[Non-DoD Source] Chemours Trail Ridge South - Application (email 1 of 6)

Danny LeJeune <dlejeune@kleinfelder.com>

Fri 12/13/2019 5:30 PM

To: CESAJ-Mine.Team <CESAJ-Mine.Team@usace.army.mil>;

Cc: Fellows, John P CIV USARMY CESAJ (USA) <John.P.Fellows@usace.army.mil>; Noah Adams <nadams@kleinfelder.com>; Connie Henderson (connie.henderson@chemours.com) <connie.henderson@chemours.com>;

3 attachments (6 MB)

Trail Ridge South Mine Application.pdf; TRS Tables.zip; Exhibits.zip;

We are submitting our application for the Chemours Trail Ridge South Mine. Due to size limitations it will be provided in 6 separate emails. An attempt was made to upload the application to the SAFE file transfer site, however access was unavailable.

This emails contains:
Application and Support Narrative
Tables
Exhibits

(5) additional emails to follow. Please confirm that all emails are received, in total you will receive the following:
Application and Support Narrative
Tables 1-5
Attachments 1 - 4
Exhibits A, B C
Figures 1-17

If you have any issues, please let me know.

Thank you,
Danny LeJeune
Project Manager
KLEINFELDER
C: 904.669.8684
O: 904.538-9171

STANDARD PERMIT APPLICATION

TRAIL RIDGE SOUTH MINE
BRADFORD AND CLAY COUNTIES, FLORIDA

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:

8933 Western Way, Suite 12
Jacksonville, Florida 32256

(KLF# 129491.003)

December 2019

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EXHIBITS

**Denotes items to be provided under separate cover*

U.S. ARMY CORPS OF ENGINEERS

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

33 CFR 325. The proponent agency is CECW-CO-R.

Form Approved - OMB No. 0710-0003 Expires: 30-SEPTEMBER-2015

Public reporting for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Nicole Middle - T Last - Newell	First - Daniel Middle - Last - LeJeune
Company - The Chemours Company FC LLC	Company - Kleinfelder, Inc.
E-mail Address - Nicole.T.Newell@Chemours.com	E-mail Address - dlejeune@kleinfelder.com
6. APPLICANT'S ADDRESS:	**9. AGENT'S ADDRESS:**
Address- PO Box 753	Address- 8933 Western Way Suite 12
City - Starke State - FL Zip - 32091 Country - US	City - Jacksonville State - FL Zip - 32256 Country - US
7. APPLICANT'S PHONE NOs. w/AREA CODE	**10. AGENTS PHONE NOs. w/AREA CODE**
a. Residence b. Business c. Fax	a. Residence b. Business c. Fax
904-964-1200	904-538-9171 904-538-9172

STATEMENT OF AUTHORIZATION

11. I hereby authorize, Kleinfelder, Inc. to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

Nicole Newell 12/12/19

SIGNATURE OF APPLICANT DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)

Trail Ridge South Mine

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
Unknown	Address Treat Road
15. LOCATION OF PROJECT Latitude: °N 29° 53' 16.94" Longitude: °W 82° 2' 52.76"	City - Starke State- FL Zip-

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

State Tax Parcel ID See Attachment 3 Municipality

Section - 6,7,12,13,18,19,24 Township - 7S Range - 22E, 23E

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address- See Attachment 3

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
U.S. ACOE	PJD	SAJ-2019-00480	2019-02-28	2019-05-17	
Bradford County	Special Use Permit	N/A	2019-09-16	2019-10-17	
FDEP	Wetland FD	FD-04-0137482-016	2019-01-17	2019-10-09	
FDEP	ERP	MMR 137482-018	2019-11-01	Pending	

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT — DATE: 12/12/19

dlejeune@kleinfelder.com 2019.11.19 11:32:10 -05'00' — SIGNATURE OF AGENT — DATE: 2019-11-19

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

THE CHEMOURS COMPANY FC, LLC
DELEGATION OF AUTHORITY

By this letter, I, E. Bryan Snell, President, Titanium Technologies, The Chemours Company FC, LLC ("Chemours") hereby delegate, to the extent permitted by law, to Nicole Newell, Plant Manager of the Chemours – Florida Plant/Mine located Off State Road, Starke, FL, 32091-0753 (the "Plant") the authority to:

- Sign or execute any permit application, report, certification or other document relating to compliance by the Plant with the environmental laws or regulations of the U.S. or the States of Florida and Georgia, including but not limited to: the Clean Air Act, 42 USC §7401 et seq., as amended, the Clean Water Act, 33 USC §1251 et seq., as amended, the Resource Conservation & Recovery Act, 42 USC §6901 et seq, as amended and comparable laws of the States of Florida and Georgia.
- Execute all orders and agreements relating to compliance by the Plant with Federal, State or local environmental laws and regulations.
- Approve the provisions of any compliance program, project-completion schedule, or similar document relating to construction, modification, and/or operation of any equipment or facilities at the Plant.
- Execute and deliver any other documents and do any other actions in connection with the foregoing, as the Plant Manager may deem necessary and advisable.

It being understood that said Plant Manager will consult Legal and/or EHS, as appropriate before exercising the authority hereby granted.

This Delegation of Authority is effective as of December 1, 2017, and is given without the authority to make further delegations.

December 1, 2017

Date

E. Bryan Snell
President, Titanium Technologies
The Chemours Company FC, LLC

ENVIRONMENTAL SUPPORT DOCUMENT

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

December 13, 2019

1.0 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 ±2,884.4-acre parcel known as the Trail Ridge South Mine (Figure 1). 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 proposed project area has historically been managed for silviculture and as such is in various stages of pine growth. Unpaved, graded roads cross the proposed project area to provide access for silviculture operations. Wetlands and ditches occur throughout the proposed project area, and portions of the wetlands have been subject to timber harvesting and replanted with pine for silviculture. Wetland boundaries were delineated by Kleinfelder and have been approved in a Preliminary Jurisdictional Determination (SAJ-2019-00480, Attachment 2) by the U.S. Army Corps of Engineers (ACOE).

The following sections provide information regarding the mining operation, existing site conditions, proposed mine plan, proposed wetland impacts and reclamation/restoration plan.

1.1 Mining Method and Operation

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 10A-10C for details.

Mining Methods

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. Mining cells will be designed at approximately 10 to 20 acres in size. These cells will be in various stages from clearing to reclamation. The excavation process will occur in the “Active Mining Cell”. 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 a 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 (± 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

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. Waste disposal is primarily related to the handling of the quartz sand tailings that are to be utilized in the reclamation process. Stormwater ponds will be constructed above grade to retain and manage stormwater.

Erosion and Sediment Control

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

All berms used for stormwater containment will be constructed in accordance with standard BMP's. The top, outside slope, and toe of all berms will be grassed with rye, millet, or other quick growing/germinating grasses. 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

A water quality certification in the form of the State issued Environmental Resource Permit (ERP) will be provided upon issuance. 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 mine footprint will consist of four components: 1) the site preparation area, 2) an active mining/regrading area, 3) tailings area, and 4) a reclamation area. This footprint for both MMU areas will be approximately 160-acres. Areas outside the active mine footprint, including undisturbed areas and fully reclaimed areas will not require stormwater management as these areas are outside the disturbance activities.

Stormwater runoff from events up to a 25-year, 24-hour storm event will be contained within the open mine pit, which will be capable to store the design storm event.

Stormwater captured in the mine pit is pumped down and utilized as process water. Excess process water will be treated and discharged under an FDEP Industrial Wastewater (IWW) permit at a permitted location. An application for a new IWW permit will be submitted to the FDEP Northeast District Office.

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

2.0 EXISTING CONDITIONS

2.1 Topography and Drainage

The proposed 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 proposed 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 site in 1-foot contour intervals. Topography within the proposed 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 proposed 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 of the site is associated with this previously mined area in the northeastern corner of the proposed project, 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 proposed project.

Unimproved roads are located throughout the proposed 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 proposed 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 off-site to wetlands and tributaries of the Santa Fe Swamp and River system. (Figure 9)

Current drainage patterns within the proposed 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* (U.S.D.A., Soil Conservation Service, 1989) and the *Soil Survey of Bradford County, Florida* (U.S.D.A., 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% 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.

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 Rutlege 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.

Neilhurst fine sand, undulating (62) -- is composed of 90% Neilhurst 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) Florida Department of Transportation (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.

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 site 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 site. 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

(*Aristrida 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 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, 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* sp.) and pipewort (*Eriocaulon* sp.).

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 proposed 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 proposed 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. serotine*), 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* sp.), 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.

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 sp*.), dwarf palmetto (*Sabal minor*), and sphagnum moss (*Sphagnum sp*.). 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 of the portion of the site 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 site. 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 sp.*), 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 sp.*), 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 site.

Wetland 5 is a 119.27-acre wetland forested mixed community (FLUCFCS 630) located in the northeastern portion of the site. 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 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 site. 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 sub-canopy 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 sp*.), pipewort, orange milkwort (*Polygala lutea*), sundew (*Drosera sp.*), beakrush, netted chain fern, meadow beauty (*Rhexia sp.*), 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 site. 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 site. 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 site. 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 site. 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 site. 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 site. 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 site. 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 site. 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 site. 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 site 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-leafed holly, wax myrtle, saltbush, highbush blueberry, slash pine, cedar (*Juniperus viginiana*), 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 site. 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 off site.

Wetland 18 is a 11.36-acre wetland located along the western boundary of the site. 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 site. The wetland community classifies as a bay swamp (FLUCFCS 611). The plant community consists 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 site. 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 proposed project site. 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 site. 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 site. 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 sp*.), 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 off the site.

Wetland 25 is a 0.23-acre wetland located in the southwest portion of the site. 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 site. 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-leafed 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 site. 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-leafed holly, sweet bay, dahoon holly, wax myrtle, saw palmetto, St. John's wort, sphagnum moss, and Virginia chain fern. Historically it appears that Wetland 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 site. 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 site. 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 off site.

Wetland 30 is a 1.38-acre isolated wetland located in the southwest portion of the site. 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 site'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 site. 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 sp*.), bog buttons and greenbriar. This wetland is hydrologically connected to Wetland 33 via a culvert under a trail road and ultimately flows off site 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 site. 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 site. 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 site. 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 site. 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 site. 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 site that continues off-site. 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 site. 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 site. 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 site. 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 site. 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 site. 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 actives 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 site. 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 site. 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 site 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 site and will remain undisturbed. SW 2 (0.67 ac) is located east of SW 3 in the northeast portion of the site.

3.0 ENVIRONMENTAL CONSIDERATIONS

3.1 Wetland and Surface Water Impacts

Direct Impacts

Mining and associated activities will impact 710.59-acres of wetlands, 3.72-acres of wetland cut ditches, 25.47-acres of upland cut ditches, and 0.67-acres of surface water within the project area (Figure 11). Of the 710.59-acres of wetland impacts, approximately 227.53 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 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 ACOE and Kleinfelder scientists on June 4, 2019 of the wetland impact areas. Completion of the UMAM assessment revealed an estimated functional loss of 347.578 (Attachment 1). A summary of the proposed direct wetland impacts is provided in the enclosed Table 1.

Secondary Impacts

Secondary wetland impacts associated with the proposed project are anticipated to be *de minimis.* Silt fencing and BMPs (as appropriate) will be installed along the limits of disturbance areas when 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 (Santa Fe River); thus, no cumulative impacts

are anticipated. A UMAM analysis of the proposed wetland impacts and wetland mitigation is provided as Attachment 1.

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 site 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 project 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 Trail Ridge Mine is to temporarily impact 740.45 acres of onsite wetlands and upland cut ditches while avoiding 725.96 acres of wetlands. 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 Trail Ridge South Mine 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 proposed project site, 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 the applicant, 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 site 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 Bradford and Clay Counties to determine which species had likelihood to occur on-site. 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; and
- **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 ACOE 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 on the project site were reviewed.

The property 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.

Eastern Indigo Snake

The eastern indigo snake maintains 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 eastern indigo snake 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.

It is likely that during land clearing activities, any eastern indigo snake within the project area will relocate themselves to adjacent undisturbed lands. Prior to construction, all staff will be notified of the potential presence of Eastern indigo snakes within the projected area and will be instructed how to identify them. If an Eastern indigo snake is observed within a construction area, all activities shall 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 the applicant also plans to incorporate the *Eastern Indigo Snake Standard Protection Measures*. Based on the Eastern Indigo Snake Programmatic Effect Determination Key (Exhibit B) 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 4).

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

Wood Stork

The wood stork is a federally-listed endangered species. 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 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 2007). 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 Assessment 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 (Archbold

1994; Catlett 2012, Bio-Tech 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 Assessment Area, primarily including xeric oak (421) habitat.

To preliminarily determine the presence or absence of scrub jays within the Assessment 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 2007(b)). 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 Assessment 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 2012). 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 2003). No suitable nesting habitat was observed within the Assessment Area.

Multiple RCW populations or clusters are located within Camp Blanding; however, none of these groups occur within 2.5 miles of the Assessment Area and no suitable nesting trees were observed within the Assessment Area (Catlett 2012; FWC 2005(b)). 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 proposed project area does not provide suitable foraging habitat for this species. It is therefore unlikely that the proposed project 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 proposed Trail Ridge South Mine 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 site shows that this habitat is not present. In addition, the larger flow ways and sloughs on site are not proposed to be impacted. This will have a two-fold effect. Firstly, if the Suwannee moccasinshell were found to be located on site 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.

3.3 Water Quantity and Quality Impacts

Water Quantity Impacts

Stormwater management for the Trail Ridge South Mine 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 Figures 10A-10D.

Four existing trail road wetland crossings are proposed to be widened during the mining phase of the 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 proposed 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.

3.5 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 3.2 above.

Economics

The proposed project would be 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 mining operations are 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 3.2 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 C.

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 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 thoughout the completion of the proposed project limiting the total area impacted at any one time. See "Mining Methods" in Section 1.1. 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 mine 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.

3.6 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 the applicant maintains a history of successful mitigation projects including wetland reclamation and enhancement within the North Florida region. Furthermore, the ACOE, 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 ACOE regulations located in 33 CFR Part 332. As part of the federal reclamation requirements, financial assurances are being processed with FDEP, and upon completion, the applicant will provide to ACOE 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. The applicant 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 off-site 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: The applicant's 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 ACOE. 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 the long-term management of the site as a whole will be handled by CBJTC.

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 the applicant 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]:

Permittee-responsible: The applicant is currently processing Financial Assurance documentation with FDEP, and upon completion, will provide to ACOE a copy of the approved financial instrument that will ensure the long-term viability of the proposed on-site mitigation. The intent of the financial assurance instrument will be to ensure that a sufficient amount of money will be reserved, through an approved financial entity, in order to successfully implement and complete the proposed on-site mitigation. This will include financial backup for the implementation, short-term monitoring and maintenance in order for the proposed mitigation to successfully off-set the wetland impacts associated with the project.

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 5). 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 ACOE

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) 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 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 3.1 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 1. The scoring was based from onsite field reviews conducted by Kleinfelder with ACOE staff on June 4, 2019 and a pre-application meeting held at the Jacksonville ACOE office on November 8, 2019.

The UMAM analysis of the proposed wetland impacts and wetland mitigation calculates a requirement of 912.62 acres of wetland mitigation to provide 348.142 functional gain units offsetting the total functional loss of 347.578 that results from the proposed 714.98 acres of direct wetland impact within the project area.

Total Function Loss – 347.578	Total Functional Gain – 348.142

Mitigation Work Plan

In order to offset the 714.98 acres of impacts to onsite wetlands the applicant proposes the onsite restoration of 710.59 acres of wetlands impacted during mining, the enhancement of 136.49 acres of onsite wetlands which are not proposed to be impacted and 65.54 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 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 site.

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 6, including general planting zones. Cross sections for each restored mitigation area are provided in 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.

The applicant 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 6.

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 site. It mimics pre-mining flow-ways and restores historic hydrologic connections severed when parts of the site were mined previously. This wetland will total 637.60 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 site. 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 site 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 site. 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 site. 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 site. 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 site. 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 site. 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 site. 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 site. 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.

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, 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.

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) 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 the applicant will provide one qualitative monitoring report to the ACOE 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). 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 1).

Maintenance Plan

Maintenance of exotic and nuisance species will be completed if it is determined the absolute coverage of these species exceeds 10%, in total, cover within the mitigation area. Those plants listed in the most recent Florida Exotic Pest Plant Council (FLEPPC) Invasive Plant List, 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 Kleinfelder on behalf of the applicant.

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 ACOE 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.

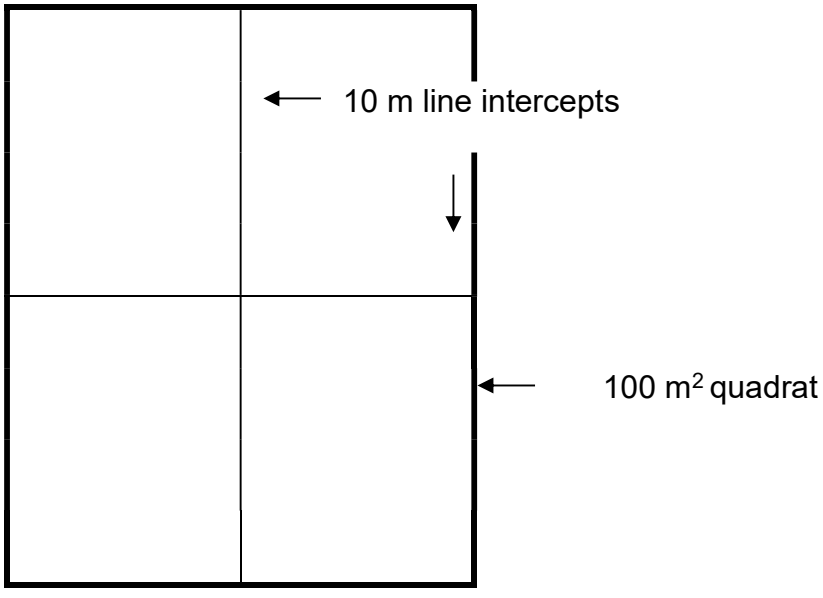
Monitoring methods in each wetland mitigation area are performed quantitatively or qualitatively, depending on the timeframe in the monitoring cycle. The first year (baseline monitoring event) is monitored quantitatively. The second, third, and fourth year annual monitoring events are performed qualitatively. 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^2) 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^2 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:

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

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:

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

Tree density was determined with the following formula:

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

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 1989). 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 ACOE, and a subsequent release inspection with ACOE 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 10 percent cover of 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 the applicant 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 ACOE to ensure mitigation success.

Financial Assurances

A cost estimate for mitigation and maintenance activities will be completed as part of the State application. In accordance with Chapter 62-330.301(1)(j), Florida Administrative code (F.A.C.) and Section 10.3.7 of the Statewide Environmental Resource Permit Handbook, the applicant shall provide the state approved financial responsibility for 110% of this cost estimate amount under separate cover (Exhibit D).

4.0 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 ±2,884.4 acres. Approximately 714.98 acres of wetlands and ditches 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 136.49 acres of onsite wetlands, and provide 65.54 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.

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, W6-9, W17-19, W22-27, W30, W33, W34, W36-W38, W41

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
Hydric Coniferous Plantation (441 W)		Impact	227.53

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 gallberry, Carolina redroot, 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, W6-9, W17-19, W22-27, W30, W33, W34, W36-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

.500(6)(a) Location and Landscape Support w/o pres or current: 5 — with: 0	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.
.500(6)(b)Water Environment (n/a for uplands) w/o pres or current: 5 — with: 0	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 Sante Fe River watershed.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current: 4 — with: 0	This assessment area is dominated by an immature, planted slash pine (*Pinus elliotti*) 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 (*Osmunda cinnomomea*) and blackstem fern (*Woodwardia virginica*) 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.

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

Impact Acres =	227.53

For impact assessment areas	
Functional Loss (FL) = delta x acres =	**106.181**

Delta = [with-current]
0.466666667

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

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?	Assessment Area Size
510/Ditch		Impact	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

.500(6)(a) Location and Landscape Support w/o pres or current: 5 with: 0	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 ijn 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.
.500(6)(b)Water Environment (n/a for uplands) w/o pres or current: 2 with: 0	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 sivicultural 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.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current: 2 with: 0	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 facitlitate off-site water flow. Some maidencane (*Panicum hemitomum*) and torpedo grass (*Panicum repens*) was observed.

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

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

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?	Assessment Area Size
Lake <10 acres (524)		Impact	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

.500(6)(a) Location and Landscape Support w/o pres or current: 5 with: 0	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 ijn 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.
.500(6)(b)Water Environment (n/a for uplands) w/o pres or current: 5 with: 0	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 Sante Fe River watershed.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current: 5 with: 0	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 facitlitate off-site water flow. Some maidencane (*Panicum hemitomum*) and torpedo grass (*Panicum repens*) was observed.

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

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

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		W20

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
Bay Swamp (611)		Impact	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, 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		W20
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: 5 / with: 0	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.
.500(6)(b)Water Environment (n/a for uplands)	w/o pres or current: 5 / with: 0	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.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	w/o pres or current: 5 / with: 0	This assessment area is dominated by an abnormally thick subcanopy consisting of wax myrtle (*Myrica cerifera*), loblolly bay (*Gordonia lasianthus*) and sweet bay (*Magnolia virginiana*) with an understory of blackstem fern (*Woodwardia virginica*), cinnamon fern (*Osmunda cinnomomea*), red root (*Lachnanthes caroliniana*) and greenbriar (*Smilax laurifolia*) 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.

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres: 0.5 / with: 0

Impact Acres =	1.29

For impact assessment areas	
Functional Loss (FL) = delta x acres =	**0.645**

Delta = [with-current]
0.5

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

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?	Assessment Area Size
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

.500(6)(a) Location and Landscape Support w/o pres or current: 5 with: 0	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 ijn 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.
.500(6)(b)Water Environment (n/a for uplands) w/o pres or current: 5 with: 0	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.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current: 5 with: 0	This assessment area is dominated by immature swamp tupelo (*Nyssa sylvatica* var. *biflora*). An abnormally thick subcanopy consisting of wax myrtle (*Myrica cerifera*), loblolly bay (*Gordonia lasianthus*), and sweet bay (*Magnolia virginiana*) with an understory of blackstem fern (*Woodwardia virginica*), cinnamon fern (*Osmunda cinnomomea*), red root (*Lachnanthes caroliniana*) and greenbriar (*Smilax laurifolia*) 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.

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres: 0.5	with: 0

Impact Acres =	0.21

For impact assessment areas	
Functional Loss (FL) = delta x acres =	**0.105**

Delta = [with-current]
0.5

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

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		W30

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
Cypress (621)		Impact	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; 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		W30
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: 5 with: 0	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 ijn 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.
.500(6)(b)Water Environment (n/a for uplands) w/o pres or current: 5 with: 0	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.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current: 5 with: 0	This assessment area is dominated by a bald cypress (*Taxodium distchen*) and pond cypress (*Taxodium ascendens*) canopy. A subcanopy consisting of red maple (*Acer rubrum*), wax myrtle (*Myrica cerifera*), black titi (*Cyrilla recemiflora*) and sweet bay (*Magnolia virginiana*) with an understory of blackstem fern (*Woodwardia virginica*), cinnamon fern (*Osmunda cinnomomea*), red root (*Lachnanthes caroliniana*) and greenbriar (*Smilax laurifolia*) 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.

Score = sum of above scores/30 (if uplands, divide by 20)
current or w/o pres: 0.5 with: 0

Impact Acres =	0.51

For impact assessment areas	
Functional Loss (FL) = delta x acres =	**0.255**

Delta = [with-current]
0.5

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

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, W18, W19, W21, W22, W24, W28, W32, W34, W45

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
Wetland Forested Mixed (630)		Impact	376.59

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, W18, W19, W21, W22, W24, W28, W32, W34, W45
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

.500(6)(a) Location and Landscape Support w/o pres or current: 5 — with: 0	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 ijn 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.
.500(6)(b)Water Environment (n/a for uplands) w/o pres or current: 5 — with: 0	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.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current: 5 — with: 0	The canopy withing this assessment area is a mixture of slash pine (*Pinus elliotti*), red maple (*Acer rubrum*), loblolly bay (*Gordonia lasianthus*), sweet bay (*Magnolia virginiana*), bald cypress (*Taxodium distchem*) and pond cypress (*Taxodium ascendens*) canopy. A subcanopy consisting of red maple (*Acer rubrum*), wax myrtle (*Myrica cerifera*), fetterbush (*Lyonia lucida*) and gallberry (*Ilex glabra*) with an understory of blackstem fern (*Woodwardia virginica*), cinnamon fern (*Osmunda cinnomomea*), red root (*Lachnanthes caroliniana*) and greenbriar (*Smilax laurifolia*) 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.

Score = sum of above scores/30 (if uplands, divide by 20)		Impact Acres = 376.59	For impact assessment areas	
current or w/o pres: 0.5	with: 0		Functional Loss (FL) = delta x acres =	**188.295**

Delta = [with-current]
0.5

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

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	15.84

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
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: 5	with: 0
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 ijn 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.		
.500(6)(b)Water Environment (n/a for uplands)	w/o pres or current: 4	with: 0
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.		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	w/o pres or current: 3	with: 0
No canopy species occur within the assesment area. The dense subcanopy consists of red maple (*Acer rubrum*), wax myrtle (*Myrica cerifera*), fetterbush (*Lyonia lucida*) and gallberry (*Ilex glabra*) with an sparse understory of blackstem fern (*Woodwardia virginica*), cinnamon fern (*Osmunda cinnomomea*), red root (*Lachnanthes caroliniana*) and greenbriar (*Smilax laurifolia*) 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.		

