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March 4, 2020

NOTICE OF INTENT TO SUE

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RE: 60-DAY NOTICE OF INTENT TO SUE
VIOLATIONS OF FEDERAL LAWS: NATIONAL ENVIRONMENTAL POLICY ACT; THE ENDANGERED SPECIES ACT; THE CLEAN WATER ACT; AND THE SAFE DRINKING WATER ACT

Notice of Intent to Sue Directed to the United States Army Corps of Engineers ("USACE"), United States Environmental Protection Agency ("USEPA"), United States Department of the Interior ("USDOI"), and United States Fish and Wildlife Service ("USFWS"):

This is to advise that our law firm, Robert N. Hartsell, P.A., represents Mark Lyons, and Citizens Against Phosphate Mining, Inc. ("CAPM") in a legal capacity with respect to work conducted for mining in the Greater Okefenokee Swamp Basin without federal agency compliance with the National Environmental Policy Act ("NEPA"); the Endangered Species Act ("ESA"); and the Safe Drinking Water Act ("SDWA"). You are formally on notice of our client's intent to sue if the federal law violations discussed herein are not remedied, through the receipt of this Notice of Intent to Sue ("NOI").

Mr. Lyons and CAPM have substantial interest that are adversely affected, and will continue to be adversely affected, by the mining operations, present and proposed, and unassessed cumulative environmental impacts that are degrading the use and enjoyment of the Greater Okefenokee Swamp Basin, a life for source wetlands and habitats of many listed species as will be discussed herein.

Accordingly, Mr. Lyons and CAPM respectfully request that the deficiencies described herein are corrected and in the interim the following relief be granted:

(1) Rescission of the NWP 44 Mining Permits issued east of the Okefenokee Swamp, including the Southern Ionic Minerals, LLC/Chemours Company (SAS-2012-01042) and the Indian Boundary Mine (SAS-2017-00669);

(2) Immediate initiation by the USACOE, USEPA, and USFWS of an Area Wide Environmental Impact Statement ("AEIS") to include the following: Southern Ionic Minerals, LLC/Chemours Company's southern expansion of the Mission Mine (SAS-2012-01042); Indian Boundary Mine (SAS-2017-00669); all current and proposed heavy mineral sands/titanium mining activities by Chemours/Dupont/Twin Pines south of the Okefenokee Swamp within the Greater Okefenokee Swamp Basin, without valid individual USACOE permits; all proposed phosphate mining activities by HPS II south of the Okefenokee Swamp within the Greater Okefenokee Swamp Basin; and any resubmitted application from Twin Pines Minerals, LLC, former SAS-2018-00554;

(3) Immediate issuance of a recommendation by USACOE, USEPA, and USFWS to Florida Department of Environmental Protection ("FDEP") to rescind all permits, including but not limited to General Permits, National Pollutant Discharge Elimination System ("NPDES") Permits, and Environmental Resource Permits ("ERP") for all Trailridge Mining Activities south of the Okefenokee Swamp by Chemours Company (aka Dupont)/Twin Pines Minerals, LLC, including but not limited to FDEP Permit File No. FL000051-012-IW3S;

(4) Immediate issuance of a recommendation by the USACOE, ESEPA, and USFWS to the FDEP to rescind all permits, including but not limited to all General Permits, NPDES Permits, and ERPs, for any activities related to the proposed phosphate mining by HPS II in Bradford County, Florida and Union County, Florida;

(5) Immediate issuance of a recommendation by the USACOE, ESEPA, and USFWS to the Georgia Department of Natural Resources ("GDNR") to rescind all permits, including but not limited to all General Permits and NPDES Permits, for any activities related to the proposed Trailridge Mining Activities, including, but not limited to activities by Twin Pines, Chemours/Dupont, and Southern Ionics;

(6) Immediate issuance of an order for restoration of mining related activities by Twin Pines Minerals, LLC east of the Okefenokee Swamp to be restored to its previous state, and exploratory wells to be plugged;

(7) Immediate issuance of an order for restoration of mining related activities by Twin Pines Minerals, LLC south of the Okefenokee Swamp to be restored to its previous state, and exploratory wells to be plugged;

(8) Immediate issuance of an order stopping all exploratory wells and ordering restoration of mining related activities by HPS Enterprises II, LLC south of the Okefenokee Swamp to be restored to its previous state, and exploratory wells to be plugged; and

(9) NWP 44 Mining Category to be declared null and void for the entire area of the Southeast Coastal Plain Ecoregion as such unique areas cannot be similar to mining activities not in environmentally sensitive areas and thus would require individual environmental assessments for permit issuance.

A copy of this Notice of Intent to Sue, and all attachments, is being provided to the USFWS as public comments for the proposed designation of critical habitat for the Suwannee Moccasinshell (*Medionidus walkeri*); the Federal Candidate Species Gopher tortoise (*Gopherus polyphemus*), eastern population; the Federal Candidate Species Gopher frog (*Rana areolata aescpus*), and the Federally Threatened Atlantic Sturgeon, Gulf subspecies (*Acipenser oxyrinchus desotoi*):

Attn: FWS–R4–ES–2019–0059
US Fish & Wildlife Service Headquarters
MS: BPHC, 5275 Leesburg Pike
Falls Church, VA 22041-3803
Federal eRulemaking Portal: regulations.gov

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Additionally, this Notice of Intent to Sue, and all attachments, is being provided to the following Federal and State Agencies, as well as State governments, for the purposes of awareness, education, and notification of potential litigation to ensure the protection of environmentally sensitive areas and listed species in the Greater Okefenokee Swamp Basin in Georgia and Florida:

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Please be advised that documents referenced herein are available electronically via the following link: https://hartsell-law.sharefile.com/d-se9357dc920e43e2b, and a hard copy of this NOI will be mailed to the USACOE, USEPA, and USFWS at the addresses provide above, with a thumb drive including electronic copies of all the referenced attachments. Additionally, included as attachments are NOIs regarding Proposed Expansions of Phosphate Mining in Central Florida, dated May 29, 2014 (**Attachment Is**), and July 6, 2018 (**Attachment If**)(addressing the exploratory wells by HPS Enterprises II, LLC), submitted to the USACOE, USEPA, USDOI, USFWS, USDA, by Reiner & Reiner, P.A., respectively, that are relevant to the issues discussed herein and are hereby respectfully incorporated into this NOI by reference and the attachments thereof, which are currently in the public record, are hereby incorporated into this NOI and should be maintained by the federal agencies within the administrative record for this NOI in addition to the attachments included herein.

The Notice of Intent to Sue is further delineated in the following sections:

I. INDIVIDUAL AND GROUP ADVERSELY AFFECTED BY MINING IN THE GREATER OKEFENOKEE SWAMP BASIN IN GEORGIA AND FLORIDA

II. COMMENT LETTER REGARDING TWIN PINES MINERALS, LLC (SAS-2018-00554) AND SOUTHERN IONIC MINERALS, LLC/CHEMOURS COMPANY SAS-2012-01042)

III. OVERVIEW OF FEDERAL LAWS VIOLATED

IV. FEDERAL VIOLATIONS RELATED TO AND PREFACING UNPERMITTED MINING ACTIVITIES IN THE GREATER OKEFENOKEE SWAMP BASIN

V. NATIONWIDE PERMITS ("NWP") 44 AUTHORIZED FOR MINING ACTIVITIES ASSOCIATED WITH THE OKEFENOKEE SWAMP VIOLATE FEDERAL LAWS

VI. HAZARDOUS WASTE FROM MINING, MINERAL PROCESSING, AND FOSSIL FUEL COMBUSTION VIOLATE FEDERAL LAWS

VII. DESTRUCTION OF ESSENTIAL AND CRITICAL HABITAT FOR FEDERALLY THREATENED, ENDANGERED, AND CANDIDATE SPECIES UNDER THE NWP 44 – MINING CATEGORY, UNPERMITTED, AND PROPOSED MINING VIOLATES FEDERAL LAWS

VII.A. PUBLIC COMMENTS

VIII. ROBERT HOLT'S TWIN PINES HYDROLOGY UGA GEOLOGY COLLOQUIUM PRESENTATION ON SEPTEMBER 13, 2019 AND THE FALLACIES WITHIN

IX. CONCLUSION

Respectfully,

Heidi Mehaffey

Heidi Mehaffey, Esq., FBN 118806
Robert N. Hartsell, P.A.

I.
INDIVIDUAL AND GROUP ADVERSELY AFFECTED BY MINING IN THE GREATER OKEFENOKEE SWAMP BASIN IN GEORGIA AND FLORIDA

A. Individual Adversely Affected by Mining in the Greater Okefenokee Swamp Basin

Mark Lyons is a fifth-generation resident of Baker County, Florida. Baker County shares the most extensive county boundary on the St. Marys River with Charlton County, Georgia. Mr. Lyons' great, great, grandmother, whose mother was a full-blooded Native America Cherokee from South Carolina, was born in Charlton County, Georgia, where she met and married Mr. Lyons' great, great, grandfather.

In 1845, Mr. Lyons' great, great grandfather (George Reynolds) was stolen from the Liverpool waterfront as an 8-year old boy and forced to work as a deck hand and cabin boy until arriving in Charleston Harbor, South Carolina at age 14. He escaped there and made his way south to Camden County, Georgia, where he drew a piece of land (lot number 353) in southern Camden County in one of Georgia's Last land lottery. Soon after he married, began a family and later served on the Camden County Board of Commissioners and later as a Representative to the Georgia State Assembly. He rafted goods down the St. Marys River, in addition to shipping other products by rail via Darbyville (old McClenny). He also constructed a bridge across the St. Marys River to move timber to his sawmill and to attend services across the river at the North Prong Mt. Zion Church. Although the present location of that bridge is approximately 50 feet south of the original location and is the third structure in approximately 100 years, it still is referred to as the "Reynold Bridge."

Mr. Lyons and the preceding four generations of his family all shared a deep love for fishing and hunting in and along the St. Marys River and the surrounding Greater Okefenokee Swamp Basin, grew and still grow their own food, and relied and still rely on potable water from shallow wells on their property in Baker County, Florida. All of those activities were and are dependent on a stable water table on the land, the St. Marys River, and in other natural surface waters. Mr. Lyons has used, is presently using, and intends to continue using the St. Marys River, Suwannee River and other areas within the Greater Okefenokee Swamp Basin in Florida and Georgia for recreational boating and canoeing, and has assisted, is presently assisting, and intends to continue assisting with research in and along the St. Marys River, the Suwannee River, and other areas within the Greater Okefenokee Swamp Basin in Florida and Georgia. A map of the Greater Okefenokee Swamp Basin in Florida and Georgia, based on the established Hydrologic Unit Codes, is provided as **Attachment Ia**.

B. Group Adversely Affected by Mining in the Greater Okefenokee Swamp Basin

Citizens Against Phosphate Mining, Inc. ("CAPM") is a Florida not for profit corporation registered as a 501(c)(3) by the United States Internal Revenue Service. A substantial number of members of CAPM live in, use and intend to continue living in and using the regional Greater Okefenokee Swamp Basin for recreation and aesthetic purposes, including fishing, boating, canoeing, kayaking, swimming, research, photography, and observing Florida's aquatic ecosystems.

Individual members of CAPM have been actively expressing concerns, as public education and comments, at the local, state, and federal levels regarding proposed mining activities; illegal and unpermitted mining activities; and violations of permitted mining activities within the regional Greater Okefenokee

Swamp Basin and regional Floridan aquifer system since at least 2010, and intend to continue expressing their concerns as planned mining expansions will continue to adversely affect their interests. Those concerns have included existing and proposed mineral mining of Trailridge by the Chemours Company ("Chemours" aka Dupont)/Twin Pines Minerals, LLC ("Twin Pines"); proposed phosphate mining by HPS Enterprises II, LLC ("HPS II); and other proposed mining within the regional Greater Okefenokee Swamp Basin. The background of the founding of Chemours as a "spin-off" company of Dupont in July 2015 is provided in **Attachment Ib**.

That Trailridge mining by Chemours includes the expansion of Mission Mine that the US Army Corps of Engineers ("USACOE") issued a Nationwide Permit ("NWP") to Jim Renner/Southern Ionics Minerals, LLC to expand last year (see **Attachment Ic**). That mine/expansion, permitted as an NWP, was acquired by Chemours last month to provide a "substantial increase in ore production." **Attachment Id**. Examples of CAPM's concerns related to mining are described in documents provided to federal, state, and local agencies, and municipalities by David Reiner, Esquire, and Ralf Brookes, Esquire and are listed as follows:

8/22/16 Brookes - Comment Letter re: Bradford County's LDRs and Comprehensive Plan and Moratorium on Mining Applications: to Bradford County (see **Attachment Ie**)

7/6/18 Reiner - Notice of Intent to Sue - Revised 60-Day Notice Re: Piecemeal Work conducted without Federal Review or Permits for Proposed Expansion of phosphate Mining in North Florida, Beyond the Central Florida Contemplated in the Final AEIS and Proposed Multi-Million Dollar Funding for a USDA NRCS EWP in Bradford County: to ACOE HQ; ACOE Jacksonville; US EPA; US DOI; US FWS; USCDA NRCS; US DOG; FDEP; FFWCC; Suwannee River WMD; St. John's WMD (see **Attachment If**)

8/8/18 Brookes - Comment Letter re: Proposed Phosphate Mining by HPS II; Proposed FPL industrial power plant: to Union County (see **Attachment Ig**)

8/13/18 Brookes - Comment Letter and Public Records Request re: Logging and Additional Concerns re: Proposed Amendments to LDRs, Proposed Phosphate Mining by HPS II; Proposed FPL industrial power plant hearing: to Union County (see **Attachment Ih**)

8/17/18 Brookes - Comment Letter re: Proposed Dredging and Tree Removal in Alligator Creek-Sampson River, Continued Flood Augmentation from Chemours NPDES Discharges, Proposed Phosphate Mining by HPS II: to Bradford County (see **Attachment Ii**)

10/9/18 Brookes - Public Records Request Proposed Phosphate mining by HPS II: to Bradford County (see **Attachment Ij**)

11/5/18 Brookes - Eludra Request to Participate in HPS II's Section 70.51 Fla. Stat. Claim dated Oct. 29, 2018: to Union County (see **Attachment Ik**)

All of those mining projects in headwater wetlands and streams of the Greater Okefenokee Swamp Basin have resulted in and will continue to result in irreversible harm to surface waters, wetlands, and the water table in the regional Greater Okefenokee Swamp Basin, in addition to the regional Floridan aquifer system, where members of CAPM live and use for recreation with concrete plans to do so in the future. *See* **Attachment IIb** (April 10, 2003 comments submitted to USEPA by 85 scientists with knowledge and expertise in the physical structure, chemistry, and biology of stream ecosystems in more than 40 states); **Attachment IIc** (2019 Colvin et al. Headwater Streams and Wetlands are Critical for Sustaining Fish, Fisheries, and Ecosystem Services).

A map showing the extent of the regional Floridan aquifer system is provided in Figure 1 from the 1986, United States Geological Survey ("USGS") Professional Paper by James Miller, included as **Attachment Il1**, with the three plates from that publication included as **Attachments Il2, Il3, and Il4**. That irreversible harm represents violations of NEPA, CWA, ESA, and SDWA, and unpermitted destruction of environmentally sensitive areas and taking of federally listed species, as described in subsequent sections.

Members of CAPM have been subjected to severe flooding events, resulting in loss and destruction of personal property in the regional Greater Okefenokee Swamp Basin from Chemours' violations of its National Pollutant Discharge Elimination System ("NPDES") conditions. CAPM members fear that the expansion of mining will result in similar damages to these members in the future, above and beyond that of the general public. Violations, including 2012 flooding of CAPM members and other residents and property owners from Chemours' Trailridge mining operations south of the Okefenokee Swamp were addressed in the 9-page Complaint dated June 16, 2016 and filed with Bradford County, Florida. A copy of that Complaint was included in the letter from CAPM's comment letter dated August 17, 2018 to Bradford County by Brookes, Esquire, which is provided with this NOI in **Attachment Ii**.

Additional severe flooding and property damage to CAPM members and other residents and property owners occurred in the fall of 2017, downstream of industrial wastewater discharges from Chemours' Trailridge mining south of the Okefenokee Swamp. On June 29, 2017, the Florida Department of Environmental Protection ("FDEP") issued a renewal NPDES permit for industrial wastewater discharge from one of Chemours' numerous Trailridge mining operations south of the Okefenokee Swamp. Page 5 of that permit states, "This discharge is an existing 40.0 MGD daily permitted maximum at Outfall D-001 to Alligator Creek (WBID 3606), a Class III fresh surface water." The abbreviation "MGD" means "Million Gallons per Day." This renewal permit also stated that industrial wastewater from that single Trailridge mining discharge location exceeded the 40 MGD maximum daily discharge allowed under that permit by amounts ranging from 42.55 MGD to 55.3 MGD, including in 2012. That Chemours' discharge renewal permit also described water quality violations of those discharges. A copy of that FDEP NPDES industrial wastewater discharge is provided with this NOI as **Attachment Im**.

Twin Pines is operating in conjunction with Chemours, mining Trailridge south of the Okefenokee Swamp, without permits and in violation of federal, state, and local laws. On March 23, 2018, FDEP issued a Warning Letter to Chemours regarding four Trailridge mining operations south of the Okefenokee Swamp in Baker, Bradford, Clay, and Duval Counties, Florida. Twin Pines was referenced four times in that Warning Letter. Those Twin Pines citations included: (1) operating without valid permits; (2) having silt fences overwhelmed by sand; process water and tailings fill deposited in a wetland without permit authorization, area not being monitored or inspected; (3) Twin Pines needing to be added to the Industrial Wastewater Permit (that was resulting in flooding of residents and property owners) to include monitoring and inspecting

requirements; and (4) industrial wastewater facilities associated with mining or formerly mined areas out of compliance. A copy of that FDEP Warning Letter is provided with this NOI as **Attachment In**.

Members of CAPM also have had their personal property, wetlands, streams, lakes, and other surface waters dewatered and their trees killed by mining activities within the regional Greater Okefenokee Swamp Basin, south of the Okefenokee Swamp, that members fear will increase in severity and extent if recently permitted and proposed expansion of mining is allowed to proceed. The dewatering of natural lakes associated with Chemours'/Dupont's Trailridge mining has been reported and groundwater pumping has been reported as early as the first well drilled for the Starke, Florida Trailridge mining by Dupont in approximately 1949. Specifically, in an interview for Gordon Jackson's Florida Times Union article dated April 4, 1997, Sue Spencer of Jacksonville, Florida and wife of the first engineer to drill for titanium in the area that became Dupont's Trailridge mine, provided an account of what happened. "Shortly after DuPont began mining at a site across the border at Starke, Fla., two lakes in town mysteriously dried up, she said. 'That was 1948 or '49, and no one knew about environmental impact in those days.'" A copy of that Florida Times Union article by Gordon Jackson is provided with this NOI as **Attachment Io**.

As a result of the repeated flooding downstream of Chemours' industrial mining wastewater discharges of more than 55 MGD from "D1" west of the mine via Alligator Creek to Lake Sampson, the Sampson River and the Santa Fe River, Chemours recently began diverting at least a portion of those industrial mining wastewater discharges to "D2." The discharges from "D2" flow south, via a different Alligator Creek, through Lowry Lake and Lake Magnolia, into Lake Brooklyn, in the vicinity of Keystone Heights, Florida, where natural lakes were dewatered from the Trailridge mining. Those dewatered lakes include Lake Brooklyn, northwest of Highway 21, and the portion of Lake Brooklyn on the southeast side of Highway 21, also known as Brooklyn Bay.

Most recently, a sinkhole opened in a neighborhood near Princeton Street and Auburn Avenue in the Keystone Heights area, south of Lake Brooklyn and Brooklyn Bay after the shallow residential well of that residential property stopped pumping, followed by similar well failure on other properties in that neighborhood (personal communications by CAPM President with residents in that neighborhood where wells no longer could pump shallow ground water). The Google Earth satellite image of that area, included with this NOI as **Attachment Ip**, shows the proximity of Lake Brooklyn and Brooklyn Bay to the approximate location of that sinkhole at the inverted, red teardrop. The stark, white border along the perimeter of Lake Brooklyn and Brooklyn Bay in that satellite image, and around other lakes in that vicinity, represents areas historically submerged in by those natural lakes. That satellite image of Lake Brooklyn also shows apparent clusters of sinkholes that form the submerged portion of that lake.

Four photographs of that Keystone Heights sinkhole in the vicinity of Princeton Street and Auburn Avenue, south of the dewatered lakes are included as **Attachment Iq**. The left side of the first of those photographs shows a linear pile of clay fill a couple of feet high that has been dumped along the edge of the unpaved road adjacent to the sinkhole in that rural, sparsely populated neighborhood. The center of that sinkhole shows an electric power pole sinking into that sinkhole. The second photograph was taken from the opposite side of that unpaved road, facing the pile of clay fill and property where the sinkhole opened after the residential well on that property quit pumping and that family was forced to make an emergency evacuation of their family and personal belongings for their safety. The view in the third photograph is a similar to the view in the second photograph but taken closer to the sinkhole and showing the power pole in approximately the center of the sinkhole. The final photograph is an aerial photograph. The left side of that

photograph includes two people standing in the center of the rural, unpaved road. The sinkhole appears approximately in the center of the photograph, showing approximately five concentric levels of subsidence in that sinkhole, which may extend into the adjacent property, with the home near the upper right corner of that photograph. The source of those photographs was the August 21, 2019 News4Jax Channel 4 Jacksonville FL, article/video by Erik Avanier – Reporter (https://www.news4jax.com/news/florida/clay-county/sinkhole-measuring-60-feet-long-opens-up-in-keystone-heights).

The irreversible harm from these individual and collective mining activities in headwater wetlands and streams of the Greater Okefenokee Swamp Basin would not be restricted to the boundaries of the regional Greater Okefenokee Swamp Basin. For example, because of the nature and characteristics of the regional, karst Floridan aquifer system, those irreversible adverse impacts related to groundwater/surfacewater interactions would extend beyond the boundaries of the regional Greater Okefenokee Swamp Basin through fractures and other karst features, extending offshore to barrier islands like Cumberland Island. Cumberland Island is a National Seashore and Wilderness Area, in the basin east of Folkston, Georgia and the Greater Okefenokee Swamp Basin, within Camden County, Georgia. Members of CAPM have visited Cumberland Island for recreation since childhood and would suffer from the adverse groundwater impacts to Cumberland Island and its natural habitat and wildlife.

The Okefenokee is of great importance and could be drastically altered and degraded if the federal protections set in place are not complied with. The Okefenokee National Wildlife's Annual Narrative Report from 1998 cautioned that were Dupont allowed to mine in the Refuge area:

> **Potentially significant, long-term alterations to the hydrology and water quality of the Okefenokee Swamp and St. Mary's River are likely**. Impacts could include the destruction of **thousands of acres of wetlands, alterations to surface water inflow, and permanent changes** to the hydrological relationships among the swamp, the underlying aquifer, and the surficial ground water in the adjacent mined area. The mining process also **may mobilize contaminants, thus, degrading surface and ground water quality**. The mining process also may **mobilize contaminants, thus, degrading surface and ground water quality.** Air quality in the Class I Wilderness Area may be degraded by dust, smoke, soot, and exhaust emissions generated at the mine. **Endangered species and their habitats that may be directly affected** include red-cockaded woodpeckers, indigo snakes, and wood storks. In addition to environmental effects, the **mine operation could significantly degrade the unique wilderness experience** available to the annual 400,000 refuge visitors through a variety of visual impacts and noise pollution.

Attachment IVa at 5(c) (emphasis added).

CAPM reasonably fears that hazardous mining waste increases adverse health effects, alters and degrades the chemical, physical, and biological integrity of the Nation's waters, and jeopardizes the survival and recovery of Federally endangered, threatened, and candidate species within and beyond the Greater Okefenokee Swamp Basin, the regional Florida Aquifer System, and Southeastern Coastal Plain Ecoregion, by the mining activities described in this NOI. CAPM members have used, presently use, and intend to continue using the natural resources within their own properties and around the Greater Okefenokee Swamp Basin, the regional Florida Aquifer System, and Southeastern Coastal Plain Ecoregion, that will be adversely affected by the mining activities described in this NOI.

II.
COMMENT LETTER REGARDING TWIN PINES MINERALS, LLC (SAS-2018-00554) AND SOUTHERN IONIC MINERALS, LLC/CHEMOURS COMPANY SAS-2012-01042)

On September 12, 2019, this law firm provided comments to the US Army Corps of Engineers ("USACOE") on behalf of affected individuals and CAPM regarding the Trailridge Mining east of the Okefenokee Swamp proposed by Twin Pines Minerals, LLC ("Twin Pines," **SAS-2018-00554**) and Southern Ionic Minerals, LLC/Chemours Company ("Chemours," **SAS-2012-01042**); and existing and proposed mining south of the Okefenokee Swamp by Chemours (aka Dupont)/Twin Pines and HPS II, all in the Greater Okefenokee Swamp Basin.

