company or otherwise, such Written Commitments of the Company as may be specified in such written appointment, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.
- (4) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to delegate in writing to any other officer of the Company the authority to execute, for and on behalf of the Company, under the Company's seal or otherwise, such Written Commitments of the Company as are specified in such written delegation, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.
- (5) The signature of any officer or other person executing any Written Commitment or appointment or delegation pursuant to this Resolution, and the seal of the Company, may be affixed by facsimile on such Written Commitment or written appointment or delegation.

FURTHER RESOLVED, that the foregoing Resolution shall not be deemed to be an exclusive statement of the powers and authority of officers, employees and other persons to act for and on behalf of the Company, and such Resolution shall not limit or otherwise affect the exercise of any such power or authority otherwise validly granted or vested."

I, Dawn M. Chloros, Assistant Secretary of **FEDERAL INSURANCE COMPANY**, **VIGILANT INSURANCE COMPANY**, **PACIFIC INDEMNITY COMPANY**, **WESTCHESTER FIRE INSURANCE COMPANY** and **ACE AMERICAN INSURANCE COMPANY** (the "Companies") do hereby certify that

- (i) the foregoing Resolutions adopted by the Board of Directors of the Companies are true, correct and in full force and effect,
- (ii) the foregoing Power of Attorney is true, correct and in full force and effect.

Given under my hand and seals of said Companies at Whitehouse Station, NJ, this March 25, 2024



*Dawn M. Chloros*

Dawn M. Chloros, Assistant Secretary

IN THE EVENT YOU WISH TO VERIFY THE AUTHENTICITY OF THIS BOND OR NOTIFY US OF ANY OTHER MATTER, PLEASE CONTACT US AT:

Telephone (908) 903-3493

Fax (908) 903-3656

e-mail: surety@chubb.com



**Exhibit G:**  
**Conservation Easement**