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres: 0.4	with: 0

Impact Acres =	15.84

For impact assessment areas	
Functional Loss (FL) = delta x acres =	**6.336**

Delta = [with-current]
0.4

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

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, W9, W10, W14, W16, W19, W21, W33, W34, W37, W39, W42, W43

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
Freshwater Marshes (641)		Impact	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)	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, W9, W10, W14, W16, W19, W21, W33, W34, W37, W39, W42, W43
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: 5	with: 0	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 ijn 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.
.500(6)(b)Water Environment (n/a for uplands)	w/o pres or current: 5	with: 0	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.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	w/o pres or current: 5	with: 0	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 *(Hypericum* spp), wax myrtle (*Myrica cerifera*), fetterbush (*Lyonia lucida*) and gallberry (*Ilex glabra*) with an understory of cattails (*Typha* spp), duck potato (*Sagittaria lattifolia*), pickerelweed (*Pontedaria cordata*), blackstem fern (*Woodwardia virginica*), cinnamon fern (*Osmunda cinnomomea*), Carolina red root (*Lachnanthes caroliniana*) and greenbriar (*Smilax laurifolia*) 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.

Score = sum of above scores/30 (if uplands, divide by 20)	current or w/o pres	with
	0.5	0

Impact Acres =	88.62

For impact assessment areas	
Functional Loss (FL) = delta x acres =	**44.31**

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		1D

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
Bay Swamp (611)		Mitigation	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
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: 0	with: 7	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.
.500(6)(b)Water Environment (n/a for uplands)	w/o pres or current: 0	with: 7	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.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	w/o pres or current: 0	with: 7	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.

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0	0.70

Delta = [with mitigation-current]
0.70

If preservation as mitigation,	
Preservation adjustment factor =	N/A
Adjusted mitigation delta =	N/A

Mitigation	
Time lag (t-factor) =	1.26
Risk factor (RF) =	1.5

For mitigation assessment areas	
RFG=delta/(t-factor x risk)=	0.370

Mitgation 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:**
Migitation	Noah Adams (KLF) Daniel LeJeune (KLF), John Fellows (ACOE)	11/8/19

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: 0	with: 7

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.

.500(6)(b)Water Environment for uplands) (n/a	w/o pres or current: 0	with: 7

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.

.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	w/o pres or current: 0	with: 7

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.

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0	0.70

Delta = [with mitigation-current]
0.70

If preservation as mitigation,	
Preservation adjustment factor =	N/A
Adjusted mitigation delta =	N/A

Mitigation	
Time lag (t-factor) =	1.26
Risk factor (RF) =	1.5

For mitigation assessment areas	
RFG=delta/(t-factor x risk)=	0.370

Mitgation 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		W151, W163

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
Wetland Coniferous Forest (620)		Mitigation	19.39

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 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.)
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):
Noah Adams (KLF) Daniel LeJeune (KLF)	11/19/2019

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		W151, W163
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**
Mitigation	Noah Adams (KLF) Daniel LeJeune (KLF)	11/19/2019

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: 0 / with: 7	As an existing fully functioning Wetland Coniferous Forest (620) system, the offsite permittee responsible mitigation provides immediate benefits offsetting the impacts of the proposed project.
.500(6)(b)Water Environment (n/a for uplands)	w/o pres or current: 0 / with: 7	The existing water environment presently supports the surrounding and downstream communities that ultimately flow into the Santa Fe River Basin.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	w/o pres or current: 0 / with: 7	Existing vegetative communities include a canopy of slash pine, and a sub canopy of wax myrtle and slash pine. Groundcover species include cinnamon fern, Virginia chain fern, and black stem fern. The area displays surface saturation and is surrounded by planted pine.

Score = sum of above scores/30 (if uplands, divide by 20)	
current or 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)=	0.700

Delta = [with mitigation-current]
0.70

Mitigation	
Time lag (t-factor) =	1
Risk factor (RF) =	1

Mitgation Area Size (acres)	19.39
Fuctional Gain (FG) (RFG x acres)	**13.573**

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

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?	Assessment Area Size
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
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: 0	with: 7	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.
.500(6)(b)Water Environment (n/a for uplands)	w/o pres or current: 0	with: 7	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.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	w/o pres or current: 0	with: 7	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.

Score = sum of above scores/30 (if uplands, divide by 20)		
current or 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

Mitgation 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		630 Enhancement

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
Wetland Forested Mixed (630)		Mitigation	136.49

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
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: 5	with: 7	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.
.500(6)(b)Water Environment (n/a for uplands)	w/o pres or current: 5	with: 7	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.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	w/o pres or current: 4	with: 7	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 siviculture. 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.

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0.46666667	0.70

Delta = [with mitigation-current]
0.2333333

If preservation as mitigation,	
Preservation adjustment factor =	N/A
Adjusted mitigation delta =	N/A

Mitigation	
Time lag (t-factor) =	1
Risk factor (RF) =	1.25

For mitigation assessment areas	
RFG=delta/(t-factor x risk)=	0.187

Mitgation Area Size (acres)	136.49
Fuctional Gain (FG) (RFG x acres)	**25.524**

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?	Assessment Area Size
Wetland Forested Mix (630)		Mitigation	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
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: 0	with: 7

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.

.500(6)(b)Water Environment for uplands) (n/a	w/o pres or current: 0	with: 7

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.

.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	w/o pres or current: 0	with: 7

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.

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0	0.70

Delta = [with mitigation-current]
0.70

If preservation as mitigation,	
Preservation adjustment factor =	N/A
Adjusted mitigation delta =	N/A

Mitigation	
Time lag (t-factor) =	1.26
Risk factor (RF) =	1.5

For mitigation assessment areas	
RFG=delta/(t-factor x risk)=	0.370

Mitgation 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		W83, W150, W153, W158

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
Wetland Forested Mixed (630)		Mitigation	10.25

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 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.)
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):
Noah Adams (KLF) Daniel LeJeune (KLF)	11/19/2019

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		W83, W150, W153, W158
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**
Mitigation	Noah Adams (KLF) Daniel LeJeune (KLF)	11/19/2019

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: 0 / with: 7	As a existing fully functioning Wetland Scrub (630) system, the offsite permittee responsible mitigation provides immediate benefits offsetting the impacts of the proposed project.
.500(6)(b)Water Environment (n/a for uplands)	w/o pres or current: 0 / with: 7	The existing water environment presently supports the surrounding and downstream communities that ultimately flow into the Santa Fe River Basin.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	w/o pres or current: 0 / with: 7	Existing vegetative communities include a canopy of slash pine, and a sub canopy of wax myrtle, slash pine, and blackgum. Groundcover species include spikerush, St John's wort, and yellow-eyed grass. The area displays soil saturation.

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)=	0.700

Delta = [with mitigation-current]
0.70

Mitigation	
Time lag (t-factor) =	1
Risk factor (RF) =	1

Mitgation Area Size (acres)	10.25
Fuctional Gain (FG) (RFG x acres)	**7.175**

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

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, W153, W154

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
Wetland Scrub (631)		Mitigation	19.57

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):
Noah Adams (KLF) Daniel LeJeune (KLF)	11/19/2019

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		W151, W153, W154
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**
Mitigation	Noah Adams (KLF) Daniel LeJeune (KLF)	11/19/2019

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: 0	with: 7	As a existing fully functioning Wetland Scrub (631) system, the offsite permittee responsible mitigation provides immediate benefits offsetting the impacts of the proposed project.
.500(6)(b)Water Environment (n/a for uplands)	w/o pres or current: 0	with: 7	The existing water environment presently supports the surrounding and downstream communities that ultimately flow into the Santa Fe River Basin.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	w/o pres or current: 0	with: 7	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.

Score = sum of above scores/30 (if uplands, divide by 20)	
current or 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)=	0.700

Delta = [with mitigation-current]
0.70

Mitigation	
Time lag (t-factor) =	1
Risk factor (RF) =	1

Mitgation Area Size (acres)	19.57
Fuctional Gain (FG) (RFG x acres)	**13.699**

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

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
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: 0	with: 7	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.
.500(6)(b)Water Environment (n/a for uplands)	w/o pres or current: 0	with: 7	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.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	w/o pres or current: 0	with: 7	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.

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0	0.70

Delta = [with mitigation-current]
0.70

If preservation as mitigation,	
Preservation adjustment factor =	N/A
Adjusted mitigation delta =	N/A

Mitigation	
Time lag (t-factor) =	1.07
Risk factor (RF) =	1.25

For mitigation assessment areas	
RFG=delta/(t-factor x risk)=	0.523

Mitgation Area Size (acres)	88.62
Fuctional Gain (FG) (RFG x acres)	**46.381**

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		W150, W151, W153, W154

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
Freshwater Marshes (641)		Mitigation	16.33

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, spikerush, 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):
Noah Adams (KLF) Daniel LeJeune (KLF)	11/19/2019

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		W150, W151, W153, W154
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**
Mitigation	Noah Adams (KLF) Daniel LeJeune (KLF)	11/19/2019

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: 0	with: 7
As a existing fully functioning Freshwater Marsh (641) system, the offsite permittee responsible mitigation provides immediate benefits offsetting the impacts of the proposed project.		
.500(6)(b)Water Environment (n/a for uplands)	w/o pres or current: 0	with: 7
The existing water environment presently supports the surrounding and downstream communities that ultimately flow into the Santa Fe River Basin.		
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	w/o pres or current: 0	with: 7
Existing vegetative communities include a canopy of slash pine, and a sub canopy of wax myrtle, slash pine, and blackgum. Groundcover species include St. John's wort, Asian coinwort, bushy bluestem, pine-barren goldenrod, rosy camphorweed, spikerush, 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.		

Score = sum of above scores/30 (if uplands, divide by 20)	
current or 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)=	0.700

Delta = [with mitigation-current]
0.70

Mitigation	
Time lag (t-factor) =	1
Risk factor (RF) =	1

Mitgation Area Size (acres)	16.33
Fuctional Gain (FG) (RFG x acres)	**11.431**

Form 62-345.900(2), F.A.C. [effective date 02-04-2004]

Site/Project Name: Trail Ridge South	Application Number: ACOE	Date: 12/13/2019

Impact Summary

	Assessment Area	Impact Type	Location and Landscape Support		Water Environment		Community Structure		Impact Delta	Acres	Functional Loss
			Current	w/Impact	Current	w/Impact	Current	w/Impact			
1	441W (W1, W3, W6-9, W17-19, W22-27, W30, W33, W34, W36-W38, W41)	Temporary	5	0	5	0	4	0	0.466666667	227.53	106.181
2	524 (SW2)	Temporary	5	0	5	0	5	0	0.5	0.67	0.335
3	510d (D1, D3, D4. D8-D11,D13-D24)	Temporary	5	0	2	0	2	0	0.3	3.72	1.116
4	611 (W20)	Temporary	5	0	5	0	5	0	0.5	1.29	0.645
5	613 (W24)	Temporary	5	0	5	0	5	0	0.5	0.21	0.105
6	621 (W30)	Temporary	5	0	5	0	5	0	0.5	0.51	0.255
7	630 (W1, W3, W5-W8, W18, W19, W21, W22, W24, W28, W32, W34, W45)	Temporary	5	0	5	0	5	0	0.5	376.59	188.295
8	631 (W12, W16)	Temporary	5	0	4	0	3	0	0.4	15.84	6.336
9	641 (W3, W9, W10, W14, W16, W19, W21, W33, W34, W37, W39, W42, W43)	Temporary	5	0	5	0	5	0	0.5	88.62	44.310
								TOTAL		714.98	347.578

Mitigation Summary

	Assessment Area	Mitigation Type	Location and Landscape Support		Water Environment		Community Structure		Mitigation Delta	Time Lag	Risk	PAF	RFG	Acres	Functional Gain
			w/o Mit	w/Mit	w/o Mit	w/Mit	w/o Mit	w/Mit							
1	611 - On site	-	0	7	0	7	0	7	0.7	1.26	1.50	-	0.370	1.29	0.478
2	613 - On site	-	0	7	0	7	0	7	0.7	1.26	1.50	-	0.370	0.21	0.078
3	621 - On site	-	0	7	0	7	0	7	0.7	1.26	1.50	-	0.370	0.51	0.189
4	630 On site	-	0	7	0	7	0	7	0.7	1.26	1.50	-	0.370	619.96	229.615
5	641 On site	-	0	7	0	7	0	7	0.7	1.07	1.25	-	0.523	88.62	46.381
6	441W - Conv to 630 - Onsite	-	5	7	5	7	4	7	0.2333333	1.00	1.25	-	0.187	136.49	25.524
7	620 - Off site	-	0	7	0	7	0	7	0.7	1.00	1.00	-	0.700	19.39	13.573
8	630 - Off site	-	0	7	0	7	0	7	0.7	1.00	1.00	-	0.700	10.25	7.175
9	631 - Off site	-	0	7	0	7	0	7	0.7	1.00	1.00	-	0.700	19.57	13.699
9	641 - Off site	-	0	7	0	7	0	7	0.7	1.00	1.00	-	0.700	16.33	11.431
															348.142

TOTALS

Impacts	Acres	Mitigation - Upland	Acres	Mitigation - Wetland	Acres
				Creation	710.59
		Restoration	0.00	Offsite	65.54
Direct Impacts	714.98	Enhancement	0.00	Enhancement	136.49
Secondary Impacts	0.00	Preservation	0.00	Preservation	0.00
Total Impacts	**714.98**	**Total**	**0.00**	**Total Wetland Mitigation**	**912.62**

Total Functional Loss	**347.578**
Total Functional Gain	**348.142**
Excess Mitigation	**0.564**

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 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.

Sincerely,

Kelly E. Unger
Chief, West Branch

Enclosure

cc: Daniel LeJeune, Kleinfelder
Noah Adams, Kleinfelder

W1 (108.2 Ac.)
W2 (0.1 Ac.)
W3 (23.0 Ac.)
W4 (0.04 Ac.)
W5 (120.8 Ac.)
W6 (37.4 Ac.)
W7 (9.9 Ac.)
W8 (11.4 Ac.)
W9 (3.8 Ac.)
W10 (1.9 Ac.)
W11 (0.4 Ac.)
W12 (4.4 Ac.)
W13 (0.02 Ac.)
W14 (0.4 Ac.)
W15 (0.1 Ac.)
W16 (19.1 Ac.)
W17 (4.1 Ac.)
W18 (10.1 Ac.)
W19 (181.6 Ac.)
W20 (1.3 Ac.)
W21 (123.9 Ac.)
W22 (7.2 Ac.)
W23 (0.7 Ac.)
W24 (190.3 Ac.)
W25 (0.2 Ac.)
W26 (10.8 Ac.)
W27 (9.8 Ac.)
W28 (12.1 Ac.)
W29 (1.2 Ac.)
W30 (1.4 Ac.)
W31 (0.9 Ac.)
W32 (2.8 Ac.)
W33 (20.3 Ac.)
W34 (103.4 Ac.)
W35 (2.0 Ac.)
W36 (2.0 Ac.)
W37 (2.3 Ac.)
W38 (1.6 Ac.)
W39 (0.4 Ac.)
W40 (3.8 Ac.)
W41 (1.7 Ac.)
W42 (0.7 Ac.)
W43 (1.1 Ac.)
W44 (1.2 Ac.)
W45 (0.7 Ac.)
S1 560 ln. ft. (0.1 Ac.)
S2 1,458 Ln. Ft. (0.3 Ac.)
S3 2,347 Ln. Ft. (0.2 Ac.)
S4 4,244 Ln. Ft. (1.0 Ac.)
SW1 (9.3 Ac.)
SW2 (11.2 Ac.)
SW3 (13.7 Ac.)
SW4 (2.6 Ac.)
SW5 (1.6 Ac.)
8A
8B
8C
8D
8E
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8G
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W2 UD1
W3 WD1
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W43 WD1
W43 UD1
W44 WD1
W44 UD1
W45 WD1
W45 UD1
UP1
UP2
UP3
UP4
UP5

Sections 12, 13 & 24, Township 7 South, Range 22 East
Sections 6, 7, 18 & 19, Township 7 South, Range 23 East

Image obtained from ESRI Basemap. Orgin: State of Florida Orthos for Bradford and Clay Counties. Date: Bradford County 2016 and Clay County 2017

Legend

- Delineation Boundary (± 2,218.6 Ac.)
- Map 8A-8G Frames
- Wetland (± 1,040.6 Ac)
- Surface Water (± 38.4 Ac.)
- Stream (± 0.2 Ac.) (2,347 Ln. Ft.)
- Culverted Stream (± 0.01 Ac.) (107 Ln. Ft.)
- Man Altered Stream (± 1.4 Ac.) (6,263 Ln. Ft.)
- Ditch (± 8.7 Ac.)
- Culvert
- Wetland Datapoints (48)
- Upland Datapoints (53)

NO.	REVISION	BY	DATE
1	REVISION 1	MNA	5/1/2019

N W E S

0 200 400 Feet

1 inch = 400 feet

FOR REDUCED PLANS: ORIGINAL IN INCHES
0 0.5 1.0 1.5 2.0

DESIGNED BY: BM
DRAWN BY: BM
CHECKED BY: DL

KLEINFELDER
Bright People. Right Solutions.

PROJ NO. 129491.003
FILE: Fig 8_Aquatic Resources Map_ Overall.mxd

Aquatic Resource Map

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

DATE: 5/1/2019
SCALE: 1:4,800
SHEET: 8
1 of 8 sheets

Document Path: G:\DPT_CHMFMI1_MXD\129491_TRSWD ACOE 2019\ACOE JD - FINAL\Fig 8_Aquatic Resources Map_ Overall.mxd; Plotted: 5/2/2019, 11:18:30 AM, nadams

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 3
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				

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

FIGURES

ATTACHMENTS

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 Braford 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 ±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 Suwanee 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 (± 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 ±1,749.92 acres within the ±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 ±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 (*Aristrida 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**"*.

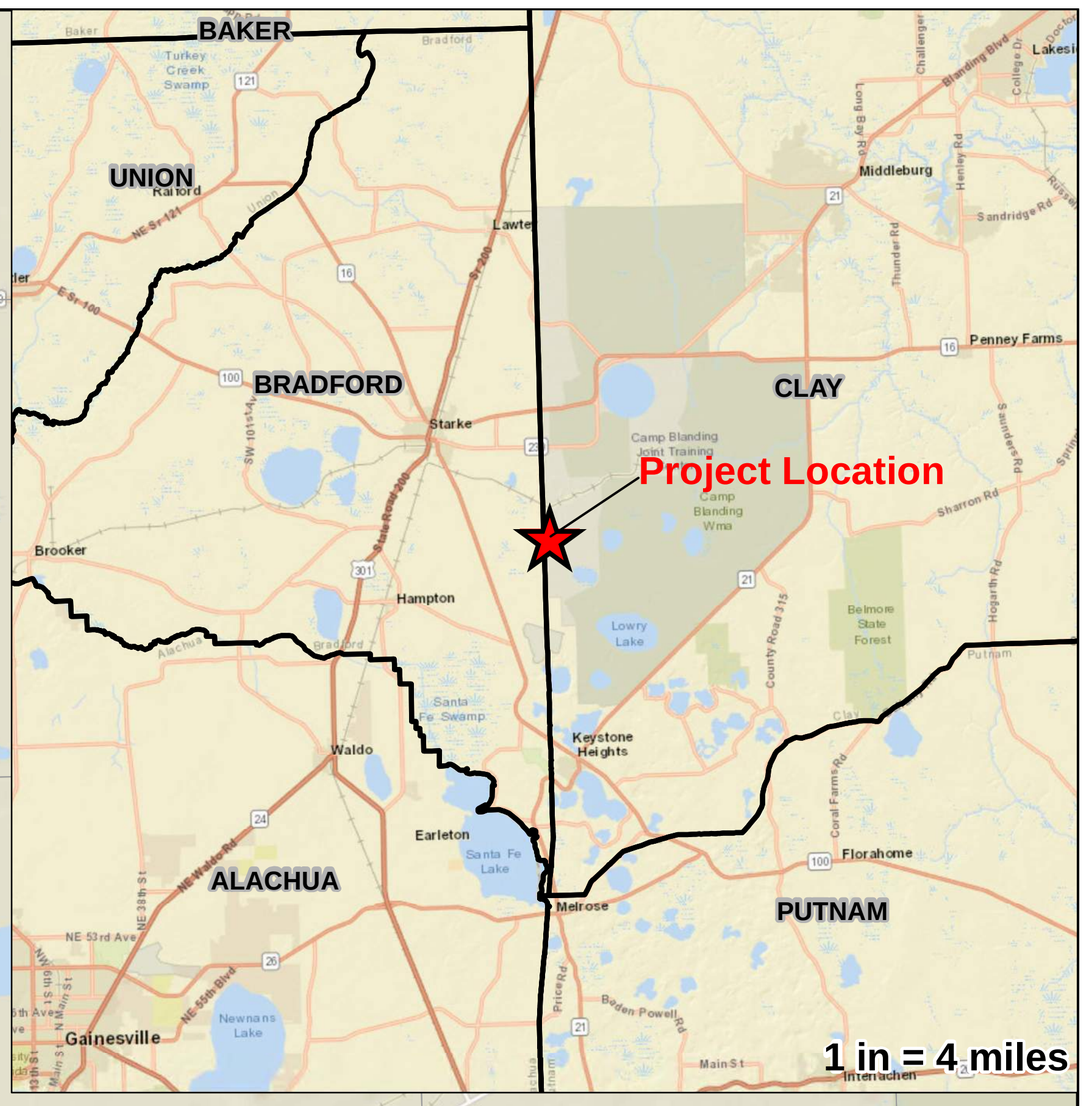
The project proposes permittee-responsible on-site/in-kind restoration implemented on an acre-for-acre and type-for-type basis (where applicable) and through the enhancement of undisturbed wetlands within the project area. The uplands will be restored to the historic natural Pine Flatwoods (411) community 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.



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26,-6,22
25,-6,22
34,-6,22
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36,-6,22
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31,-7,23
32,-7,23

BRADFORD
CLAY

Legend

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

N

ORIGINAL MAP SIZE: 22" x 34"

0 650 1,300 Feet

1 inch = 1,300 feet

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

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Location Map

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

Figure 1

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2,-7,22
1,-7,22
6,-7,23
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12,-7,22
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8,-7,23
Bradford
Clay
14,-7,22
13,-7,22
18,-7,23
17,-7,23
23,-7,22
24,-7,22
19,-7,23
20,-7,23
25,-7,22
30,-7,23
29,-7,23

Legend

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

N

ORIGINAL MAP SIZE: 22" x 34"

0 350 700 Feet

1 inch = 700 feet

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

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Aerial Map

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

Figure 2

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Bradford

Clay

Legend

Mine Permit Boundary (± 2,884.4 Ac.)

County Boundary

N

ORIGINAL MAP SIZE: 22" x 34"

0 350 700 Feet

1 inch = 700 feet

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Source: Imagery was obtained from USGS Topographic Map, Starke and Keystone Heights Quadrangles.

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USGS Topographic Map

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

Figure 3

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2,-7,22

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11,-7,22

12,-7,22

7,-7,23

Area 1

Area 3

Area 7

Area 8

Area 2

Bradford

Clay

14,-7,22

18,-7,23

18,-7,22

Area 4

24,-7,22

Area 5

19,-7,23

Area 6

25,-7,22

30,-7,23

Legend

- Mine Permit Boundary (± 2,884.4 Ac.)
- Watershed Drainage Basins
- County Boundary
- Section, Township, Range

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.)

N

ORIGINAL MAP SIZE: 22" x 34"

0 350 700

Feet

1 inch = 700 feet

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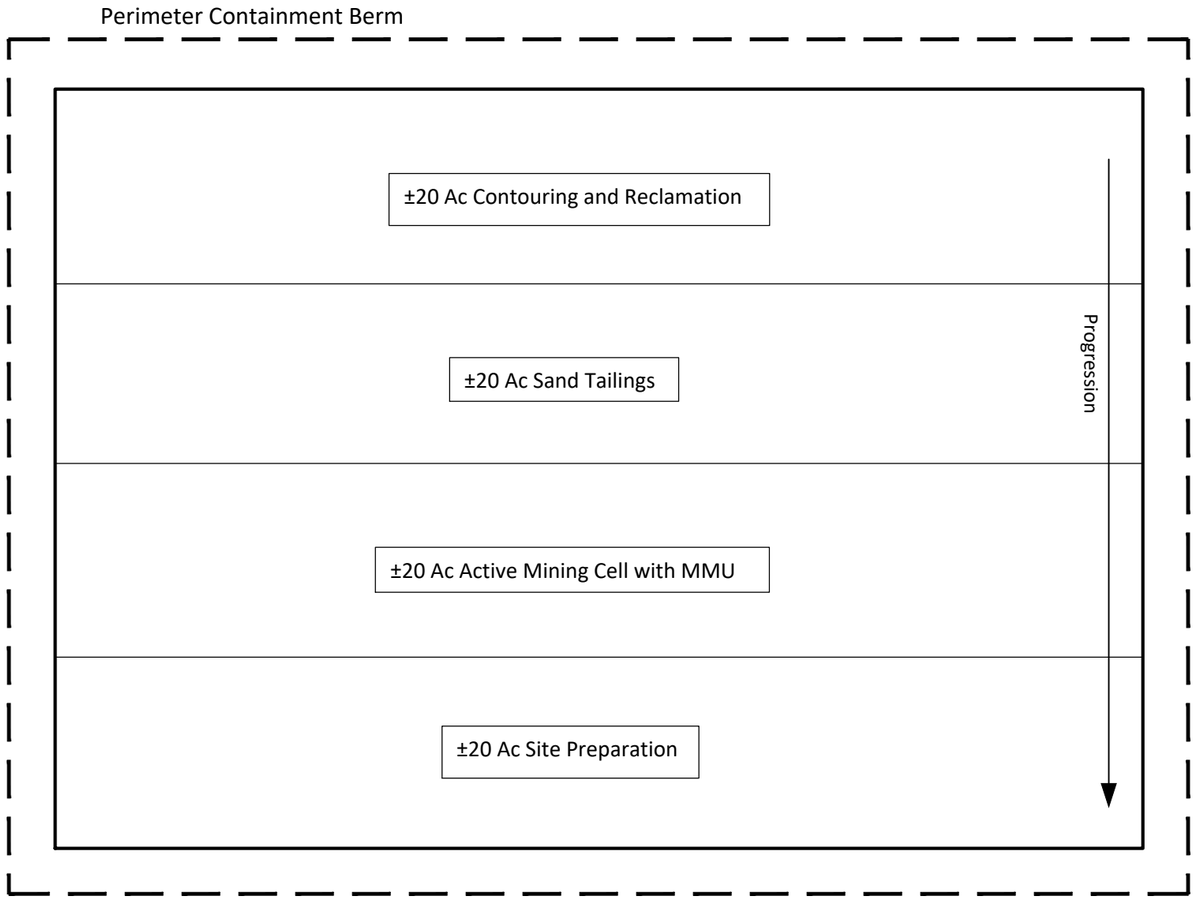
Pre-Mining Land Use and Vegetation Map

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

Figure 7

Typical Mining Footprint

±80 acres per Mobile Mining Unit (MMU)



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.