Those comments demanded denial of the proposed mining or, in the alternative, demanded that a comprehensive Areawide Environmental Impact Statement ("AEIS") be completed to address all of the direct, indirect/secondary, and cumulative impacts of mining conducted and proposed within the Greater Okefenokee Swamp Basin. That comment letter included **Attachments Ia-Ir; IIa-IIg3; IIIa-IIIj; and IVa-e**. A copy of that comment letter is included as **Attachment IVf**, with all of the attachments accompanying that comment letter, and is relevant to the issues discussed herein and are hereby respectfully incorporated into this NOI by reference.

As of February 10, 2020, Twin Pines has withdrawn SAS-2018-00554, which sought to mine titanium near the Okefenokee Swamp in South Georgia, however as further discussed herein, Twin Pines continues to operate mining activities without any valid permits. The concerns raised in the comment letter still remain valid as it relates to the unassessed cumulative impacts of other proposed, permitted, and unpermitted operational mining facilities in the Greater Okefenokee Swamp Basin, the regional Florida Aquifer System, and Southeastern Coastal Plain Ecoregion. Accordingly, any resubmission by Twin Pines for mining operations must require an Area Wide Environmental Impact Statement to comply with NEPA, and ensure that federal agencies involved are not permitting violations of the CWA, ESA, and SDWA.

FAILURE TO CORRECT FEDERAL VIOLATIONS

More than one-hundred and sixty (160) days have passed since the Twin Pines comment were submitted, describing the failure to assess cumulative impacts related to mining in the Greater Okefenokee Swamp Basin, in violation of federal laws. No AEIS has been initiated to consider the mining activities of Trailridge initiated by Chemours (aka Dupont)/Twin Pines east and south of the Okefenokee Swamp, and the phosphate mining activities south of the Okefenokee Swamp initiated by HPS II. As such, the parties represented herein, who have been adversely affected by the mining in the Okefenokee Swamp Basin in Georgia and Florida, present their notice of intent to sue if the presented federal violations addressed in the comment letter and presented herein are not corrected within sixty (60) days.

III.
OVERVIEW OF FEDERAL LAWS VIOLATED

A. National Environmental Policy Act

The USACOE must consider any permit issued by a federal agency under federal law within the purview of NEPA, the Nation's charter for protection of the environment. 40 C.F.R. § 1500.1(a).

Its central goals are "[t]o declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; [and] to enrich the understanding of the ecological systems and natural resources important to the Nation . . . ." 42 U.S.C. § 4321.

Furthermore, in order for the national policy to be carried out it is USACOE's responsibility to "use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may:

> (1) fulfill the responsibilities of each generation as **trustee of the environment for succeeding generations**;
> (2) assure for all Americans **safe, healthful, productive, and esthetically and culturally pleasing surroundings**;
> (3) attain the **widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences**;
> (4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice;
> (5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and
> (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources."

42 U.S.C. § 4331 (b) (emphasis added).

Mining within the Okefenokee Swamp Basin and Okefenokee National Wildlife Refuge calls into question subsections (1)-(3) as outlined above. Specifically, mining operations in the sensitive environmental area will do little to nothing to fulfil the responsibility of this generation as the trustee of the environment for succeeding generations, and more likely will cause irreparable harm and a degradation of the ecosystem that, as the USFWS has pointed out, may never recover from, thereby precluding future generations from experiencing this Refuge. "**The effects of the action may be permanent to the entire 438,000-acre swamp and nearby ecosystems, including nearby Trail Ridge"** (see **Attachment IIIi**).

Additionally, history has demonstrated the detrimental effects mining has not only on the surrounding ecosystem, but on the hydrology, above and below the surface, resulting in hazardous flooding, contamination of aquifers, sinkholes, and the disappearance of bodies of water altogether that would violate sections (2) and (3) in which the USACOE is mandated to uphold.

As mining operations undoubtable alter and impact the surrounding environment, including wildlife and habitats that rely on the stability of the environment, the extent of the impacts must be analyzed before any action can take place through an Environmental Assessment ("EA") or an Environmental Impact Statement / Areawide Environmental Impact Statement (EIS/AEIS). An EIS/AEIS must describe:

(i) the environmental impact of the proposed action,
(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
(iii) alternatives to the proposed action,
(iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
(v) any irreversible and irretrievable commitment of resources which would be involved in the proposed action should it be implemented.

42 U.S.C. § 4332(C).

An EIS must also "specify the underlying purpose and need to which the agency is responding." *Id.* This purpose and need statement is intended to explain why the agency is proposing an action and what the agency expects to achieve in taking that action. Similarly, within an EA the agency "shall include brief discussions of the need for the proposal, of alternatives as required by section 102(2)(E) [of NEPA], [and] of the environmental impacts of the proposed action and alternatives." 40 C.R.F. § 1508.9.

Part of this analysis requires the USACOE to analyze the indirect and cumulative effects of the proposed mine that are reasonably foreseeable consequences as well as the impacts that will occur in conjunction with existing and expansions of other mining operations, regardless of where or those impacts might occur, and take a "hard look" at the environmental consequences of those actions. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 352 (1989); 40 C.R.F. § 1502.16(b).

Accordingly, it is the responsibility of the USACOE to analyze the indirect effects that would be caused by mining in the Greater Okefenokee Swamp Basin even if the mining operations are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to **induced changes in the pattern of land use, population density or growth rate**, and related effects on air and water and other natural systems, **including ecosystems**. Id. at § 1508.8(b) (emphasis added). Furthermore, the USACOE must analyze cumulative impacts on the environment which result from the **incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions**. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Id. at § 1508.7 (emphasis added).

Under the Council on Environmental Quality's regulations implementing NEPA, agencies must consider all "connected actions" that are closely related; "cumulative actions" that have cumulatively significant impacts; and "similar actions" that have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography within a single environmental impact statement. 40 C.F.R. § 1508.25(a).

NEPA ensures its commitment to "prevent or eliminate damage to the environment and biosphere" is honored by focusing the governmental agencies and public's attention on the environmental effects of proposed agency action. 42 U.S.C. § 4321. In this way, ***NEPA ensures that the agency will not act on incomplete information, only to regret its decision after it is too late to correct***. See *Robertson*, 490 U.S., at 349. Similarly, the broad dissemination of information mandated by NEPA permits the public and other government agencies to react to the effects of a proposed action at a meaningful time. *Id.* at 349–350.

The Supreme Court of the United States has held, "It would be incongruous with this approach to environmental protection, and with the Act's manifest concern with preventing uninformed action, for the blinders to adverse environmental effects, once unequivocally removed, to be restored prior to the completion of agency action simply because the relevant proposal has received initial approval." *Marsh v. Oregon Nat. Res. Council*, 490 U.S. 360, 371–72 (1989).

Accordingly, even though an initial approval has been granted and although "it would make sense to hold NEPA inapplicable at some point in the life of a project, because the agency would no longer have a meaningful opportunity to weigh the benefits of the project versus the detrimental effects on the environment," prior to a point of a NEPA analysis being rendered meaningless, "NEPA cases have generally required agencies to file environmental impact statements when the remaining governmental action would be environmentally 'significant.' " *TVA v. Hill*, 437 U.S. 153, 188, n. 34 (1978).

Therefore, when projects have been approved separately, and the totality of the impacts have not been properly reviewed, **NEPA is still applicable and must be complied with.** Jurisprudence consistently has held that "[a]n agency impermissibly 'segments' NEPA review when it divides connected, cumulative, or similar federal actions into separate projects and thereby **fails to address the true scope and impact of the activities that should be under consideration**." *Del. Riverkeeper Network v. FERC*, 753 F.3d 1304, 1313 (D.C. Cir. 2014) (emphasis added). NEPA ensures that an agency considers the full environmental impact of connected, cumulative, or similar actions before they are undertaken, so that it can assess the true costs of an integrated project when it is best situated to evaluate different courses of action and mitigate anticipated effects. *City of Bos. Delegation v. Fed. Energy Regulatory Comm'n*, 897 F.3d 241 (D.C. Cir. 2018).

Accordingly, USACOE's must conduct a NEPA analysis of the totality of the mining facilities of which this Notice of Intent to Sue for non-compliance is directed, in order to evaluate the regional adverse impacts of existing and proposed mining in the Greater Okefenokee Basin and the regional Floridan aquifer system pursuant to NEPA.

B. The Endangered Species Act

By enacting the federal Endangered Species Act ("ESA"), Congress declared that "the United States has pledged itself as a sovereign state in the international community to conserve to the extent practicable the various species of …wildlife … facing extinction." 16 U.S.C. § 1531(a)(4). One of the stated purposes of the Act is "to provide a program for the conservation of …endangered species and threatened species." Id. § 1531(b). To that end, the ESA makes it unlawful for any person, including federal, state and local governments, to take or harass any threatened or endangered species. The ESA defines the term "take" to mean harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. 16 U.S.C. § 1532(19).

"Harass" is defined as intentional or negligent actions that create a likelihood of injury to listed species "to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering." 50 CFR § 17.3. The ESA defines an "endangered species" as "any species which is in danger of extinction." 16 U.S.C. § 1532(6). A "threatened species" is one that is likely to become endangered within the foreseeable future. Id. § 1532(20). The US Department of the Interior has defined "harm" as an act which actually kills or injures wildlife, **including significant habitat modification or degradation** where it actually kills or injures wildlife by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. See 50 C.F.R. Section 17.3; *Babbit v. Sweet Home Chapter of Communities for a Great Oregon*, 515 U.S. 687, 695-70 (1995) (upholding the regulation as reasonable interpretation of the statute).

The Act also requires the USFWS to "develop and implement . . . 'recovery plans . . . for the conservation and survival of endangered species and threatened species." 16 U.S.C. § 1533(f)(1). Section 7 of the ESA provides that each federal agency "shall, in consultation with and with the assistance of the Secretary, insure that any action authorized . . . by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification" of a listed species' designated critical habitat. Id. § 1536(a)(2).

To fulfill its obligations under Section 7, each federal agency must review its actions to determine whether they "may affect" an endangered or threatened species. 50 C.F.R. § 402.14(a). An agency may first initiate "informal consultation" to determine whether an action is likely to adversely affect a ***listed species or its critical habitat***. *Id.* § 402.13(a). The agency must provide the USFWS with the "best scientific and commercial data available or which can be obtained during the consultation for an adequate review." *Id.* § 402.14(d). The USFWS must analyze the effects of the proposed action on listed species and habitat, which includes the direct and indirect effects, "***together with effects of other activities that are interrelated or interdependent with that action, [which] will be added to the environmental baseline***." Id. § 402.02 (emphasis added). The USFWS must also analyze the cumulative effects of "***future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area***." *Id.* (emphasis added). "Action area" includes "all areas to be ***affected directly or indirectly*** by the Federal action and ***not merely the immediate area*** involved in the action." *Id.* (emphasis added).

As such, the federal ESA not only prohibits the acts of those persons that directly take a threatened or endangered species, it also prohibits those acts of a third party such as the applicant which will bring about acts (**secondary impacts and cumulative secondary impacts**) likely to exact a taking of a threatened or endangered species. *Loggerhead Turtle v. County Council of Volusia County*, 896 F.Supp. 1170, 1180-81 (M.D. Fla. 1995)(county's authorization of vehicular beach access during turtle mating season exacted a take of turtles in violation of ESA); *Strahan v. Coxe*, 127 F.3d 155, 163-64 (1st Cir. 1997)(governmental third party, pursuant to whose authority actor directly exacted a taking of an endangered species, could be deemed to have violated the ESA); *Sierra Club v. Yeuter*, 926 F.2d 429, 438-39 (5th Cir. 1991) (Forest Service's management of timber stands was a taking of Redcockaded Woodpeckers (RCWs) in violation of the ESA); *Defenders v. EPA*, 882 F.2d 1294, 1301 (8th Cir. 1989) (EPA's registration of pesticide violated ESA because endangered species died from its ingestion and the pesticide could not be distributed without EPA's registration approval); *Palilia v. Hawaii Dep't of Land and Nat. Resources*, 639 F.2d 495, 497-98 (9th Cir. 1981) (State's practice of maintaining feral goats and sheep in palilia's habitat constituted a take under the ESA).

Accordingly, as there are direct and indirect impacts to threatened and endangered species as a result of the totality of the mining operations within the Greater Okefenokee Swamp Basin of which this Notice of Intent to Sue for non-compliance is directed, the failure to conduct such an impact analysis is a violation of the Endangered Species Act as further discussed herein.

C. The Clean Water Act

The objective of the Clean Water Act ("CWA"), codified in 33 U.S.C. § 1251 *et seq*., is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." *Id.* at (a). The CWA requires a Section 404 permit from the USACOE before any dredged and fill material can be discharged into the waters of the United States. 33 U.S.C. § 1344(a); see § 1362(6) (defining dredged material as a pollutant). All wetlands are considered to be special aquatic sites under Section 404 guidelines. ***Special aquatic sites are subject to greater protection than other waters under the guidelines because of their significant contribution to the general overall environmental health or vitality of the entire ecosystem of a region.***

The USACOE has found that "wetlands constitute a productive and valuable public resource, the unnecessary alteration and destruction of which should be discouraged as contrary to the public interest." 33 C.F.R. § 320.4(b)(1). The Corps' regulations list wetland functions that are "important to the public interest." These include:

(i) Wetlands which serve significant natural biological functions, including food chain production, general habitat and nesting, spawning, rearing and resting sites for aquatic or land species;
(iii) Wetlands the destruction or alteration of which would affect detrimentally natural drainage characteristics, sedimentation patterns, salinity distribution, flushing characteristics, current patterns, or other environmental characteristics;
(v) Wetlands which serve as valuable storage areas for storm and flood waters;
(vi) Wetlands which are ground water discharge areas that maintain minimum baseflows important to aquatic resources and those which are prime natural recharge areas;
(vii) Wetlands which serve significant water purification functions; and
(viii) Wetlands which are unique in nature or scarce in quantity to the region or local area.

Id. § 320.4(b)(2).

The regulations further provide that "[n]o permit will be granted which involves the alteration of wetlands identified as important" unless the USACOE finds under its "public interest review" that "the benefits of the proposed alteration outweigh the damage to the wetlands resource." Id. § 320.4(b)(4). In making these determinations, the USACOE must consider "[a]ll factors which may be relevant to the proposal . . . ***including the cumulative effects thereof***." *Id.* § 320.4(a) (emphasis added). A section 404 permit should be denied if the USACOE determines that "issuance would be contrary to the public interest." 33 C.F.R. § 323.6(a); 33 C.F.R. § 320.4(a)(1); *Hoosier Envtl. Council v. U.S. Army Corps of Eng'rs*, 722 F.3d 1053, 1055 (7th Cir. 2013).

A broad range of factors are considered under the public interest review:

> The decision whether to issue a permit will be based on an evaluation of the **probable impacts, including cumulative impacts**, of the proposed activity and its intended use on the **public interest**. . . . The benefits which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. . . . **All factors which may be relevant to the proposal must be considered** including the cumulative effects thereof: among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people.

33 C.F.R. § 320.4(a)(1); *B&B P'ship v. United States*, 133 F.3d 913, at *5 (4th Cir. 1997) (emphasis added).

Public interest regulations specifically identify a concern for wetlands and provide that **most wetlands constitute a valuable and productive public resource, the unnecessary alteration or destruction of which should be discouraged as contrary to the public interest**. 33 C.F.R. § 320.4. Permit denials for projects involving wetland impacts are appropriate unless the benefits of the proposed alteration outweigh the damage to the wetland resource. *Id*.

Furthermore, permits for the discharge of dredged or fill material will not be approved "if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem." 40 C.F.R. § 230.10(a)(2) (An alternative is practicable "if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.").

Section 404 establishes a presumption that a project involving a proposal to fill that is not water dependent will have practicable upland alternatives unless clearly demonstrated otherwise. In addition, where a discharge is proposed for a wetland, there is a regulatory presumption that all practicable alternatives to the proposed discharge that do not also involve a discharge into a wetland have less adverse impact on the aquatic ecosystem unless clearly demonstrated otherwise. The permit applicant has the burden to overcome these presumptions. 40 C.F.R. § 230.10(a).

For projects like mining operations within the Greater Okefenokee Swamp Basin, which are not water dependent and which propose to discharge into wetlands considered "special aquatic sites" under 40 C.F.R. § 230.41, "practicable alternatives that do not involve special aquatic sites are presumed to be available" unless clearly demonstrated otherwise, and "all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem . . . ." 40 C.F.R. § 230.10(a)(3).

In order to overcome the presumption that practicable alternatives exist, the regulations require a showing by the permit applicant that it has evaluated <u>all practicable alternative locations</u> that would not impact the special aquatic environment. 40 CFR §230.10(a)(2). "Practicable" means "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes." 40 CFR §230.3(q).

If it is otherwise a practicable alternative, an area not presently owned by the applicant that could reasonably be obtained, utilized, expanded or managed in order to fulfill the basic purpose of the proposed activity may be considered. 40 CFR §230.10. In order to meet this burden, the applicant must conduct a survey of all practicable alternatives which must in effect, show that there are **NO** practicable alternatives to the proposed discharge.

Finally, USACOE's regulations provide that **NO** Section 404 permit should be issued if the permitted project "will cause or contribute to significant degradation of the waters of the United States." 40 C.F.R. § 230.10(c).

Under the Guidelines issued by the USACOE,

> [E]ffects contributing to significant degradation considered individually or collectively, include: (1) Significantly adverse effects of the discharge of pollutants on human health or welfare, including but not limited to effects on . . . wildlife, and special aquatic sites; (2) Significantly adverse effects of the discharge of pollutants on life stages of aquatic life and other wildlife dependent on aquatic ecosystems . . . (3) Significantly adverse effects of the discharge of pollutants on aquatic ecosystem diversity, productivity, and stability. Such effects may include, but are not limited to, loss of fish and wildlife habitat . . . (4) Significantly adverse effects of discharge of pollutants on recreational, aesthetic, and economic values.

Id.

"[T]he degradation or destruction of special aquatic sites, such as filling operations in wetlands, is considered to be among the most severe environmental impacts covered by these Guidelines." 40 C.F.R. § 230.1(d).

As discussed herein, the mining operations in the Greater Okefenokee Swamp Basin will continue to significantly degrade the waters of the United States and cause significant adverse effects to wildlife and special aquatic sites, and negatively impact the diversity, productivity, and stability of the aquatic ecosystem in violation of the Clean Water Act if appropriate action is not taken.

D. The Safe Drinking Water Act

The purpose of the Safe Drinking Water Act "SWDA", 42 U.S.C. §§ 300f, et seq., is to "assure that water supply systems serving the public meet minimum national standards for protection of public health." H.R. Rep. No. 93-1185 (1974), reprinted at 1974 U.S.C.C.A.N 6454. The Act thus authorizes the EPA to: "establish federal standards applicable [to public water supplies] for protection from harmful contaminants, and establish a joint federal-state system for assuring compliance with these standards and for protecting underground sources of drinking water." *Id.* at 6454-55.

The legislative history to section 1431(a) demonstrates that Congress intended "to confer completely adequate authority to deal promptly and effectively with emergency situations which jeopardize the health of persons" using public water systems. H.R.Rep. No. 93–1185 at 6487. Congress intended a broad reading of the term "imminent" to allow the EPA "the time it may take to prepare administrative orders or moving papers, to commence and complete litigation, and to permit issuance, notification, implementation, and enforcement of administrative or court orders to protect the public health." *Id.* at 6488. Moreover, the EPA may take action to prevent even a risk of harm to a public drinking water system. See *id*.

"[F]or example, the Administrator may invoke this section when there is an imminent likelihood of the introduction into drinking water of contaminants that may cause health damage after a period of latency." *Id.*

Section 1431(a) of SDWA authorizes the EPA Administrator to take action necessary to protect the public's health from an imminent and substantial endangerment created by contaminants in a public water system or an underground source of drinking water when state and local officials have not acted first. See 42 U.S.C. § 300i(a). It is undisputed that the mining operations within the Greater Okefenokee Swamp Basin will have a direct, indirect, and cumulative impact on tributaries that feed aquifers which replenish drinking waters of the nearby municipalities.

Accordingly, as there are direct and indirect impacts to the drinking waters of nearby communities as a result of the totality of the mining operations within the Greater Okefenokee Swamp Basin of which this Notice of Intent to Sue for non-compliance is directed, the failure to conduct such an impact analysis is a violation of Safe Drinking Water Act as further discussed herein.

IV.
FEDERAL VIOLATIONS RELATED TO AND PREFACING UNPERMITTED MINING ACTIVITIES IN THE GREATER OKEFENOKEE SWAMP BASIN

Federal Jurisprudence consistently has held that "[a]n agency impermissibly 'segments' NEPA review when it divides connected, cumulative, or similar federal actions into separate projects and thereby fails to address the true scope and impact of the activities that should be under consideration." *Del. Riverkeeper Network v. FERC*, 753 F.3d 1304, 1313 (D.C. Cir. 2014). NEPA ensures that an agency considers the full environmental impact of connected, cumulative, or similar actions before they are undertaken, so that it can assess the true costs of an integrated project when it is best situated to evaluate different courses of action and mitigate anticipated effects. *City of Bos. Delegation v. Fed. Energy Regulatory Comm'n*, 897 F.3d 241 (D.C. Cir. 2018). When the proper NEPA analysis is lacking, the cumulative ecological effect of proposed, permitted, and unpermitted actions cannot be properly evaluated and mitigated, resulting in unnecessary environmental degradation and adverse public health effects.

A. Federal Violations Related to and Prefacing Trailridge Mining Activities East of the Okefenokee Swamp by Southern Ionic Minerals, LLC/Chemours Company (SAS-2012-01042) (SAS-2017-00669)

The US Army Corps of Engineers ("USACOE") issued a Nationwide Permit ("NWP") to Jim Renner/Southern Ionics Minerals, LLC for the "Mission Mine" to expand its mining operations last year to continue mining heavy mineral sand deposits near Folkston, Charlton County, Georgia (see **Attachment Ic**). That mine/expansion, permitted as an NWP, was acquired by Chemours last month to provide a "substantial increase in ore production" (see **Attachment Id**). Additionally, the US Army Corps of Engineers ("USACOE") issued a Nationwide Permit ("NWP") to Jim Renner/Southern Ionics Minerals, LLC for the Indian Boundary Mine (SAS-2017-00669) in Charlton County, Georgia. This is an additional heavy mineral sands/titanium mining activity near the Okefenokee Swamp, that will mine over three wetlands, and is located within the proximity of water supply intakes for the City of Folkston's public water supply facility's groundwater supply system in Folkston, Georgia.

This mining expansions failed to take into consideration the mining facilities that are interconnected with the Chemours Company, formerly known as Dupont, which initiated Trailridge mining in Starke, Florida in 1949, causing significant dewatering of nearby lakes, and now has mining operations prevalent in Baker, Bradford, Clay, and Duval Counties. An AEIS by the USACOE to evaluate the regional adverse impacts of existing and proposed mining in the Greater Okefenokee Basin and the regional Floridan aquifer system is required to ensure that a hard look is conducted pursuant to NEPA.

Additionally, history has demonstrated the detrimental effects mining has not only on the surrounding ecosystem, but on the hydrology, above and below the surface, resulting in hazardous flooding, contamination of aquifers, sinkholes, and the disappearance of bodies of water altogether that would violate the Clean Water Act, to which the USACOE is mandated to uphold. Part of this analysis requires the USACOE to analyze the indirect and cumulative effects of the proposed mine that are reasonably foreseeable consequences as well as the impacts that will occur in conjunction with existing and expansions of other mining operations, regardless of where or when those impacts might occur, and take a "hard look" at the environmental consequences of those actions. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 352 (1989); 40 C.R.F. § 1502.16(b).

The Southern Ionic Minerals, LLC, Mission Mine and Indian Boundary Mine mining expansions through a NWP is clearly violative of NEPA, and there is a need for an AEIS as the additional mining operations combined with other existing mining facilities in the Trailridge east of the Okefenokee Swamp that will indirectly or cumulatively affect the environment, as there will be a greater significant potential cumulative effects that would affect surface water resources, groundwater and aquifer resources, surface water hydrology, including water supply and conservation, surface and ground water quality, wetlands, fish and wildlife habitats and resources, including federally listed threatened and endangered species, streams and upland habitat that will be violative of the CWA and ESA, as well as increasing mining pollution in violation of SWDA as there are numerous streams that feed into aquifers providing drinking water for the nearby communities.

B. Federal Violations Related to and Prefacing Trailridge Mining Activities East of the Okefenokee Swamp by Twin Pines Minerals, LLC

As of February 10, 2020, Twin Pines withdrew its application with the intention to resubmit. There are still valid concerns that need to be recognized by the federal agencies at issue, and that warrant an Area Wide Environmental Impact Statement.

The formerly proposed Twin Pines Minerals, LLC mine site was approximately 12,000 acres and the area would have been mined in 1,000-acre parcels over 30 years. Each 1,000-acre block was proposed to be mined at approximately 25-40 acres per month, and backfilled and graded within approximately 30 days following excavation. The depth of mining across the property will vary based on the resource but should average 50 feet below land surface. **Attachment IIIi**. Wetlands and streams within and adjacent to the proposed mine site of approximately 12,000 acres are headwater wetlands and streams in the Greater Okefenokee Swamp Basin. The proposed mining in and adjacent to those headwater wetlands and streams would violate the federal and state Antidegradation Standards. Those violations cannot be "mitigated" by purchasing "credits" in "mitigation banks," even if sufficient numeric "credits" were available within the Greater Okefenokee Swamp Basin, beyond the extensive area of groundwater impacts already present. The issuance of that NWP constitutes a federal "action" and NEPA applies to federal agency "actions," including direct agency undertakings, funding, permitting and proposals for legislation. All federal agencies are implicated by NEPA. Additionally, both the proposed Trailridge mining by Twin Pines (Project No. SAS-2018-00554) and the issued Southern Ionics Minerals, LLC NWP, now under the control of Chemours/Dupont, appear to be piece-meal mining of Trailridge.

Twin Pines has a pattern of non-compliance with environmental rules and regulations and other infractions, in the Trailridge mining area: (1) operating a mine **without** an Industrial Wastewater permit under the guise of Chemours; (2) failing to comply with record and reporting requirements; (3) discharging into wetlands **without** permit authorization; and (4) failing to inspect treatment systems that allow discharge to flow out of the permit boundary, resulting in a Consent Order issued by FDEP to Chemours for compliance and fines (see **Attachment IVd**). The Consent Order details numerous other violations committed by Chemours in its three other mining facilitates that are in need of resolution to ensure compliance with environmental rules and regulations.

Chemours is in the process of complying with the consent order, yet in its June 18, 2019 report of the Twin Pines Trailridge Facility in Bradford County, the samples still exhibited chronic toxicities (see **Attachment IVe**). In August of 2019, Chemours applied to Bradford County for a Special Exemption to *continue* its heaving mining operation at the Twin Pines Trailridge Facility across 886 acres, which would greatly increase the mining area in that county and increasing adverse impacts to designated critical habitat to federally listed species (see **Attachment IIe1**). The existing mining operations have been conducted in that county without compliance with the county's Comprehensive Plan for many years. Additionally, Chemours recently purchased Southern Ionics' NWP for substantial expansion of Trailridge mining. Such piecemeal mining should not be overlooked by the USACOE in determining the environmental impacts of including reasonably foreseeable additional mining in the Greater Okefenokee Swamp Basin.

An AEIS by the USACOE to evaluate the regional adverse impacts of existing and proposed mining in the Greater Okefenokee Basin and the regional Floridan aquifer system is required to ensure that a hard look is conducted pursuant to NEPA. Accordingly, it is the responsibility of the USACOE to analyze the indirect effects that would be caused by the mining in the Trailridge area even if the mining operations are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to **induced changes in the pattern of land use, population density or growth rate**, and related effects on air and water and other natural systems, **including ecosystems**. Id. at § 1508.8(b) (emphasis added). Furthermore, the USACOE must analyze cumulative impacts on the environment which result from the **incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions**. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Id. at § 1508.7 (emphasis added).

Twin Pines has failed to demonstrate that it has no practicable alternatives with less impacts to special aquatic sites and rather has proposed several alternatives, all build alternatives are slight deviations from the proposed project and fail to include alternatives such as offsite processing or higher efficiency of mining at existing mines. The application for a Section 404 permit for the proposed mine should not be considered without an AEIS as the proposed mining operation will significantly degrade the waters of the United States and cause significant adverse effects to wildlife and special aquatic sites, and negatively impact the diversity, productivity, and stability of the aquatic ecosystem.

Furthermore, Twin Pines has identified numerous threatened species at risk however, that list is deficient. For example, Twin Pines failed to identify the oval pigtoe mussel (Pleurobema pyriforme) as a listed endangered species identified in the impacted rivers and tributaries. Accordingly, as there are threatened and endangered species at risk of being taken and having their habitats permanently altered or destroyed, the anticipated re-submission for mining should be denied as discussed herein.

C. Federal Violations Related to and Prefacing Trailridge Mining Activities South of the Okefenokee Swamp by Chemours Company (aka Dupont)/Twin Pines Minerals, LLC (No Corps Permits) (FDEP Permit File No. FL000051-012-IW3S)

On June 29, 2017, the Florida Department of Environmental Protection ("FDEP") issued a renewal NPDES permit for industrial wastewater discharge from one of Chemours' numerous Trailridge mining operations south of the Okefenokee Swamp. Page 5 of that permit states, "This discharge is an existing 40.0 MGD daily permitted maximum at Outfall D-001 to Alligator Creek (WBID 3606), a Class III fresh surface

water." The abbreviation "MGD" means "Million Gallons per Day." This renewal permit also stated that industrial wastewater from that single Trailridge mining discharge location exceeded the 40 MGD maximum daily discharge allowed under that permit by amounts ranging from 42.55 MGD to 55.3 MGD, including in 2012. That Chemours' discharge renewal permit also described water quality violations of those discharges. A copy of that FDEP NPDES industrial wastewater discharge is provided with this NOI as **Attachment Im**.

There have been numerous violations associated with the Chemours' Trailridge mining operations south of the Okefenokee Swamp, including the 2012 flooding of CAPM members and other residents and property owners from were addressed in the 9-page Complaint dated June 16, 2016 and filed with Bradford County, Florida. A copy of that Complaint was included in the letter from CAPM's comment letter dated August 17, 2018 to Bradford County by Brookes, Esquire, which is provided with this NOI in **Attachment Ii**. Additional severe flooding and property damage to CAPM members and other residents and property owners occurred in the fall of 2017, downstream of industrial wastewater discharges from Chemours' Trailridge mining south of the Okefenokee Swamp.

Twin Pines is operating in conjunction with Chemours, mining Trailridge south of the Okefenokee Swamp, without permits and in violation of federal, state, and local laws. On March 23, 2018, FDEP issued a Warning Letter to Chemours regarding four Trailridge mining operations south of the Okefenokee Swamp in Baker, Bradford, Clay, and Duval Counties, Florida. Twin Pines was referenced four times in that Warning Letter. Those Twin Pines citations included: 1) operating without valid permits; 2) having silt fences overwhelmed by sand; process water and tailings fill deposited in a wetland without permit authorization, area not being monitored or inspected; 3) Twin Pines needing to be added to the Industrial Wastewater Permit (that was resulting in flooding of residents and property owners) to include monitoring and inspecting requirements; and 4) industrial wastewater facilities associated with mining or formerly mined areas out of compliance. A copy of that FDEP Warning Letter is provided with this NOI as **Attachment In**.

Based on the adverse impacts already demonstrated in Trailridge mining of headwater wetlands and streams by Chemours/Dupont and Twin Pines south of the Okefenokee Swamp, mining Trailridge violates the federal and state Antidegradation Standards. Depleting the regional groundwater resources, while simultaneously discharging industrial mining wastewater contaminants makes it impossible to comply with Antidegradation laws. The failure to conduct an AEIS for the direct, indirect, and cumulative impacts of the mining operations is a clear violation of NEPA, resulting in unregulated violations of the CWA, ESA, and SWDA.

D. Federal Violations Related to and Prefacing Trailridge Mining Activities South of The Okefenokee Swamp by HPS II (No Corps Permits)

HPS II is in the process of seeking approval for mining operations south of the Okefenokee Swamp that has the potential to cause polluted water drainage to discharge into the Santa Fe River, which flows into the Suwanee River and the Okefenokee Swamp, impacting the water quality of the river and drinking supply of the surrounding communities, as well as the Floridan aquifer, conservation lands, and springs. HPS II has been engaging in exploratory well digging without permits and causing significant disruption to the environmentally sensitive area. The direct, indirect, and cumulative impacts of these wells have never been taken into consideration in conjunction with the vast mining operations operating near the Okefenokee Swamp.

Furthermore, the information provided by HPS II's consultant was found to be "difficult, and in some cases not feasible" to answer the main question of "**how the proposed mining operation would affect the environment outside of the project area and what the effects and impacts could be on the groundwater and surface-water resources in the areas surrounding the proposed phosphate mine**." (Shreuder, In. Responses and Comments on Mining and Mitigation Information Prepared on Behalf of HPS II, dated Oct. 13, 2018). There have been numerous concerns and unknowns surrounding the proposal that mandate a hard look under NEPA in conjunction with the other mining operations. For example, no data was provided to illustrate that watersheds shall be restored, which is of utmost importance in ensuring that there is no permanent environmental degradation as a result of the proposed mining, and again, is of the utmost importance to be considered and assessed via an AEIS rather than as a stand-alone project.

The proposed HPS II mine will require federal permits and must be considered in an AEIS of all mining operations in the area because: 1) this proposed phosphate mine is yet another phosphate mine within the regional Floridan Aquifer System; 2) the area of impact considered in the aforementioned mining facilities failed to assess the areawide impacts and cumulative effects of phosphate mining mines within the regional Floridan Aquifer System and the Okefenokee Swamp; and 3) clearly the environmental studies, if any, prepared by the US ACOE, the USEPA and the USFWS failed to consider the regional areawide impacts and cumulative effects of existing and proposed phosphate mining on the regional Floridan Aquifer System underlying the phosphate mining and the Okefenokee Swamp that will be directly impacted by the increased mining operations.

E. Federal Violations Related to and Prefacing Trailridge Mining Activities South of The Okefenokee Swamp by Chemours Company Trailridge South (No Corps Permits)

Chemours Company at its Trailridge South Mine recently applied for and was granted a Special Exception from Bradford County, Florida, to conduct mining operations in the area. The accumulation of these mining facilities in environmentally sensitive areas without an AEIS is a clear violation of NEPA, resulting in unregulated violations of the CWA, ESA, and SWDA.

F. Mining Activities are Required to be Evaluated together to ensure that the Cumulative Effects of Proposed, Permitted, and Unpermitted Activities do not Cause Unnecessary Ecological Degradation and Adverse Public Health Effects

Mining operations evaluated within a vacuum, essentially dividing projects from connected, cumulative, or similar federal actions into separate projects, thereby fail to address the true scope and impact of the activities under consideration, permitted, or operational without permits. An Areawide Environmental Impact Statement review of mining facilities that are interconnected is required to ensure that the environmental assessments are adequate and in compliance with NEPA and not violating CWA, ESA, and SDWA.

The USEPA has recognized the importance of conducting an AEIS in high concentrated mining areas. On March 10, 2010, the USEPA advised the USACOE that due to the "environmentally sensitive mining region" in the Peace River Watershed, Florida, there should be a consideration of "overall cumulative impacts" within the Bone Valley Phosphate Mining Region, rather than the "incremental review of permits and their associated impacts. Attachment IVg at p. 1.

The USEPA explained to the ACOE that an areawide environmental impact study serves to evaluate overall impacts of an industry or region, such as the Trailridge mining activities in the Okefenokee Swamp Basin, especially when there are concerns about cumulative impacts and the downstream effects "that accumulate and may pose a serious threat to the environment over time from one or more sources, and those that can result in the degradation of important resources," such as special aquatic areas, listed species habitats, and drinking water sources, specifically when "water quality deterioration due to mining activities may compromise the public drinking water supplies and adversely impact public health." *Id.* at p. 2.

Similar to the USEPA's concerns in the Peace River Watershed, "[a]ddressing cumulative and secondary (indirect) effects in a piecemeal manner through the regulatory process (i.e., permit by permit) for impacts of this magnitude, ***cannot effectively or sufficiently address*** cumulative impacts" to the Greater Okefenokee Swamp Basin as a whole. *Id*. (emphasis added). When such an environmental analysis is lacking, the ecological and adverse public health effects are not properly evaluated or mitigated, resulting in unfettered federal action without the necessary "hard look" requirement of NEPA enacted to prevent such degradation from taking place.

V.
NATIONWIDE PERMITS ("NWP") 44 AUTHORIZED FOR MINING ACTIVITIES ASSOCIATED WITH THE OKEFENOKEE SWAMP VIOLATE FEDERAL LAWS

This section incorporates herein, by reference, all preceding and other paragraphs and Attachments of this Notice of Intent to Sue ("NOI") regarding mining activities in Greater Okefenokee Swamp Basin, the regional Floridan Aquifer System, and the Southeastern Coastal Plain Ecoregion.

A. Requirements of Similar in Nature / Minimal Adverse Environmental Effects

The current Rules and Regulations for Issuance and Reissuance of Nationwide Permits ("NWP Rules and Regulations"), published on Friday, January 6, 2017 in Volume 82, Number 4 of the Federal Register, determine what activities meet the requirements to be considered under NWP categories and other general permits for activities authorized by the USACOE and specifically require that the proposed activities shall **not** "**result in more than minimal individual or cumulative adverse environmental effects**" and must be **"similar in nature**." (see **Attachment Va1** at p. 1860 emphasis added).

Specifically, the NWP Rules and Regulations state:

> The U.S. Army Corps of Engineers (Corps) issues nationwide permits (NWPs) to **authorize activities** under **Section 404 of the Clean Water Act** and Section 10 of the Rivers and Harbors Act of 1899 **that will result in no more than minimal individual and cumulative adverse environmental effects.** The NWPs can only be issued for a period of five years or less, unless the Corps reissues those NWPs (see 33 U.S.C. 1344(e) and 33 CFR 330.6(b)). We are reissuing 50 existing NWPs and issuing two new NWPs. These NWPs will go into effect on March 19, 2017, and will expire on March 18, 2022. …
>
> Section 404(e) of the Clean Water Act provides the statutory authority for the Secretary of the Army, after notice and opportunity for public hearing, to issue general permits on a nationwide basis for any category of activities involving discharges of dredged or fill material into waters of the United States. ... The Secretary's authority to issue general permits has been delegated to the Chief of Engineers and his or her designated representatives. **Nationwide permits are a type of general permit issued by the Chief of Engineers** and are designed to regulate with little, if any, delay or paperwork certain activities in jurisdictional waters and wetlands **that have no more than minimal adverse environmental impacts (see 33 CFR 330.1(b))**. **Activities authorized by NWPs and other general permits must be similar in nature, cause only minimal adverse environmental effects when performed separately, and will have only minimal cumulative adverse effect on the environment (see 33 U.S.C. 1344(e)(1)).** Nationwide permits can also be issued to authorize activities pursuant to Section 10 of the Rivers and Harbors Act of 1899 (see 33 CFR 322.2(f)). The NWP program is designed to provide timely authorizations for the regulated public **while protecting the Nation's aquatic resources.**

Id. (emphasis added), *see also* pp. 1860, 1864, 1868, 1918, 1923. (discussing requirement that activities authorized under NWP be similar in nature and have minimal adverse environmental effects).

Generally, not all mining activities authorized under the NWP 44 - Mining Category are "similar in nature," as evidenced by the five following examples:

> 1. mining activities that involve **excavation into an aquifer system** do **not** have similar individual and cumulative adverse environmental effects as mining activities that do **not** excavate into an aquifer system;
> 2. mining activities that involve **groundwater extraction**, by pumping and/or altering the flow of ground water, do **not** have similar individual and cumulative adverse environmental effects as mining activities that do **not** involve groundwater extraction, by pumping and/or altering the flow of ground water;
> 3. mining activities that **discharge contaminants into Waters of the US**, directly and/or indirectly, do **not** have similar individual and cumulative adverse environmental effects as mining activities that do **not** discharge contaminants into Waters of the US, directly and/or indirectly;
> 4. mining activities that result in the **production of hazardous waste** do **not** have similar individual and cumulative adverse environmental effects as mining activities that do **not** result in the production of hazardous waste; and
> 5. mining activities that are land-dependent and presumed **not** to be water-dependent activities do **not** have similar individual and cumulative adverse environmental effects as mining activities that are water dependent, such as mining in Rivers/large streams or coastal waters distant from the shore.

Accordingly, the Mining Activities in the Greater Okefenokee Swamp Basin, the regional Floridan Aquifer System, and the Southeastern Coastal Plain Ecoregion are not "Similar in Nature" as mining in other non-environmentally sensitive areas.

Furthermore, mining activities that are water dependent also are not "**similar in nature**" to mining activities that are **not** water dependent. The federal guidance on the preparation of analysis of Section 404 permit applications addresses activities that are water dependent and activities presumed **not** to be water-dependent activities. **Attachment Va2 (**Guidelines for preparation of analysis of Section 404 permit applications pursuant to the section 404(b)(1) guidelines of the clean water act (40 CFR, section 230))**.** The guidance distinguishes between a residential development, of which the purpose is provide housing for people and therefore "do not need to be located in a special aquatic site to fulfill the basic purpose of the project," with a boat launch or dock that by its very purpose required access to water. *Id.* at p. 2.

Where an activity is not water dependent, meaning that access or proximity to a special aquatic site will not fulfil the basic purpose, yet the activity is requested to be conducted in special aquatic site, "practicable alternatives that do not involve special aquatic sites are presumed to be available, unless clearly demonstrated otherwise." *Id*. (citing 40 CFR Section 230.10(a)(3)). Additionally, when the activity involves a ***discharge*** in a special aquatic site, "all practicable

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

Case law holds firm that **mining activities are not water dependent** as the purpose of extracting minerals does not require use of special aquatic sites. *Bering Strait Citizens for Responsible Res. Dev. v. U.S. Army Corps of Engineers*, 524 F.3d 938, 947 (9th Cir. 2008) (applying the presumption that practicable alternatives exists for an Alaskan gold mining project because the project was not water dependent); *Sierra Club v. Van Antwerp*, 362 F. App'x 100, 107 (11th Cir. 2010) (upholding that the district court's conclusion that the ACOE's decision that the mining project's basic purpose was water dependent was ***arbitrary***).

The United States Court of Appeals for the Eleventh Circuit case of *Sierra Club v. Van Antwerp* is instructive to the issues at hand. In that case, the applicant sought to extract limestone that was located in a wetland and argued that due to the location of the limestone desired to be extracted from a wetland it was indeed "water dependent." The USACOE's determination that the basic purpose to extract limestone within a wetland was water dependent based upon the need to be located in a special aquatic site to fulfil its basic purpose, was found to be ***arbitrary and capricious***. 362 F. App'x at 106-107. The Eleventh Circuit ordered the USACOE to apply the required presumption of availability of practicable alternative that will not affect special aquatic sites such as wetlands, before any issuance of a CWA Section 4040 permit could be valid. *Id*. at 107.

B. NWP 44 Mining Permits for Southern Ionics Minerals: Mission Mine and Indian Boundary Mine

On August 16, 2017, the USACOE received a "Preconstruction Notification for Nationwide Permit No. 44 (Mining Activities) Southern Ionics Minerals, Indian Boundary Mine, Charlton County, Georgia" from Jim Renner, P. G. and Manager of Environmental Stewardship ("Southern Ionics Minerals PCN"). *See* **Attachments Ic; Vb1; Vb2**. The project area sought to be converted to mining was silviculture for timber harvesting, *id*. at p. 2, with the purpose of using wetlands to fulfil the project purpose "to conduct mining activities to extract heavy mineral sands for production and sale to customers." *Id*. at p. 7. Despite the presumption that "[a]fter mining is complete, lands are continuously reclaimed to pre mine conditions, including the reclamation and restoration of wetlands," *id*. at p. 2, the conversion to mining was demonstrated to permanently destroy potential habitat for Eastern Indigo Snakes by collapsing gopher tortoise burrows and relocating the gopher tortoises, thereby precluding any reclamation and restoration of the habitat for the Eastern Indigo Snakes. *Id*. at p. 5.

The permanent destruction and removal of essential habitat provided to Federally Threatened Eastern Indigo Snakes by burrows created by Federal Candidate Species Gopher tortoises is described in detail in Section VII. of this NOI and its attachments, and such an impact should have been sufficient for the USACOE to deny the proposed NWP 44 – Mining Category permit and require a comprehensive "Individual" Permit, resulting in an arbitrary and capricious NWP 44 issuance. *See also* **Section V** for other reasons why the issuance of the Southern Ionics

Mineral NWP 44 Mining Permits in the Greater Okefenokee Swamp Basin were arbitrary and capricious.

Furthermore, it is chemically, physically, and biologically impossible to return areas mined for heavy mineral sands/titanium over aquifers to "pre mine conditions." *See* **Attachment Vu.** That is because the entire surficial aquifer is homogenized during the mining process, making it impossible to re-establish natural hydroperiods for those wetlands, and thus an impossibility to return such areas to "pre mine conditions." *See* **Attachments Ve8, Ve10, Vu.**

Additionally, millions of gallons of water will be extracted from the regional Floridan Aquifer System to facilitate that heavy mineral sands/titanium mining and all other mining-related activities required for that heavy mineral sands/titanium mining, resulting in substantial dewatering. That dewatering of the regional Floridan Aquifer System is described in the daily volume of water authorized by the FDEP's NPDES permit to Chemour/Dupont/Twin Pines at only one of their many discharge locations. **Attachment Im**, *see also* **Attachments Ig-Ih; Ve1; Vg.**

The stated "Purpose" of the mining expansions are specifically listed as follows: "The purpose of the project is to conduct mining activities to extract heavy mineral sands for production and sale to customers." **Attachment Vb1.** Per the binding case precedent in *Sierra Club v. Van Antwerp*, 362 F. App'x 100 (11th Cir. 2010), these NWP 44 Mining Activities are **not water dependent**, and there is a presumption that there are other practicable alternatives that will not require activities to be conducted on special aquatic sites, such as the wetlands and tributaries of the Greater Okefenokee Swamp Basin. According to Southern Ionics Mineral's application, an analysis of nine alternative mining locations, and one no build alternative, were conducted, however, the only sites deemed practicable due to the availability of ore required use of wetlands, which ultimately would result in adverse environmental effects. **Attachment Vb3** at pp. 12-21 (Application for Mission Mine). The decisional documents by the USACOE identify the impact to wetlands to be approximately 9.3 acres authorized in 2017, and impacts to 11.07 acres of wetlands authorized in 2018. Despite the impacts being considered "temporary" due to requirements for remediation, the analysis completely fail to take into account any cumulative impacts from additional mining activities in the region.

The Clean Water Act requires environmental considerations under NEPA, which mandate a hard look at direct, indirect, and cumulative impacts, as well as a public interest review of projects. **Attachment Va2.**

The extensive body of scientific literature as discussed herein this Notice, based on factual evidence, supports the conclusion that even the individual direct and indirect/secondary impacts, separately and without consideration of the cumulative impacts to the Southeastern Coastal Plain Ecoregion and the regional Floridan Aquifer System from the mining activities authorized by the NWP 44 – Mining Category permits for southward expansion of Mission Mine (SAS-2012-01042) and Indian Boundary Mine (SAS-2017-00669) would result in "**more than minimal individual and cumulative adverse environmental effects**." Therefore, mining activities authorized by NWP 44 – Mining Category permits in the Okefenokee Swamp in Charlton County, Georgia are arbitrary and capricious as the heavy mineral sands/titanium mining associated with the Okefenokee Swamp does not meet any of the requirements or criteria for an NWP 44 – Mining

Category permit as such mining activities are not "similar in nature" to all other NWP 44 Permits, and do not result in minimal "**cumulative adverse effect on the environment.**"

C. Public Interest

Pursuant to 33 C.F.R. § 320.4(a)(1), the USACOE cannot issue a 404 permit if it "**would be contrary to the public interest**." This requires that the agency consider "**the probable impacts**" of a proposed project on "**[a]ll factors which may be relevant to the proposal**[,] including cumulative effects." The decision must "reflect the national concern for both protection and utilization of important resources" (33 C.F.R. § 320.4(a)(1)).

Federal law requires that:

> All factors which may be relevant to the proposal must be considered including the cumulative effects thereof: among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people.

33 C.F.R. § 320.4(a)(1). *See also* **Attachment Vb4** at p. 35-43 (mandating that public review consider benefits and detriments that may result from activities authorized by NWP 44).

Additionally, the following general criteria will be considered in the evaluation of every application under 33 CFR Parts 321-324:

> (i) The relative extent of the public and private need for the proposed structure or work: (ii) Where there are unresolved conflicts as to resource use, the practicability of using reasonable alternative locations and methods to accomplish the objective of the proposed structure or work; and (iii) The extent and permanence of the beneficial and/or detrimental effects which the proposed structure or work is likely to have on the public and private uses to which the area is suited.

In performing its substantive review of permit applications, the USACOE is required to give wetlands the highest possible level of protection. 33 C.F.R. § 320.4(b) ("[W]etlands constitute a productive and valuable public resource, the unnecessary alteration and destruction of which should be discouraged as contrary to the public interest."); *see also, Buttrey v. United States*, 690 F.2d 1170, 1180 (5th Cir.1982), cert. denied, 461 U.S. 927 (1983) ("It would hardly be putting the case too strongly to say that the Clean Water Act and the applicable regulations do not contemplate that wetlands will be destroyed simply because it is more convenient than not to do so.").