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.

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TYPICAL MINING FOOTPRINT

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

FIGURE
10D

2,-7,22

1,-7,22

6,-7,23

5,-7,23

Bradford

Clay

11,-7,22

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SHWE 191.58

SHWE 193.41

SHWE 184.57

SHWE 194.17

SHWE 194.64

Legend

Mine Permit Boundary (± 2,884.4 Ac.)

Limits of Disturbance (± 1,749.92 Ac.)

Limits of Mining (± 1,548.99 Ac.)

County Boundary

Section, Township, Range

Impacted Wetlands (± 740.45 Ac.)

441W-Coniferous Plantation Wetland (± 227.53 Ac.)

510d-Ditches (± 29.19 Ac.)

524-Lakes Less than 10 Acres (± 0.67 Ac.)

611-Bay Swamp (± 1.29 Ac.)

613-Gum Swamp (± 0.21 Ac.)

621-Cypress (± 0.51 Ac.)

630-Wetland Forested Mix (± 376.59 Ac.)

631-Wetland Scrub (± 15.84 Ac.)

641-Freshwater Marsh (± 88.62 Ac.)

Wetland Impact Cross-Sections

Season High Water Elevation (SHWE)*

Undisturbed Wetlands (± 708.15 Ac.)

Undisturbed Wetlands

Undisturbed Surface Water (± 17.81 Ac.)

Undisturbed Surface Water

N

ORIGINAL MAP SIZE: 22" x 34"

0 350 700

Feet

1 inch = 700 feet

*Season High Water Elevation (SHWE) measured from the average elevation of 3-4 points within the wetland. SHWE were set and surveyed in wetlands with appropreate above ground biological indicators. If SHWE is not shown, then SHWE is about ground surface.

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Wetland Impacts Map

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

Figure 11

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Area 1
Area 2
Area 3
Area 4
Area 5

Legend

- 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

Unsdisturbed Uplands (± 378.46 Ac.)

- Undisturbed Uplands

N

ORIGINAL MAP SIZE: 22" x 34"

0 350 700

Feet

1 inch = 700 feet

Document Path: G:\DPT_CHM\FM1_MXD\129491_TRS_ACOE\Fig 13_Post-Mining Land Use and Veg Map.mxd

NO.	REVISION	BY	DATE
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www.kleinfelder.com

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

Post-Mining Land Use and Vegetation Map

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

Figure 13

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 Recourses) 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

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:
Resiliency (population level): • Large populations able to withstand stochastic events **Needs** • High habitat quantity • Habitat diversity • Low habitat fragmentation • Adequate shelter • Population connectivity	• 53 (of 83) extant populations • Population resiliency: 4 High 13 Medium 28 Low 8 Very Low 30 Extirpated	• 46 (of 83) extant populations. Seven lost to sea level rise, and 44 to 47 very low or extirpated. • Low urbanization rates: One highly resilient population and 6 to 10 medium resilient populations at 2050 and 2070, respectively. • Moderate urbanization rates: One highly resilient population and 5 to 6 medium resilient populations at 2050 and 2070, respectively. • High urbanization rates: One highly resilient population and 4 to 5 medium resilient populations at 2050 and 2070, respectively. • Targeted Conservation: Moderate urbanization rates are mitigated via habitat conservation & repatriation. By 2070, 6 highly resilient populations, 16 medium resilient and 2-4 populations repatriated.
Representation (species level): • Genetic and ecological diversity to maintain species adaptive potential **Needs** • Genetic variation exists between populations • Ecological variation exists across geographic gradient	Compared to historical distribution: • 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) • Genetic and ecological variation retained but with losses in key areas needed for connectivity	• 3 of 4 regions continue to be represented but with declines across all scenarios. • All scenarios exhibit declines in representation due to population declines across genetic and ecological gradients. • 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. • Island populations are mostly lost across all scenarios due to seal level rise. • 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.

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:
Redundancy (species level): • Number and distribution of populations to withstand catastrophic events **Needs** • Multiple resilient populations in each area of representation	• 30 of 83 historical populations extirpated • Overall 48% decline in population extent • 4 highly resilient populations: Panhandle*: 0 North Florida: 0 Southeast Georgia: 1 Peninsular Florida: 3	• 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. • 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

* 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; South Florida Field Office: verobeach@fws.gov; Panama City Field Office: 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 <u>LIVE</u> 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 <u>DEAD</u> 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.

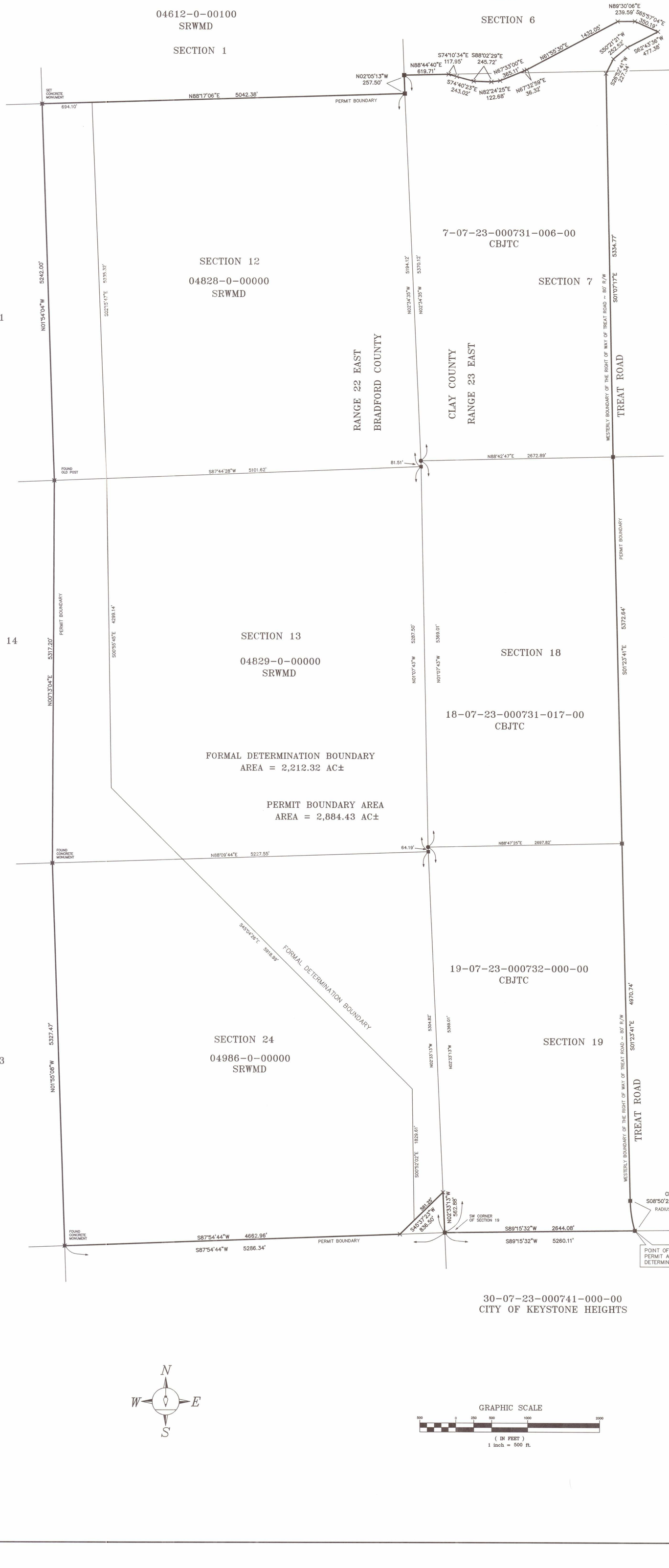
3. Periodically during construction activities, the applicant's designated agent should visit the project area to observe the condition of the posters and Plan materials, and replace them as needed. Construction personnel should be reminded of the instructions (above) as to what is expected if any eastern 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.

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 ½" 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, 836.50 feet to the Southerly boundary of said Section 24; thence South 87 degrees 54 minutes 44 seconds West, along said Southerly boundary, 4662.96 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 Westerly boundary of said Section 13, a distance of 5317.20 feet to a concrete monument located at the Northwest corner of said Section 13 (the SW Corner of Section 12); thence North 01 degree 54 minutes 04 seconds West, 5242.01 feet to a concrete monument located at the Northwest corner of said Section 12; thence North 88 degrees 17 minutes 06 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 1) a distance of 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 82 degrees 24 minutes 25 seconds East, 122.68 feet; thence North 67 degrees 33 minutes 00 seconds East, 365.11 East; thence North 67 degrees 32 minutes 59 seconds East, 36.32 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, 5372.64 feet to an iron rod on the Southerly boundary of said Section 18; 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 alone 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 ½" 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, 561.25 feet; thence North 00 degrees 52 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 06 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 1, 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 82 degrees 24 minutes 25 seconds East, 122.68 feet; thence North 67 degrees 33 minutes 00 seconds East, 365.11 East; thence North 67 degrees 32 minutes 59 seconds East, 36.32 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, 5372.64 feet to an iron rod on the Southerly boundary of said Section 18; 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 alone 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

GRAPHIC SCALE

500 0 250 500 1000 2000

(IN FEET)
1 inch = 500 ft.

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 61G17-6, Florida Administrative Code, pursuant to Section 472.027, Florida Statutes.

By Patrick B. Welch 07/02/19

PATRICK B. WELCH, PSM
FLORIDA CERTIFICATE NO. 2714
BUSINESS NO. LB 4012

DATE SIGNED

FOR : THE CHEMOURS COMPANY FC, LLC

DRAWN BY : MTB | CHECKED BY : PBW | FIELD BOOK : N/A
SCALE : 1" = 500' | JOB NO. : 05-14-26G | 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

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[2].....*"may affect"*

On Page 5

The following replaces footnote #3:

"[3]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, 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 20th 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

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 guanhumi*) 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[1]. 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[2] .....*"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[2]..... *"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[3]. 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[2] ..... *"may affect"*

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[1]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.

[2]Consultation may be concluded informally or formally depending on project impacts.

[3] 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**. 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.

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[1]……*May affect*

Project more than 2,500 feet from a colony site……go to B

B. Project does not affect suitable foraging habitat[2] (SFH)…….*no effect*

Project impacts SFH[2]……go to C

C. Project impacts to SFH are less than or equal to 0.5 acre[3]…….....*NLAA*[4]

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[5] (see attached map) of a colony site, and no wood storks have been documented foraging on site…….....NLAA[4]

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*[6] 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*[4]

Project does not satisfy these elements.……....……...*May affect*

[1] 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.

[2] 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*.

[3] 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.

[4] 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.

[5] 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.

[6]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.

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*.

Sincerely,

Jason Aldridge
For

Timothy A. Parsons, Ph.D.
Director, Division of Historical Resources
and State Historic Preservation Officer

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BRADFORD
CLAY

Legend

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

N

ORIGINAL MAP SIZE: 22" x 34"

0 650 1,300 Feet

1 inch = 1,300 feet

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

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

PROJECT NO.	129491.003
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Location Map

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

Figure 1

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Legend

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

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ORIGINAL MAP SIZE: 22" x 34"

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1 inch = 700 feet

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

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Aerial Map

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

Figure 2

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Bradford

Clay

Legend

Mine Permit Boundary (± 2,884.4 Ac.)

County Boundary

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ORIGINAL MAP SIZE: 22" x 34"

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1 inch = 700 feet

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 USGS Topographic Map, Starke and Keystone Heights Quadrangles.

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USGS Topographic Map

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

Figure 3

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Legend

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

Bradford County Soils

- 4-Mascotte sand, 0 to 2 percent slopes
- 6-Plummer-Plummer wet, sands
- 7-Surrency and Pantego soils, depressional
- 9-Leon fine sand, 0 to 2 percent slopes
- 11-Allanton loamy sand
- 12-Sapelo sand
- 14-Pamlico and Croatan mucks
- 15-Pottsburg sand
- 19-Leon sand, 0 to 2 percent slopes
- 23-Pelham complex, 0 to 2 percent slopes
- 24-Starke mucky fine sand, depressional
- 31-Pottsburg fine sand
- 45-Meadowbrook and Allanton soils, frequently flooded
- 58-Allanton fine sand, frequently flooded

Clay County Soils

- 3-Hurricane fine sand, 0 to 5 percent slopes
- 5-Penney fine sand, 0 to 5 percent slopes
- 6-Mandarin fine sand, 0 to 2 percent slopes
- 7-Centenary fine sand, 0 to 5 percent slopes
- 9-Leon fine sand, 0 to 2 percent slopes
- 11-Allanton and Rutlege mucky fine sands, depressional
- 27-Pamlico muck
- 31-Pottsburg fine sand
- 58-Allanton fine sand, frequently flooded
- 62-Neilhurst fine sand, undulating
- 63-Solite fine sand
- 99-Water

N

ORIGINAL MAP SIZE: 22" x 34"

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Feet

1 inch = 700 feet

Soil Data: USDA, Natural resource Conservation Service, 2018.
Origin: State of Florida Orthos for Bradford and Clay Counties.
Date: Bradford County 2016, Clay County 2017.

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Soils Map

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

Figure 4

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Legend

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

Flood Zone

- A - 1% Annual Chance of Flood Hazard
- AE - Floodway
- Zone X - Areas of Minimal Flood Hazard

N

ORIGINAL MAP SIZE: 22" x 34"

0 350 700 Feet

1 inch = 700 feet

Document Path: G:\DPT_CHM\FM1_MXD\129491_TRS_ACOE\Fig 5_FEMA Map.mxd

Image Source: Image was obtained from ESRI Basemap.
Origin: State of Florida Orthos for Bradford and Clay Counties.
Date: Bradford County 2016, Clay County 2017.
Flood Zone Source: FEMA- Flood Insurance Rate Map (FIRM) Panels: 12007C, & 12019C

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FEMA Floodplain Map

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

Figure 5

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Source: USA Topo Maps was obtained from ESRI Basemap. National Geographic Society, i-cubed

PZ-20
PZ-18
PZ-19
PZ-16
PZ-15
PZ-11
PZ-8
PZ-9
PZ-7
PZ-10
PZ-14
PZ-6
PZ-13
PZ-5
PZ-4
PZ-12
PZ-3
PZ-1
PZ-2

BRADFORD CO
CLAY CO
WILDLIFE MANAGEMENT AREA
RESTRICTED USE
STRIP
LEVEE
4 WC
CMP
BLANDING
MILITARY
RESERVATION BDY
Blue Pond Cem
GRADE
TREAT

0.25 0.125 0 0.25 Miles

1 inch = 0.25 miles

Legend

- Mine Permit Boundary (± 2884.4 Ac.)
- Pre-Mining Average Water Table Depth (ft)
- Piezometers

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Pre-Mining Average Depth to Water

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

FIGURE
6

2,-7,22

1,-7,22

6,-7,23

5,-7,23

11,-7,22

12,-7,22

7,-7,23

Area 1

Area 3

Area 7

Area 8

Area 2

Bradford

Clay

14,-7,22

18,-7,23

18,-7,22

Area 4

24,-7,22

Area 5

19,-7,23

Area 6

25,-7,22

30,-7,23

Legend

- Mine Permit Boundary (± 2,884.4 Ac.)
- Watershed Drainage Basins
- County Boundary
- Section, Township, Range

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.)

N

ORIGINAL MAP SIZE: 22" x 34"

0 350 700

Feet

1 inch = 700 feet

Document Path: G:\DPT_CHM\FM1_MXD\129491_TRS_ACOE\Fig 7_Pre-Mining Land Use and Veg Map.mxd

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Pre-Mining Land Use and Vegetation Map

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

Figure 7

2,-7,22

1,-7,22

6,-7,23

5,-7,23

11,-7,22

12,-7,22

7,-7,23

Bradford

Clay

14,-7,22

13,-7,22

18,-7,23

23,-7,22

24,-7,22

19,-7,23

25,-7,22

30,-7,23

Legend

- Mine Permit Boundary (± 2,884.4 Ac.)
- County Boundary
- Section, Township, Range
- **Pre-Mining Wetlands (± 1,466.41 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 Mix (± 797.51 Ac.)
- 631-Wetland Scrub (± 17.11 Ac.)
- 641-Freshwater Marsh (± 104.50 Ac.)

N

ORIGINAL MAP SIZE: 22" x 34"

0 350 700

Feet

1 inch = 700 feet

Document Path: G:\DPT_CHM\FM\1_MXD\129491_TRS_ACOE\Fig 8_Pre-Mining Wetlands.mxd

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Pre-Mining Wetlands

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

Figure
8

2,-7,22
1,-7,22
6,-7,23
5,-7,23
11,-7,22
12,-7,22
7,-7,23
8,-7,23
Bradford
Clay
14,-7,22
13,-7,22
18,-7,23
17,-7,23
23,-7,22
24,-7,22
19,-7,23
20,-7,23
25,-7,22
30,-7,23
29,-7,23

Area 1
Area 2
Area 3
Area 4
Area 5
Area 6
Area 7
Area 8

215
200
205
195
190
185
180
175
170

Legend

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

N

ORIGINAL MAP SIZE: 22" x 34"

0 350 700
Feet

1 inch = 700 feet

Source: Southern Resource Mapping, Inc. Date: 2011 & 2012.

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Pre-Mining Topography and Drainage Basins Map

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

Figure 9

Document Path: G:\DPT_CHM\FM\1_MXD\129491_TRS_ACOE\Fig 9_PreMining Topo and Drainage.mxd

2,-7,22
1,-7,22
6,-7,23
5,-7,23
11,-7,22
12,-7,22
7,-7,23
8,-7,23
14,-7,22
13,-7,22
18,-7,23
17,-7,23
23,-7,22
24,-7,22
19,-7,23
20,-7,23
25,-7,22
30,-7,23

Year 1
Year 2
Year 3
Year 4
Year 5
Year 6
Year 7
Year 8

A
B
Cross Section A-B
E
F
Cross Section E-F
C
D
Cross Section C-D

Bradford
Clay

Legend

- Mine Permit Boundary (± 2,884.4 Ac.)
- Plant Site Boundary (± 44.1 Ac.)
- Limits of Disturbance (± 1,749.92 Ac.)
- County Boundary
- Section, Township, Range
- Cross Sections

Mine Plan-Year of Disturbance

- YEAR 1
- YEAR 2
- YEAR 3
- YEAR 4
- YEAR 5
- YEAR 6
- YEAR 7
- YEAR 8

N

ORIGINAL MAP SIZE: 22" x 34"

0 350 700
Feet

1 inch = 700 feet

Document Path: G:\DPT_CHM\FM\1_MXD\129491_TRS_ACOE\Fig 10_Mine Plan Map.mxd

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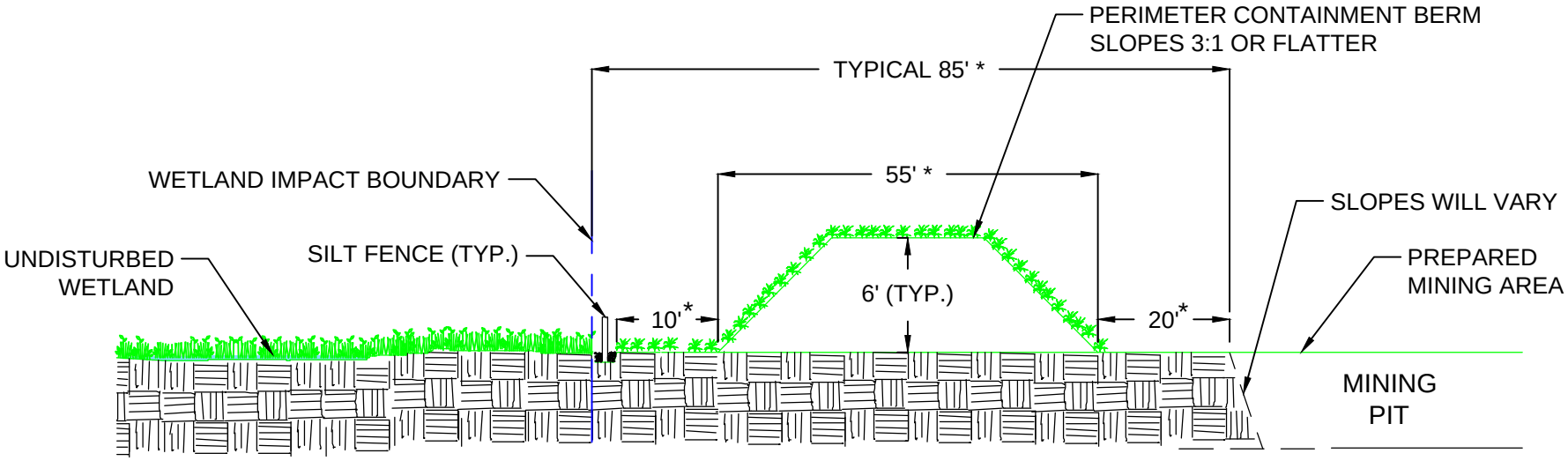
Mine Plan Map

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

Figure
10



*DISTANCES MAY CHANGE WITH CHANGE IN SLOPE

CROSS SECTION A-B - WETLAND IMPACT BOUNDARY

NOT TO SCALE

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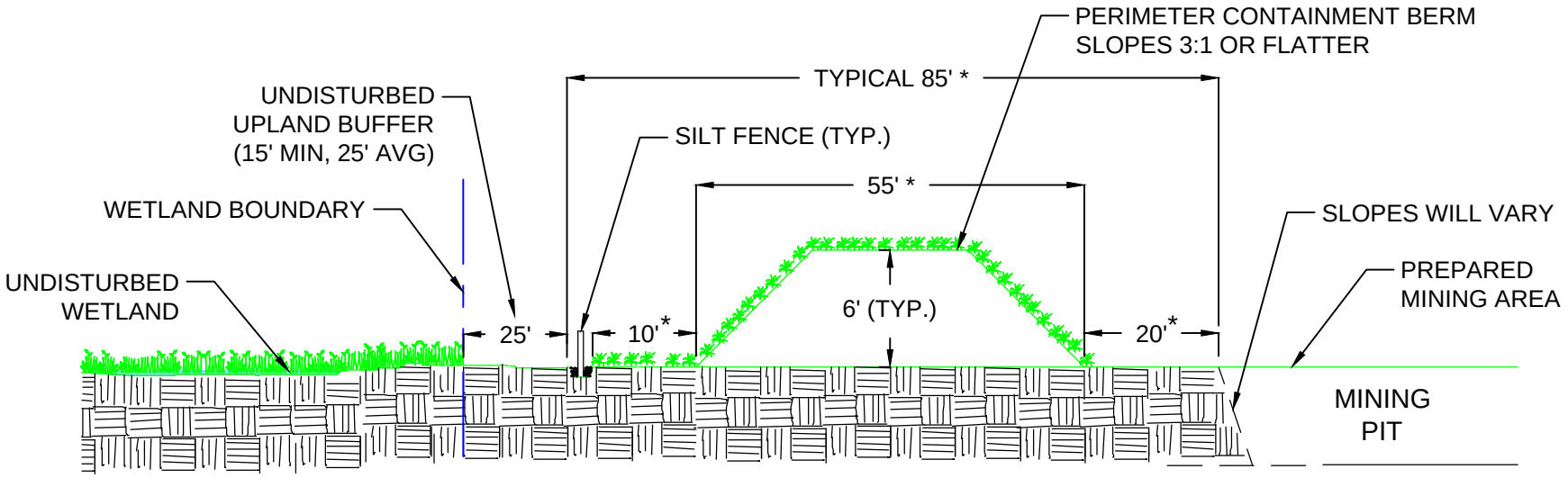
CROSS SECTION A - B

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

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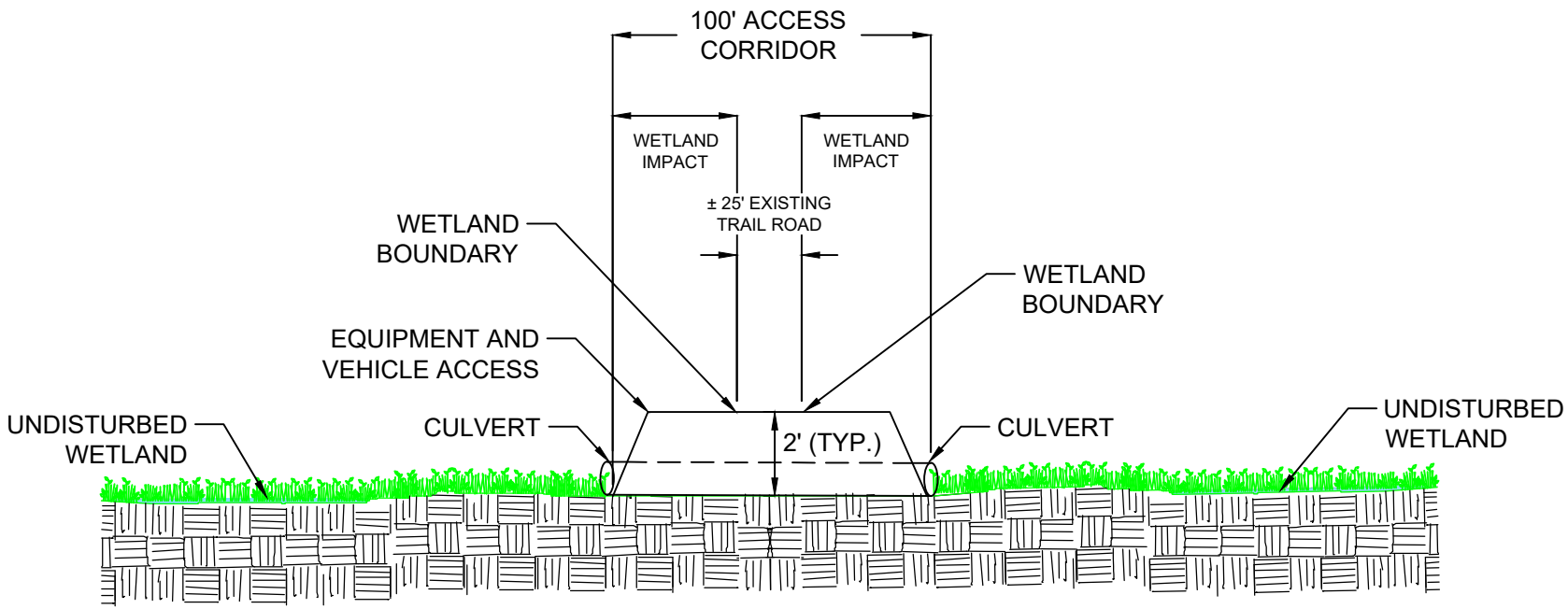
CROSS SECTION C - D

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

FIGURE

10B



CROSS SECTION E-F - CULVERTED ROAD WETLAND CROSSING
NOT TO SCALE

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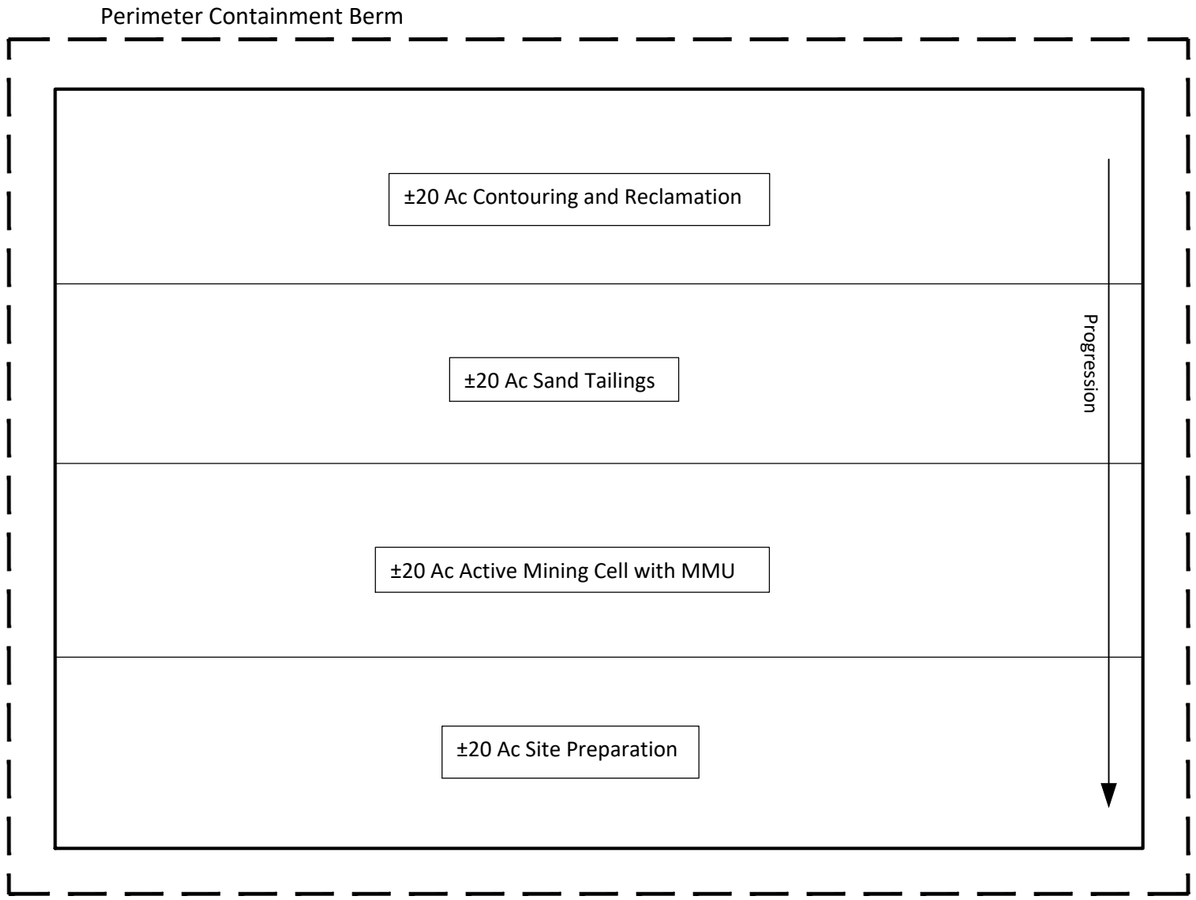
CROSS SECTION E - F

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

FIGURE
10C

Typical Mining Footprint

±80 acres per Mobile Mining Unit (MMU)



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.

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.

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TYPICAL MINING FOOTPRINT

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

FIGURE
10D

2,-7,22

1,-7,22

6,-7,23

5,-7,23

Bradford

Clay

11,-7,22

12,-7,22

7,-7,23

8,-7,23

14,-7,22

13,-7-22

18,-7,23

17,-7,23

23,-7,22

24,-7,22

19,-7,23

20,-7,23

25,-7,22

30,-7,23

29,-7,23

SHWE 191.58

SHWE 193.41

SHWE 184.57

SHWE 194.17

SHWE 194.64

Legend

Mine Permit Boundary (± 2,884.4 Ac.)

Limits of Disturbance (± 1,749.92 Ac.)

Limits of Mining (± 1,548.99 Ac.)

County Boundary

Section, Township, Range

Impacted Wetlands (± 740.45 Ac.)

441W-Coniferous Plantation Wetland (± 227.53 Ac.)

510d-Ditches (± 29.19 Ac.)

524-Lakes Less than 10 Acres (± 0.67 Ac.)

611-Bay Swamp (± 1.29 Ac.)

613-Gum Swamp (± 0.21 Ac.)

621-Cypress (± 0.51 Ac.)

630-Wetland Forested Mix (± 376.59 Ac.)

631-Wetland Scrub (± 15.84 Ac.)

641-Freshwater Marsh (± 88.62 Ac.)

Wetland Impact Cross-Sections

Season High Water Elevation (SHWE)*

Undisturbed Wetlands (± 708.15 Ac.)

Undisturbed Wetlands

Undisturbed Surface Water (± 17.81 Ac.)

Undisturbed Surface Water

N

ORIGINAL MAP SIZE: 22" x 34"

0 350 700

Feet

1 inch = 700 feet

*Season High Water Elevation (SHWE) measured from the average elevation of 3-4 points within the wetland. SHWE were set and surveyed in wetlands with appropreate above ground biological indicators. If SHWE is not shown, then SHWE is about ground surface.

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Wetland Impacts Map

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

Figure 11

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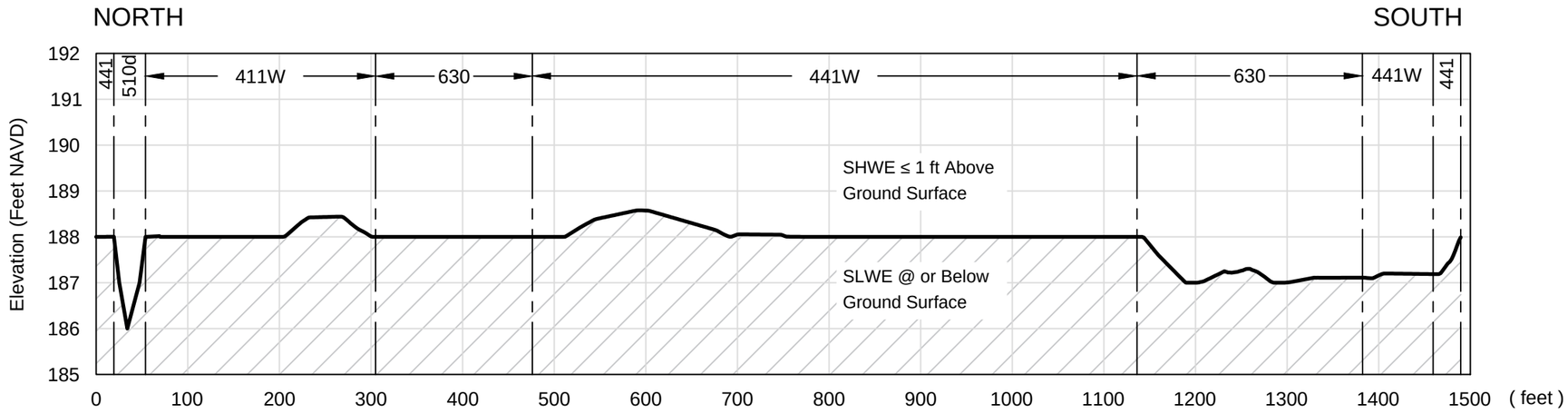


Wetland 1

LEGEND

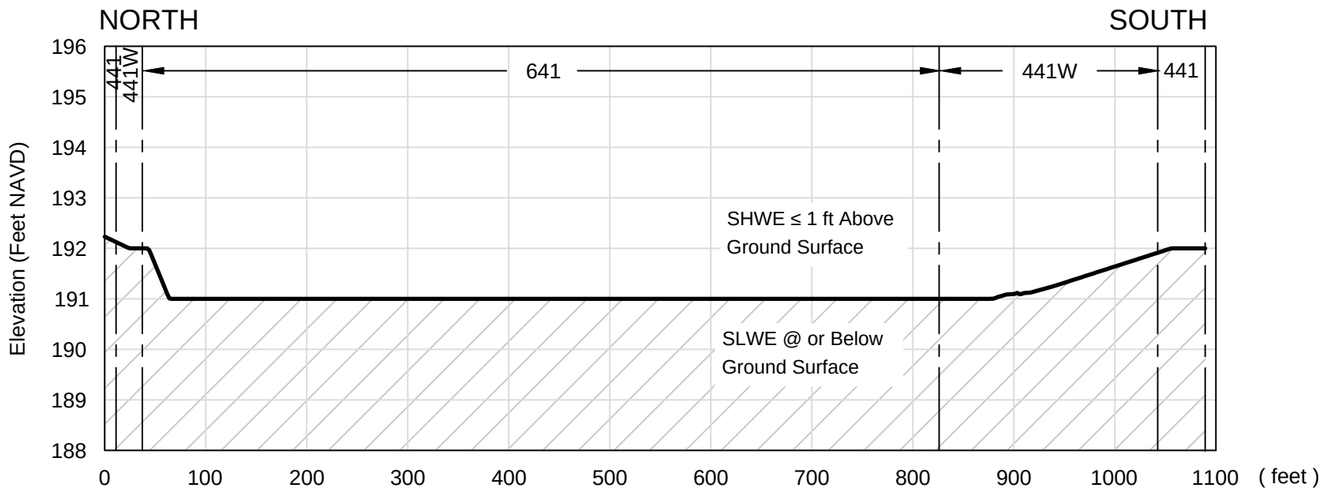
IMPACT

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.

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

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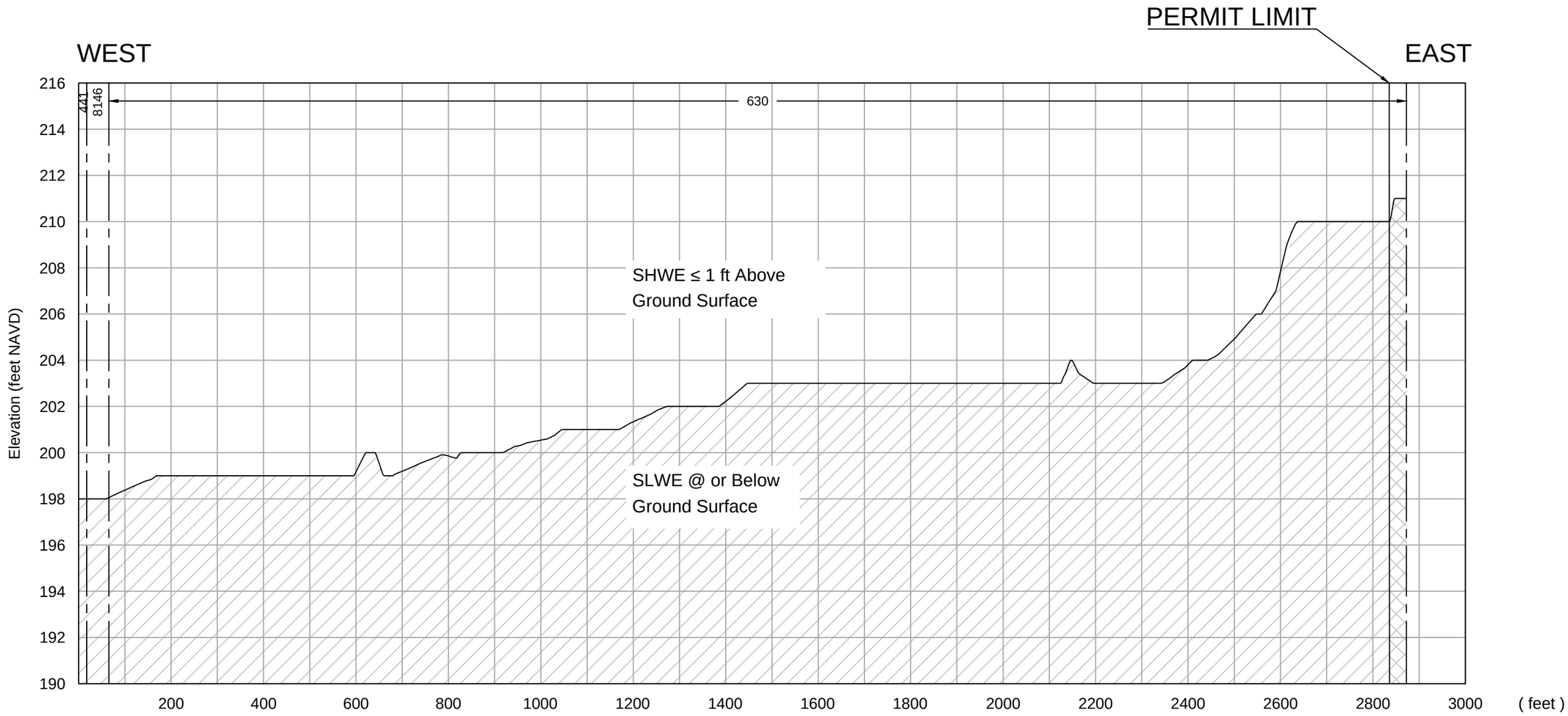
WETLAND IMPACT CROSS-SECTION
WETLAND 1 & 3

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

FIGURE
11A



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

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

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

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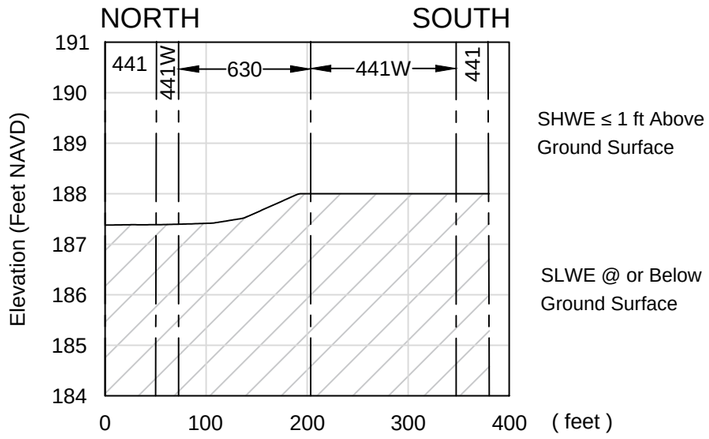
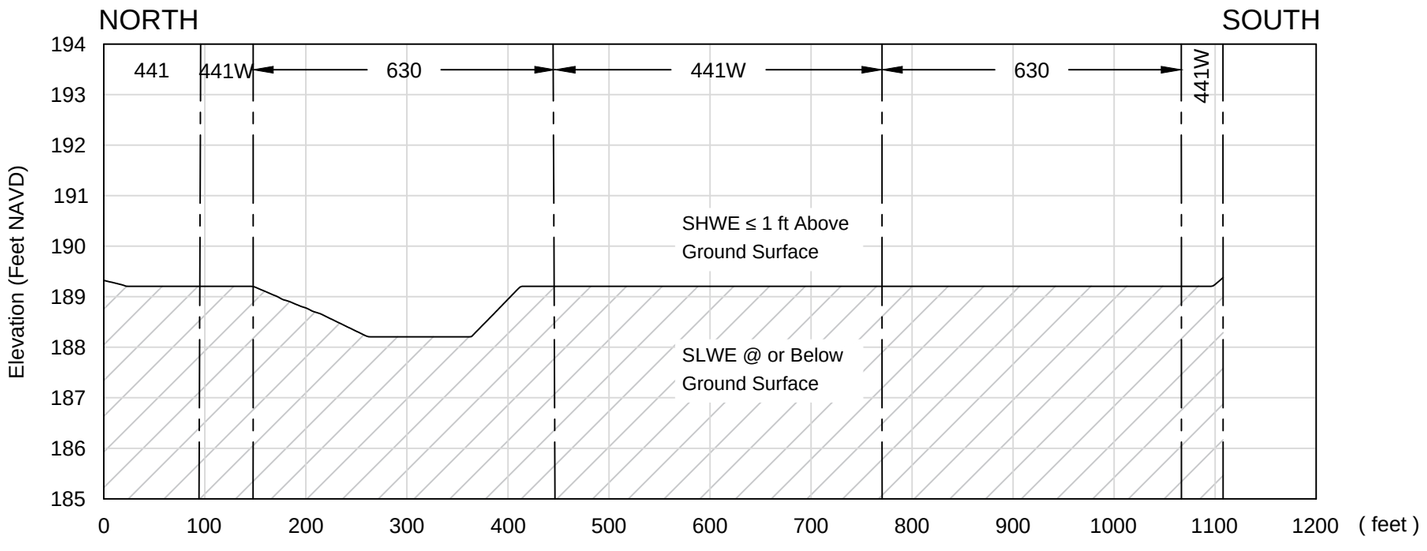
WETLAND IMPACT CROSS-SECTION
WETLAND 5

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

FIGURE
11B



Wetland 6



Wetland 7

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.

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

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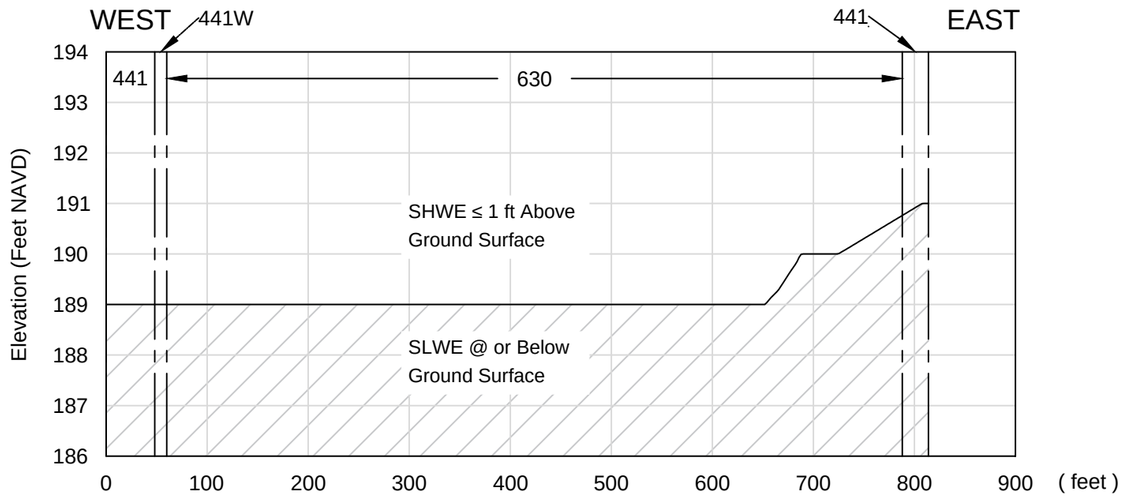
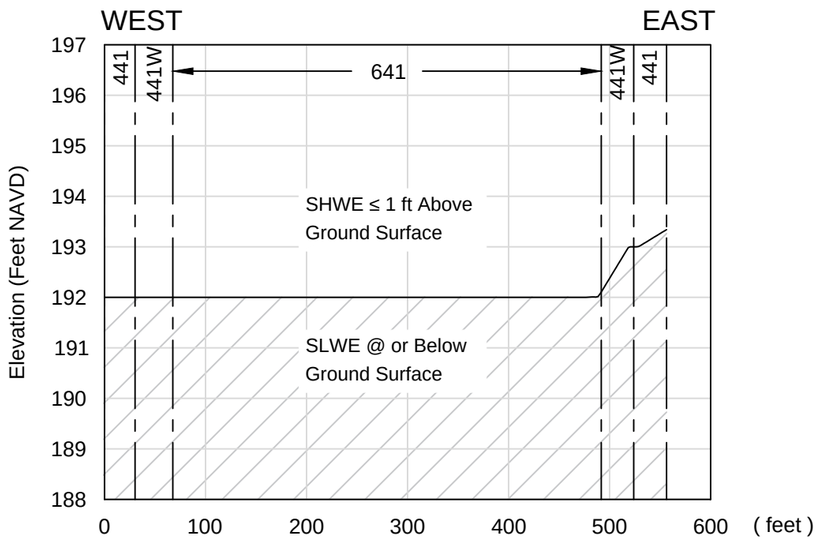
WETLAND IMPACT CROSS-SECTION
WETLAND 6 & 7

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

FIGURE
11C



Wetland 8



Wetland 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.

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

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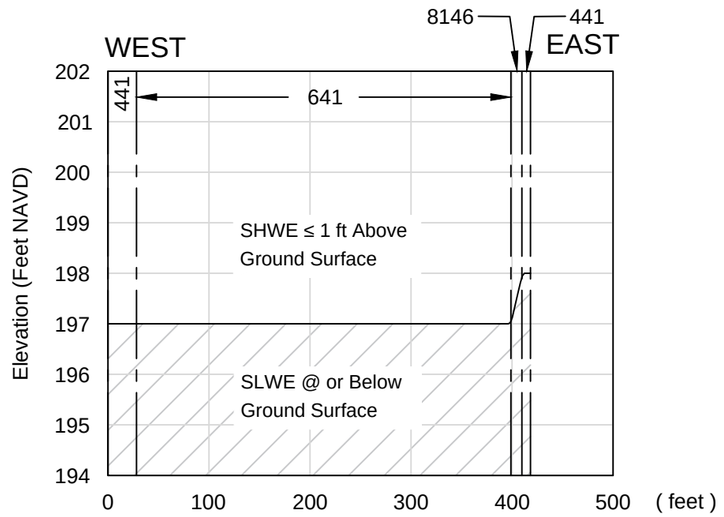
WETLAND IMPACT CROSS-SECTION
WETLAND 8 & 9

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

FIGURE
11D



Wetland 10

LEGEND

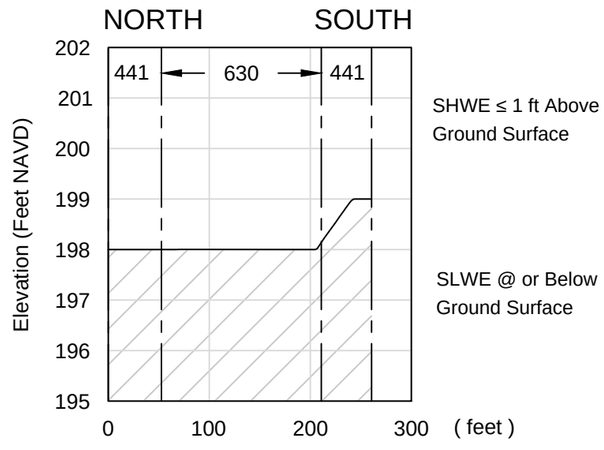
IMPACT

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 11

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

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

KLEINFELDER
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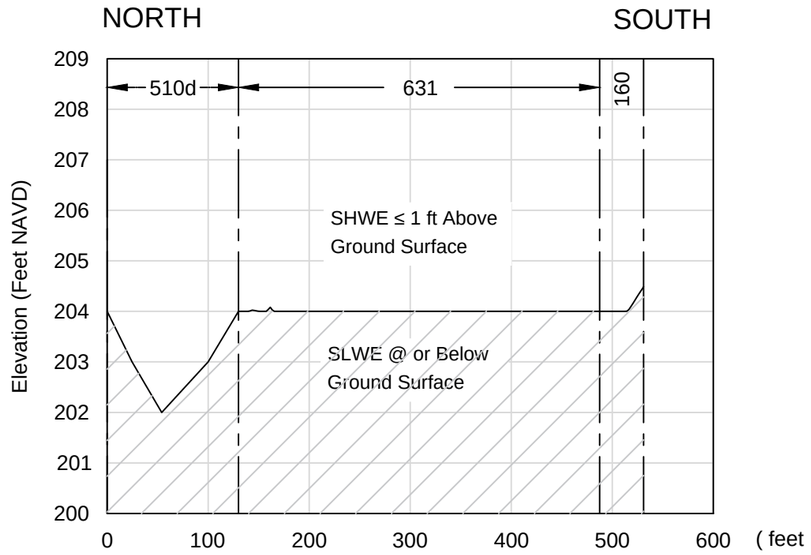
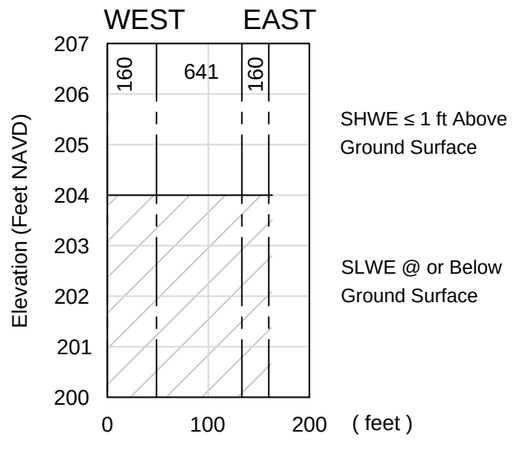
WETLAND IMPACT CROSS-SECTION
WETLAND 10 & 11

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

FIGURE
11E



Wetland 12



Wetland 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.