When it comes to wetlands there is a presumption that it is against the public interest. Wetlands considered to perform functions important to the public interest include:

> (i) Wetlands which serve significant natural biological functions, including food chain production, general habitat and nesting, spawning, rearing and resting sites for aquatic or land species; (ii) Wetlands set aside for study of the aquatic environment or as sanctuaries or refuges; (iii) Wetlands the destruction or alteration of which would affect detrimentally natural drainage characteristics, sedimentation patterns, salinity distribution, flushing characteristics, current patterns, or other environmental characteristics; (iv) Wetlands which are significant in shielding other areas from wave action, erosion, or storm damage. Such wetlands are often associated with barrier beaches, islands, reefs and bars; (v) Wetlands which serve as valuable storage areas for storm and flood waters; (vi) Wetlands which are ground water discharge areas that maintain minimum baseflows important to aquatic resources and those which are prime natural recharge areas; (vii) Wetlands which serve significant water purification functions; and (viii) Wetlands which are unique in nature or scarce in quantity to the region or local area.
>
> 33 C.F.R. § 320.4(b)(2).

The regulations further provide that a permit may not be granted to work in wetlands identified as "important" under these criteria unless the CORPS finds that under its public interest review, "the benefits of the proposed alteration outweigh the damage to the wetlands resource," and "the proposed alteration is necessary to realize those benefits." 33 C.F.R. § 320.4(b)(4).

The massive negative public response and overwhelming concern for the impacts on the Greater Okenefenokee Swamp Basin due to Dupont's proposed heavy mineral sands/titanium mining in the late 1990s clearly established, at the very least, that heavy mineral sands/titanium mining activities associated with the Okefenokee Swamp was "**not in the public interest**." *See* **Attachments Vc; Vd.**

On February 5, 1999, multiple organizations, municipalities, and elected officials signed "No Mining Scenario Agreement" with Dupont, **Attachment Vf1**, and declared that the signatories:

> participated in a collaborative process to address concerns about the proposed DuPont titanium mine in Charlton County, Georgia. By signing below, they and the organizations they represent commit to fully support the Proposed No Mining Scenario developed in the Collaborative Process, including the provisions for retirement of the mineral rights, acquisition of 10,000 acres for expansion of the wildlife refuge, promotion of nature based tourism, enhanced local economic development, and endangered species protection.

It has been 21 years since that "No Mining Scenario Agreement" with Dupont was signed. During that 21 years heavy mineral sands/titanium mining activities on the east side of the Okefenokee National Wildlife Refuge ("ONWR") has contributed to that large-scale dewatering. **Attachment Vf2** (map of Acquisition Boundary Project Area), *see also* **Attachment Vg** (declaration of Mark Lyons and attachments regarding repeated incidents of extreme low water conditions totally preventing navigation in and surrounding the ONWR and extreme destructive wildfires in the vicinity of the Okefenokee Swamp and ONWR that coincided with those periods of extreme low water levels).

Although the USACOE knew or should have known from the mass public objections to the proposed heavy mineral sands/titanium mining activities by Dupont in the late 1990s that mining "**similar in nature**" to the proposed Dupont mining was "**not in the public interest**," because it would **exceed the** "**minimal cumulative adverse effect on the environment**," the USACOE arbitrarily authorized NWP 44 – Mining Category permits for the southward expansion of Mission Mine (SAS-2012-01042) and the Indian Boundary Mine (SAS-2017-00669), both east of the Okefenokee Swamp in Charlton County, Georgia. More extensive discussion and documentation of those permanent and irreversible **adverse individual and cumulative adverse effect on the environment that are significantly greater than minimal** and cannot be avoided or mitigated are provided in **Attachments In; Ip; Iq; IIa-IId; IIg1-IIg3; IIIe-IIIf; IIIi-IIIj; IVd; IVe; Ve1-Ve18**.

D. Cumulative Impacts Failed to be Assessed in Issuance of NWP-44 Permits for Mining Activities in the Greater Okefenokee Swamp Basin

Federal laws, such as NEPA and CWA, require ***environmental review of cumulative impacts***. Furthermore, the 2017 NWP 44 Decisional Document specifically requires cumulative effects analysis that is not limited only to "activities authorized by the NWP, other NWPs, or other DA permits (individual permits and regional general permits). **The NEPA cumulative effects analysis must also include other Federal and non-Federal activities that affect the Nation's wetlands, streams, and other aquatic resources, as well as other resources (e.g., terrestrial ecosystems, air) that may be directly or indirectly affected by the proposed action and other actions**." **Attachment Vb4 at pp. 24-25.** Additionally, a NEPA cumulative effects analysis must also identify and consider the "disturbances and stressors that cause degradation of those resources, including those caused by actions unrelated to the proposed action." *Id.* at p. 25.

Specifically, when doing a cumulative impacts analysis for mining operations, the USACOE must recognize:

> Cumulative effects also include environmental effects caused by reasonably foreseeable future actions that may take place after the permitted activity is completed. Such effects may include direct and indirect environmental effects caused by the operation and maintenance of the facility constructed on the discharge of dredged or fill material into waters of the United States or the structures or work in navigable waters of the United States. For NWP 44, **this includes activities associated with other operations associated with the mining activities authorized by this NWP**. A variety of **pollutants might be released into the environment** during these associated activities. Those pollutants may be discharged through either point sources or non-point sources and reach jurisdictional waters and wetlands. Point-source discharges would likely require National Pollutant Discharge Elimination System Permits under Section 402 of the Clean Water Act, which is administered by U.S. EPA or by states with approved programs. Pollutants may also be discharged through spills and other accidents. **Activities associated with the authorized mining activities may also have other direct and indirect effects on wetlands, streams, and other aquatic resources.**

Id. at p. 27 (emphasis added).

However, despite this direct and specific requirement, and even though the heavy mineral sands/titanium mining activities for the southward expansion of Mission Mine and the Indian Boundary Mine mirror the heavy mineral sands/titanium mining activities proposed by Twin Pines on the east side of the Okefenokee Swamp, mining activities by Chemours/Dupont/Twin Pines south of the Okefenokee Swamp, existing phosphate mining south of the Okefenokee Swamp, in Hamilton County, Florida, and phosphate mining proposed by HPS II south of the Okefenokee Swamp in Bradford and Union Counties, Florida, the NWP 44 Permits issued for the Mission Mine and Indian Boundary Mine were done so without a cumulative impacts analysis, despite clear scientific evidence of such impacts.

Furthermore, USACOE Headquarters also failed to consider the cumulative effects of dewatering the regional Floridan Aquifer System that results in catastrophic, destructive wildfires, when it issued the NWP 44 – Mining activities for southward expansion of Mission Mine (SAS-2012-01042) and Indian Boundary Mine (SAS-2017-00669). The Declaration provided by CAPM member Mark Lyons references some of the catastrophic, destructive wildfires associated with the Okefenokee Swamp from the direct, indirect/secondary, and cumulative adverse impacts on the regional Floridan Aquifer System from the regional mining. **Attachment Vg**. The prolonged burning times and destructive nature of those wildfires resulted from the dewatering of the thick organic soils in the wetlands that comprise the Okefenokee Swamp and surrounding wetlands in the Greater Okefenokee Swamp Basin.

On September 19, 2019, by Chemours/Dupont/Twin Pines, applied for and was granted a Special Use Permit from to Bradford County for a mine expansion in Bradford County that would include 2,106.11 acres of additional mining activities south of the Okefenokee Swamp (*see* **Attachments Vt1**; **Vt2**. Based on numerous FOIA requests to the USACOE by CAPM members, the USACOE has issued no permit for, or received any application from Chemours/Dupont/Twin Pines to expand mining activities for heavy mineral sands/titanium mining in Bradford County, as evidenced by the lack of responses to a FOIA request for those specific permits, if in existence. **Attachment Vt3**. Those proposed mining activities also are within the Greater Okefenokee Swamp Basin. The multiple FOIA requests to the USACOE for mining applications and permits within the Greater Okefenokee Swamp Basin also produced no applications or permits for mining activities for the proposed HPS II phosphate mining in Bradford and Union Counties, despite the fact that HPS II already has conducted mining related activities.

Finally, the "appropriate geographic area (*e.g.,* watershed, ecoregion, Corps district geographic area of responsibility, other geographic region)...." to be assessed, per the NWP Rules and Regulations, **Attachment Va1 at p. 1860**, is the Greater Okefenokee Swamp Basin, regional Floridan Aquifer System, and Southeastern Coastal Plain Ecoregion as all of these ecosystems rely upon each other. Any adverse direct, indirect/secondary, and cumulative impacts to one will result in adverse direct, indirect/secondary, and cumulative effects to all of the ecosystems. *See* **Attachments IId; Ve1-Ve17.**

Mining is an example of a type of activity that results in permanent, irreversible adverse water quantity and water quality effects to the Floridan Aquifer System and all of the ecosystems and endemic species within the Southeastern Coastal Plain Ecoregion. Those adverse impacts on habitat from those mining activities "result from changes in water levels, water flow and

circulation, salinity, chemical content, and substrate characteristics and elevation" and "result in the loss or change of breeding and nesting areas, escape cover, travel corridors, and preferred food sources for resident and transient wildlife species associated with the aquatic ecosystem," in violation of 40 CFR Section 230.32.

One example of those adverse water quality effects includes acidic pollutants discharged from phosphate mining waste that dissolve the carbonate structure or skeleton of the regional Floridan Aquifer System that is known as the matrix. When the matrix dissolves, permanent and irreversible collapse of parts of the regional Floridan aquifer system may occur even considerable distances away from the surface footprint of the mining activities that caused those collapses. **Attachment VIq1.**

Another example of those permanent, irreversible, adverse water quality effects from mining activities is the abnormally high levels of iron and pollutants released from humate layers during and after the surficial aquifer is mined and homogenized from heavy mineral sands/titanium mining. Those impacts can extend throughout all tributaries and wetlands associated with those discharges. **Attachments VIl; VIv.**

Sinkholes also can result from water quality alterations within the regional Floridan Aquifer System (e.g., acidic waste from mining activities) as well as from the dewatering (e.g., water quantity alterations) associated with heavy mineral sands/titanium mining, phosphate mining, and most other types of mining within the regional Floridan Aquifer System, where the water table is near the surface in most areas that have not been mined or otherwise dewatered. Examples of both water quantity and water quality alterations that are permanent and irreversible from mining activities within the Southeastern Coastal Plain Ecoregion and regional Floridan Aquifer System are provided in **Attachments In; Ip; Iq; IIa-IId; IIg1-IIg3; IIIe-IIIf; IIIi-IIIj; IVd-IVe; Ve1-Ve18**.

Accordingly, the cumulative impacts must be accessed in an AEIS for proper analysis under federal laws, and the issuance of the NWP 44 Permits for mining within this environmentally sensitive area was arbitrary and capricious.

E. Presumption of Economic Benefits with Mining in NWP 44 Decisional Documents is Flawed, and Approval based upon this Presumption is Arbitrary and Capricious

The 2017 NWP 44 Decisional Document allows for a consideration of the "Economic" benefit of mining to a community to weigh in favor of public interest, and makes the blatant statement that "Mining activities will have positive impacts on the local economy," without any factual support for such a presumed result. **Attachment Vb4 at p. 36**. However, to the contrary, Dr. Richard Weisskoff, Harvard graduate and Professor of Economics at University of Miami, has conducted detailed economic analyses of the economic impacts of mining activities in the same region as Mission Mine and the Indian Boundary Mine. **Attachment Vl1**. Specifically, mining activities that Dr. Weisskoff used for his detailed economic analyses were within the extent of the regional Floridan Aquifer System and Southeastern Coastal Plain Ecoregion.

Dr. Weisskoff's 2010 report, "Economic Impact of Mining on Levy County, Florida: A Strategic View," negates the blatant statement that mining activities will have positive impacts on the local economy, and concluded that while giant industrial mines may create "35 to 52 jobs," it could "also cause the loss of 1,371 jobs and alter the character of the region." **Attachment Vl1** at p 19. Dr. Weisskoff cautioned that mining industries using environmentally sensitive lands would "**sacrifice the county's real legacy, which is to guard its forests and wetlands, to fish and boat in its waters, to farm the land and harvest the timber, and develop a 'cluster' of low-impact outdoor activities of unsurpassed variety, accessibility, and affordability**," and recommended that the there is more of a "**lead in developing more jobs on the basis of recreational activities rather than on "new" and especially-heavy industry,** especially, **whose very creation is competitive and antithetical to environmentally-sensitive recreation, hunting, and fishing**." *Id*. at 18 – 19 (emphasis added). *See also* **Attachments Vm1-Vm2** (discussing the consequences of adverse land uses on the ecosystem); **Vh1-Vh3** (discussing the economic benefits of preserving nature).

Dr. Weisskoff further explained, "Mining is a machine-intensive industry, requiring great use of capital, energy, and relatively steady and well-paid labor, while the recreation and sports "industry" reflects purchases of food, lodging, gasoline, specialized but lightweight equipment (guns, fishing rods, ammunition, etc.), and government licenses and permits, paid for the most part in the region. The mine, on the other hand, is a foreign-owned, centrally-operated branch plant, while recreation is a decentralized, highly-personalized set of individual behaviors and spending, competing for the same space as the mine." *Id*. at 14.

In 2016, Dr. Weisskoff released a two-part economic analysis of the proposed phosphate mining activities in Bradford and Union Counties, Florida that are comparable to the mining activities for the southward expansion of Mission Mine and the Indian Boundary Mine in Charlton County, Georgia, on the east side of the Okefenokee Swamp. **Attachment Vl2**.

The 2016 report discussed long-term adverse economic effects of mining on communities, and provide examples of the growth stunting economic impacts directly resulting from mining activities that contradict the 2017 NWP 44 Decision Document's blatant conclusion that "**Mining activities will have positive impacts on the local economy**." **Attachment Vb4 at p. 36.** Specifically, the 2016 report found that there are inflated expectations when a mining activity is proposed as owners of agricultural lands are paid high prices to sell or lease for mining, "giving the impression that the owners and their families are financially secure for the rest of their lives. Unfortunately, the boom-and-bust cycle begins with the initiation of the mining and the processing operations. **The sudden growth is not sustainable and the community is converted into a moonscape that continues for decades**," *id.* at p. 2, and takes away the opportunity for continued sustainable livelihoods such as citrus, cattle, and vegetable farms and tourism. *Id*. at p. 5. Dr. Weisskoff cautioned that "[p]hosphate mining technology results in wasted land and contaminated water, and, during the mining period, actually fewer local jobs than before the mining started. Finally, at the end of the process, there may be no jobs for anybody once the land is mined out and the processing plants have moved abroad." *Id*. at pp. 5-6; *see also* **Attachment V13** (Wesskoff final report on economic effects of mining in communities).

Furthermore, the USFWS Division of Economics released a report in May 2019 titled, "The Economic Contributions of Recreational Visitation at the Okefenokee National Wildlife Refuge ("Okefenokee NWR"). *See* **Attachment Vh2**. The Okefenokee NWR is located on the west side of the NWP 44 – Mining Category permits issued for the southern extension of Mission Mine and the Indian Boundary Mine. Within the report is an analysis of the 2016 economic contributions of the Okefenokee NWR to the "four-county area of Charlton, Clinch, and Ware Counties in Georgia and Baker County, Florida," *id.* at p. 2, that are types of sustainable economic contributions (recreational, hunting, fishing) that Dr. Weisskoff described as being destroyed by local government's conversion to a non-sustainable, industrial, mining-based economy from mining activities. The USFWS Report concluded that visitor recreation expenditures for 2016 were "$64.7 million with non-residents accounting for $59.8 million or 93 percent of total expenditures. Expenditures on non-consumptive activities accounted nearly all expenditures." *Id.*

Furthermore, the USFWS recognized that "[s]pending in the local area generates and **supports economic activity within the four county area … The contribution of recreational spending in local communities was associated with about 753 jobs, $17.2 million in employment income, $5.4 million in total tax revenue, and $64.7 million in economic output.**" *Id.* at p. 3 (emphasis added).

Prior to the 2017 NWP Decisional Document and notably lacking from the USACOE Decisional Document or analysis for the Mission Mine and the Indian Boundary Mine on the east side of the Okefenokee Swamp, is the USFWS April 2012 Assessment of Ecosystem Services Associated with National Wildlife Refuges. **Attachment Vh3**. The assessment included an analysis of the wetland ecosystems that compose a large portion of the ONWR, and found that the Okefenokee NWR has extreme inherent value for its ecosystem services, such as water-quality provisioning and carbon sequestration, at an aggerate gross present value of approximately $4 billion, **Attachment Vh3 at pp. 33-38**, above and beyond the recreational values described above.

Finally, in the USFWS' "Banking on Nature 2017" Report, revised in July of 2019, the USFW emphasized that The National Wildlife Refuge System not only adds over 41,000 jobs to local communities, but also "generates many individual and societal benefits including, but not limited to, fish and wildlife conservation, open spaces, science and educational services, improvements in water quality, and flood resilience." **Attachment Vh1 at p. 5.**

The irreversible dewatering of the regional Floridan Aquifer System from mining activities, on the east side of the ONWR, are combined with the even greater irreversible dewatering of the regional Floridan Aquifer System from the heavy mineral sands/titanium mining by Dupont/Chemours/Twin Pines south of the Okefenokee Swamp and ONWR.

All of that water is essential for the survival of the Okefenokee Swamp, its habitat, and its wildlife that the ONWR depends on. The dewatering of the Okefenokee Swamp by removal of millions of gallons of ground water each day from each of the existing heavy mineral sands/titanium mining activities will continue to increase the occurrences of extreme low water levels and extreme, destructive wildfires and causing continued closures and loss of "local economic development" to each of those four counties surrounding the Okefenokee Swamp and ONWR.

Accordingly, in direct contradiction to the unsupported conclusion that mining activities have a positive effect on the local economy, there is extensive scientific evidence from federal agencies that support the conclusion that ***preservation of the Greater Okefenokee Swamp Basin has positive impact on the local economy***, and therefore the issuance of the NWP 44 Permits for mining within this environmentally sensitive area was arbitrary and capricious as there was a complete lack of analysis as to the benefits of a no build alternative or consideration of the economic value of protecting the Greater Okefenokee Swamp Basin.

F. Failure to Consider Climate Change when Issuing NWP 44 Permits for Mission Mine and Indian Boundary Mine was Arbitrary and Capricious

The USACOE's 2017 NWP Rules and Regulations recognizes that wetlands and other aquatic ecosystems are affected by resource extraction and climate change. **Attachment Va1 at p. 1861.** Additionally, the 2017 NWP 44 Decision Document also recognizes Climate Change as an environmental consequence to be considered in the analysis of whether or not to issue a NWP 44 Permit. **Attachment Vb4 at p. 35.** Specifically, it recognized that climate change is one of "greatest challenges our country faces with profound and wide-ranging implications for the … environment… It will have far-reaching impacts on natural ecosystems…" *Id.*

More specifically:

> Climate change can **affect ecosystems and species** through a number of mechanisms, such as **direct effects on species, populations, and ecosystems**; compounding the effects of other stressors; and the d**irect and indirect effects of climate change mitigation or adaptation actions** (Staudt et al. 2013). Other stressors include land use and land cover changes, **natural resource extraction** (including water withdrawals), pollution, species introductions, and removals of species (Staudt et al. 2013, Bodkin 2012, MEA 2005d) and changes in nutrient cycling (Julius et al. 2013).

Id. (emphasis added).

A review of the Southern Ionics Minerals application and subsequent decisional documents for the NWP 44 Permits issued for the Mission Mine and Indian Boundary Mine in the Greater Okefenokee Swamp Basin reveal a complete failure to analyze environmental consequences of climate change in correlation Twin Pines proposed mining; Chemours/Dupont/Twin Pines proposed mining expansion; HPS II proposed phosphate mining, will result in catastrophic increases in adverse impacts, such as dewatering consequences, that can be exacerbated by climate change. *See generally* **Attachments Vb4 Attachment Vb5, Attachment Vb6 (**Decisional Documents for Mission Mine (SAS-2012-01042) / Indian Boundary Mine (SAS-2017-00669)**.**

Dewatering is a serious concern for the regional Floridan Aquifer System. A 2003 USGS publication described the severe declines in the regional Floridan Aquifer System. **Attachment Vo.** That report focused on Ground Water in Freshwater-Saltwater Environments of the Atlantic Coast, and illustrated the significant drawdowns that had occurred by 2001 in Camden County,

Georgia and Nassau County, Florida. *Id.* at p. 30. ***It is important to note that those two counties are adjacent to and east of Charlton County, Georgia, where the mining east of the Okefenokee Swamp has been authorized as NWP – 44 Mining activities and proposed mining by Twin Pines in Charlton County***. Additionally, the USGS Report shows that groundwater withdrawals in both Camden County, Georgia and Nassau County, Florida ranged from 31 to 80 million gallons per day in 2001. *Id.* at p. 51.

The dewatered condition of the regional Floridan Aquifer System resulting increased salinities in that aquifer system are severe environmental concerns that cannot be overlooked:

> Ground-water withdrawals have resulted in long-term regional water-level declines of more than 10 ft in three broad areas of the flow system: (1) coastal Georgia and adjacent South Carolina and northeast Florida; (2) west-central Florida; and (3) the Florida panhandle (fig. 18). In these and a number of other coastal areas, ground-water withdrawals have reversed the generally seaward direction of ground-water flow, creating the potential for saltwater intrusion from the Gulf of Mexico or Atlantic Ocean or from deep parts of the aquifer that contain saltwater.
>
> *Id*. at p. 27.
>
> The natural balance between freshwater and saltwater in coastal aquifers is **disturbed by ground-water withdrawals and other human activities that lower ground-water levels, reduce fresh ground-water flow to coastal waters, and ultimately cause saltwater to intrude coastal aquifers.**
>
> *Id*. at p. 31.
>
> **Ground water withdrawn from the Upper Floridan aquifer is the principal source of water supply for 24 counties of coastal Georgia**… As part of the interim strategy, **the GaEPD has restricted permitted withdrawals of water from the Upper Floridan aquifer in parts of the coastal area** (including the Savannah and Brunswick areas) **to 1997 rates, has restricted additional permitted pumpage in all 24 coastal counties to 36 Mgal/d above 1997 rates,** and has encouraged and promoted conservation and reduced ground-water use wherever feasible throughout southeast Georgia.
>
> *Id.* at p. 49.

It is important to note that the "**36 Mgal/d [million gallons per day] above 1997 rates**," referenced above as a withdrawal restriction by the Georgia Environmental Protection Division ("EPD") is **less than the daily discharge volume of industrial wastewater from only a single discharge in Bradford County, Florida of the multiple discharges authorized under the NPDES permit** for the heavy mineral sands/titanium mining by Chemours/Dupont/Twin Pines, yet such mining activities were not considered in a cumulative impacts analysis or climate change analysis when the NWP 44 Permits were issued for Mission Mine and Indian Boundary Mine.

That 2003 USGS publication also emphasized the importance of the regional Floridan Aquifer System as the major source of water supply in southeastern Georgia and northeastern Florida as "ground-water withdrawals in the 24-county area of coastal Georgia served more than 500,000 people in 1997," **Attachment Vo at p. 51,** and due to the regional scale of the Floridan Aquifer System and other aquifer systems along the Atlantic coast, the effects of withdrawals from regional aquifer systems on neighboring communities. *Id.* at p. 6.

Accordingly, the USACOE failed to consider the cumulative adverse effects of the climate change and dewatering of the regional Floridan Aquifer System, including on the sole public water supply of communities and increased salinity of the regional aquifer system, by the individual direct, indirect/secondary, and cumulative adverse impacts of mining, including in the Greater Okefenokee Swamp Basin, when it arbitrary and capriciously issued the NWP 44 – Mining activities for southward expansion of Mission Mine (SAS-2012-01042) and Indian Boundary Mine (SAS-2017-00669).

G. NWP 44 Mining Activity Conditions are Not Met for the Mission Mine and Indian Boundary Mine

The NWP 44 – Mining Activities contains 32 NWP General Conditions under Section A, that must be met for a valid permit under the NWP 44 – Mining Category. **Attachment Vq.** The pertinent conditions that are failed to be met are as follows: Navigation; Aquatic Life Movements; Suitable Material; and Water Supply Intakes.

Condition 1. Navigation. (a) No activity may cause more than a minimal adverse effect on navigation.