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

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PROJECT NO.	00129491.003A
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DATE:	11-08-2019
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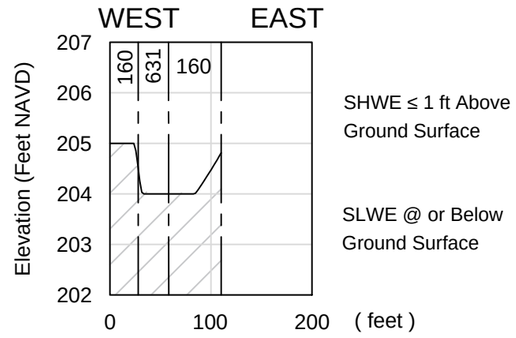
WETLAND IMPACT CROSS-SECTION
WETLAND 12 & 14

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

FIGURE
11F



Wetland 15

LEGEND

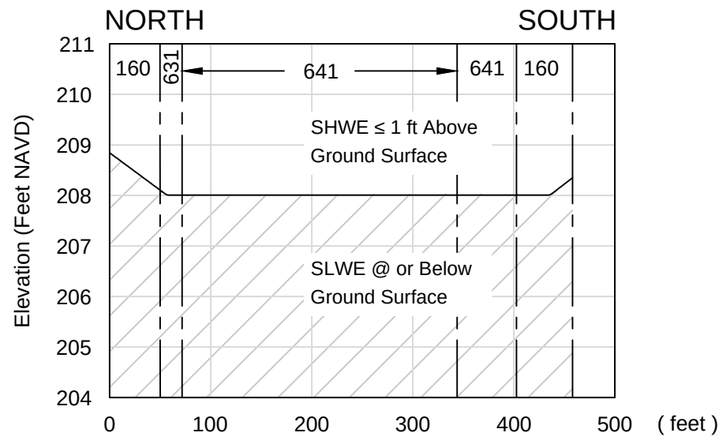
IMPACT

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 16

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

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

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DATE:	11-08-2019
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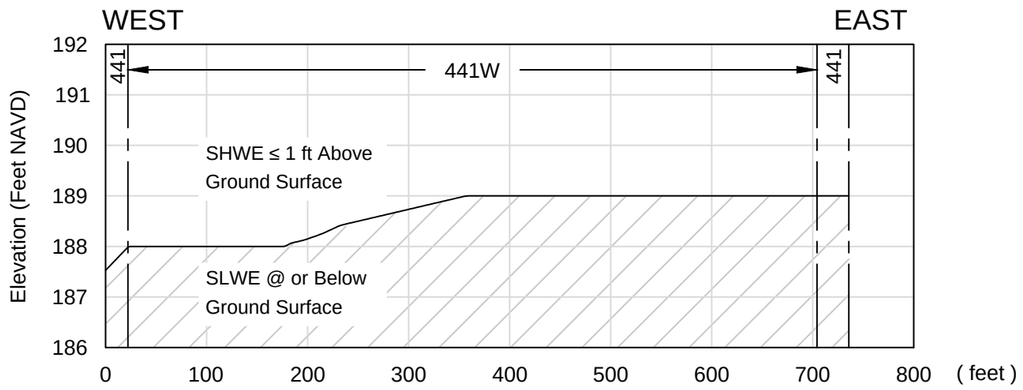
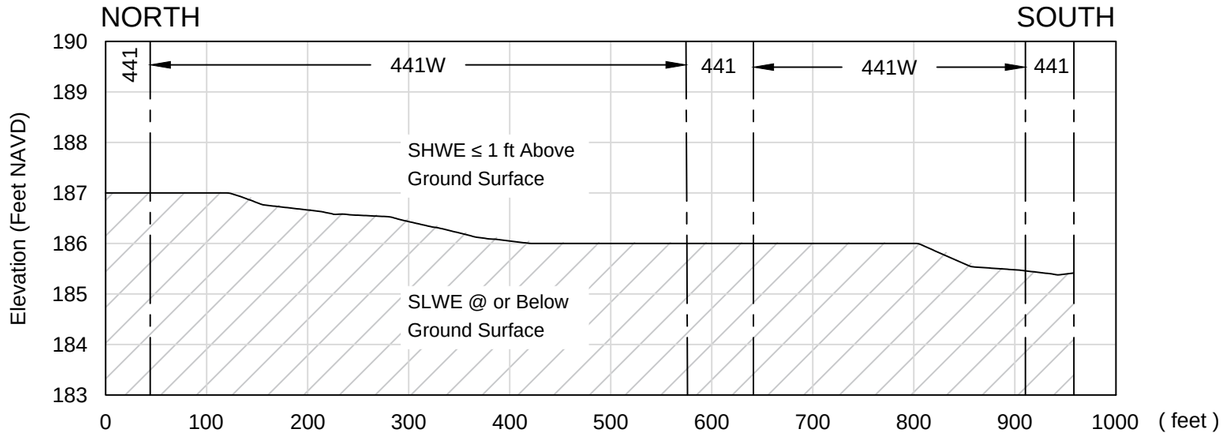
WETLAND IMPACT CROSS-SECTION
WETLAND 15 & 16

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

FIGURE
11G



Wetland 17



Wetland 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.

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

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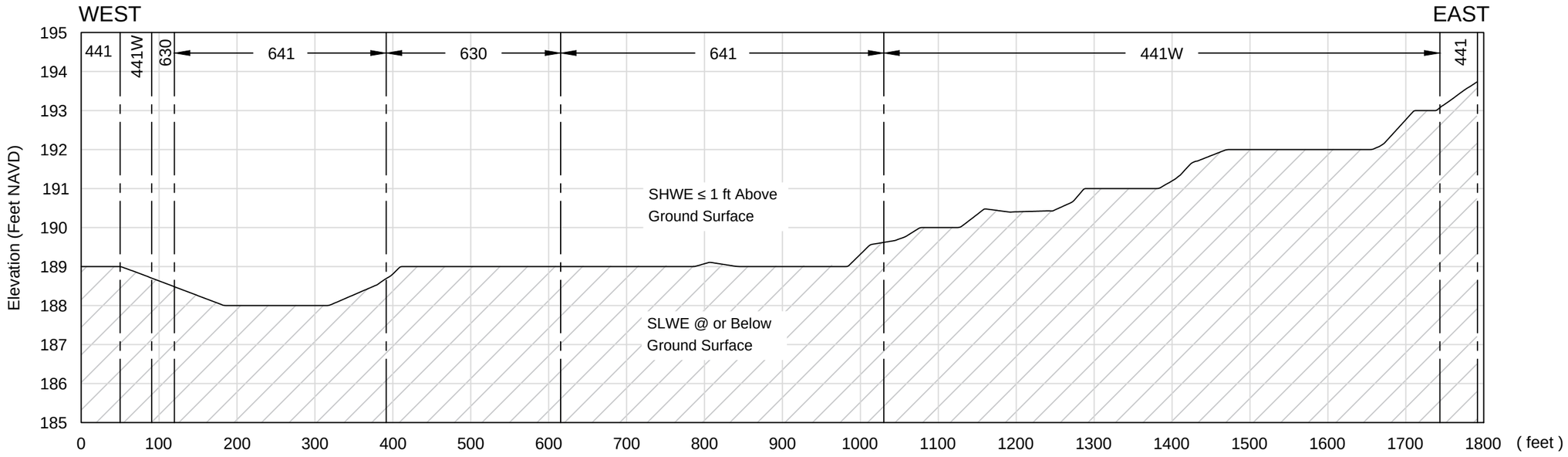
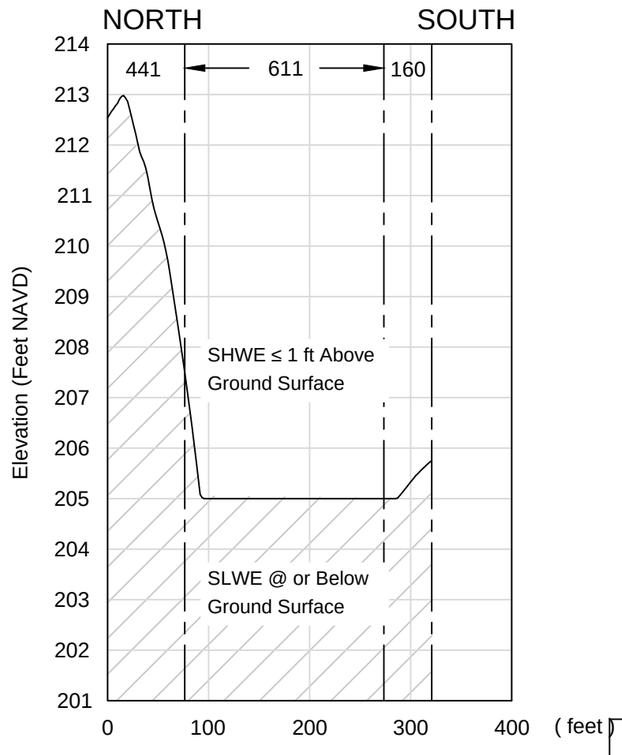
WETLAND IMPACT CROSS-SECTION
WETLAND 17 & 18

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

FIGURE
11H



Wetland 19



Wetland 20

LEGEND

- IMPACT
- UNDISTURBED
- EXISTING GROUND
- LAND USE CODE

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

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

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

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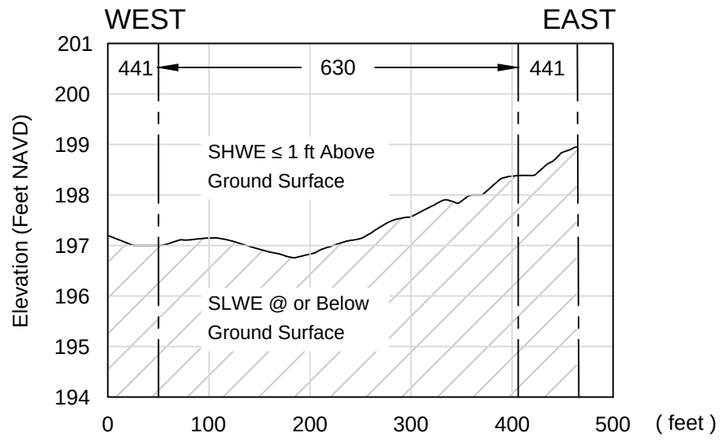
DATE:	11-08-2019
REVISED:	

WETLAND IMPACT CROSS-SECTION
WETLAND 19 & 20

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

FIGURE
11I



Wetland 21

LEGEND

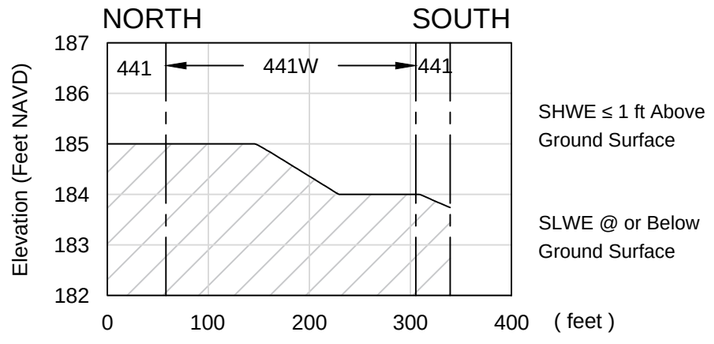
IMPACT

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 23

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

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

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PROJECT NO.	00129491.003A
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DATE:	11-08-2019
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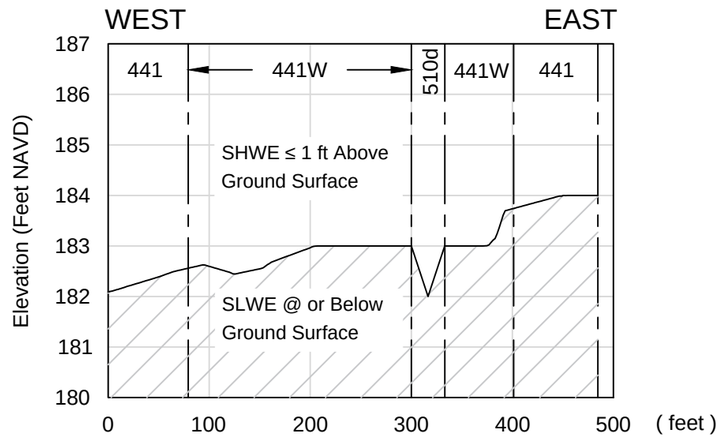
WETLAND IMPACT CROSS-SECTION
WETLAND 21 & 23

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

FIGURE
11J



Wetland 24-1

LEGEND

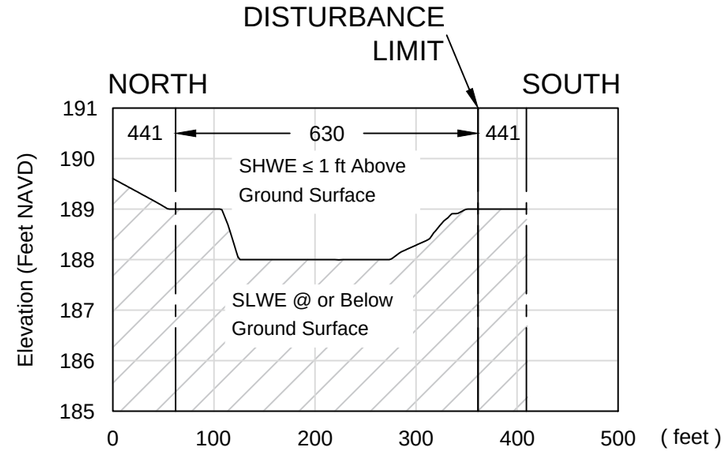
IMPACT

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.

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

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DATE:	11-08-2019
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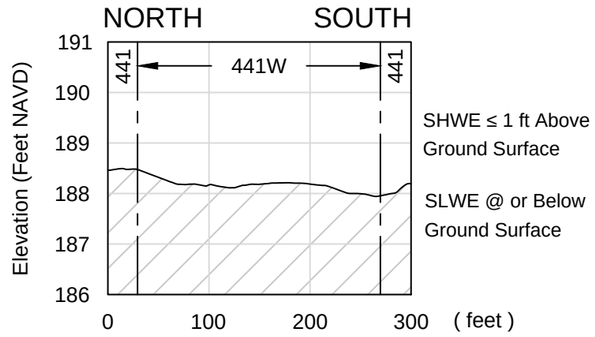
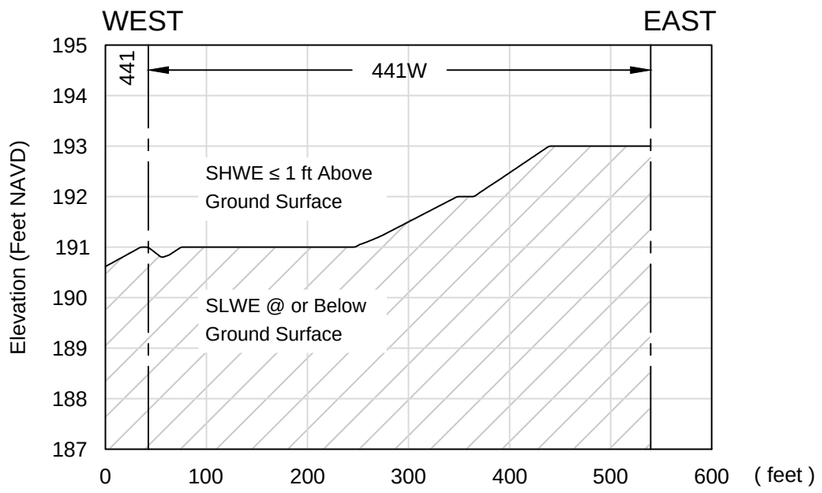
WETLAND IMPACT CROSS-SECTION
WETLAND 24

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

FIGURE
11K



Wetland 25



Wetland 26

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.

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

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PROJECT NO.	00129491.003A
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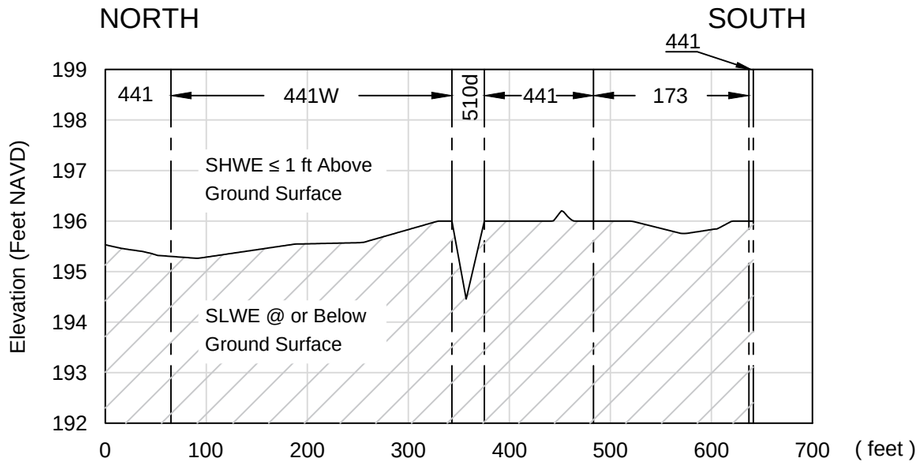
WETLAND IMPACT CROSS-SECTION
WETLAND 25 & 26

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

FIGURE

11L



Wetland 27

LEGEND

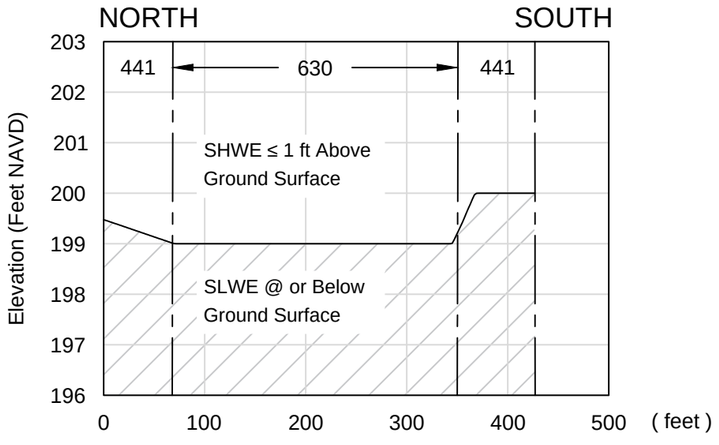
IMPACT

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.

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

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PROJECT NO.	00129491.003A
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DATE:	11-08-2019
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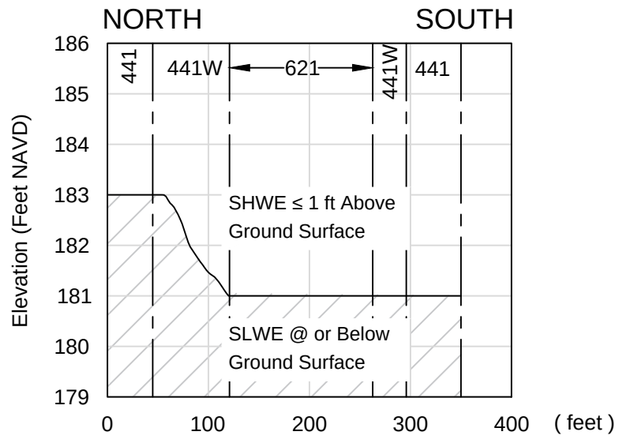
WETLAND IMPACT CROSS-SECTION
WETLAND 27 & 28

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

FIGURE
11M



Wetland 30

LEGEND

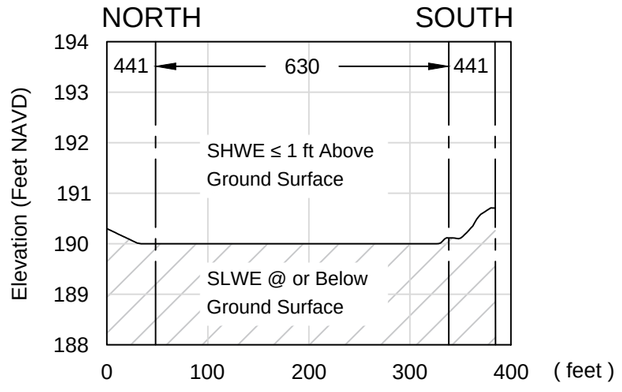
IMPACT

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.

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

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PROJECT NO. 00129491.003A
DRAWN BY YQ
CHECKED BY TRD
DATE: 11-08-2019
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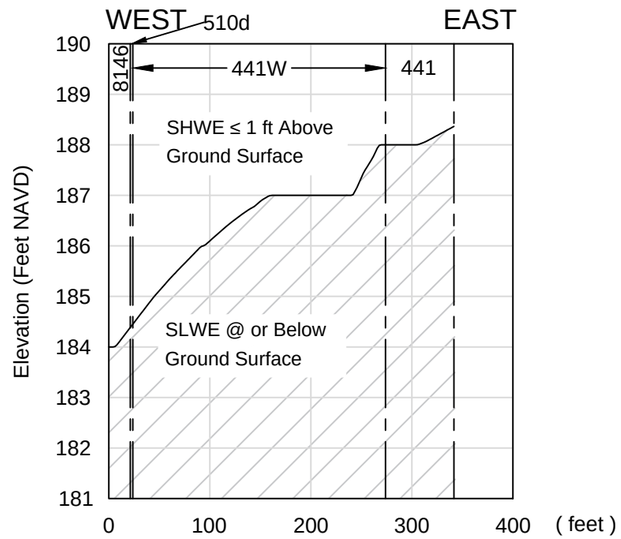
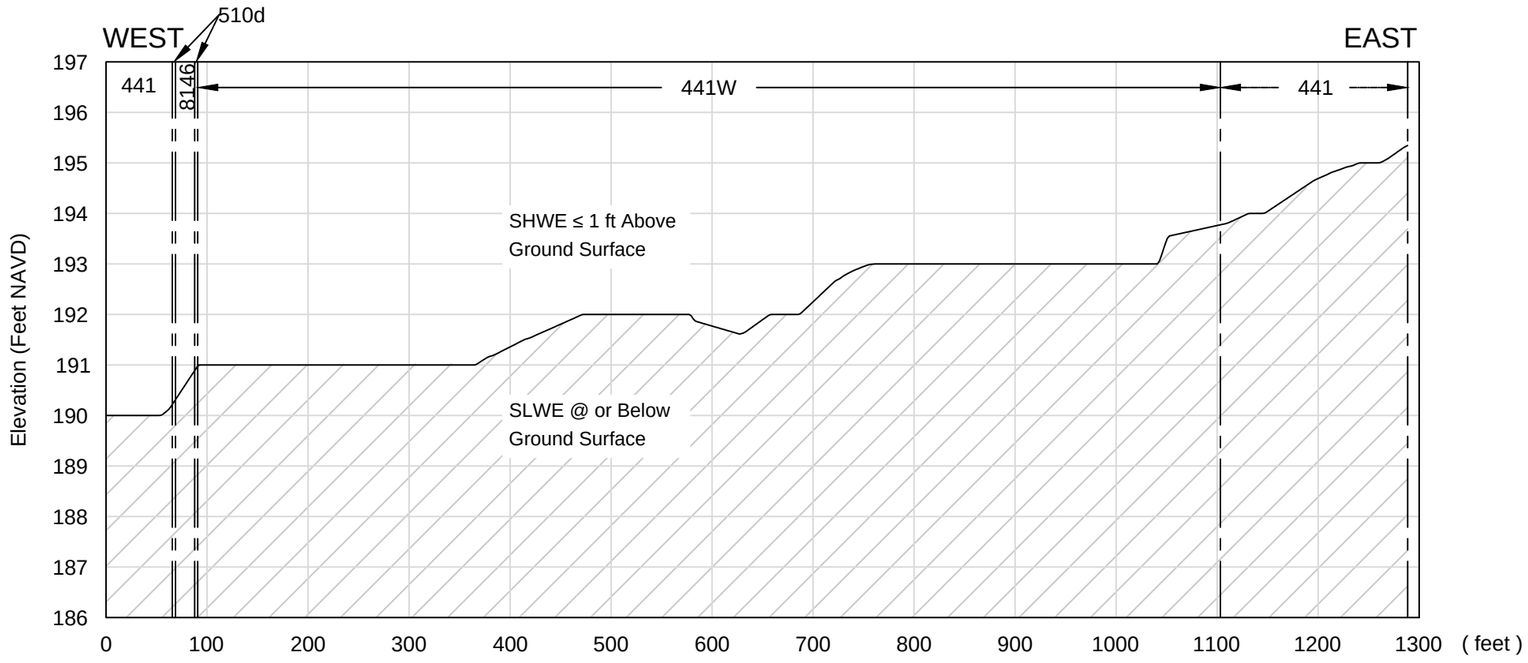
WETLAND IMPACT CROSS-SECTION
WETLAND 30 & 32

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

FIGURE
11N



Wetland 33



Wetland 34-1

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

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

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

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PROJECT NO.	00129491.003A
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DATE:	11-08-2019
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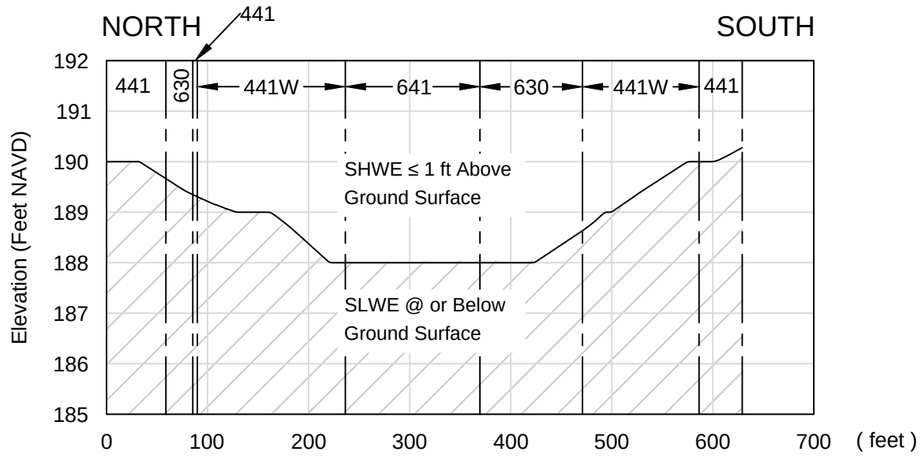
WETLAND IMPACT CROSS-SECTION
WETLAND 33 & 34

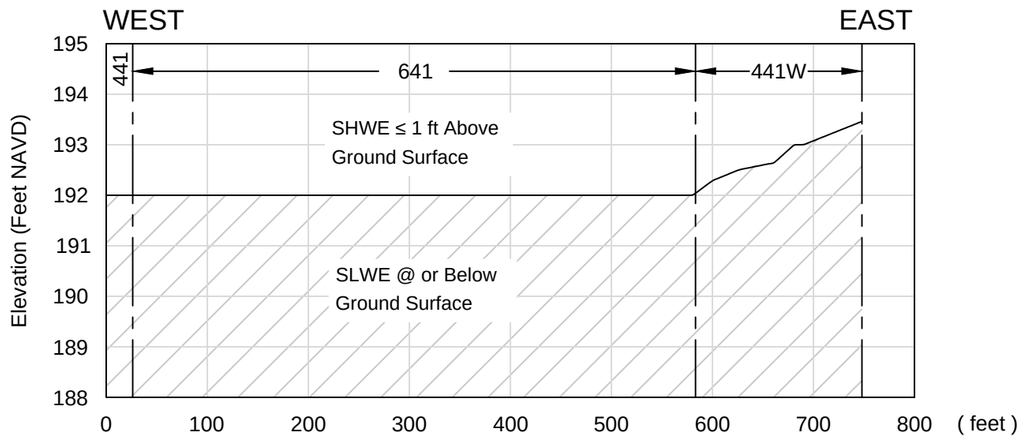
Trail Ridge South
The Chemours Company FC LLC
Bradford and Clay Counties, FL

FIGURE

11O



Wetland 34-2



Wetland-34-3

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.

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

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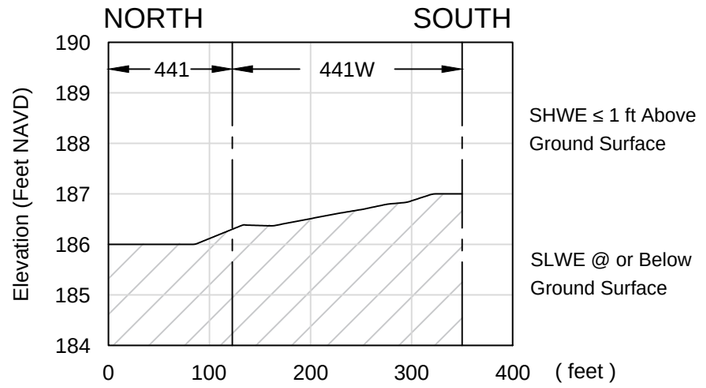
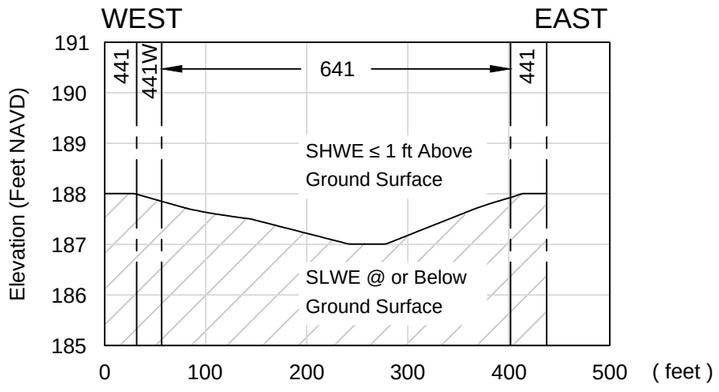
WETLAND IMPACT CROSS-SECTION
WETLAND 34

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

FIGURE
11P



Wetland 36



Wetland 37

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.

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

KLEINFELDER
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PROJECT NO.	00129491.003A
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DATE:	11-08-2019
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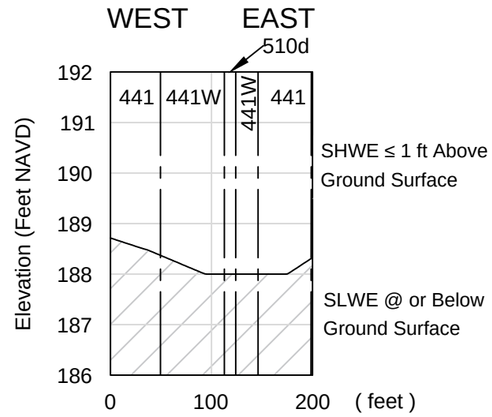
WETLAND IMPACT CROSS-SECTION
WETLAND 36 & 37

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

FIGURE
11Q



Wetland 38 -1

LEGEND

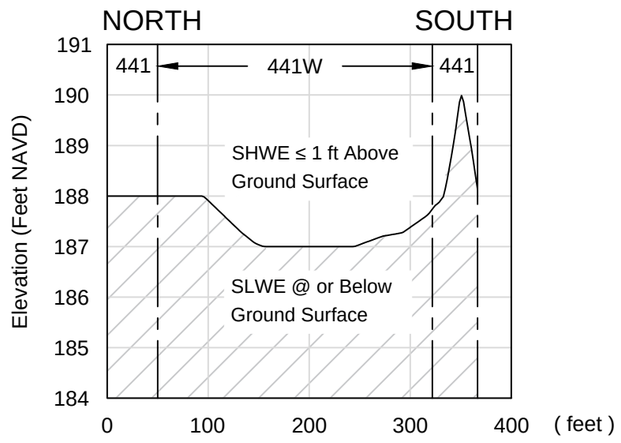
IMPACT

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.

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

KLEINFELDER
Bright People. Right Solutions.

PROJECT NO.	00129491.003A
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DATE:	11-08-2019
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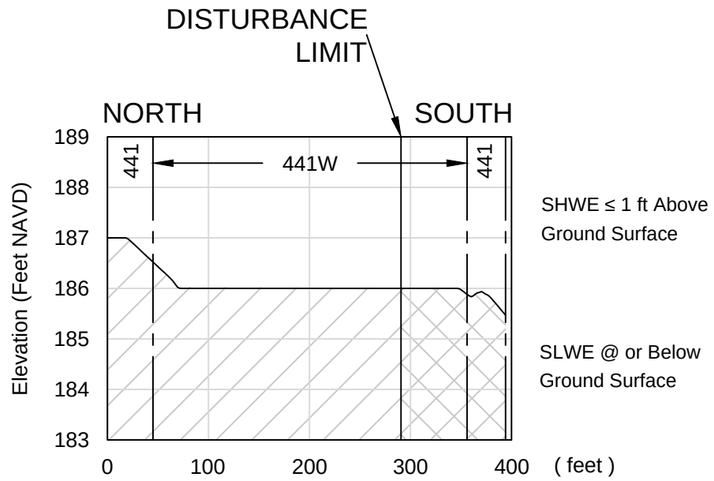
WETLAND IMPACT CROSS-SECTION
WETLAND 38

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

FIGURE
11R



Wetland 38-3

LEGEND

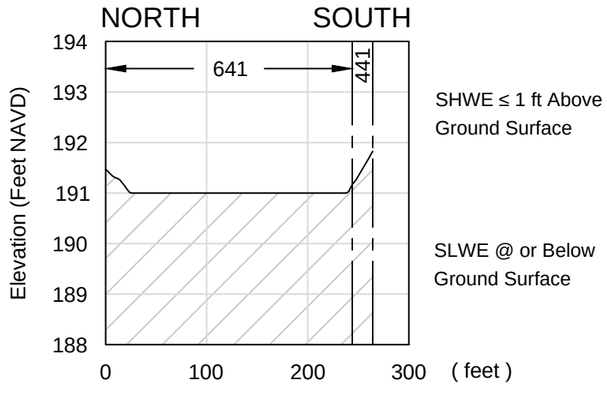
IMPACT

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 39

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

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

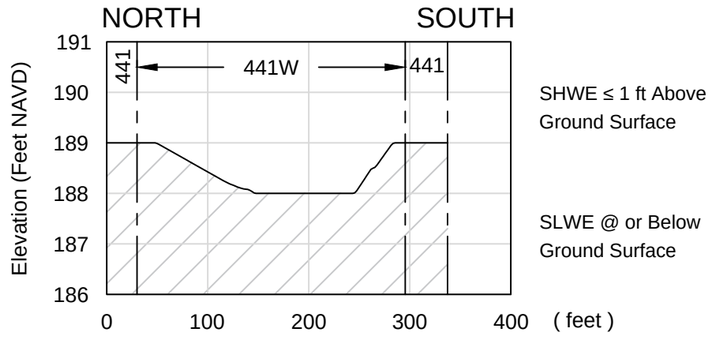
KLEINFELDER
Bright People. Right Solutions.

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
11S



Wetland 41

LEGEND

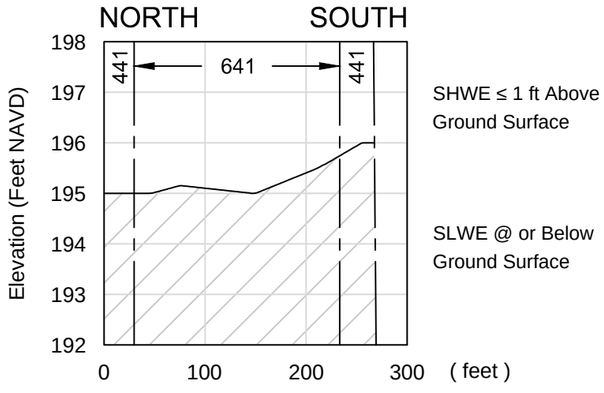
IMPACT

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



Wetland 42

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

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

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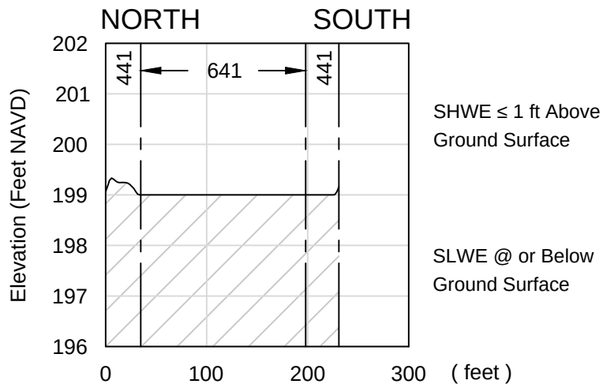
WETLAND IMPACT CROSS-SECTION
WETLAND 41 & 42

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

FIGURE
11T



Wetland 43

LEGEND

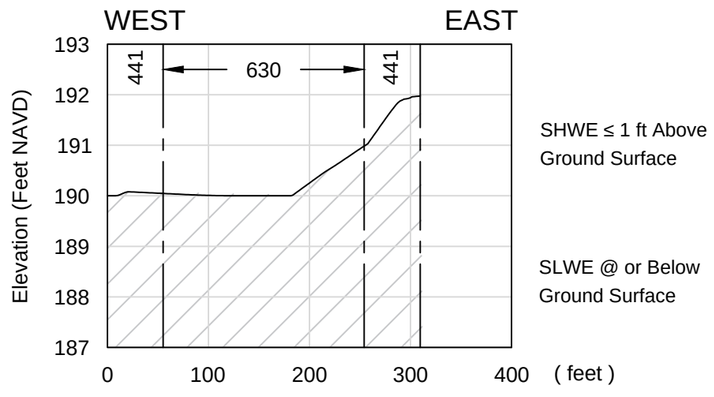
IMPACT

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 45

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

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

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WETLAND IMPACT CROSS-SECTION
WETLAND 43 & 45

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

FIGURE
11U

Document Path: \\kleinfelder.com\Shares\MOUNTDORA-DATA\GISCAD\Chemours_2019\00129491.003A_Chemours-FL-CY2019 Trail Ridge South\TRS_ACOE_Fig12_Post_AvgDWT.mxd; Plotted: 11/8/2019, 11:48:14 AM, TDesmarais

Source: USA Topo Maps was obtained from ESRI Basemap. National Geographic Society, i-cubed

PZ-20
PZ-18
PZ-17
PZ-11
PZ-19
PZ-16
PZ-8
PZ-15
PZ-9
PZ-7
PZ-10
PZ-14
PZ-6
PZ-13
PZ-5
PZ-4
PZ-12
PZ-3
PZ-1
PZ-2

0.25 0.125 0 0.25 Miles

1 inch = 0.25 miles

Legend

- Mine Permit Boundary (± 2884.4 Ac.)
- Post-Mining Average Water Table Depth (ft)
- Piezometers

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Post-Mining Average Depth to Water

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

FIGURE
12

2,-7,22
1,-7,22
6,-7,23
5,-7,23
11,-7,22
12,-7,22
7,-7,23
8,-7,23
17,-7,23
Bradford
Clay
14,-7,22
13,-7,22
18,-7,23
19,-7,23
24,-7,22
23,-7,22
25,-7,22
30,-7,23

Area 1
Area 2
Area 3
Area 4
Area 5

Legend

- 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

Unsdisturbed Uplands (± 378.46 Ac.)

- Undisturbed Uplands

N

ORIGINAL MAP SIZE: 22" x 34"

0 350 700

Feet

1 inch = 700 feet

Document Path: G:\DPT_CHM\FM1_MXD\129491_TRS_ACOE\Fig 13_Post-Mining Land Use and Veg Map.mxd

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Post-Mining Land Use and Vegetation Map

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

Figure 13

2,-7,22
1,-7,22
6,-7,23
5,-7,23
11,-7,22
12,-7,22
7,-7,23
8,-7,23
14,-7,22
13,-7,22
18,-7,23
17,-7,23
23,-7,22
24,-7,22
19,-7,23
20,-7,23
25,-7,22
30,-7,23
29,-7,23

Area 1

Area 2

Area 3

Area 4

Area 5

Bradford

Clay

Legend

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

N

ORIGINAL MAP SIZE: 22" x 34"

0 350 700

Feet

1 inch = 700 feet

Source: Southern Resource Mapping, Inc. Date: 2011 & 2012.

NO.	REVISION	BY	DATE
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Post-Mining Topography and Drainage Basins Map

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

Figure 14

Document Path: G:\DPT_CHM\FM\1_MXD\129491_TRS_ACOE\Fig 14_Post-Mining Topo and Drainage.mxd

2,-7,22
1,-7,22
6,-7,23
5,-7,23
8,-7,23
11,-7,22
12,-7,22
13,-7,22
14,-7,22
17,-7,23
18,-7,23
19,-7,23
23,-7,22
24,-7,22
25,-7,22
30,-7,23
Bradford
Clay

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 9 10 11 12

160 630 510d 441W 441 8146 523 524 641 621 530

Legend

- Mine Permit Boundary (± 2,884.4 Ac.)
- Limits of Disturbance (± 1,749.92 Ac.)
- County Boundary
- Section, Township, Range
- MM Mitigation Area

Mitigation Areas Land Use (± 847.08 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 (± 136.49 Ac.)
- 641-Freshwater Marsh (± 88.62 Ac.)
- Wetland Mitigation Cross-Sections

Undisturbed Wetlands (± 571.66 Ac.)

- Undisturbed Wetlands

Undisturbed Surface Water (± 17.81 Ac.)

- Undisturbed Surface Water

Undisturbed Uplands (± 378.46 Ac.)

- Undisturbed Uplands

N

ORIGINAL MAP SIZE: 22" x 34"

0 350 700

Feet

1 inch = 700 feet

Document Path: G:\DPT_CHM\FM1_MXD\129491_TRS_ACOE\Fig 15_Wetland Mitigation Map_NA.mxd

NO.	REVISION	BY	DATE
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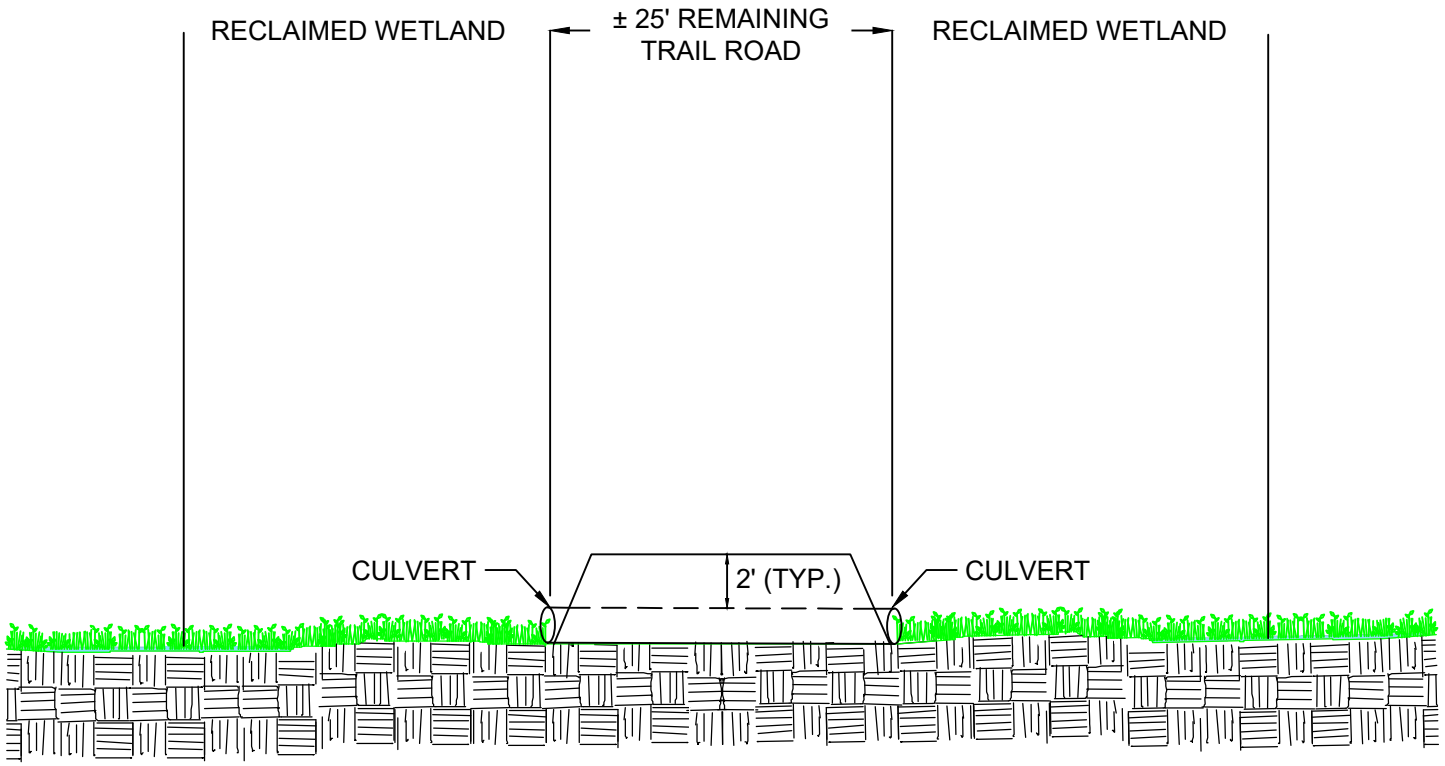
Onsite Wetland Mitigation Map

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

Figure 15



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

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CROSS SECTION G - H

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

FIGURE
16

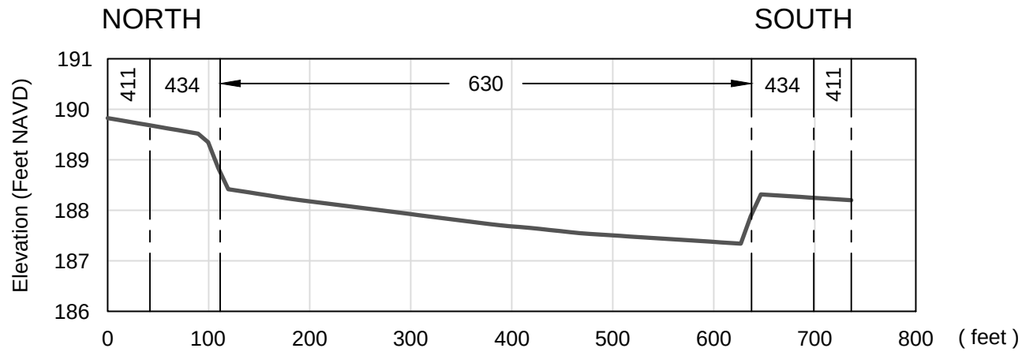
Note:

611, 630 : SHWE ≤ 1' Above Ground Surface

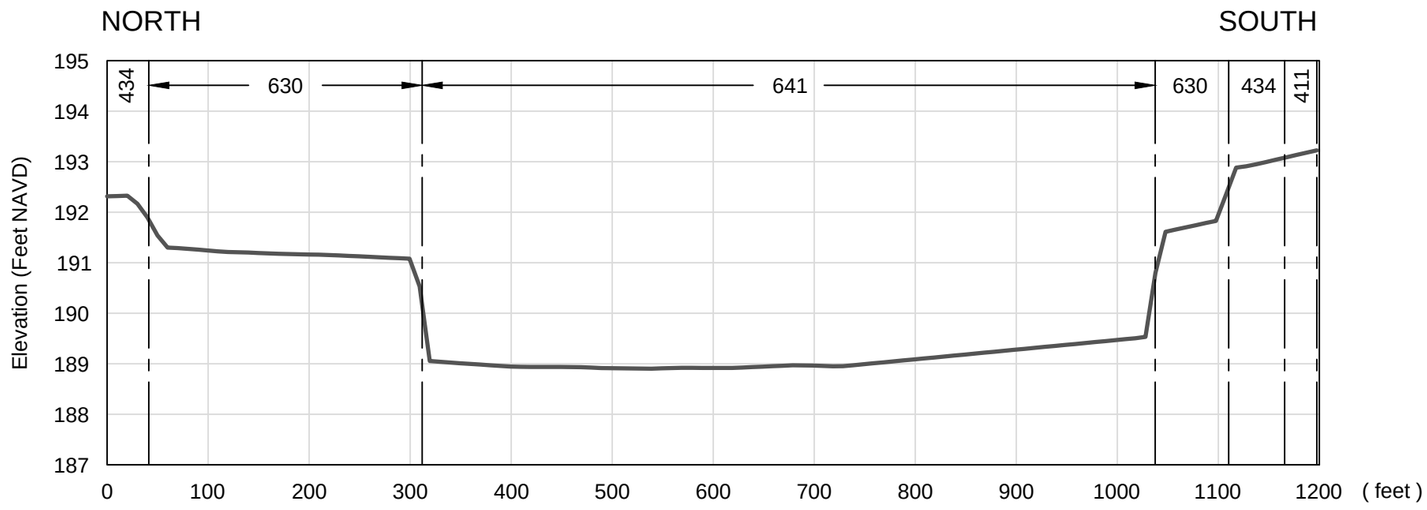
621, 613 : SHWE ≤ 18" Above Ground Surface

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

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

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WETLAND MITIGATION
CROSS-SECTION 1A & 1B

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

FIGURE
16A

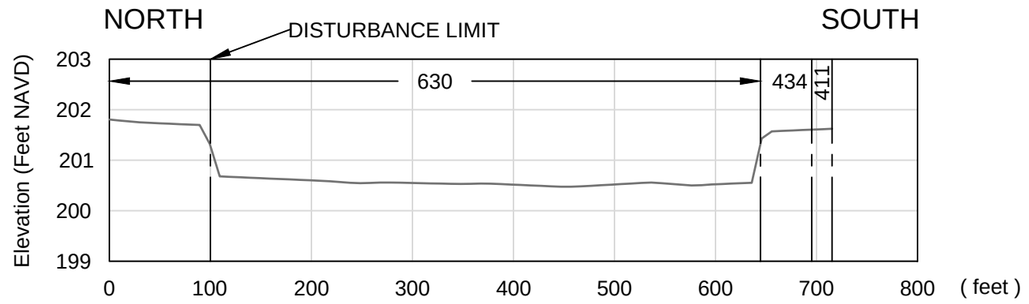
Note:

611, 630 : SHWE ≤ 1' Above Ground Surface

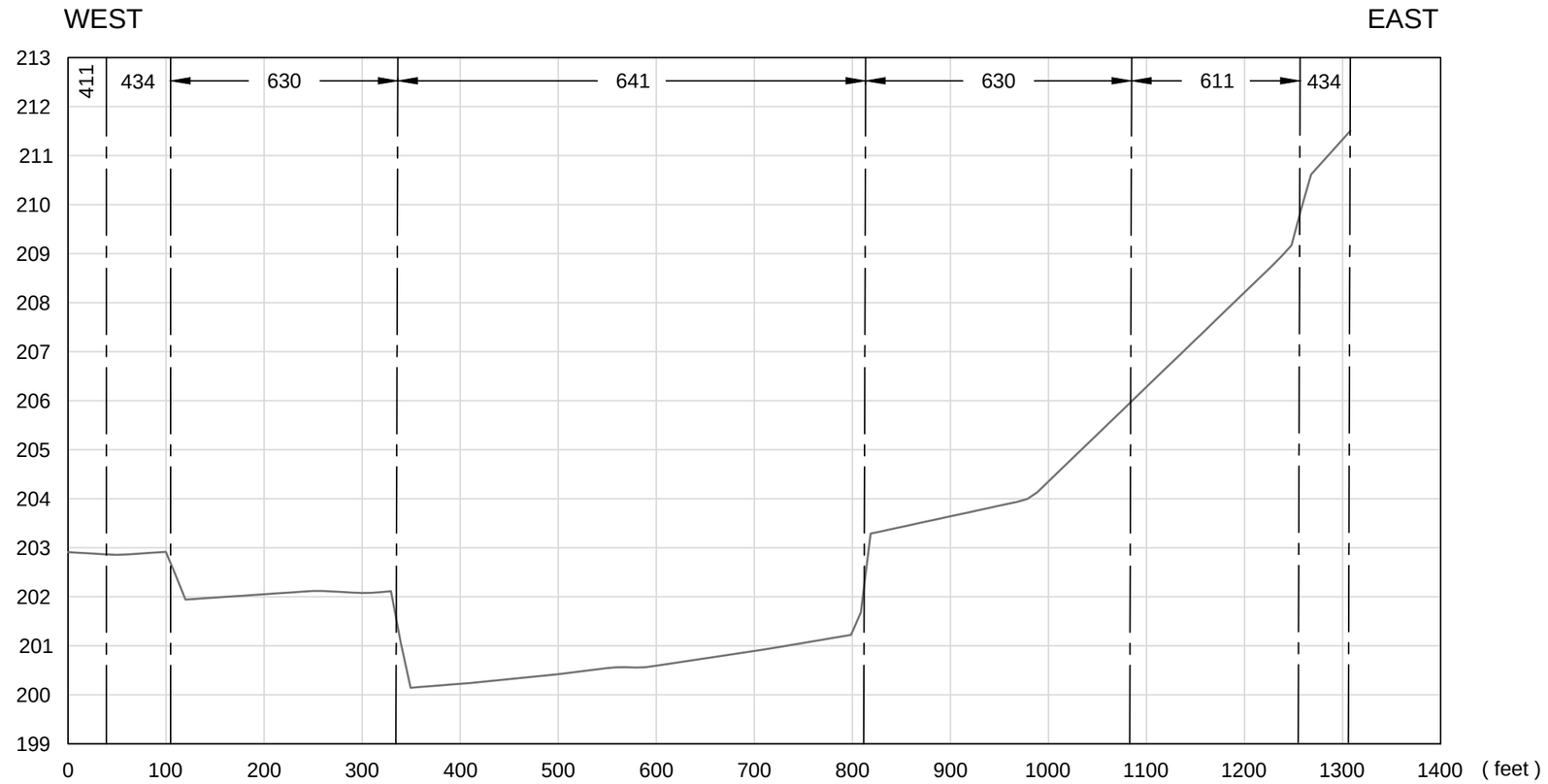
621, 613 : SHWE ≤ 18" Above Ground Surface

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'

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WETLAND MITIGATION
CROSS-SECTION 1C & 1D

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

FIGURE
16B

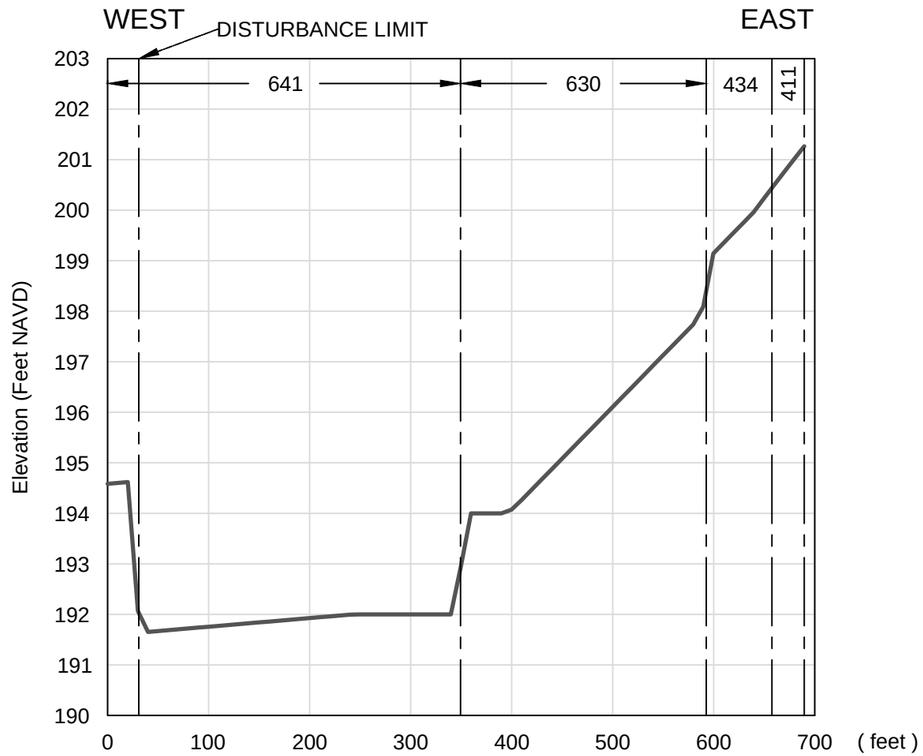
Note:

611, 630 : SHWE ≤ 1' Above Ground Surface

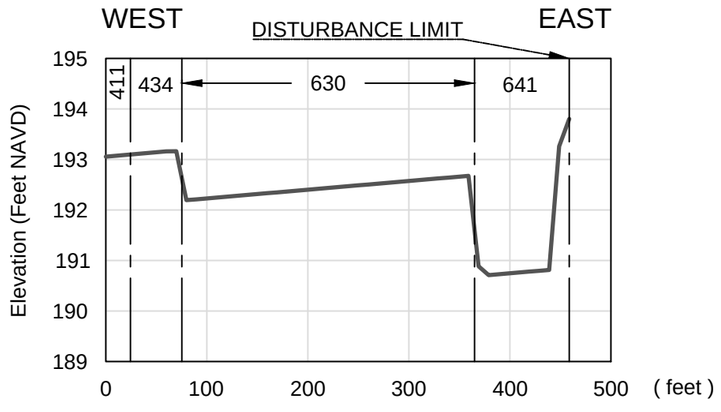
621, 613 : SHWE ≤ 18" Above Ground Surface

641 : SHWE ≤ 2' Above Ground Surface

SLWE @ Or Below Ground Surface



Cross-Section 1E



Cross-Section 1F

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'

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WETLAND MITIGATION
CROSS-SECTION 1E &1F

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

FIGURE
16C

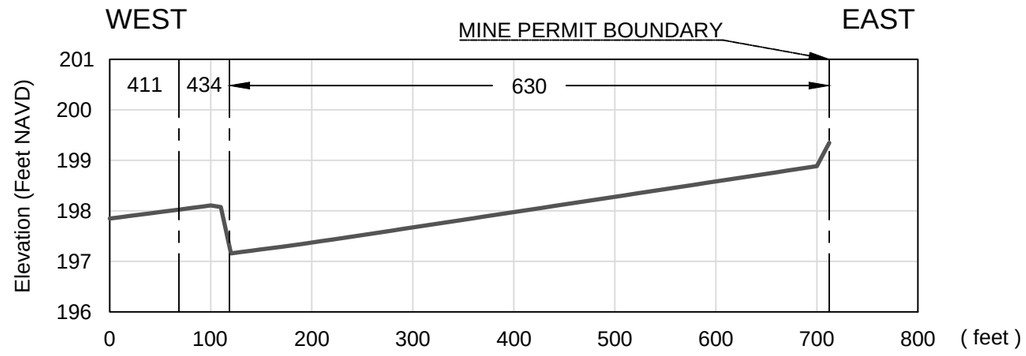
Note:

611, 630 : SHWE ≤ 1' Above Ground Surface

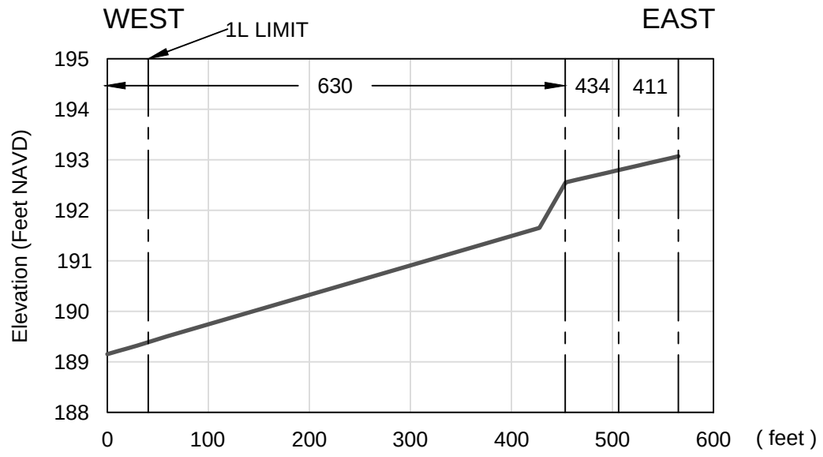
621, 613 : SHWE ≤ 18" Above Ground Surface

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'

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WETLAND MITIGATION
CROSS-SECTION 1G & 1H

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

FIGURE
16D

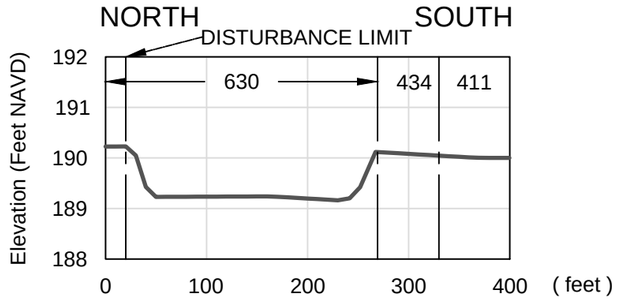
Note:

611, 630 : SHWE ≤ 1' Above Ground Surface

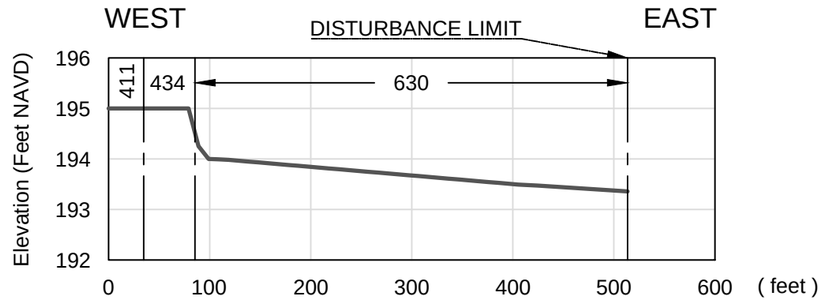
621, 613 : SHWE ≤ 18" Above Ground Surface

641 : SHWE ≤ 2' Above Ground Surface

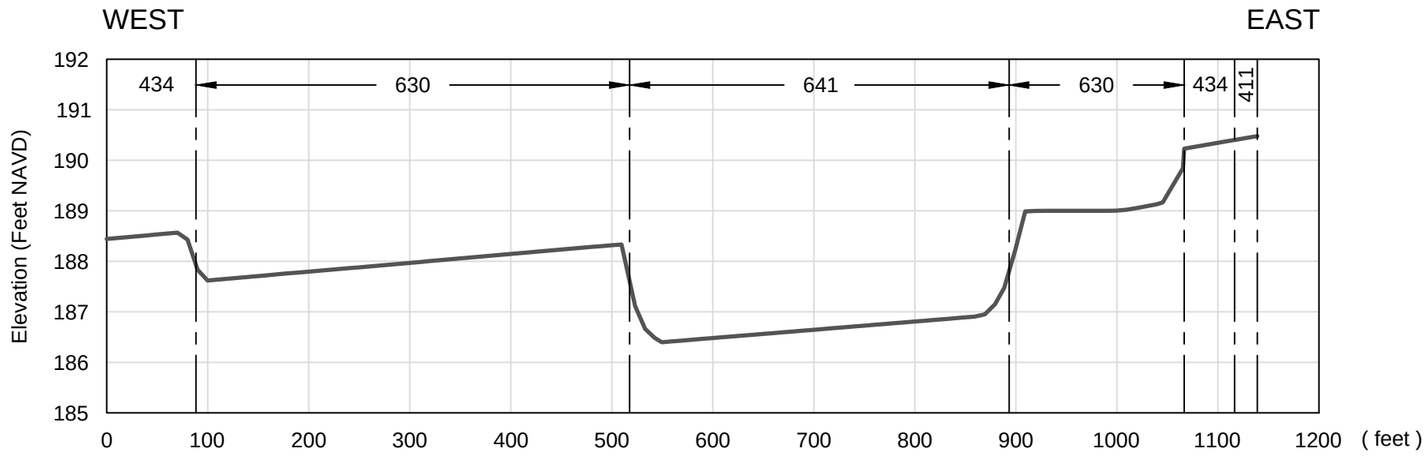
SLWE @ Or Below Ground Surface



Cross-Section 1I



Cross-Section 1J



Cross-Section 1K

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'

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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

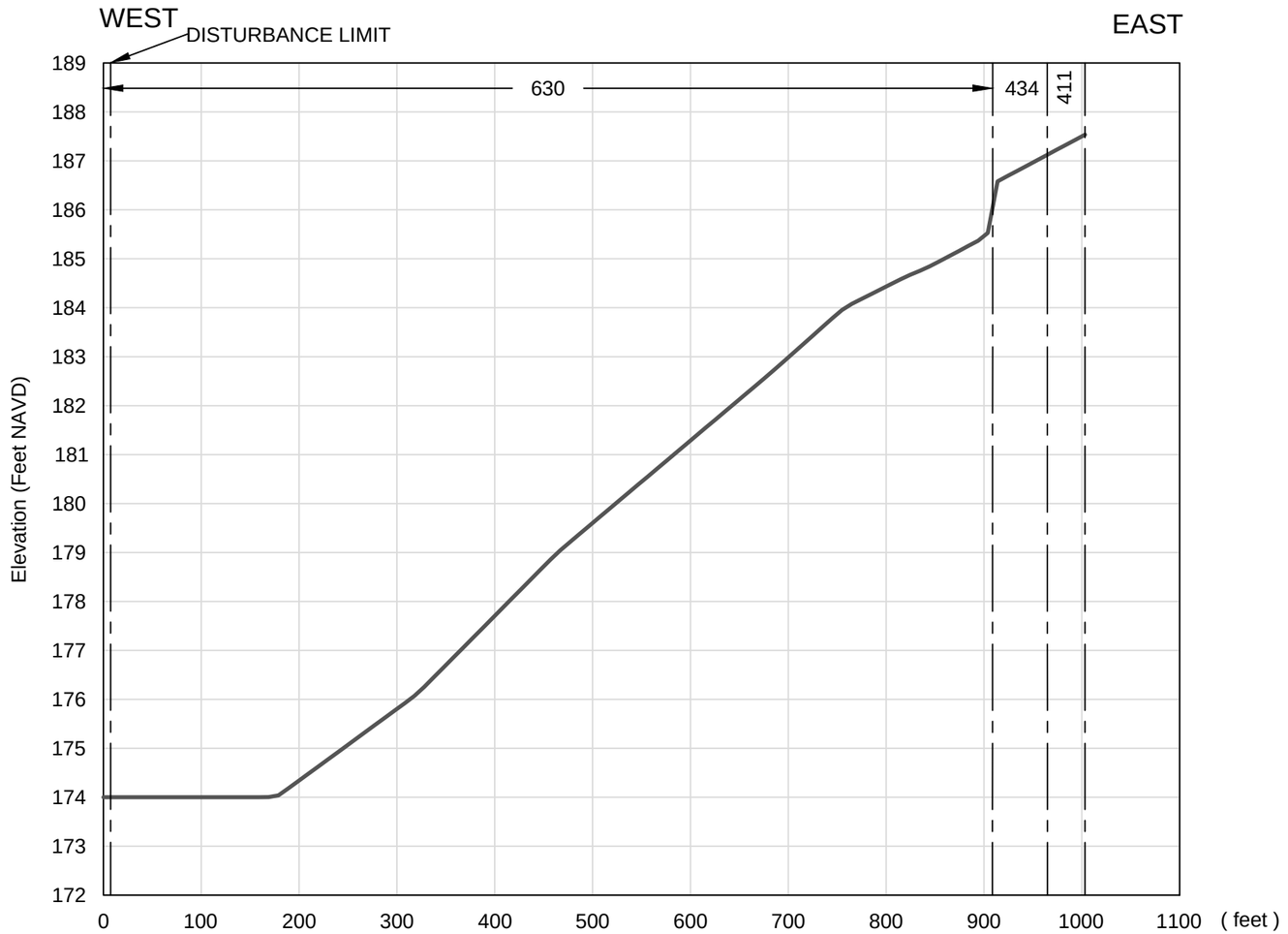
Note:

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 1L

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'

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WETLAND MITIGATION
CROSS-SECTION 1L

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

FIGURE
16F

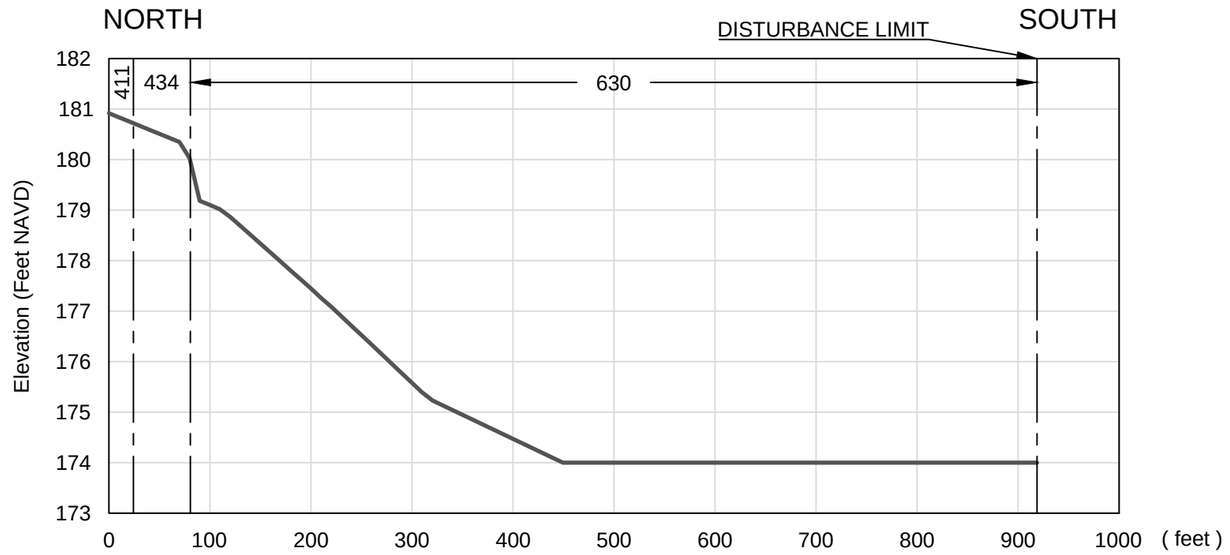
Note:

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



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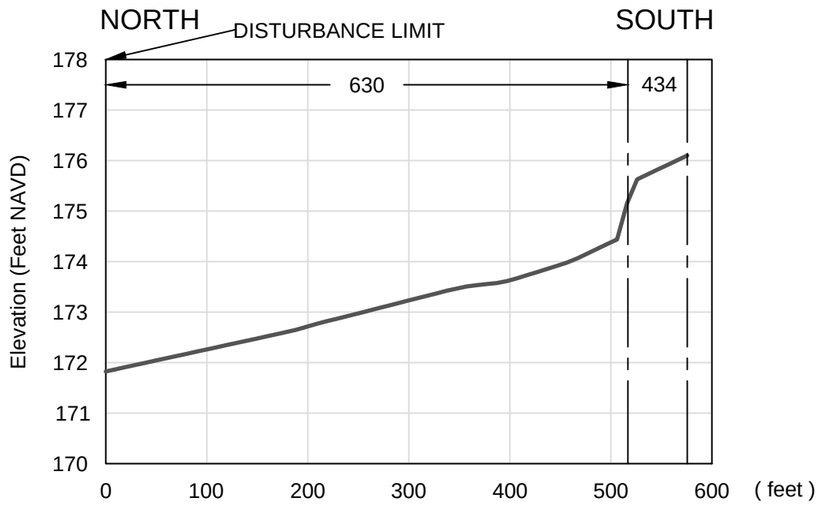

Cross-Section 1N

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

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

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WETLAND MITIGATION
CROSS-SECTION 1M &1N

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

FIGURE
16G

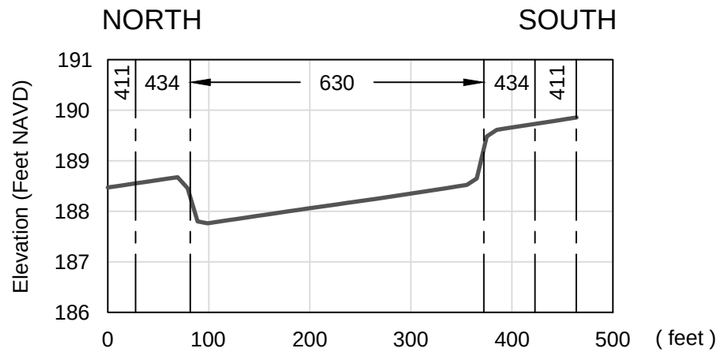
Note:

611, 630 : SHWE ≤ 1' Above Ground Surface

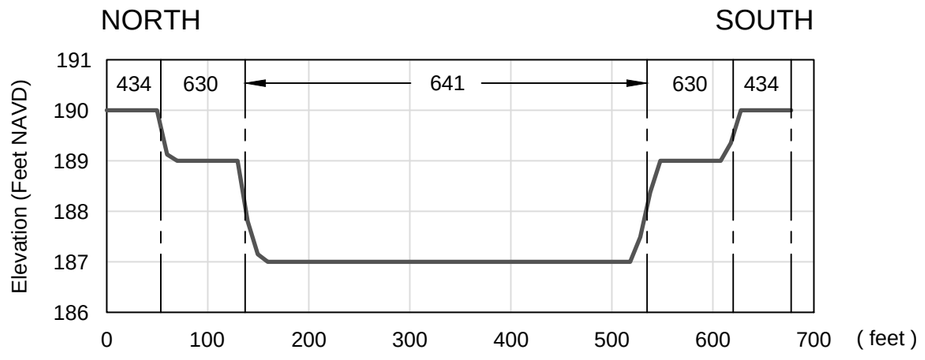
621, 613 : SHWE ≤ 18" Above Ground Surface

641 : SHWE ≤ 2' Above Ground Surface

SLWE @ Or Below Ground Surface



Cross-Section 1O



Cross-Section 1P

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'

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WETLAND MITIGATION
CROSS-SECTION 1O & 1P

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

FIGURE
16H

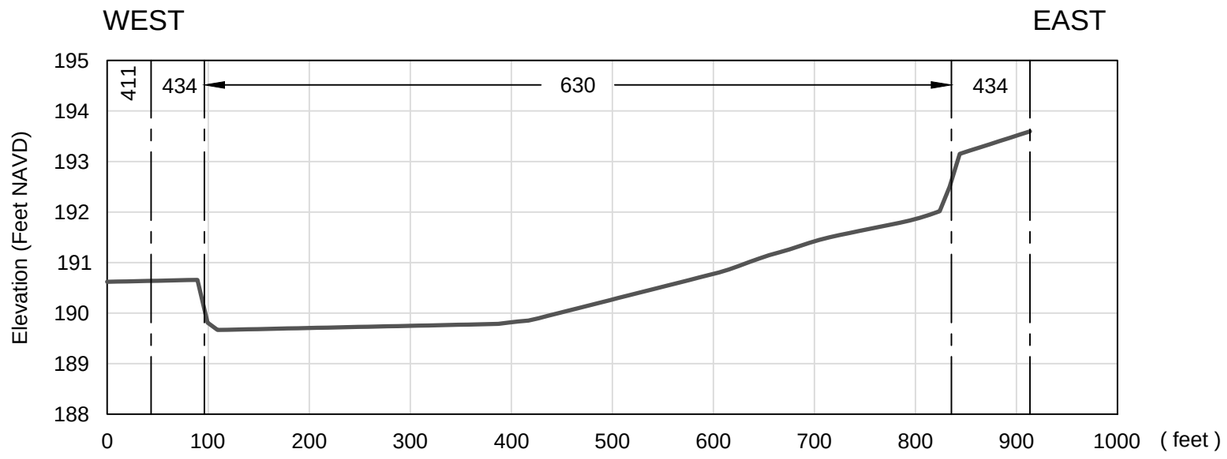
Note:

611, 630 : SHWE ≤ 1' Above Ground Surface

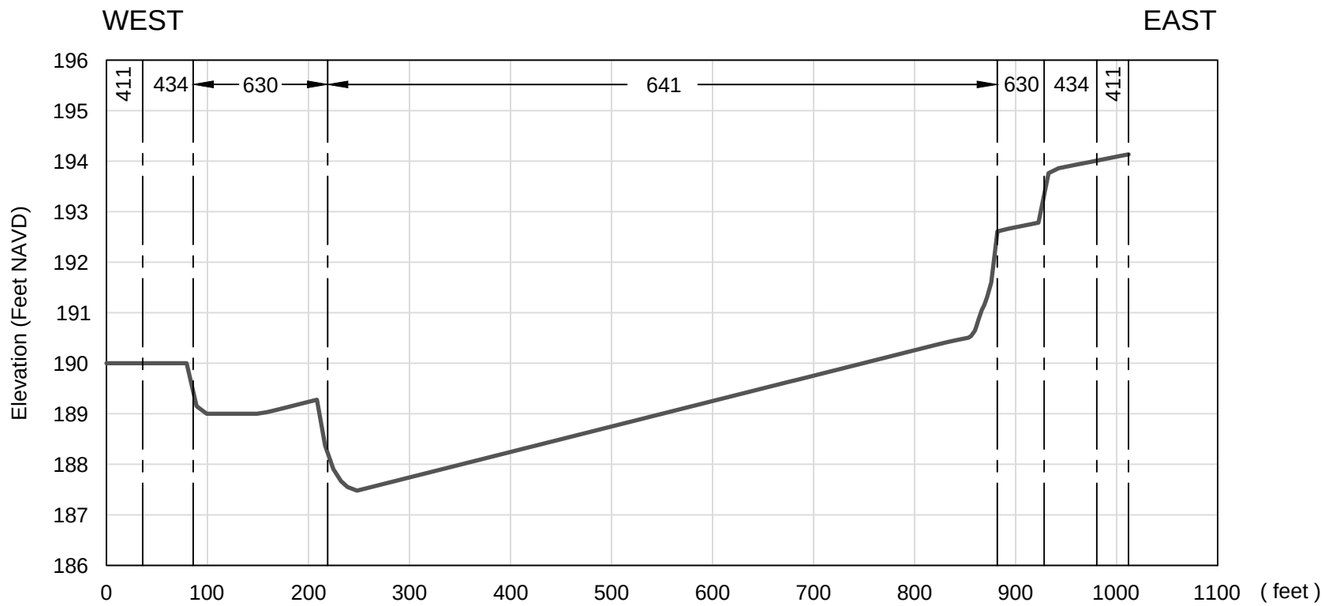
621, 613 : SHWE ≤ 18" Above Ground Surface

641 : SHWE ≤ 2' Above Ground Surface

SLWE @ Or Below Ground Surface



Cross-Section 1Q



Cross-Section 1R

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'

KLEINFELDER
Bright People. Right Solutions.