The heavy mineral sands/titanium mining activities currently being conducted by Chemours/Dupont/Twin Pines south of the Okefenokee Swamp, in northeast Florida already has resulted in catastrophic adverse effects on navigation in the Santa Fe River, as well as in the headwaters and tributaries of the Santa Fe River and the New River. **Attachment Ve1.** Those catastrophic adverse effects have included multiple catastrophic flooding events in Alachua, Bradford, Columbia, and Union Counties from wastewater discharges from that heavy mineral sands/titanium mining activities, not only making navigation impossible, but threatening destruction of public bridges over those navigable waters and public roads associated with those navigable waters. *See also* **Attachments Vg**; **Vs1-Vs2** (Declarations of CAPM members Mark Lyons, Steve Lodle, and Carol Burton**).**

Multiple Freedom of Information Act ("FOIA") requests were submitted to the USACOE for copies of all mining permits and applications within the Greater Okefenokee Swamp Basin and for other documents. Despite those FOIA requests, no copies of any USACOE mining permits, including even NWP 44 mining permits, were provided for the heavy mineral sands/titanium mining currently being conducted by Chemours/Dupont/Twin Pines south of the Okefenokee Swamp, nor were applications or permits produced for mining activities for the proposed HPS II phosphate mining in Bradford and Union Counties, **Attachment Vt3**, despite the fact that HPS II already has conducted mining related activities without a permit from the USACOE. All of the heavy mineral sands/titanium mining activities by Chemours/Dupont/Twin Pines south of the

Okefenokee Swamp are within the Greater Okefenokee Swamp Basin. A map of the Greater Okefenokee Swamp Basin is included in **Attachment Ia**.

The heavy mineral sands/titanium mining activities currently being conducted by Chemours/Dupont/Twin Pines south of the Okefenokee Swamp; the heavy mineral sands/titanium mining activities proposed east of the Okefenokee Swamp by Twin Pines; the heavy mineral sands/titanium mining activities currently proposed by Chemours/Dupont/Twin Pines south of the Okefenokee Swamp in Bradford County, Florida; and phosphate mining proposed by HPS II south of the Okefenokee Swamp in Bradford and Union Counties, Florida, are contributing to flooding or have the potential to contribute to flooding from discharges that will affect Navigation and therefore require an Areawide Environmental Impact Statement be conducted within the Greater Okefenokee Swamp Basin, including in floodplains of tributaries of the Suwannee River. The current NWP 44 Permits issued are therefore arbitrary and capricious.

Condition 2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water.

Most types of aquatic life (e.g., federally endangered and threatened mussels and fish, such as salmon attempting to swim upstream to spawn) cannot relocate when their waterbodies (i.e., wetlands, lakes, tributaries, other special aquatic sites/aquatic ecosystems, and Waters of the US) are dewatered, contaminated by mining activities, and/or affected by abnormal flooding from discharges of contaminated industrial wastewater from mining and processing of mined material. **Attachments Im; Vm1-Vm2; VIq1;** *see also* **Section VII.** The disruption of aquatic life in dewatered and/or contaminated waterbodies not only substantially disrupts "the necessary life cycle movements" of those species indigenous to the body of water, but also those migratory species, and can result in the death of those aquatic species due to lack of food and essential habitat needs. *See* **Section VII.** For example, sessile mussels are unable to swim, walk, or fly to a new location when the waterbodies they are indigenous to are dewatered and/or contaminated by mining activities. *See* **Section VII.**

The dewatering of waterbodies from direct, indirect/secondary, and cumulative adverse effects of mining activities as discussed above, results in irreversible adverse impacts to the indigenous aquatic life within the Floridan Aquifer System and Southeastern Coastal Plain Ecoregion. **Attachment IId; Ve1-VE17,** *see also* **Section VII.** The cumulative impacts from mining activities on aquatic live movements from the southward expansion of Mission Mine and the Indian Boundary Mine located on the east side of the Okefenokee Swamp in Charlton County, Georgia; heavy mineral sands/titanium mining activities proposed east of the Okefenokee Swamp, in Charlton County by Twin Pines; heavy mineral sands/titanium mining activities proposed by Chemours/Dupont/Twin Pines south of the Okefenokee Swamp in Bradford County, Florida and currently being operated without any apparent federal permits; heavy mineral sands/titanium mining activities by Dupont/ Chemours/Twin Pines that have been underway for years south of the Okefenokee Swamp in Baker, Bradford, Clay, and Duval Counties; phosphate mining activities that have been underway for decades south of the Okefenokee Swamp, in Hamilton County; and the phosphate mining activities proposed by HPS II south of the Okefenokee Swamp, in Bradford

and Union Counties, Florida, have never been evaluated for the substantial disruption of the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, and those migratory species, through the Santa Fe River, Suwannee River, and throughout the Greater Okefenokee Swamp Basin, and accordingly require an Areawide Environmental Impact Statement. The current NWP 44 Permits issued are therefore arbitrary and capricious.

Additionally, Section VII herein provides a detailed description of the hazardous mining waste associated with the existing and proposed heavy mineral sands/titanium mining activities and phosphate mining activities that must be addressed in the comprehensive AEIS. That hazardous mining waste will "**substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody**." Therefore, those materials that are being discharged violate General Condition 2.

Condition 6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).

The material authorized by the USACOE to be mined under the NWP 44 - Mining Category for the southward expansion of Mission Mine and the Indian Boundary Mine is not suitable material to be discharged into all of the waterbodies (i.e., wetlands, lakes, tributaries, other special aquatic sites/aquatic ecosystems, and Waters of the US) that were authorized to be mined as such material is not "free from toxic pollutants." *See* **Section VI.** That is because all of the individual layers of the surficial aquifer will be homogenized during the extraction of the titanium and other desirable minerals, including materials that were not previously toxic or biologically reactive because that material was bound in those aquifer layers. **Attachment Vu.** Those naturally bound materials become toxic pollutants after they are mined, homogenized, and discharged into those waterbodies during and after that mining process, adjacent to the east side of the Okefenokee Swamp. **Attachments Im; VII;** *see also* **Section VI.**

As an example, Chemours/Dupont/Twin Pines discharges in Bradford County, Florida, which are comparable to the mining at Mission Mine and the Indian Boundary Mine, have been found by the Florida Department of Environmental Regulation ("FDEP") to discharge unsuitable material. **Attachment Vq.** Specifically, violations documented in effluent grab samples for toxicity testing collected in September 2014 contained: ammonia concentration at 0.04 mg N/L; iron (1080 ug/L) exceeded Class III Fresh Water Criteria and the permitted limit; and suspended solids, fluoride, arsenic, total chromium and nickel were detected between the laboratory method detection limits (MDL) and practical quantitation limits (PQL). *Id.*

Furthermore, under the USEPA requirements contained in the 404(b)(1) Guidelines, **Attachment Va2**, the USACOE is prohibited from issuing a CWA 404 permit if the proposed discharge of dredged or fill material "will cause or contribute to significant degradation of the waters of the United States:"

> [N]o discharge of dredged or fill material shall be permitted which will cause or contribute to significant degradation of the waters of the United States. . . .
> [E]ffects contributing to significant degradation considered individually or

> collectively, include:
> (1) Significantly adverse effects of the discharge of pollutants on human health or welfare, including but not limited to effects on municipal water supplies, plankton, fish, shellfish, wildlife, and special aquatic sites.
> (2) Significantly adverse effects of the discharge of pollutants on life stages of aquatic life and other wildlife dependent on aquatic ecosystems, including the transfer, concentration, and spread of pollutants or their byproducts outside of the disposal site through biological, physical, and chemical processes;
> (3) Significantly adverse effects of the discharge of pollutants on aquatic ecosystem diversity, productivity, and stability. Such effects may include, but are not limited to, loss of fish and wildlife habitat or loss of the capacity of a wetland to assimilate nutrients, purify water, or reduce wave energy; or
> (4) Significantly adverse effects of discharge of pollutants on recreational, aesthetic, and economic values.
>
> 40 C.F.R. § 230.10(c).

According to the USFWS briefing packet for the Georgia Department of Natural Resources Board of Commissioners during consideration of Dupont's original attempt to obtain permits to mine Trailridge east of the Okefenokee Swamp in the late 1990s, **Attachment Vu**, extensive permanent and irreversible adverse effect occur from mining activities as further detailed below. *Id.* at p. 12. ("Effects of Proposed Mining on the Soil Profiles of Trail Ridge" *compare* "Before Mining" *with* "After Mining" cross sections). Heavy mineral sands/titanium mining activities within the extent of the regional Floridan Aquifer System and Southeastern Coastal Plain Ecoregion involve dredging, and homogenizing into a slurry, the upper layer of the Floridan Aquifer System (i.e., the surficial aquifer). That includes the lower-permeability layers associated with surficial aquifer, as illustrated in **Attachment Vu** at p. 12. Those lower-permeability layers, often referenced as "hardpan," are essential for the survival of wetlands, particularly during natural, cyclical periods of low rainfall. Specifically, those lower-permeability layers retard the vertical, downward flow of water in and surrounding wetlands throughout that entire ecoregion and promote lateral flow to adjacent and neighboring wetlands and streams. **Attachments IId; Ve1-Ve17; Vu.**

Heavy mineral sands/titanium mining waste is dredged material that is then discharged as contaminated fill into the dredged pits. That dredged material contains contaminants, including hazardous materials that are not desirous to the mining company and thus, not retained with the desirable minerals that are mined. *See* **Section VI**. Those dredged pits include all of the dredged wetlands within the surface footprint of the authorized mining area. **Attachment Vt1;** *see also* **Section V.** Those discharges of dredged or fill material, as contaminated mine waste slurry, occur throughout the entire mine site. **Attachments Im; VIc; VIl.** Those contaminated discharges occur in all mined wetlands, streams, and other special aquatic sites/aquatic ecosystems and must be a consideration when issuing a NWP 44 Mining Permit as those discharges result in permanent adverse effects to, loss of, and change the use of Waters of the US:

> by filling, flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material

> that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters for **determining whether a project may qualify for an NWP**; it is **not a net threshold that is calculated after considering compensatory mitigation that may be used to offset** losses of aquatic functions and services....
>
> **Attachment Vq at p. 15** (emphasis added).

Examples of the adverse impacts from heavy mineral sands/titanium mining activities by Chemours/Dupont, that result in more than minimal individual or cumulative adverse environmental effects, including flooding, are described in **Attachment Ve1**. Those mining activities are located south of the Okefenokee Swamp, within the regional Floridan Aquifer System and the Coastal Plain Ecoregion. Those adverse impacts exemplify the "**more than minimal individual or cumulative adverse environmental effects**" that will result from the heavy mineral sands/titanium mining activities authorized by the USACOE under the two NWP 44 – Mining Category permits east of the Okefenokee Swamp (i.e., SAS-2012-01042 for southward expansion of Mission Mine and SAS-2017-00669 for the Indian Boundary Mine), within the regional Floridan Aquifer System and the Southeastern Coastal Plain Ecoregion.

Additionally, the 404(b)(1) Guidelines describe wildlife loss of values, 40 CFR Section 230.32, and recreational and commercial fisheries loss of values, 40 CFR Section 230.51, *id.* at p. 21, that result from the discharge of contaminated fill, in addition to changes in water levels, water flow and circulation, salinity, chemical content, and substrate characteristics and elevation:

> a. Wildlife. Wildlife associated with aquatic ecosystems are resident and transient mammals, birds, reptiles, and amphibians.
> b. Possible loss of values. The discharge of dredged or fill material can result in the **loss or change of breeding and nesting areas, escape cover, travel corridors, and preferred food sources for resident and transient wildlife species associated with the aquatic ecosystem**. **These adverse impacts upon wildlife habitat may result from changes in water levels, water flow and circulation, salinity, chemical content, and substrate characteristics and elevation**. **Increased water turbidity can adversely affect wildlife species** which rely upon sight to feed, and disrupt the respiration and feeding of certain aquatic wildlife and food chain organisms. **The availability of contaminants from the discharge of dredged or fill material may lead to the bioaccumulation of such contaminants in wildlife.** Changes in such physical and chemical factors of the environment may favor the introduction of undesirable plant and animal species at the expense of resident species and communities. In some aquatic environments lowering plant and animal species diversity may disrupt the normal functions of the ecosystem and lead to reductions in overall biological productivity.
>
> **Attachment Va2 at p. 16** (emphasis added).

a. Fisheries: Recreational and commercial fisheries consist of harvestable fish, crustaceans, shellfish, and other aquatic organisms used by man.
b. Possible loss of values: The discharge of dredged or fill materials can affect the suitability of recreational and commercial fishing grounds as habitat for populations of consumable aquatic organisms. **Discharges can result in the chemical contamination of recreational or commercial fisheries.** They may also interfere with the reproductive success of recreational and commercially important aquatic species through disruption of migration and spawning areas. **The introduction of pollutants at critical times in their life cycle may directly reduce populations of commercially important aquatic organisms or indirectly reduce them by reducing organisms upon which they depend for food.** Any of these impacts can be of short duration or prolonged, depending upon the physical and chemical impacts of the discharge and the biological availability of contaminants to aquatic organisms.

Id. at pp. 20-21 (emphasis added).

Section VII herein provides a detailed description of the hazardous mining waste associated with the existing and proposed heavy mineral sands/titanium mining activities and phosphate mining activities that must be addressed in the comprehensive AEIS. That hazardous mining waste being discharged is **not** "**suitable material**" because it is **not "free from toxic pollutants in toxic amounts.**" Therefore, those materials that are being discharged violate General Condition 6.

The cumulative impacts from unsuitable mining material from the southward expansion of Mission Mine and the Indian Boundary Mine located on the east side of the Okefenokee Swamp in Charlton County, Georgia; heavy mineral sands/titanium mining activities proposed east of the Okefenokee Swamp, in Charlton County by Twin Pines; heavy mineral sands/titanium mining activities proposed by Chemours/Dupont/Twin Pines south of the Okefenokee Swamp in Bradford County, Florida and currently being operated without any apparent federal permits; heavy mineral sands/titanium mining activities by Dupont/ Chemours/Twin Pines that have been underway for years south of the Okefenokee Swamp in Baker, Bradford, Clay, and Duval Counties; phosphate mining activities that have been underway for decades south of the Okefenokee Swamp, in Hamilton County; and the phosphate mining activities proposed by HPS II south of the Okefenokee Swamp, in Bradford and Union Counties, Florida, have never been evaluated for the cumulative discharges of toxic material through the Santa Fe River, Suwannee River, and throughout the Greater Okefenokee Swamp Basin, and accordingly require an Areawide Environmental Impact Statement. The current NWP 44 Permits issued are therefore arbitrary and capricious.

Condition 7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

First, neither of the NWP 44 – Mining Category permits authorized on the east side of the Okefenokee Swamp for the Mission Mine and Indian Boundary Mine are "for the repair or improvement of public water supply intake structures or adjacent bank stabilization." *See*

Attachments Vb4-Vb6. Secondly, although the Safe Drinking Water Act ("SDWA") does not specifically define "public water supply," the SDWA includes a definition of a "public water system:"

> The term ''public water system'' means a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves at least twenty-five individuals.
>
> Section 1401(4)(A).

The regional Floridan Aquifer System is the public water supply and public water system throughout most of the extent of that regional aquifer system. That regional aquifer system has considerably more than fifteen service connections and regularly serves more than twenty-five individual members of the public that regularly rely on the regional Floridan aquifer system as their sole source of water via rural wells which provide the public water for human consumption. **Attachment Vo; Attachment Vs2.**

The NWP 44 – Mining Category activities for the southward expansion of Mission Mine and the Indian Boundary Mine both are located in the proximity of water supply intakes for the City of Folkston's public water supply facility's groundwater supply system in Folkston, Georgia, and also are located in the proximity of water supply intakes for the City of Homeland's public water supply facility's groundwater supply system in Homeland, Georgia. **Attachments Vb1-Vb2; Vs2; VIIc; *see* Section V.** These mining activities located east of the Okefenokee Swamp threaten the loss of public water supply for the approximately 1,657 Charlton County residents receiving water from those two facilities. *Id.*, *see also* **Attachment IId; Attachments Ve1-Ve17.** Many of the remaining 11,311 residents in Charlton County, who receive their water from the public water supply provided to individual wells by the Floridan Aquifer System's groundwater supply system, **Attachment Vs2**, are at risk of losing their public water supply from the direct, indirect, and cumulative adverse impacts of heavy mineral sands/titanium mining activities from the Mission Mine and Indian Boundary Mine as well as proposed heavy mineral sands/titanium mining activities by Twin Pines, all located on the east side of the Okefenokee Swamp. *Id.* Consequently, the mining activities on the east side of the Okefenokee Swamp authorized by the USACOE under the NWP 44 – Mining Category permits are invalid because they violate General Condition 7 of those permits.

Furthermore, the public water supply for the Cherokee of Georgia Tribal Council in Charlton County, Georgia is a specific example of existing wells providing water for human consumption through pipes from the Floridan Aquifer System's groundwater supply system. **Attachment VIh3.**The loss of those public water supplies will occur as a result of the adverse indirect and cumulative impacts from mining activities east of the Greater Okefenokee Swamp Basin and the adverse direct, indirect, and cumulative impacts. **Attachment Vg**. Therefore, all of those mining activities must be considered in the comprehensive AEIS to address all of the adverse direct, indirect/secondary, and cumulative impacts of those mining activities on the Greater Okefenokee Swamp Basin, the regional Floridan Aquifer System, and the Southeastern Coastal Plain Ecoregion.

The Declaration by CAPM member Carol Burton (*see* **Attachment Vs2**) also describes the real-life experiences of how similar loss of public water supplies already has occurred south of the Okefenokee Swamp, in northeast Florida, as the result of heavy mineral sands/titanium mining activities by Chemours/Dupont/Twin Pines. The USACOE responses to FOIA requests for copies of all of the permits issued for mining activities within the Greater Okefenokee Swamp Basin, including for all of the mining south of the Okefenokee Swamp, produced **no** federal permit documents for that large-scale heavy mineral sands/titanium mining currently being conducted by Chemours/Dupont/Twin Pines south of the Okefenokee Swamp *Id*.

Those other heavy mineral sands/titanium mining activities within the Greater Okefenokee Basin, regional Floridan Aquifer System, and Southeastern Coastal Plain Ecoregion are located south of Okefenokee Swamp and being conducted by Chemours/Dupont/Twin Pines in the proximity of water supply intakes in Clay County, Florida. **Attachment Im; Attachment VII.** Those mining activities have resulted in such significant dewatering of the regional Floridan Aquifer System that those public water supplies were lost. Sinkholes also have occurred in proximity to those heavy mineral sands/titanium mining activities by Chemours/Dupont/Twin Pines that are located in the proximity of water supply intakes. **Attachment Ip; Attachment Iq**.

Other proposed mining activities that are located in the proximity of water supply intakes, including those proposed mining activities include the Chemours/Dupont/Twin Pines mine expansion in Bradford County and the HPS II phosphate mining in Bradford and Union Counties. **Attachments Vt1** and **Vk**, respectively.

Accordingly, as the cumulative effect upon public water supplies has not been evaluated no activities related to those proposed mining activities should occur until after all of the comprehensive adverse direct, indirect/secondary, and cumulative impacts of those proposed mining activities south of the Okefenokee Swamp have been considered in the AEIS for the Greater Okefenokee Swamp Basin, and the issuance of the current NWP 44 Permits is therefore arbitrary and capricious.

H. Mitigation for the NWP 44 Mining Activities for the Mission Mine and Indian Boundary Mine are Insufficient

Mitigation measures, pursuant to the NWP Decision Document, must ensure that the cumulative adverse environmental effects of these activities are no more than minimal. **Attachment Vb4 at p. 27.** However, the adverse effects of dewatering the regional Floridan Aquifer System as a result of the Mission Mine and Indian Boundary Mine NWPs are incapable of being mitigated. **Attachments IId; Ve1-Ve17; Vu.** That fact means it also is impossible to reverse the permanent alteration of natural hydroperiods within the Southeastern Coastal Plain Ecoregion, resulting in permanent **adverse individual and cumulative adverse effect on the environment** of all of the ecosystems and endemic species in that Ecoregion, including federally threatened and endangered species.

Additionally, the accounts of wetlands that would be "lost" by mining activities are a gross underreport based on the actual total acreage of wetlands that are and will be permanently lost because of the permanent alteration of natural hydroperiods. **Attachments IId; Ve1; Ve9.**

The alteration of natural hydroperiods, from individual mining activities that involve dredging into and/or dewatering the surficial aquifer, extends far beyond the surface footprint of those single, individual mining activities, resulting in why wetlands both within and beyond the surface footprint of those individual mining activities cannot by "preserved" or "recreated" or "mitigated," and the fallacy of "mitigation banks" as a restorative remedy. **Attachments IId; Ve1; Ve8.**

Therefore, there is no factual basis that any "mitigation measures" can "ensure that the cumulative adverse environmental effects of these activities are no more than minimal" for mining activities that are "similar in nature" to the southern extension of Mission Mine and the Indian Boundary Mine, for all of the reasons described in this NOI.

Furthermore, compensatory are also insufficient. Compensatory mitigation should be "located within the same watershed as the impact site, and should be located where it is most likely to successfully replace lost functions and services, taking into account such watershed scale features as aquatic habitat diversity, habitat connectivity, relationships to hydrologic sources (including the availability of water rights), trends in land use, ecological benefits, and compatibility with adjacent land uses." 33 CFR 332.3(b)(1).

Compensatory mitigation in the same watershed or where it will replace lost functions will not remedy permanent loss as there are no impenetrable hydrologic barriers in the regional Floridan Aquifer System that prevent dewatering associated with heavy mineral sands/titanium mining and phosphate mining from pirating of water from surrounding watersheds. **Attachments IIa; Ve1.** The dewatering of the regional Florida Aquifer System from mining activities, such as Mission Mine and Indian Boundary Mine, heavy mineral sands/titanium mining activities proposed by Twin Pines, all east of the Okefenokee Swamp, and proposed heavy mineral sands/titanium mining activities by Chemours/Dupont/Twin Pines and the phosphate mining proposed by HPS II, all south of the Okefenokee Swamp, are irreversible adverse impacts that cannot be mitigated because that water is gone. **Therefore, the adverse impacts from those types of mining activities** are **permanent, not temporary adverse impacts for which there is no valid mitigation. Therefore, the issuance of NWP 44 – Mining Category permits was arbitrary and capricious**.

I. Conclusion

Accordingly, for the reasons stated herein in Section V, and all of the attachments as incorporated by reference, the issuance of NWP 44 Mining Permits for Southern Ionics Minerals: Mission Mine and Indian Boundary Mine in the absence of an AEIS to adequately assess all cumulative impacts according to NEPA was arbitrary and capricious.

VI.
HAZARDOUS WASTE FROM MINING, MINERAL PROCESSING, AND FOSSIL FUEL COMBUSTION VIOLATE FEDERAL LAWS

This section incorporates herein, by reference, all preceding and other paragraphs and Attachments of this Notice of Intent to Sue ("NOI") regarding mining activities in Greater Okefenokee Swamp Basin, the regional Floridan Aquifer System, and the Southeastern Coastal Plain Ecoregion.

A. Despite Hazardous Waste Mining, Mineral Processing, and Fossil Fuel Combustion Exempted from USEPA Regulation, the Impacts must Still be Evaluated under NEPA

The USACOE must consider any permit issued by a federal agency under federal law within the purview of NEPA, the Nation's charter for protection of the environment. 40 C.F.R. § 1500.1(a).The USACOE is required to analyze the indirect and cumulative effects of the proposed mine that are reasonably foreseeable consequences as well as the impacts that will occur in conjunction with existing and expansions of other mining operations, regardless of where or those impacts might occur, and take a "hard look" at the environmental consequences of those actions. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 352 (1989); 40 C.R.F. § 1502.16(b).

Accordingly, it is the responsibility of the USACOE to analyze the indirect effects that would be caused by mining in the Greater Okefenokee Swamp Basin even if the mining operations are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to **induced changes in the pattern of land use, population density or growth rate**, and related effects on air and water and other natural systems, **including ecosystems**. Id. at § 1508.8(b) (emphasis added). Furthermore, the USACOE must analyze cumulative impacts on the environment which result from the **incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions**. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Id. at § 1508.7 (emphasis added).

Under the Council on Environmental Quality's regulations implementing NEPA, agencies must consider all "connected actions" that are closely related; "cumulative actions" that have cumulatively significant impacts; and "similar actions" that have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography within a single environmental impact statement. 40 C.F.R. § 1508.25(a).

NEPA ensures its commitment to "prevent or eliminate damage to the environment and biosphere" is honored by focusing the governmental agencies and public's attention on the environmental effects of proposed agency action. 42 U.S.C. § 4321. In this way, ***NEPA ensures that the agency will not act on incomplete information, only to regret its decision after it is too late to correct***. See *Robertson*, 490 U.S., at 349. Similarly, the broad dissemination of information mandated by NEPA permits the public and other government agencies to react to the effects of a proposed action at a meaningful time. *Id.* at 349–350.