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WETLAND MITIGATION
CROSS-SECTION 1Q & 1R

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

FIGURE
16I

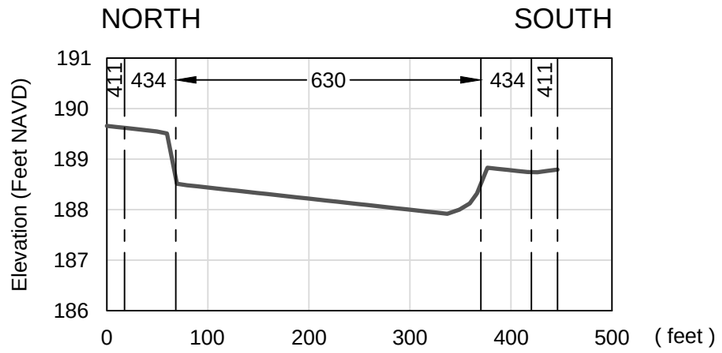
Note:

611, 630 : SHWE ≤ 1' Above Ground Surface

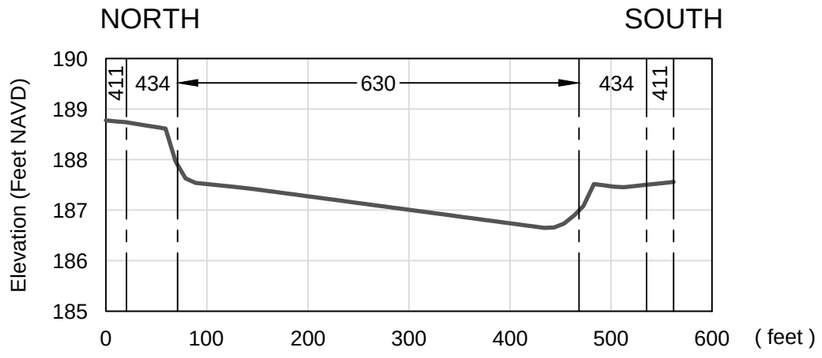
621, 613 : SHWE ≤ 18" Above Ground Surface

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'

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PROJECT NO. 00129491.003A
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DATE: 11-12-2019
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WETLAND MITIGATION
CROSS-SECTION 1S & 1T

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

FIGURE
16J

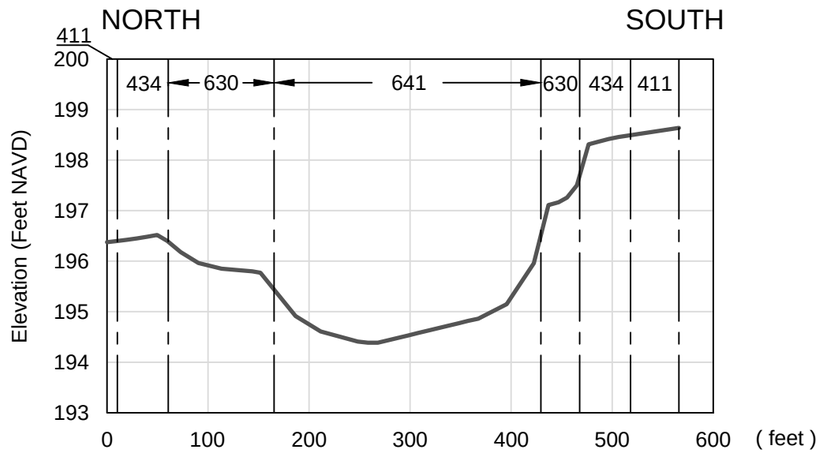
Note:

611, 630 : SHWE ≤ 1' Above Ground Surface

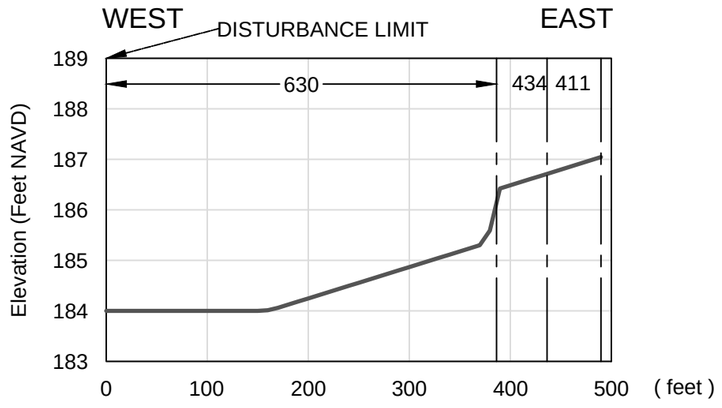
621, 613 : SHWE ≤ 18" Above Ground Surface

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

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

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WETLAND MITIGATION
CROSS-SECTION 2 & 3

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

FIGURE
16K

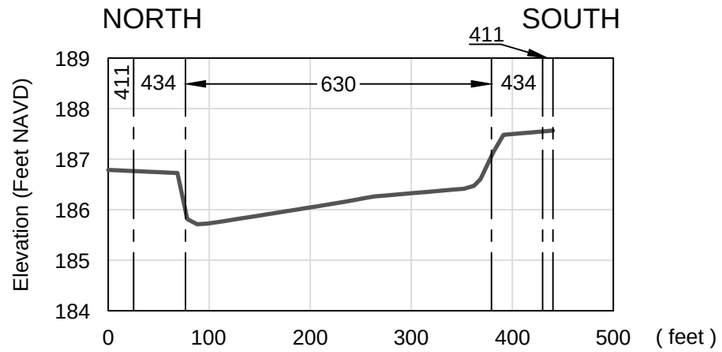
Note:

611, 630 : SHWE ≤ 1' Above Ground Surface

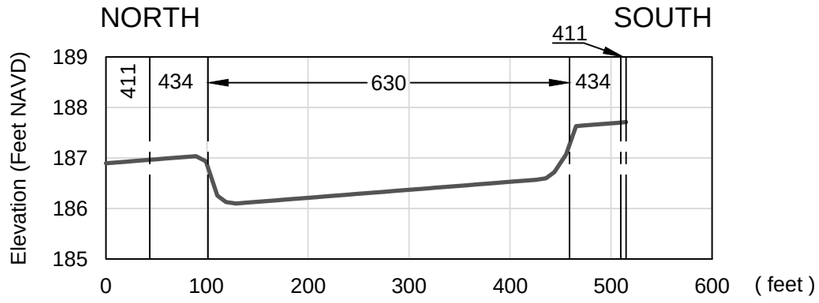
621, 613 : SHWE ≤ 18" Above Ground Surface

641 : SHWE ≤ 2' Above Ground Surface

SLWE @ Or Below Ground Surface



Cross-Section 4



Cross-Section 5

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'

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WETLAND MITIGATION
CROSS-SECTION 4 & 5

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

FIGURE
16L

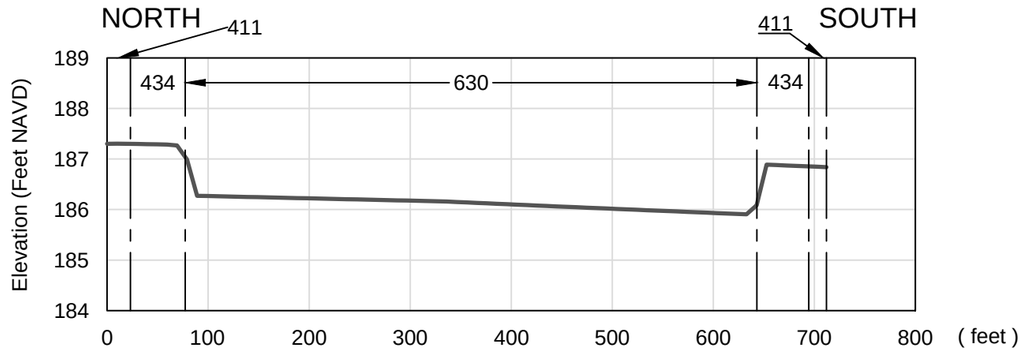
Note:

611, 630 : SHWE ≤ 1' Above Ground Surface

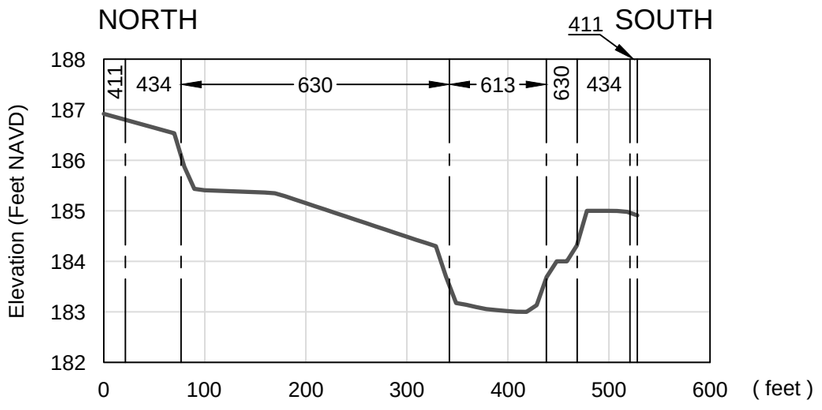
621, 613 : SHWE ≤ 18" Above Ground Surface

641 : SHWE ≤ 2' Above Ground Surface

SLWE @ Or Below Ground Surface



Cross-Section 6



Cross-Section 7

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'

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WETLAND MITIGATION
CROSS-SECTION 6 & 7

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

FIGURE
16M

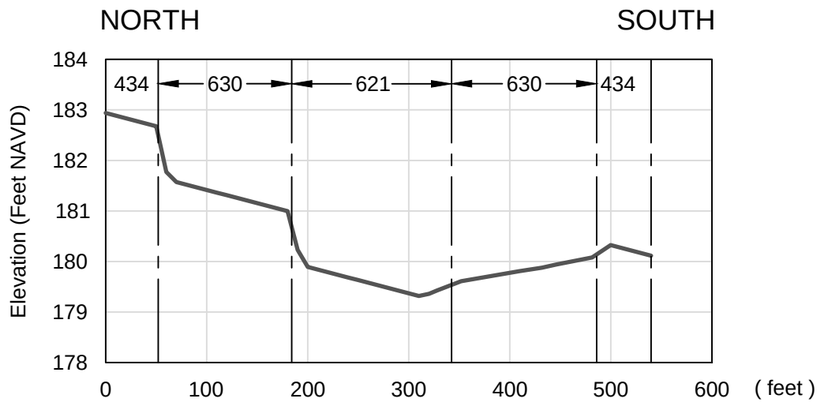
Note:

611, 630 : SHWE ≤ 1' Above Ground Surface

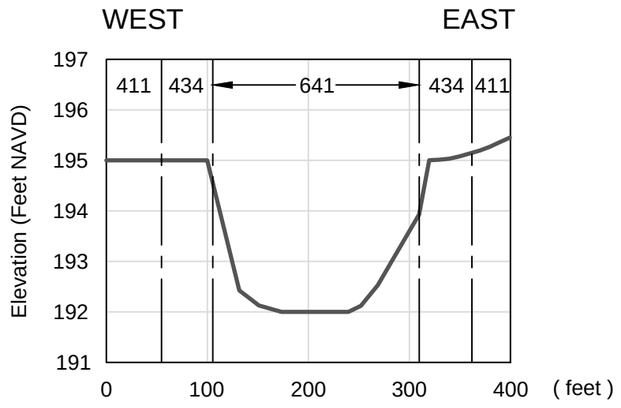
621, 613 : SHWE ≤ 18" Above Ground Surface

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'

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DATE: 11-12-2019
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WETLAND MITIGATION
CROSS-SECTION 8 & 9

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

FIGURE
16N

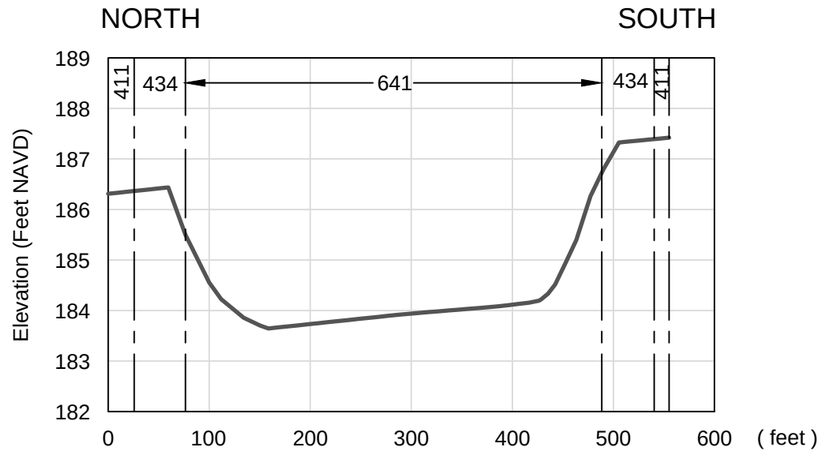
Note:

611, 630 : SHWE ≤ 1' Above Ground Surface

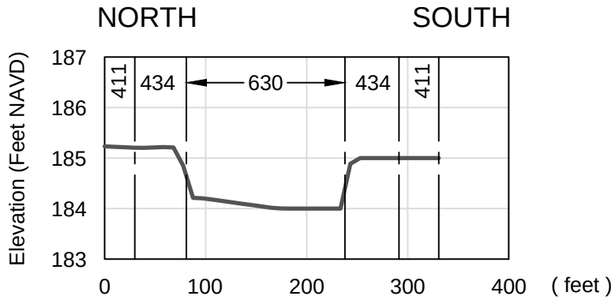
621, 613 : SHWE ≤ 18" Above Ground Surface

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'

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DATE:	11-12-2019
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WETLAND MITIGATION
CROSS-SECTION 10 & 11

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

FIGURE
16O

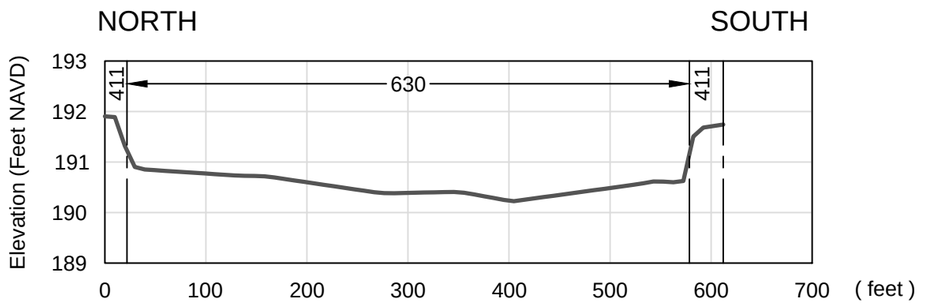
Note:

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'

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DATE:	11-12-2019
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WETLAND MITIGATION
CROSS-SECTION 12

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

FIGURE
16P

26,-5,22
25,-5,22
35,-5,22
36,-5,22
31,-5,23
32,-5,23
2,-6,22
1,-6,22
6,-6,23
5,-6,23
Bradford
Clay
W158
W151
W151
W154
W153
W150
11,-6,22
12,-6,22
7,-6,23
8,-6,23
W163
W83
18,-6,23
17,-6,23
24,-6,22
19,-6,23
20,-6,23

Legend

- Florida Mine-Trail Ridge Boundary (± 1,937.0 ac.)
- County Boundary
- Section, Township, Range

Offsite Permittee Responsible Mitigation (± 65.54 Ac.)

- 620-Wetland Coniferous Forest (± 19.39 Ac.)
- 630-Wetland Forested Mixed (± 10.25 Ac.)
- 631-Wetland Scrub (± 19.57 Ac.)
- 641-Freshwater Marsh (± 16.33 Ac..)
- Unpaved Trails

ORIGINAL MAP SIZE: 22" x 34"

0 350 700 Feet

1 inch = 700 feet

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

NO.	REVISION	BY	DATE
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PROJECT NO.	129491.003
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DRAWN BY:	LS
CHECKED BY:	NA
FILE NAME:	See File Path

Offsite Permittee Responsible Mitigation

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

Figure 17

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Table 1 Wetland and Surface Waters

December 2019
Trail Ridge South Mine

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					MA1 / Enhancement
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					MA 1 / Enhancement
W9	641	2.88	0.00		2.88					MA 1 / Enhancement
W10	641	1.87	0.00		1.87					MA 2 / Enhancement
W11	630	0.40	0.00		0.40					MA 2 / Enhancement
W12	631	4.44	0.00		4.44					MA 1 / Enhancement
W13	631	0.02	0.00		0.02					MA 2 / Enhancement
W14	641	0.36	0.00		0.36					MA 1 / Enhancement
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					MA 4, 5, 6 / Enhancement
W18	630	0.29	0.00		0.29					MA 4, 5, 6 / Enhancement
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					MA 1 / Enhancement
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					MA 1 / Enhancement
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					MA 8 / Enhancement
W30	621	0.51	0.00		0.51					MA 8 / Enhancement
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					MA 1 / Enhancement
W37	441W	0.52	0.00		0.52					MA 1 / Enhancement
W37	641	1.82	0.00		1.82					MA 10 / Enhancement
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					MA 1 / Enhancement
W43	641	1.16	0.00		1.16					MA 1 / Enhancement
W45	630	0.69	0.00		0.69					MA 1 / Enhancement
W46	630	0.06	0.06							Undisturbed
W47	630	0.33	0.33							Undisturbed

Table 1 Wetland and Surface Waters

December 2019
Trail Ridge South Mine

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	
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**		

Wetland Type: from an established wetland classification system
Impact Type: D=dredge; F=Fill; H=change hydrology; S=shading; C=clearing; O=other

Table 2
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
	Total	**2,884.40**

Table 3 Wetland Impact Summary

WETLAND ID	LAND USE	TOTAL (ac)	TOTAL IMPACTS (Ac)	ACOE JURISDICTION
W1	441W	48.19	28.65	YES
W1	630	84.21	7.89	YES
W2	641	0.10	0.10	YES
W3	441W	12.85	12.85	YES
W3	630	1.25	1.25	YES
W3	641	8.89	8.89	YES
W4	641	0.04	0.04	YES
W5	630	119.27	108.77	YES
W6	441W	13.29	4.25	YES
W6	630	28.08	2.50	YES
W7	441W	4.99	4.99	YES
W7	630	4.90	4.90	YES
W8	441W	0.41	0.41	YES
W8	630	11.02	11.02	YES
W9	441W	0.89	0.89	YES
W9	641	2.88	2.88	YES
W10	641	1.87	1.87	YES
W11	630	0.40	0.40	YES
W12	631	4.44	4.44	YES
W13	631	0.02	0.02	YES
W14	641	0.36	0.36	YES
W16	631	12.57	11.38	YES
W16	641	5.61	5.61	YES
W17	441W	4.08	4.08	YES
W18	441W	10.23	6.57	YES
W18	630	0.29	0.29	YES
W19	441W	63.03	58.49	YES
W19	630	92.11	48.51	YES
W19	641	26.42	26.42	YES
W20	611	1.29	1.29	YES
W21	630	98.32	60.51	YES
W21	641	25.57	10.80	YES
W22	441W	6.70	0.10	YES
W22	630	8.48	0.11	YES
W23	441W	0.67	0.67	YES
W24	441W	89.37	35.95	YES
W24	613	0.21	0.21	YES
W24	630	241.56	68.74	YES
W25	441W	0.23	0.23	YES
W26	441W	10.89	6.15	YES
W27	441W	9.82	9.82	YES
W28	630	11.82	11.82	YES
W30	441W	0.87	0.87	YES
W30	621	0.51	0.51	YES
W32	630	2.77	2.77	YES
W33	441W	15.28	9.95	YES
W33	641	5.13	4.02	YES
W34	441W	33.48	33.48	YES
W34	630	46.42	46.42	YES
W34	641	23.52	23.52	YES
W36	441W	4.33	1.29	YES
W37	441W	0.52	0.52	YES
W37	641	1.82	1.82	YES
W38	441W	34.13	5.60	YES
W39	641	0.43	0.43	YES
W41	441W	1.72	1.72	YES
W42	641	0.70	0.70	YES
W43	641	1.16	1.16	YES
W45	630	0.69	0.69	YES
SW2	524	0.67	0.67	YES
D1	510d	0.77	0.69	YES
D3	510d	0.14	0.11	YES
D4	510d	0.12	0.12	YES
D8	510d	0.41	0.12	YES
D9	510d	0.13	0.13	YES
D10	510d	0.07	0.07	YES
D11	510d	0.09	0.08	YES
D13	510d	0.05	0.05	YES
D14	510d	0.0002	0.0002	YES
D15	510d	0.36	0.36	YES
D16	510d	0.01	0.01	YES
D17	510d	0.10	0.10	YES
D18	510d	0.15	0.15	YES
D19	510d	0.32	0.32	YES
D20	510d	0.68	0.54	YES
D21	510d	0.04	0.01	YES
D22	510d	0.13	0.13	YES
D23	510d	0.01	0.01	YES
D24	510d	0.72	0.72	YES
	TOTAL	**1246.07**	**714.98**	

Table 4
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%
	TOTAL	**2,884.40**	**100.00%**

Table 5
Mitigation Summary

December 2019
Trail Ridge South Mine

MITIGATION AREA ID	LAND USE	MITIGATION TYPE	RESTORATION (Ac)	ENHANCEMENT (Ac)
1A	630	Permitee Responsible Onsite	36.21	
1B	630	Permitee Responsible Onsite	46.78	
1B	641	Permitee Responsible Onsite	13.18	
1C	630	Permitee Responsible Onsite	65.40	
1D	630	Permitee Responsible Onsite	48.25	
1D	641	Permitee Responsible Onsite	3.25	
1D	611	Permitee Responsible Onsite	1.29	
1E	630	Permitee Responsible Onsite	55.18	
1E	641	Permitee Responsible Onsite	6.38	
1F	630	Permitee Responsible Onsite	32.23	
1F	641	Permitee Responsible Onsite	0.94	
1G	630	Permitee Responsible Onsite	29.57	
1G	641	Permitee Responsible Onsite	2.89	
1H	630	Permitee Responsible Onsite	7.67	
1I	630	Permitee Responsible Onsite	21.94	
1J	630	Permitee Responsible Onsite	12.64	
1K	630	Permitee Responsible Onsite	34.16	
1K	641	Permitee Responsible Onsite	28.27	
1L	630	Permitee Responsible Onsite	57.52	
1M	630	Permitee Responsible Onsite	34.86	
1N	630	Permitee Responsible Onsite	8.55	
1O	630	Permitee Responsible Onsite	5.49	
1O	641	Permitee Responsible Onsite	0.29	
1P	630	Permitee Responsible Onsite	13.99	
1P	641	Permitee Responsible Onsite	9.45	
1Q	630	Permitee Responsible Onsite	65.80	
1Q	641	Permitee Responsible Onsite	1.44	
1R	630	Permitee Responsible Onsite	10.67	
1R	641	Permitee Responsible Onsite	15.89	
1S	630	Permitee Responsible Onsite	1.81	
1T	630	Permitee Responsible Onsite	5.61	
2	630	Permitee Responsible Onsite	1.63	
2	641	Permitee Responsible Onsite	1.55	
3	630	Permitee Responsible Onsite	5.67	
4	630	Permitee Responsible Onsite	1.65	
5	630	Permitee Responsible Onsite	3.20	
6	630	Permitee Responsible Onsite	7.43	
7	630	Permitee Responsible Onsite	1.54	
7	613	Permitee Responsible Onsite	0.21	
8	630	Permitee Responsible Onsite	3.21	
8	621	Permitee Responsible Onsite	0.51	
9	641	Permitee Responsible Onsite	0.97	
10	641	Permitee Responsible Onsite	4.12	
11	630	Permitee Responsible Onsite	0.33	
12	630	Permitee Responsible Onsite	0.97	
W151, W163	620	Permitee Responsible Offsite	19.39	
W83, W150, W153, W158	630	Permitee Responsible Offsite	10.25	
W151, W153, W154	631	Permitee Responsible Offsite	19.57	
W150, W151, W153, W154	641	Permitee Responsible Offsite	16.33	
ENHANCEMENT	630	Enhancement Onsite		136.49
		TOTAL	776.13	136.49