The USEPA's definition of hazardous mining wastes includes "waste generated during the extraction, beneficiation, and processing of minerals." **Attachment VIa** (USEPA website at https://www.epa.gov/hw/special-wastes). Hardrock mining, which includes the mining of metallic ores and phosphate rock, begins with extraction, the initial removal of ore from the earth, followed by beneficiation, which is a process to free and concentrate the minerals of the extracted ore through a multitude of operations that include, but are not limited to, crushing; washing; pelletizing; briquetting; calcining; roasting in preparation for leaching; electrostatic separation; solvent extraction; and in situ leaching. *Id.*

The USEPA has recognized that the extraction and beneficiation of minerals "usually generates large quantities of waste." *Id.* Additionally, the mineral processing operations often change the chemical composition and physical structure of the ore or mineral through techniques including, but not limited to, smelting, electrolytic refining, and acid attack or digestion. **Attachment VIa.** The USEPA has recognized that mineral processing "waste streams" far from resemble the materials that entered the operation, "producing product and waste streams that are not earthen in character." *Id.*

The USEPA determined that most extraction and beneficiation wastes from hardrock mining, as well as 20 specific mineral processing wastes, would be excluded from the agency's regulations of hazardous waste under Subtitle C of the Resource Conservation and Recovery Act ("RCRA") enacted in 1976. *Id.* These hazardous wastes from mining and mineral processing include, but are not limited to the:

Phosphogypsum from phosphoric acid production
Slag from elemental phosphorous production
Gasifier ash from coal gasification
Process wastewater from coal gasification
Flurogypsum from hydrofluoric acid production
Process wastewater from hydrofluoric acid production
Process wastewater from phosphoric acid production
Chloride process waste solids from titanium tetrachloride production

Attachment VIa.

Despite the USEPA exemption from regulation of these specific hazardous mining waste under RCRA, the direct, indirect, and cumulative adverse effects must still be evaluated under NEPA before any agency action, such as the issuance of a NWP, takes place so that a hard look can be taken at the full spectrum of environmental damage being permitted. Therefore, the adverse direct, indirect/secondary, and cumulative effects of these hazardous wastes are required to be considered by agencies such as the USACOE in preparation of NEPA evaluations, such as an EIS and AEIS, in order to prevent the violation of federal laws such as the CWA, ESA, and SDWA.

B. Examples of Circumvention of NEPA Requirements for Considerations of Adverse Direct, Indirect/Secondary, and Cumulative Effects of Mining and Hazardous Wastes by the USACOE and Other Federal Agencies

There are numerous examples of the USACOE not requiring an AEIS or even an EIS prior to the issuance of a permit for mining in Florida and Georgia that involved dredging and discharge of dredged or fill material in waters of the United States. In some of those cases the USACOE did not require any permits, or at the most, required only a Nationwide Permit ("NWP"). *See* Section V.

i. Extraction of Fossil Fuels

One of those examples is the dangers of hazardous fossil fuel wastes disposed in a landfill that was filled with contaminants that leaked into groundwater in Wayne County, Georgia. **Attachments VIb1 through VIb7**. Hazardous waste accepted into a local landfill from fossil fuel included 800,000 tons of coal ash. *Id.* That coal ash was created from coal mined from an unknown location, then burned as fossil fuel by Jacksonville Electric Authority ("JEA") in Jacksonville, Florida. *Id.* That acceptance of hazardous wastes t to local landfills, and the subsequent leakage into groundwater, occurred without any USEPA oversight. *Id.*

The public was unaware of the threat to their sole source of potable water, as well as the threat to the recreational waters, until after the extensive groundwater contamination from that hazardous waste. *Id.* The seepage into groundwater potentially caused the unlawful discharge into the coal ash into tributaries and wetlands of the Altamaha River, *id.*, and cause disastrous affects to the fragile ecosystem similar to the 2008 coal ash disaster that covered nearby rivers in Tennessee. **Attachment VIb6**.

The landfill owner applied to the "U.S. Army Corps of Engineers to develop 25 acres of land near the landfill for a rail yard and four rail spurs at a length of 1 mile each off the CSX main rail line." The purpose of that rail facility would be to haul in "10,000 tons of coal ash every day from coal plants in other parts of the country," **Attachment VIb7**, again without any USEPA oversight, and without an AEIS requested by the USACOE upon receipt of the application despite the fact that coal-fired power plants in the US produce "more than 100 million tons of coal ash a year," containing "arsenic, lead and mercury" and causing "200 times the cancer risk as those same regulators deem acceptable." **Attachment VIb6**.

Consequently, the rural residents harmed by the initial activities by having their public water supply contaminated by that hazardous coal ash waste were forced to spend more than $1 million to fight the application, which was eventually withdrawn by the applicant. **Attachment VIb6.**

The failure of the USACOE to initiate an environmental assessment immediately for the dredging and filling of tributaries and wetlands to create a rail to further expand the transport and storage of hazardous mining waste, specifically coal ash, prevented a comprehensive evaluation and participation by the public during the review of the application. The allowance of storage of hazardous mining waste resulted in groundwater leakage that threatened regional actions water quality of waters of the US pursuant to the CWA, federally endangered and threatened species pursuant to the ESA, and drinking waters pursuant to the SDWA.

ii. Titanium Mining

Hazardous waste products generated from titanium mining include "[c]hloride process waste solids from titanium tetrachloride production." **Attachment VIa**. As discussed herein, despite that hazardous waste being exempted from USEPA regulation under RCRA, the presence from mining activities and the associated impacts are not exempt from a NEPA review. Therefore, adverse direct, indirect/secondary, and cumulative effects of that hazardous waste from all of the titanium mining within the Greater Okefenokee Swamp Basin must be considered during the AEIS for past, current, and proposed mining in that basin.

a. Dupont Mining in the 1990's

The USACOE's pattern and practice of circumventing NEPA requirements are evident in the Greater Okefenokee Swamp Basin. The extent of the Greater Okefenokee Swamp Basin is shown in the map included in **Attachment Ia**. In the 1990s, the USACOE failed to initiate promptly an AEIS or even an EIS for Dupont's proposed large-scale mining of Trailridge for titanium in south Georgia, east of the Okefenokee Swamp, or any of the existing mining in the Greater Okefenokee Swamp Basin south of the Okefenokee Swamp, which resulted in "scores of soil denuded of vegetation" within a 15-acre mine pit. *See* **Attachment Vd** (April 4, 1997 article by Charles Seabrook describing the scene when USDOI Secretary Bruce Babbitt flew over the Dupont mine); *see also* **Attachment Vt3.**

Since that fly-over inspection by USDOI in 1997, the Dupont/Chemours/Twin Pines mine pits, south of the Okefenokee Swamp, have increased in number and total surface area, as shown in various satellite images of that area included within the attachments incorporated into this NOI. It must be noted for clarification, although almost all of that mined area in four counties remains "denuded of vegetation" today, Secretary Babbitt was not looking at "soil" in any of those mined areas in 1997. In fact, he was looking at the dewatered, homogenized remains of the surficial aquifer, which forms the uppermost layer of the regional Floridan Aquifer System, as described in this NOI and the incorporated attachments, including **Attachment Vu**, which depicts a pre-mining and post-mining graphic created by the USFWS for the original proposed mining by Dupont on the east side of the Okefenokee Swamp in the 1990s. The dewatered, homogenized remains of the surficial aquifer, that looked like "soil" from an aerial view, also includes hazardous mine waste from the unwanted, processed material that was mined. *See* **Section VI.**

That action, and inaction, by the USACOE for Dupont's proposed mining of Trailridge, east of the Okefenokee Swamp in the 1990s mirrors the USACOE's action, and inaction, regarding the discharged fill material consisting of 800,000 tons of hazardous fossil fuel coal ash in the dredged (aka mined) pit in the Altamaha River's tributaries and wetlands described in subsection VI. B.i., above.

In fact, Dupont's titanium mining project proposed in the 1990s was approximately 50 miles due south of the site where 800,000 tons of hazardous fossil fuel, coal ash, were discharged into the dredged (aka mined) pit in the Altamaha River's tributaries and wetlands. **Attachments Vf2; VIb1-VIb7.** Similar to the fossil fuel hazardous waste discharges, the proposed mining of Trailridge also was withdrawn due to over-whelming negative public response.

b. Southern Ionics Mineral Mining and Chemours

On April 20, 2018, the USACOE issued NWP SAS-2012-01042 to Southern Ionics Minerals, LLC, to expand mining of Trailridge for titanium at the Mission Mine, located south of Lowther Road and west of River Road, near the City of Folkston, in Charlton County, Georgia and east of the Okefenokee Swamp, **Attachment Ic,** despite the serious issues described in Section V that evidences the issuance was arbitrary and capricious, and without any evaluation of mining wastes.

On February 4, 2019, the USACOE referenced Jurisdictional Determinations ("JD") for wetlands in both Brantley and Charlton Counties, evidencing that efforts to expand Trailridge mining on the east side of the Okefenokee Swamp, and within Big Bay Swamp 5 miles east of the Okefenokee Swamp, have been ongoing since at least 2013. **Attachment VIc at p. 59**.

On August 2, 2019, Chemours acquired that Southern Ionics mining operation which "will enable substantial increase in ore production," **Attachment Id**. Chemours, and the original company "Dupont," have a long history of dealing with hazardous waste from mining facilities that have substantially degraded the surrounding environment, and endangered wildlife and human populations. For example, Chemours was referenced with Dupont in providing $670 million to settle 3,550 lawsuits in Ohio and West Virginia, based on those Ohio Valley residents' claims they were sickened by exposure to drinking water contaminated by Dupont/Chemours with Perfluorooctanoic Acid ("PFOA"), a man-made perfluorinated chemical. **Attachment VId** (February 20, 2017 article by Marc S. Reisch). Additionally, the State of New York sued Chemours and DuPont de Nemours Inc. over PFAS chemicals that allegedly contaminated drinking water supplies. **Attachment VIe** (November 5, 2019: "Environment & Energy Report"). Finally, as has been made more well known in the recent cinema movie, "Dark Waters," released on December 6, 2019, a lawsuit in West Virginia against Dupont focused on toxic PFOA contaminant and the detrimental effects of exposure from a long history of irresponsible waste management beginning in 1951. **Attachment VIf** (January 6, 2016 article by Nathaniel Rich, NY Times).

A few of the devastating effects of PFOA were publicly discovered as a result of the West Virginia lawsuit against Dupont/Chemours, and had been kept secret by the company despite clear knowledge and ability to control, including but not limited to: organ malfunctioning and deformities in cattle leading to death due to "high concentrations of fluoride in the water that they drink," *id.* at pp. 3-4, resistance to degradation, *id*. at p. 5, accumulation in human blood, *id*. at pp. 5, 9, 11, caused birth defects, *id*. at pp. 6,8, cancer and tumors. *Id*. at p. 8. Despite the knowledge, and ability to prevent or mitigate such effects through less damaging chemicals, DuPont chose to continue to manufacture with PFOA, at an annual profit of $1 billion. *Id*. at p. 9. During the course of its operations, the Dupont facility "dumped 7,100 tons of PFOA-laced sludge into ''digestion ponds'' – unlined pits – that resulted into the chemical seeping into the ground and entering the local water table and drinking water system that serviced more than 100,000 individuals. *Id*. at p. 5. In 2006, DuPont settled with the USEPA, which had accused the company of concealing its knowledge of PFOA's toxicity and presence in the environment in violation of the Toxic Substances Control Act for approximately $16.5 million. *Id*. at p. 12.

The West Virginia lawsuit followed, after individuals were notified that an unregulated chemical was detected in the drinking water but was not believed to be a "health risk." **Attachment VIf at p. 13.** It was discovered that six water districts, as well as dozens of private wells, were tainted with levels of PFOA higher than DuPont's own internal safety standard. *Id.* DuPont formed a team composed of its

own scientists and scientists from the West Virginia Department of Environmental Protection, and determined that a "safe" amount of PFOA in drinking water was 150 parts per billion, whereas the toxicologists hired as experts for the plaintiffs had settled upon a safety limit of 0.2 parts per billion. *Id*. at p. 8. The lawsuit settled, however, the USEPA later investigated PFOA and in 2009, set a "provisional" limit of only 0.4 parts per billion for short-term exposure, but has never finalized that figure. *Id*. at p. 11.

PFOA has not yet been appropriately regulated, and there is danger in the "public misperception that if a chemical was dangerous, it was regulated." *Id*. at p. 11. Similar to PFOA, there are numerous hazardous wastes resulting from mining that are not properly regulated, but can still cause detrimental environmental impacts and adverse public health issue mandating a "hard look" under NEPA at these potential impacts to ensure compliance with federal laws.

Chemours/DuPont currently has mined/is mining thousands of acres of Trailridge, south of the Okefenokee Swamp, in tributaries and wetlands of northeast Florida. That mining is located in Baker, Bradford, Clay, and Duval Counties (*see* **Attachments Ve1; VIv**). The USACOE has failed to initiate a regional AEIS or even an EIS for any of that extensive dredging and discharge of dredged material in those waters of the US.

c. Twin Pines Minerals, LLC Proposed Mining

On July 12, 2019, the USACOE published a Public Notice for proposed large-scale mining of Trailridge east of the Okefenokee Swamp by Twin Pines Minerals, LLC. **Attachment VIg**; *see also* **Attachments IVh1-IVh3**. CAPM submitted comments in opposition to the mining application and raised numerous issues with the lack of an AEIS. **Attachment IVf**. The USACOE closed the comment period on September 12, 2019, **Attachment VIh1**, and on October 15, 2019, the USACOE confirmed that it had received more than 20,500 public comments during that 60-day comment period. **Attachment VIh2**. including comments from the Chief of the Cherokee of Georgia, an Indian Tribe. **Attachment VIh3**.

The Cherokee Chief brought valid concerns to light regarding the environmental degradation associated with heavy mineral sand strip mining, noting that the lack of studies leads to an impossibility for the USACOE to "comprehend, much less forecast, the impact on local waters this mining operation may have," including, "wetlands, the supply and quality for local shallow and deep wells, **discharge and drainage** into nearby creeks and the rivers they flow into." *Id*. at p. 1 (emphasis added). The need for an AEIS was implied by advising that St. Marys River has been suffering for "decades from discharge and pollutants," and "[s]trip mining within the watershed for this river poses yet another threat." *Id*. The noted topsoil to be removed during the strip mining will be "heavily worked with herbicides which has a potential to reach the river [if] not stored properly," that can result not only in the destruction of wetlands that cannot be restored in such a unique area, but will have a devastating impact on the wildlife within the Okefenokee Swamp and Wildlife Refuge forcing animals out. *Id*. at pp. 1-2. Finally, the Cherokee Chief's concerns regarding Twin Pines Minerals, LLC's compliance history echoes those of CAPM and Mr. Lyons herein this NOI, as the company "has been **cited for permit violations at its operations on a Chemours mine in Florida**. Having a company which ignores permit, inspection, and maintenance requirements operating so close to the Federally protected land of the Wildlife Refuge, there **will be detrimental impacts** to the Refuge, environment, and community." *Id.* at p. 2 (emphasis added).

Furthermore, Mr. Paul Rominger, of the Cherokee of Georgia Tribal Council, submitted under separate cover to demonstrate the public interest in preserving the Greater Okefenokee Swamp Basin due to the high value of the area for continue exploration of archeological sites, a number of which are within the proposed area to be mined by Twin Pines. **Attachment VIh4 at p. 2.**

CAPM, Mr. Lyons, and the Cherokee Tribe of Georgia are not the only public members raising concerns and opposition to the proposed Twin Pines mining east of the Okefenokee Swamp, as the USEPA and USACOE discussed among the agencies the overwhelming number of negative public comments in response to the public notice, specifically on August 29, 2019, prior to the deadline for public comments, noting that the "response has been significant," and out of approximately 950 comments thus received, only two had been in support of the project. **Attachment VIi.**

Despite the plethora of opposition, an AEIS for a comprehensive evaluation of all of the adverse direct, indirect/secondary, and cumulative effects of that proposed mining, combined with all of the other existing and proposed mining in the Greater Okefenokee Swamp Basin was not required prior to Twin Pines withdrawing its application on February 10, 2020. The USACOE and the USEPA are no strangers to the requirements and necessity of an AEIS in unique areas such as the Greater Okefenokee Swamp Basin. *See* **Attachments IVg; VIj** (discussing the AEIS in the Peace River Basin).

While the permit application was pending, Twin Pines began Phase I of the proposed Twin Pines mining project, as described in the summary of the seminar presented by Robert Holt at the UGA on September 13, 2019, which was the day after the USACOE closed the public comment period for that proposed mining by Twin Pines. *See* Section VIII. Phase I seemed to come as a surprise to the USEPA whom correspondence with the USACOE on June 6, 2019, and acknowledged that the USEPA had not heard anything specific or formal about the project from the applicant or USACOE since the USEPA had submitted comments on September 5, 2018 on the proposed Phase I Work Plan - Piezometer Installation & Drilling of Exploratory Borings. **Attachment VIi**.

While the USEPA had an opportunity to submit comments on the Phase I work, there appears to be a lack of public participation on this phase of the proposed mining, representing a circumvention of the NEPA requirements, and a continued failure to assess the cumulative impacts of mining activities in the Greater Okefenokee Swamp Basin.

d. Chemours / Dupont Bradford County Mining

Most recently, on October 17, 2019, Chemours/Dupont requested approval of a special exception to the Bradford County Comprehensive Plan from the Commissioners for that county to expand mining in that county by approximately 3,000 acres. **Attachment Vt1**. That mining would include extensive dredging and discharge of dredged material in wetlands and tributaries of waters of the US. **Attachment Vt2**. The request was subsequently approved by Bradford County, despite legal notice from CAPM's counsel, dated October 15, 2019, regarding the deficiencies of the notice to the public for the October commission meeting. **Attachment VIk**.

Up until the approval of the special exception, any and all ongoing and previous mining operations in Bradford County had been conducted in violation of the County's Comprehensive plan. Those violations were addressed in a formal complaint dated December 16, 2019, from Bradford County resident Paul Still to

the Bradford County Land Development Regulation Administrator ("Still Complaint"). **Attachment VIl**. The Still Complaint included multiple aerial images of unauthorized, unpermitted mining activities in Lawtey at the Bradford / Clay County line, from 1999 to 2013, and the resulting flooding from discharges. *Id.*

The special exception approval allows continued mining that has detrimental effects on the environment, wildlife, and public health as discussed herein, in violation of the CWA, ESA, and SDWA, and the effects of this expansion were not considered in any AEIS by the USACOE for additional mining activities within the area in violation of NEPA.

C. Adverse Direct, Indirect/Secondary, and Cumulative Effects of Mining and Hazardous Wastes

a. Violations of NEPA and CWA

Phosphate mining within the regional Floridan Aquifer System and other areas world-wide results in myriad adverse direct, indirect/secondary, and cumulative impacts to the human environment. *See* **Attachments Ve8-Ve10**; *see also* **Attachment VIn (**2018 article by Reta et al., published in the International Journal of Hydrology, entitled "Environmental impact of phosphate mining and beneficiation: Review").

Such adverse effects from phosphate mining include, but are not limited to: "large amounts of waste including toxic metals and radioactive elements," the hazardous elements of which end up "being lost either to waste disposal or to the environment, mainly soil, water, atmosphere and human food chain." *Id.* at p. 1so. The phosphate mining process typically requires the use of "strong acids (such as sulfuric acid, phosphoric or nitric acids)" in order to produce soluble phosphate products. *Id*. Furthermore, the dominant mineral in phosphate ores, apatite:

> "is generally associated with fluoride, **which is a potential risk for human health**. During the current decade there is a **rising concerns about the environmental impacts** of the phosphate mining industries. Most of the impacts are being reflected in the form of **changes to local hydrology, water contamination, water consumption, air pollution and human risk**."

Id. (emphasis added).

Mining within the Greater Okefenokee Swamp Basin must be evaluated in the AEIS to ensure that the consideration under NEPA of adverse direct, indirect/secondary, and cumulative effects of mining and hazardous wastes described above and identified by the USEPA, see **Attachment VIa**, to ensure violations of the CWA do not occur.

b. Violations of SDWA

Hazardous waste from phosphate mining also is the source of fluoride added as a "contaminant" to many of the water supplies distributed throughout the US as public water service. For example, public water service reports from Athens-Clarke County, Georgia ("ACC"), lists fluoride additives as a contaminant in the water supply. **Attachment VIo1**. The ACC staff identified Hydrofluosilicic Acid as the type of fluoride added to the ACC public water supply, **Attachment VIo2**, and includes within the Mosaic Material Safety Data Sheet ("MSDS") the contact for the phosphate mining company MOSAIC

in the Peace River Basin in west-central Florida. Health Hazards listed on the MSDS for Mosaic's Hydrofluosilicic Acid cautions that:

> Hydrofluosilicic Acid is **corrosive to the skin, eyes, and mucous membranes through direct contact, inhalation and ingestion**. Large doses can cause **nausea, vomiting, diarrhea, abdominal burning, and cramp-like pains**. Circulatory, respiratory, nervous complaints, and skin rashes may occur.
>
> **Liquid** or vapor also causes s**evere irritation and burns, which may not be immediately apparent**. It also causes severe irritation to the lungs, nose and throat. **If swallowed, it can cause severe damage to throat and stomach.** Handle with extreme caution.

Attachment VIo2

USEPA research has also concluded that fluoride is one of many "Chemicals with Substantial Evidence of Developmental Neurotoxicity," **Attachment VIp1**, and one of numerous "Drinking Water Contaminants." **Attachment VIp2**. In fact, fluoride is listed as one of the "Inorganic Chemical Contaminants" along with arsenic, barium, cadmium, cyanide, and other highly toxic inorganic contaminants allowed to occur in drinking water, and can led to "bone disease" and "mottled teeth." **Attachment VIp2 at p. 2.**

Further evidence of harm from the consumption of hazardous mining waste fluoride was published in 2013 the Journal of Environmental and Public Health, and addresses some of the physical harms of ingestion, as well as the fallacy of the presumption that ingesting toxic fluoride from industrial waste could influence dental caries. **Attachment VIq1**; *see also other scientific studies relied herein and included in this NOI as* **Attachment VIq2** (2013 journal addressing racehorse fatalities following fluoridation of public water supplies with hazardous waste from phosphate mining); **Attachment VIq3** (2013 study finding that an increased fluoride uptake in coronary arteries may be associated with an increased cardiovascular risk); **Attachment VIq4** (2013 journal describing a cost-benefit analysis for using hydrofluorosilicic acid ("HFSA") from industrial waste for fluoridation of public water supplies and concluded that due to the significant amount of arsenic in HFSA, the US could save $1-5 billion by not fluoridating public water supplies with HFSA from industrial waste); **Attachment VIq5** (2006 journal detailing the health issues of horses that resulted from consumption of water contaminated with hazardous fluoride); **Attachment VIq6** (2018 publication discussing the "Physiologic Conditions Affect Toxicity of Ingested Industrial Fluoride Used in Public Drinking Water"); **Attachment VIq7** (August 30, 2019, letter drafted by professionals on behalf of sub-populations exceptionally vulnerable to fluoride toxicity, including pregnant women and their fetuses, bottle-fed babies and young children, ethnic and low-income groups, the elderly and those in fragile health to educate on the life-long adverse effects ingestion of low doses of fluoride consistent with fluoridation programs); **Attachment VIq8** (2014 addressing how fluoride intake also leads to increased risk of bone fractures);

Specifically, the scientific journals concluded that while industrial fluoride from treated water is often too low to affect dental caries, blood levels of fluoride due to "lifelong consumption can **harm heart, bone, brain, and even developing teeth enamel.**" **Attachments VIq1 at Abstract** (emphasis added).

Furthermore, industrial fluoride in drinking water can cause gastrointestinal distress, resulting in the aggravation and prevention of healing of ulcerated tissues, and abdominal discomfort from consumption of fluoride can result only one part-per-million and often without any visible damage. *Id*. at p. 4. The main source of fluoride that is absorbed into the bloodstream results from fluoride in public water supplies, and studies have shown that fluoride accumulates in the body over time resulting in other health issues such as bone weakening and eventual arthritis pain, accumulation in soft tissues and ligaments, and major organs and systems such as the brain, kidney, and aorta affecting the heart. *Id.* at pp. 5-6, 8-9.

Drinking water fluoride is often sourced from fluoriosilici acid and hazardous waste produced form fertilizer manufacturing, despite there being no known controlled human clinical trials for safety and effectiveness of water treated with either sodium fluoride or fluorosilicic acid, nor the US Food and Drug Administration every approving fluoride for ingestion. *Id.* at p. 7.

People who are exceptionally susceptible to bodily harm from ingesting and/or absorbing hazardous fluoride waste include infants and children with developing brains, bones, and teeth, in addition to the elderly, because of increased bone fractures from brittle bones caused by bioaccumulation of fluoride, and immune-deficient and hypersensitive people, such as people with autism and kidney dialysis patients. *See* **Attachments VIq1, VIq6, VIq7, VIq8**. An example of people handicapped by their hypersensitivity to ingestion and absorption of water and food contaminated with hazardous fluoride waste from fluoridation of public water supplies is CAPM member Kyle Adams, who has extreme hypersensitivity to hazardous fluoride waste. **Attachments VIr.** The 14-year history of Kyle's pain and suffering from ingesting and absorbing public water in King County, Washington that is contaminated with hazardous fluoride waste is summarized by his mother, CAPM member Audrey Adams, and through a number of documents providing examples of the countless efforts she has made to remedy the harm that this hazardous mining waste incorporated into her family's water supply is causing her son, Kyle, her husband, and herself. *Id. See also* **Attachment VIs1** (CAPM members in South Carolina with hypersensitivities suffering from ingestion and absorption of fluoride from public water supply); **Attachments VIs2** and **VIs3 (**CAPM members in Florida with hypersensitivities suffering from ingestion and absorption of fluoride from public water supply).

The SDWA mandates that "the Administrator shall identify those treatment techniques which, in the Administrator's judgment, would **prevent known or anticipated adverse effects on the health of persons to the extent feasible**," 42 U.S.C.A. § 300g-1(b)(7)(A) (emphasis added), and against the stated goals and standards that the level of contaminants be set to insure that "no known or anticipated adverse effects on the health of persons occur and which allows an adequate margin of safety." *Id.* at (b)(4)(A). The addition of hazardous mining waste into water supplies causes distinct and concrete injuries to the public health, and the direct, indirect/secondary, and cumulative impacts on the public health from concentrated areas of mining must be assessed under NEPA to avoid violations of the SDWA that are not in the public interest.

c. Violations of ESA

Fluoride in waterways can also be harmful to wildlife by direct contamination and causing environmental harm to habitats and food sources. **Attachment VIq1 at pp. 2, 5, 7, 11** (salmon spawning navigation issues, narcotized salmon, premature death of animals from extended consumption of treated water, liver silicosis in alligators, and detrimental impacts on plants such as the alterations of leaves, chlorophyll and chloride content, root weight, and transpiration water loss rate).

Samples collected from ACC's highly treated municipal wastewater that is discharged into the Oconee River in Georgia contained fluoride contaminants remaining from the fluoridation of that public water supply with hazardous waste from phosphate mining. **Attachment VIu1.** The samples were collected directly from the discharge water from the pipe, without any mixing of water from the Oconee River. *Id.* Georgia is one of numerous states in the US that has a state law requiring all municipalities to fluoridate public water supplies. *Id.* Due to this requirement, there has been discharges of fluoridated water and treated sewage "compost" containing fluoride into the environment and sold as biosludge to the public for use in public schools and vegetable gardens. **Attachment VIu2.** The biosludge was not tested for fluoride prior to public availability, *id.*, and upon information and believe the USEPA does not require that the fluoride levels be tested or reported, resulting in unknown effects on wildlife and its habitats that could be in violation of the ESA. **Attachment VIq.**

d. Conclusion

All of the contaminants referenced above, which are being discharged into Waters of the US, represent significant degradation of those waters, in violation of the CWA, into drinking water in violation of the SWDA, and into the environment affecting listed species in violation of the ESA, have been permitted, or allowed, without proper NEPA analysis. Accordingly, an AEIS of all mining activities within the Greater Okefenokee Swamp Basin is necessary to stem any further violations of federal laws.

VII.
Destruction of Essential and Critical Habitat for Federally Threatened, Endangered, and Candidate Species Under the NWP 44 – Mining Category and Unpermitted and Proposed Mining

This section incorporates herein, by reference, all preceding and other paragraphs and Attachments of this Notice of Intent to Sue ("NOI") document regarding mining activities, the regional Floridan Aquifer System, the Southeastern Coastal Plain Ecoregion, and/or the Okefenokee Swamp.

A. Significant Habitat Modification and/or Degradation from Individual Direct and Indirect/ Secondary Impacts, and Cumulative Impacts Constitutes Unpermitted "Take" and "Harm" of Federally Threatened, Endangered, and Candidate Species Under the Endangered Species Act.

It is well settled law in the United States that modification or destruction of critical habit of a Federally listed or threatened species constituted a harm or taking, and if done so unpermitted, is therefore unlawful. In *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon* 515 US 687, 688 (1995) the Supreme Court held that significant habitat modification or degradation falls squarely within the meaning of "take" as contemplated by the Endangered Species Act. **Attachment VIIa.**

> As relevant here, the Endangered Species Act of 1973 (ESA or Act) makes it unlawful for any person to "take" endangered or threatened species, § 9(a)(1)(B), and defines "**take**" to mean to **"harass, harm, pursue," "wound," or "kill,"** § 3(19). In 50 CFR § 17.3, petitioner Secretary of the Interior further defines **"harm"** to include **"significant habitat modification or degradation where it actually kills or injures wildlife."**
>
> **The Secretary reasonably construed Congress' intent when he defined "harm" to include habitat modification.**
>
> (a) The Act provides three reasons for preferring the Secretary's interpretation. **First, the ordinary meaning of "harm" naturally encompasses habitat modification that results in actual injury or death to members of an endangered or threatened species.** Unless "harm" encompasses indirect as well as direct injuries, the word has no meaning that does not duplicate that of other words that § 3 uses to define "take." **Second, the ESA's broad purpose of providing comprehensive protection for endangered and threatened species supports the reasonableness of the Secretary's definition.** … **Third, the fact that Congress in 1982 authorized the Secretary to issue permits for takings that § 9(a)(1)(B) would otherwise prohibit,** "if such taking is incidental to, and not for the purpose of, the carrying out of an otherwise lawful activity," **§ 10(a)(1)(B), strongly suggests that Congress understood § 9 to prohibit indirect as well as deliberate takings. No one could seriously request an "incidental" take permit to avert § 9 liability for direct, deliberate action against a member of an endangered or threatened species.**
>
> **(b) The Court of Appeals made three errors** in finding that "harm" must refer to a direct application of force because the words around it do. **First, the court's premise was flawed.** Several of the words accompanying "harm" in § 3's definition of "take" refer to actions or effects that do not

require direct applications of force. **Second, to the extent that it read an intent or purpose requirement into the definition of "take," it ignored § 9's express provision that a "knowing" action is enough to violate the Act. Third, the court employed *noscitur a sociis* to give "harm" essentially the same function as other words in the definition, thereby denying it independent meaning.**

Babbitt, 515 US at 696–708.

B. Examples of Federally Threatened, Endangered, and Candidate Species in the Southeastern Coastal Plain Ecoregion Experiencing Unpermitted "Take" and "Harm" Due to Significant Habitat Modification and/or Degradation from Individual Direct and Indirect/Secondary Impacts, and/or Cumulative Impacts of Mining in the Greater Okefenokee Swamp Basin

Years of cumulative and direct impacts of extensive mining activities underway and proposed within the regional Floridan Aquifer System and Southeastern Coastal Plain Ecoregion, and specifically within the Greater Okefenokee Swamp Basin has led to a significant modification and degradation of endangered and threatened species habitat. Examples of those federally threatened, endangered, and candidate species include, but are not limited to the following, with an "*" indicating species reportedly located on the ONWR:

Federally Endangered Oval Pigtoe Mussel (*Pleurobema pyriforme*) and its designated critical habitat
Federally Endangered Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*)
Federally Endangered Florida Panther (*Felis concolor coryi*)*
Federally Endangered Hairy Rattleweed (*Baptisia arachnifera*)*
Federally Endangered Red-Cockaded Woodpecker (*Picoides borealis*)*
Federally Endangered Shortnose Sturgeon (*Acipenser brevirostrum*)

Federally Threatened Atlantic Sturgeon, Gulf subspecies (*Acipenser oxyrinchus desotoi*)
Federally Threatened Eastern Indigo Snake (*Drymarchon corais couperi*)*
Federally Threatened Frosted Flatwoods Salamander (*Ambystoma cingulatum*)*
Federally Threatened Wood Stork (*Mycteria Americana*)*

Federal Candidate Species Gopher frog (*Rana areolata aescpus*)*
Federal Candidate Species Gopher tortoise (*Gopherus polyphemus*)*
Federal Candidate Species Striped newt (*Notophthalamus perstriatus*)*

Proposed Federal Critical Habitat for Suwannee Moccasinshell (*Medionidus walkeri*)

Unpermitted mining activities, as described herein this NOI, have resulted in the unpermitted, and therefore unlawful, taking and harming of federally threatened, endangered, and candidate species in violation of the ESA.

C. Failure of the USACOE, USFWS and USEPA to Comply with the NEPA Requirements and Enforce the ESA for the Federally Endangered Oval Pigtoe Mussel and its Designated Critical Habitat

It has been recently reported that the Florida Department of Economic Opportunity authorized an additional $867,000 in state funds for flood abatement activities within the Critical Habitat for the Federally

Endangered Oval Pigtoe Mussel within the New River and Santa Fe River in Bradford County that could result in faster dispersing of contaminated industrial wastewaters by Chemours/Dupont/Twin Pines in Baker, Bradford, Clay, and Duval Counties. **Attachments If; Im; Vg; Ve1; Vs1-Vs2; VIl; VIv; VIIc**. Those industrial wastewater discharges have already exceeded volumes authorized by the NPDES permit issued by FDEP to Chemours/Dupont/Twin Pines for those heavy mineral sands/titanium mining activities. **Attachments Im; Ve1; VIv.**

The oval pigtoe mussel was listed as a federally endangered species in the March 16, 1998 issue of the Federal Register, Volume 63, Number 50, pages 12664-12687. That publication of the Rules and Regulations for that federal listing included the listing of designated critical habitat for the Federally Endangered Oval Pigtoe Mussel and other federally listed species. The Background and Introduction for the listing of the Federally Endangered Oval Pigtoe Mussel was included on page 12665 of that Federal Register issue. Excerpts from the Description of the listing of the Federally Endangered Oval Pigtoe Mussel, in addition to the Previous Federal Action related to the oval pigtoe mussel are provided below, with emphasis on the **Suwannee, Santa Fe and New Rivers** (*see* **Attachment VIId1**, emphasis added):

> The **oval pigtoe** was also known from **a single Suwannee River mainstem site and the confluent SantaFe River system,** and in Econfina Creek (Clench and Turner 1956, Butler 1993). Once a species of localized abundance... The species was found at ... one site in the **New River (upper Santa Fe River system)**, and two sites in Econfina Creek. The **oval pigtoe** has apparently been extirpated from the Chattahoochee River system in Alabama and much of the Chipola River system.... **Oval pigtoe** density at the five new sites never exceeded 0.4 specimens per meter square (J. Brim Box, USGS, pers. comm.). **The smallest individual collected during or subsequent to the status survey was 26 mm (1.0 in) in length, indicating that juveniles were not present in these collections.**

Attachment VIId1 at p. 12668.

> The fat threeridge, shinyrayed pocketbook, **oval pigtoe**, and purple bankclimber first appeared as category 2 species in the Service's notices of review for animal candidates that were published on January 6, 1989 (54 FR 554) and on November 21, 1991 (56 FR 58804). At that time, a category 2 species was one that was being considered for possible addition to the Federal List of Endangered and Threatened Wildlife. Designation of category 2 species was discontinued in the February 28, 1996, **Federal Register** notice (61 FR 7596) (see also Issue 103 in the ''Summary of Comments and Recommendations'' section). The Service determined that these four species plus the Gulf moccasinshell, Ochlockonee moccasinshell, and Chipola slabshell qualified as candidate species at the time of proposal for listing. A candidate species is a species for which the Service has sufficient information to propose it for protection under the Act. All seven species have been recommended for conservation status by Williams *et al.* (1992a) and Williams and Butler (1994).

Id. at p. 12669.

The Federal Register publication also included a Summary of the Factors Affecting the Species, in five categories (A through E). As further discussed below, factors affecting that species include "**oval pigtoe were absent downstream of the dam**" and "**in-stream and near-stream** gravel **mining**," suggesting that the Federally Endangered Oval Pigtoe Mussel may be eliminated from their limited habitat by physical, chemical, and/or biological changes associated with altered stream flow and in-stream and near-stream mining activities.

The Federally Endangered Oval Pigtoe Mussel populations in the **Suwannee, Santa Fe,** and **New Rivers** have been subjected to physical, chemical, and biological changes due to in-stream and near-stream mining from previously described mining activities south of the Okefenokee, without any apparent USACOE permits or USFWS authorizations. **Attachments If; Vt3, *see also* Section VII.** The additional mining proposed south and east of the Okefenokee Swamp would increase the severity of those physical, chemical, and biological changes in those river systems.

Further excerpts from that Summary of the Factors Affecting the Species is as follows:

Summary of Factors Affecting the Species

After a thorough review and consideration of all information available, the Service has determined that the fat threeridge, shinyrayed pocketbook, Gulf moccasinshell, Ochlockonee moccasinshell, and **oval pigtoe** should be classified as endangered species, and the Chipola slabshell and purple bankclimber should be classified as threatened species...

A. The Present or Threatened Destruction, Modification, or Curtailment of its Habitat or Range
...The shinyrayed pocketbook, Ochlockonee moccasinshell, and **oval pigtoe were absent downstream of the dam**. Only occasional populations of the purple bankclimber were found in this portion of the river....

...**In-stream and near-stream** gravel **mining** has occurred in various portions of the Apalachicolan Region. Jenkinson (1973) recorded the shinyrayed pocketbook, **oval pigtoe,** Gulf moccasinshell, and ten other species in Little Uchee Creek, a tributary of the Chattahoochee River in Alabama....

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes
C. Disease or Predation
D. The Inadequacy of Existing Regulatory Mechanisms
E. Other Natural or Manmade Factors Affecting Its Continued Existence
...
Oval pigtoe: This species was historically found throughout the ACF, Chipola, Ochlockonee, and **Suwannee River systems,** and in Econfina Creek. It occurred at one-third of the historical sites sampled. It has been extirpated from the mainstem of the Chattahoochee River, representing a significant portion of its historical range; **occurrences in the** Flint and **Suwannee River systems have decreased from 32 to 12.** The species is currently known to occur at 26 sites, **with no evidence of recruitment.**

Id. at pp. 12680-12683.

The Critical Habitat listing for the Federally Endangered Oval Pigtoe Mussel populations were found to be affected by "impacts on stream channel geometry, bottom substrate composition, water quantity and quality, and stormwater runoff," and mandated that "[s]uch activities would be subject to review under section 7(a)(2) of the Act, whether or not critical habitat was designated. Section 7(a)(2) requires Federal agencies to ensure that **activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species or to destroy or adversely modify its critical habitat.**" *Id.* at p. 12684 (emphasis added).

There was no apparent review under Section 7(a)(2) of the ESA for the Federally Endangered Oval Pigtoe Mussel populations related to any of the previously referenced mining activities south or east of the Okefenokee Swamp, because there were no USACOE permits for any of the Florida mining in the Greater Okefenokee Swamp Basin. **Attachment Vt3**. There also was no apparent review under section 7(a)(2) of the ESA for the Federally Endangered Oval Pigtoe Mussel populations related to the federal funds provided by the USDA to Bradford County, Florida that resulted in "**impacts on stream channel geometry, bottom substrate composition, water quantity and quality,** and **stormwater runoff**" and "**in-stream and near-stream**" and dredging in tributaries of the Santa Fe River. **Attachment If.** That federal funding, provided to Bradford County by the USDA, was used to accommodate the industrial wastewater discharges in Bradford County into tributaries of the Santa Fe River. Specifically, those "**impacts on stream channel geometry, bottom substrate composition, water quantity and quality,** and **stormwater runoff**" were to increase the rate of flow in those tributaries to accommodate those industrial wastewater discharges that exceed the daily discharge volumes (e.g., more that 50 million gallons per day) of the industrial wastewater discharges from the heavy mineral sands/titanium mining authorized by the FDEP under the NPDES permit to Chemours/Dupont/Twin Pines. **Attachments If, Ve1; Vs1-Vs2.** That federally funded accommodation of "**impacts on stream channel geometry, bottom substrate composition, water quantity and quality,** and **stormwater runoff**" for industrial wastewater discharges by Chemours/Dupont/Twin Pines occurred south of the Okefenokee Swamp. **Attachments If; VIIc.** Those industrial wastewater discharges mirror the discharges that would occur from the proposed Twin Pines mining east of the Okefenokee Swamp.

The March 16, 1998 issue of the Federal Register that designated the Federally Endangered Oval Pigtoe Mussel also designated the critical habitat for the Federally Endangered Oval Pigtoe Mussel. Excerpts from the Critical Habitat section related to the Federally Endangered Oval Pigtoe Mussel and include the following (emphasis added):

Critical Habitat

Critical habitat is defined in section 3 of the Act as: **(i) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features** (I) **essential to the conservation of the species** and (II) that may require special management considerations or protection; and (ii) **specific areas outside the geographic area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. ''Conservation'' means the use of all methods and procedures needed to bring the species to the point at which listing under the Act is no longer necessary.**

Section 4(a)(3) of the Act, as amended, requires that, to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time a species is determined to be endangered or threatened. The Service's regulations at 50 CFR 424.12(a)(1) state that designation of critical habitat is not prudent when one or both of the following situations exist: (1) The species is threatened by taking or other activity and the identification of critical habitat can be expected to increase the degree of threat to the species or (2) such designation of critical habitat would not be beneficial to the species. The Service finds that designation of critical habitat is not prudent for these species. Such a determination would result in no known benefit to these species, and designation of critical habitat could further pose a threat to them through publication of their site-specific localities.

Critical habitat designation, by definition, directly affects only Federal agency actions. **Since these seven mussel species are aquatic throughout their life cycles, Federal actions that might affect these species and their habitats include those with impacts on stream channel geometry, bottom substrate composition, water quantity and quality, and stormwater runoff. Such activities would be subject to review under section 7(a)(2) of the Act, whether or not critical habitat was designated. Section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species or to destroy or adversely modify its critical habitat.** The fat threeridge, shinyrayed pocketbook, Gulf moccasinshell, Ochlockonee moccasinshell, **oval pigtoe**, Chipola slabshell and purple bankclimber **have become so restricted in distribution that any significant adverse modification or destruction of their occupied habitats would likely jeopardize their continued existence.** This would also hold true as the species recovers and its numbers increase. **As part of the development of this final rule, Federal and State agencies were notified of the mussels' general distributions, and they were requested to provide data on proposed Federal actions that might adversely affect the species. Should any future projects be proposed in areas inhabited by these mussels, the involved Federal agency will already have the general distributional data needed to determine if the species may be impacted by their action, and if needed, more specific distributional information would be provided.** Therefore, habitat protection for these seven species can be accomplished through the section 7 jeopardy standard and there is no benefit in designating currently occupied habitat of these species as critical habitat.

Recovery of these species will require the identification of unoccupied stream and river reaches appropriate for reintroduction. The Service is currently working with the State and other Federal agencies to periodically survey and assess habitat potential of stream and river reaches for listed and candidate aquatic species within the ACF and Ochlockonee river systems and the Yellow and **Santa Fe river**s....

Attachment VIId1 at p. 12684.

More specific designation of critical habitat for the Federally Endangered Oval Pigtoe Mussel was addressed in the USFWS Rules and Regulations published on November 15, 2007 in Volume 72, Number 220 of the Federal Register, which lists five Primary Constituent Elements ("PCE"). Excerpts from those PCEs are as follows (see **Attachment VIId2 at pp.** 64298-64302, emphasis added):

Primary Constituent Elements

...we consider those physical and biological features that are essential to the conservation of the species, and within areas occupied by the species at the time of listing, that may require special management considerations or protection. The physical and biological features essential to the conservation of the species are the primary constituent elements (PCEs) laid out in an appropriate quantity and spatial arrangement for recovery. These include, but are not limited to:
(1) **Space for individual and population growth and for normal behavior;**
(2) **Food, water, air, light, minerals, or other nutritional or physiological requirements;**
(3) **Cover or shelter;**
(4) **Sites for breeding, reproduction, or rearing (or development) of offspring;** and

(5) **Habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.**

Space for individual and population growth and normal behavior, and sites for reproduction and development of offspring are provided for the seven mussels on and within the streambed of stable channels with a suitable substrate, which we have captured in the PCEs regarding channel stability, substrate quality, and flow regime. Because the seven mussels are dependent on fish to complete their larval life stage, the PCE regarding fish hosts is a further requirement for successful reproduction. Various nutritional and physiological requirements are captured in the PCEs regarding flow regime and water quality. These PCEs are explained in additional detail below.

Based on our current knowledge of the life history, biology, and ecology of the seven mussels, and the habitat requirements for sustaining their essential life history functions, we have determined that the seven mussels require the PCEs described below.

PCE 1. **A geomorphically stable stream channel** (a channel that maintains its lateral dimensions, longitudinal profile, and spatial pattern over time without a consistent aggrading or degrading bed elevation).... In addition to the direct effects above, channel instability indirectly affects mussels and their fish hosts in several ways. Channels becoming wider and shallower via bank erosion develop more extreme daily and seasonal temperature regimes, which affects dissolved oxygen levels and many other temperature-regulated physical and biological processes. Mussels in wider and shallower channels are likely more susceptible to predation. Erosive channels lose the habitat complexity provided by mature bank-side vegetation, which reduces diversity and abundance of fish species. Fewer fish means lower probability of mussel recruitment. The many direct and indirect adverse effects of channel instability on mussels and their fish hosts strongly suggest that channel stability is a habitat feature essential to their conservation.

PCE 2. A predominantly sand, gravel, and/or cobble stream substrate with **low to moderate amounts of silt and clay**....

PCE 3. **Permanently flowing water**....

PCE 4. **Water quality (including temperature, turbidity, dissolved oxygen, and chemical constituents)** that meets or exceeds the current aquatic life criteria established under the Clean Water Act (CWA) (33 U.S.C. 1251–1387).

The temperature, dissolved oxygen (DO), pH, and conductivity ranges that define suitable habitat conditions for the seven mussels have not been specifically investigated....Most mussels are considered sensitive to low DO levels and high temperatures (Fuller 1974, p. 245).... The **oval pigtoe demonstrated moderate, but significantly higher than average, mortality when DO was less than 5 mg/L....**

Water temperature affects the amount of oxygen that can be dissolved in water and the toxicity of various pollutants. The toxic effects of ammonia are more pronounced at higher temperatures and at higher pH (Mummert *et al.* 2003, p. 2545, 2550; Newton 2003, p. 2543). **High temperatures or**

decreasing pH may increase the toxicity of metals to unionids (Havlik and Marking 1987, p.14)....

Ammonia is lethal to juveniles at concentrations as low as 0.7 ppm total ammonia nitrogen, normalized to pH 8, and lethal to glochidia at concentrations as low as 2.4 ppm (Augspurger *et al.* 2003, p. 2569–2575). **In streams, ammonia may occur at highest concentrations in substrate interstitial spaces where juvenile mussels live and feed** (Whiteman *et al.* 1996, p. 794; Hickey and Martin 1999, p. 38; Augspurger *et al.* 2003, p. 2569–2575).

PCE 5. Fish hosts (such as largemouth bass, sailfin shiner, brown darter) that support the larval life stages of the seven mussels....Host-fish specificity has been examined in laboratory tests for five of the seven mussels: The fat threeridge, Gulf moccasinshell, **oval pigtoe,** purple bankclimber (O'Brien and Williams 2002, p. 151), and shiny-rayed pocketbook (O'Brien and Brim Box 1999, 136)....

The oval pigtoe releases rigid white to pinkish conglutinates, which passively drift in the current and may resemble the food organisms of small-bodied fishes. O'Brien and Williams (2002, p. 152) tested 11 fish species as hosts, finding that glochidia transformed on the gills of fish such as the sailfin shiner (*Pteronotropis hypselopterus*) and eastern mosquitofish. **They considered only the sailfin shiner as a primary host,** as it was the only species upon which the transformation rate exceeded 50 percent.

That critical habitat for the Federally Endangered Oval Pigtoe Mussel includes the Santa Fe River and the New River, which converge downstream of the industrial wastewater discharges of Chemours/Dupont/Twin Pines in Bradford County, Florida. The habitat will suffer adverse indirect/secondary and cumulative effects from all of the referenced mining activities individually and cumulatively. The previously described existing and proposed mining south and east of the Okefenokee Swamp have violated and/or will violate the conditions of one or more of those five Primary Constituent Elements ("PCE") in violation of the ESA.

D. Harm to the Survival and Recovery of the Federally Endangered Florida Panther in the Southeastern Coastal Plain Ecoregion from Indirect/Secondary Impacts, and Cumulative Impacts of Mining Activities in the Greater Okefenokee Swamp Basin

The Florida panther is one of the most endangered large mammals in the world. Population viability projections have concluded that, under prevailing conditions, the panther may become extinct within two to four decades. **Attachment VIId3** at 4-117. To prevent this extinction, the USFWS recovery plan calls for quickly stabilizing this last remaining population in south Florida and establishing two additional populations in the southeastern United States. *Id.* at 4-141

The USFWS has stated that achieving a self-sustaining population of the Florida panther will require a minimum of 50 **breeding** adults, and that "further habitat loss will result in a reduced population." **Attachment VIId4.** Thus, the panther's final population in south Florida will not become self-sustaining unless its remaining habitat is protected.

To coordinate panther recovery efforts, the USFWS, National Parks Service, Florida Game and Fresh Water Fish Commission, and Florida Department of Environmental Protection formed the Florida Panther Interagency Committee. In November 1993, this committee issued a Florida Panther Habitat Preservation

Plan ("HPP") identifying 1,253,000 acres of panther habitat on private land that it deemed "essential" for maintaining a self-sustainable population of panthers in south Florida *Id.*

These acres were divided into three categories: 1) 326,000 acres of lands already in a conservation program; 2) 458,000 acres north of the Caloosahatchee River not yet occupied by any breeding population but potentially suitable for occupation by dispersing panthers; and 3) 468,000 acres of occupied areas south of the Caloosahatchee River. The committee then ranked the land not already in conservation programs as Priority 1 (frequently used or high quality habitat) and Priority 2 (less frequently used or lower quality habitat) and recommended that *all* such land (in order of "priority") be acquired and protected.

In May 1999, the USFWS reaffirmed the validity of the HPP's scientific conclusions in its updated panther recovery plan, known as the South Florida Multi-Species Recovery Plan ("MSRP"). The MSRP refers to protection of HPP-defined Priority habitats as a "top priority" recovery action, which the USFWS defines as an action "necessary to prevent the extinction or the irreversible decline of the species." **Attachment VIId5.** (48 Federal Register 16756 (April 19, 1983)). The MSRP reiterates that protecting Priority habitats is "**essential to maintaining a minimum viable population of 50 breeding adult panthers in South Florida**" (emphasis added).

The influence of the highly fractured regional Floridan Aquifer System on panther habitat in South Florida was evaluated in a 2018 publication by Xu et al. **Attachment Ve2**. That study emphasized the fact that habitat alterations from groundwater and other mining associated with previously mapped fractures in the Floridan aquifer system can occur many kilometers from the surface footprint of the sources of those alterations due to preferential flow through those fractures. Conclusions from that study suggested that panther dens were associated with previously mapped fractures in the Floridan Aquifer System and that hydroperiod alterations could degrade panther habitat significant distances from the surface footprint of groundwater and other types of mining. The findings of that study also suggested that degradation of panther habitat could be influencing the suitability of habitat for panther dens, selection of den sites by female panthers, and the availability, and abundance of high-quality prey items essential to meet the nutritional demands of successfully rearing panther kittens in the wild.

Those findings support the possibility that sightings of Florida panthers in large areas of previously intact wetlands within the Greater Okefenokee Swamp Basin as long ago as the late 1970s-early 1980s may have resulted from panthers dispersing from areas of limited and poor-quality habitat in the primary and secondary panther habitat zones of South Florida, to higher-quality panther habitat in northeast Florida and southeast Georgia. Unfortunately, northeast Florida and southeast Georgia also is where multiple increases in large-scale mining recently were authorized under the NWP 44 – Mining Category and additional mining is proposed.

The conclusion of the 2018 publication by Xu et al., regarding the degraded quality of panther habitat in South Florida, also is supported by the USFWS report known as the **Florida Panther Recovery Plan**. That plan was released in January 2006 and concluded that "**[T]here is insufficient habitat in South Florida to sustain a viable panther population.**" The habitat will suffer adverse indirect/secondary and cumulative effects from all of the referenced mining activities individually and cumulatively in the Greater Okefenokee Swamp Basin and ONWR contributing to the decline of sufficient panther habitat in violation of the ESA.

E. Harm to Federally Listed Sturgeon in the Southeastern Coastal Plain Ecoregion from Individual Direct and Indirect/Secondary Impacts, and Cumulative Impacts of Mining Activities in the Greater Okefenokee Swamp Basin

Habitat for all three of the federally listed Sturgeon within the Southeastern Coastal Plain Ecoregion will suffer adverse indirect/secondary and cumulative effects from all of the referenced mining activities individually and cumulatively. Those Sturgeon include the Federally Endangered Atlantic Sturgeon, the Federally Endangered Shortnose Sturgeon, and the Federally Threatened Atlantic Sturgeon, Gulf subspecies. The basic background was provided for those federally listed Sturgeon in the comment letter submitted on September 12, 2019 by the Southern Environmental Law Center ("SELC") regarding the proposed Twin Pines mining east of the Okefenokee Swamp. A copy of that 73-page SELC comment letter providing the basic background of those federally listed Sturgeon is provided as **Attachment VIIe**.

Those SELC comments, however, did not discuss the adverse impacts from the heavy mineral sands/titanium mining associated with the southward expansion of Mission Mine (SAS-2012-01042) or the Indian Boundary Mine (SAS-2017-00669). Mining activities authorized under both of those NWP 44 – Mining Category permits in Charlton County, Georgia are "**similar in nature**" to the proposed heavy mineral sands/titanium mining by Twin Pines, also on the east side of the Okefenokee Swamp.

Those SELC comments also did not discuss the adverse impacts from the proposed expansion of heavy mineral sands/titanium mining by Chemours/Dupont/Twin Pines south of the Okefenokee Swamp, in Bradford County, Florida. That proposed mining expansion by Chemours/Dupont/Twin Pines south of the Okefenokee Swamp also is "**similar in nature**" to the proposed Twin Pines mining and is within the Greater Okefenokee Swamp Basin.

Those SELC comments also did not discuss the adverse impacts from the phosphate mining proposed by HPS II south of the Okefenokee Swamp. That proposed mining also is "**similar in nature**" to the proposed Twin Pines mining on the east side of the Okefenokee Swamp. That proposed mining by HPS II also is within the Greater Okefenokee Swamp Basin.

Those SELC comments also did not address the adverse impacts from the existing phosphate mining south of the Okefenokee Swamp, in Hamilton County, Florida. That existing phosphate mining in Hamilton County, Florida, originally initiated in the decades ago by Occidental Chemical and Petroleum Industry already has resulted in significant dewatering of the regional Floridan Aquifer System and the Suwannee River in the Greater Okefenokee Swamp Basin. Those mining activities also are "**similar in nature**" to the proposed Twin Pines mining east of the Okefenokee Swamp.

Therefore, the "**take**" and "**harm**" to all of the species and habitat referenced above exceeds the adverse impacts addressed in the SELC comments. The EIS requested in the SELC comments focused solely on the individual and cumulative adverse impacts of the proposed Twin Pines mining east of the Okefenokee Swamp. In order to encompass the necessary geographic area or the full magnitude of the "**take**" and "**harm**" to all of the species and habitat referenced above, an AEIS of regional extent, similar to the AEIS conducted for mining in the Peace River Basin, in required to ensure that the ESA is not being violated.

On April 11, 2019, the USFWS published a notice in the Federal Register (Volume 84, Number 70) announcing that the agency was conducting the 5-year status review on the Federally Threatened Atlantic Sturgeon, Gulf subspecies, as required by the ESA. That public notice preceded the USACOE's public notice requesting comments on the proposed Twin Pines mining east of the Okefenokee Swamp by several months. That public notice for the 5-year status review on the Federally Threatened Atlantic Sturgeon, Gulf subspecies also preceded the public's knowledge of the southward expansion of Mission Mine (SAS-2012-01042) and the Indian Boundary Mine (SAS-2017-00669), both are authorized east of the Okefenokee Swamp, under the NWP 44 – Mining Category and mirror the proposed Twin Pines mining, also east of the Okefenokee Swamp.

Mining activities authorized under the NWP 44 – Mining Category do not have to meet the public notice requirements of mining activities considered under applications for "Individual" USACOE mining permits, such as the proposed Twin Pines mining east of the Okefenokee Swamp. Therefore, public comments regarding the "**take**" and "**harm**" that would result from those individual mining activities and cumulative mining activities to the Federally Threatened Atlantic Sturgeon, Gulf subspecies could not be submitted by CAPM and other public entities by the deadline for those public comments regarding the Gulf subspecies of the Atlantic Sturgeon. The USFWS, however, should have known about all of the mining referenced in this NOI.

The USFWS notice of the 5-year status review on the Federally Threatened Atlantic Sturgeon, Gulf subspecies was published on April 11, 2019, on pages 14668-14669 of the Federal Register. A copy of that notice is available in **Attachment VIIf1**

That public notice specifically references Florida and Alabama as two of the four Gulf Coast states where the Federally Threatened Gulf subspecies of the Atlantic Sturgeon is known to occur. The Gulf Coast areas of those two states are associated with the regional Floridan Aquifer System. Therefore, all of the NOI Attachments related to the significant permanent and irreversible adverse impacts from all of the existing and proposed mining on that regional aquifer system represents permanent and irreversible adverse impacts on the habitat of the Federally Threatened Gulf subspecies of the Atlantic Sturgeon.

Additional information regarding the Federally Threatened Gulf subspecies of the Atlantic Sturgeon is provided in the 2001 Field Guide to the Rare Animals of Florida. That information, provided by the Florida Natural Areas Inventory ("FNAI") and consolidated on two pages, includes a map of the counties in Florida where the Gulf subspecies of the Atlantic Sturgeon occurs. Those counties include counties within the Greater Okefenokee Swamp Basin, where the permanent and irreversible adverse impacts from the mining activities discussed in this NOI will be most severe. A copy of that field guide is available in **Attachment VIIf2**.

The preceding additional information from the FNAI indicates that the Federally Threatened Gulf subspecies of the Atlantic Sturgeon spend the majority of its life – approximately eight to nine months – and spawns in the few remaining undammed rivers flowing into the Gulf of Mexico in only four states. That additional information by FNAI emphasizes the importance of the Suwannee River as only one of three rivers in Florida where breeding individuals of the Federally Threatened Gulf subspecies of the Atlantic Sturgeon have been observed.

G. Jeopardized Survival and Recovery of the Downlisted Federally Threatened Wood Stork in the Southeastern Coastal Plain Ecoregion from Indirect/Secondary Impacts, and Cumulative Impacts of Mining Activities in the Greater Okefenokee Swamp Basin that Result in Unpermitted "Take" and "Harm" of Wood Storks in Florida and Georgia

a. South Florida

Detailed background on the Federally Endangered Wood Stork was provided in the USFWS Fact Sheet dated February 28, 1984, from the Multi-Species Recovery Plan for South Florida. The opening paragraph and page 4-409 of that Fact Sheet included the following statements, respectively (see **Attachment VIIk1**, emphasis added):

> **The unique feeding method of the wood stork gives it specialized habitat requirements; the habitats on which wood storks depend have been disrupted by changes in the distribution, timing, and quantity of water flows** in South Florida. **The population declines that accompanied this disruption led to its listing as an endangered species and continue to threaten the recovery of this species in the U.S.**
>
> The **acquisition or preservation of this colony is habitat and recovery of more natural hydropatterns within the foraging grounds** surrounding this colony, **are critical to the recovery of wood storks** in South Florida.

Page 4-417 of that Fact Sheet for the Federally Endangered Wood Stork in 1984, included the "Recovery Objective: RECLASSIFY to threatened, then delist," the "Recovery Criteria," and the "Species-level Recovery Actions." The first paragraph under the "Species-level Recovery Actions" section of that Fact Sheet included the statements, "...**the recovery of wood storks depends on the success of the birds throughout their range**. **Historically, South Florida supported greater than 70 percent of the nesting wood storks in the Southeast. Recent nesting populations in South Florida average around 10 to 13 percent with the major nesting occurring at the Corkscrew colony**." A copy of the entire S1 paragraph from that Fact Sheet is included, as follows (see **Attachment VIIk1**, emphasis added):

> Species-level Recovery Actions
>
> S1. Determine the distribution and status of wood storks in South Florida. All evidence suggests that the wood stork population in the southeast U.S. is a single population, with individuals moving throughout the landscape in response to habitat conditions; **the recovery of wood storks depends on the success of the birds throughout their range. Historically, South Florida supported greater than 70 percent of the nesting wood storks in the Southeast. Recent nesting populations in South Florida average around 10 to 13 percent with the major nesting occurring at the Corkscrew colony.** More recent data provided by Ogden (1997) also present evidence that South Florida provides winter foraging grounds for many of the recently developed northern breeding colonies in north Florida, Georgia, and South Carolina. **The restoration and enhancement of the South Florida foraging habitat is important to the overall recovery of the wood stork population and the reversal of the decreasing nesting trends in South Florida. Distribution must be monitored into the future to determine wood stork response to Everglades restoration activities.**

The last two sentences in the preceding "Recovery Action" statement imply that "Everglades restoration activities" will result in "**restoration and enhancement of the South Florida foraging habitat**" for wood storks. This erroneous conclusion fails to consider the extension and expansion of mining occurring in south Florida since that Fact Sheet for the Federally Endangered Wood Stork in 1984, resulting in permanent dewatering of the regional Floridan Aquifer System.

Page 4-418 of that Fact Sheet for the Federally Endangered Wood Stork in 1984 includes S2 of the "Species-level Recovery Actions." That "Species-level Recovery Actions" paragraph includes the following statements (see **Attachment VIIk1**, emphasis added):

> **S2. Protect and enhance wood storks in the South Florida Ecosystem through provisions of section 7 of the ESA. The majority of management activities to protect and enhance wood storks in the South Florida ecoregion must occur at an ecosystem level (see habitat-level recovery actions),** not a species-specific level; **wood storks respond to changing environmental conditions** by integrating habitat conditions **over a large geographic area** and therefore **will be more affected by large-scale management practices.** ...

The habitats for wood storks in environmentally sensitive areas, similar to the Greater Okefenokee Swamp Basin and surrounding areas, have incurred changing environmental conditions over a large geographic area due to large-scale dewatering of the regional Florida Aquifer System that resulted in the degradation and destruction of natural habitat and ecosystems in south and central Florida dependent on the wood storks for survival and recovery. **Attachments IId; IIg1-IIg3; Ve1-Ve5; Ve7-Ve10; Ve12-Ve15; Ve17; Vo.**

That Fact Sheet for the Federally Endangered Wood Stork in 1984 also includes "Habitat-level Recovery Actions" that begin on page 4-423 and continue to the end of that 36-page Fact Sheet. The first of the "Habitat-level Recovery Actions," H1, stated the following (see **Attachment VIIk1**, emphasis added):

> H1. **Prevent degradation of existing wood stork habitat in South Florida through identification and protection. At a minimum, for continued survival of the U.S. population, currently occupied nesting, foraging, and roosting habitat in South Florida must be protected from further loss or degradation. Watersheds supporting natural nesting habitat should remain unaltered, or be restored to function as a natural system if previously altered.**

Habitat in Florida essential for the survival and recovery has been degraded and destroyed from the dewatering of the regional Floridan Aquifer System, **Attachment Ve2**), as large-scale, permanent, and irreversible hydroperiod alterations are degrading and destroying the survival and recovery of those federally listed species within the Southeastern Coastal Plain Ecoregion, preventing the implementation of successful recovery actions.

The second of the "Habitat-level Recovery Actions" included in the USFWS's Fact Sheet for the Federally Endangered Wood Stork in 1984 was provided on page 4-425 of that Fact Sheet. That second of the "Habitat-level Recovery Actions," H2, stated the following (see **Attachment VIIk1**, emphasis added):

> **H2. Restore and enhance habitat. A prerequisite for the recovery of wood storks in the southeastern United States is the restoration and enhancement of suitable habitat** throughout

the mosaic of habitat types **used by this species. Historically, South Florida supported greater than 70 percent of the nesting by wood storks in the Southeast. The deterioration of the Everglades and Big Cypress basins has resulted in decreased nesting by wood storks in South Florida** and increased nesting in northern Florida, Georgia, and South Carolina.

The admitted precipitous decline of south Florida's nesting population from 70 percent of the total nesting population of wood storks in the southeast to a mere 10 to13 percent, without a subsequent recovery of that nesting population of wood storks in south Florida confirms the USFWS's failure to achieve the "Habitat-level Recovery Actions," described in H2. The primary reason for that failure is the irreversible, permanent alteration of hydroperiod in the natural habitats required for nesting and foraging of wood storks for survival and recovery.

b. Southeast Georgia and Northeast Florida

Attachment VIIl3 is a satellite image showing the location of Kings Bay, Georgia, where the 1987 publication by Ruckdeschel and Shoop referenced the nearest colony of nesting wood storks to Cumberland Island. Note the proximity of that colony to Cumberland Island, due east, and to the Okefenokee National Wildlife Refuge, due west.

That colony of the now Federally Threatened Wood Storks is within the range of adverse individual and cumulative hydrologic impacts from preferential flow through fractures and other karst conduits from mining activities proposed by Twin Pines on the east side of the Okefenokee Swamp, near St. George, and southwest of Kings Bay.

That Kings Bay colony of now Federally Threatened Wood Storks also is within the range of adverse individual and cumulative hydrologic impacts from preferential flow through fractures and other karst conduits from the NWP 44 – Mining Category activities authorized by the USACOE also on the east side of the Okefenokee Swamp, in Charlton County. Those mining activities are "**similar in nature**" to the mining activities proposed by Twin Pines and located a similar distance northwest from the Kings Bay colony of now Federally Threatened Wood Storks.

The orange dot located near the Georgia/Florida state line, west of the south end of Cumberland Island in the 2019 USFWS map (see **Attachment VIIl3**), appears to represent that Kings Bay colony or the relocation of that Kings Bay colony. Also note that the additional wood stork colonies located northwest of the apparent Kings Bay wood stork colony in **Attachment VIIl3** also will be within the range of adverse individual and cumulative hydrologic impacts from preferential flow through fractures and other karst conduits from the NWP 44 – Mining Category activities authorized by the USACOE in Charlton County.

Also note the three nesting wood stork colonies identified by the green dots located in Columbia County, Florida and their associated foraging areas (see **Attachment VIIl3**). Those three nesting wood stork colonies and associated foraging areas also are within the range of adverse individual and cumulative hydrologic impacts from preferential flow through fractures and other karst conduits from the existing phosphate mining in Hamilton County, Florida and the phosphate mining proposed by HPS II in Bradford and Union Counties.

Those three nesting wood stork colonies and associated foraging areas also are within the range of adverse individual and cumulative hydrologic impacts from preferential flow through fractures and other karst conduits from the existing heavy mineral sands/titanium mining activities by Chemours/Dupont/Twin Pines in Baker, Bradford, Clay, and Duval Counties, Florida and the proposed expansion of those mining activities in Bradford County. Consequently, all of those nesting colonies not only are threatened by unpermitted take of those nesting wood storks, but the permanent, irreversible hydroperiod alterations that will degrade and ultimately destroy those nesting sites and foraging sites in violation of the ESA.

H. Consideration of NOI as Public Comments on Designation of Critical Habitat for the Suwannee Moccasinshell, Federally Endangered Oval Pigtoe Mussel and its Designated Critical Habitat, Proposed Federal Candidate Gopher Tortoise, Eastern Population, the Proposed Federal Candidate Gopher Frog, and the Ramifications for the Federally Threatened Eastern Indigo Snake.

The separate Appendix Section VII.A, is presented for consideration as Public Comments and incorporated herein to this NOI as potential legal causes of action against the USFWS if such deficiencies described within the Appendix Section VII.A are failed to be remedied.

APPENDIX SECTION VII.A

Consideration of NOI as Public Comments

A. Designation of Critical Habitat for the Suwannee Moccasinshell

Proposed Designation of Critical Habitat for the Suwannee Moccasinshell – This NOI document and all attachments are provided as public comments for the proposed designation of Critical Habitat for the Suwannee Moccasinshell. On November 27, 2019, the USFWS published a proposed rule in the Federal Register to designate critical habitat for the Suwannee Moccasinshell at the following link (see **Attachment VIIb**):

https://www.federalregister.gov/documents/2019/11/27/2019-25598/endangered-and-threatened-wildlife-and-plants-designation-of-critical-habitat-for-suwannee

The summary of that proposed USFWS rule states:

> We, the U.S. Fish and Wildlife Service (Service), propose to designate critical habitat for the Suwannee moccasinshell (*Medionidus walkeri*) under the Endangered Species Act (Act). **The Suwannee moccasinshell is a freshwater mussel species from the Suwannee River Basin in Florida and Georgia.** In total, **approximately 306 kilometers (190 miles) of stream channels in Alachua, Bradford, Columbia, Dixie, Gilchrist, Hamilton, Lafayette, Madison, Suwannee, and Union Counties, Florida, and Brooks and Lowndes Counties, Georgia, fall within the boundaries of the proposed critical habitat designation. If we finalize this rule as proposed, it would extend the Act's protections to this species' critical habitat. The effect of this regulation is to designate critical habitat for the Suwannee moccasinshell under the Act.** We also announce the availability of a draft economic analysis of the proposed designation.

Much, if not most, of that proposed critical habitat for the Suwannee Moccasinshell already has been subjected to **"significant habitat modification or degradation where it actually kills or injures wildlife"** from indirect/secondary, as well as cumulative adverse impacts from the White Springs phosphate mining activities in Hamilton County, Florida; the heavy mineral sands/titanium mining activities by Chemours/Dupont/Twin Pines in Baker, Bradford, Clay, and Duval Counties, Florida, and other mining activities in Alachua County, Florida, including within the Santa Fe River floodplains (see **Attachment Ve1**). Additional **"significant habitat modification or degradation where it actually kills or injures wildlife"** from individual indirect/secondary, as well as cumulative adverse impacts within that proposed critical habitat for the Suwannee Moccasinshell will occur from the proposed expansion of heavy mineral sands/titanium mining activities by Chemours/Dupont/Twin Pines in Bradford County, Florida and the proposed phosphate mining by HPS II in Bradford and Union Counties, Florida.

B. Public Comments on the Proposed Federal Candidate Gopher Tortoise, Eastern Population, the Proposed Federal Candidate Gopher Frog, and the Ramifications for the Federally Threatened Eastern Indigo Snake

Federally Threatened Eastern Indigo Snake, Federal Candidate Species Gopher Tortoise, Eastern Population, and Federal Candidate Species Gopher Frog – This NOI document and all attachments are

provided as public comments for the Proposed Federal Candidate Gopher Tortoise, Eastern Population and the Proposed Federal Candidate Gopher Frog, in addition to documentation of the failure of the USACOE and USFWS to comply with the requirements of NEPA and enforce the ESA regarding the Federally Threatened Eastern Indigo Snake. The Federally Threatened Eastern Indigo Snake and the Federal Candidate Species Gopher Tortoise, Eastern Population and Federal Candidate Species Gopher Frog are discussed together in this subsection because the survival and recovery of the Federally Threatened Eastern Indigo Snake and Federal Candidate Species Gopher Frog are dependent on the survival and recovery of the Federal Candidate Species Gopher Tortoise, Eastern Population. Therefore, the listing status of the gopher tortoise should be identical to the listing status of the Federally Threatened Eastern Indigo Snake.

The USFWS public notice for proposed rules regarding the gopher tortoise as a candidate species was published on Thursday, October 10, 2019 in Volume 84, Number 197 of the Federal Register. Note that no statement was included regarding what the abbreviation "LPN" represents. The following information, including the summary, was published on the first page (page 54732) of that 26-page long public notice (see **Attachment VIIg**, emphasis added):

DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
50 CFR Part 17
[Docket No. FWS–HQ–ES–2019–0009; FF09E21000 FXES11190900000 167]

Endangered and Threatened Wildlife and Plants; Review of Domestic and Foreign Species That Are Candidates for Listing as Endangered or Threatened; Annual Notification of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions
AGENCY: Fish and Wildlife Service, Interior.
ACTION: Notice of review.

SUMMARY: In this candidate notice of review (CNOR), we, the U.S. Fish and Wildlife Service (Service), present an updated list of plant and animal species that we regard as candidates for or have proposed for addition to the Lists of Endangered and Threatened Wildlife and Plants under the Endangered Species Act of 1973, as amended. **Identification of candidate species can assist environmental planning efforts by providing advance notice of potential listings, and by allowing landowners and resource managers to alleviate threats and thereby possibly remove the need to list species as endangered or threatened. Even if we subsequently list a candidate species, the early notice provided here could result in more options for species management and recovery by prompting earlier candidate conservation measures to alleviate threats to the species.** This document also includes our findings on resubmitted petitions and describes our progress in revising the Lists of Endangered and Threatened Wildlife and Plants (Lists) during the period October 1, 2016, through September 30, 2018. **Moreover, we request any additional status information that may be available for the candidate species identified in this CNOR.**
DATES: We will accept information on any of the species in this notice at any time.
ADDRESSES: This notice is available on the internet at *http://www.regulations.gov* and *http://www.fws.gov/endangered/what-we-do/cnor.html.*

For domestic species: Species assessment forms with information and references on a particular candidate species' range, status, habitat needs, and listing priority assignment are available for review at the appropriate Regional Office listed below in **SUPPLEMENTARY INFORMATION** or at the Branch of Domestic Listing, Falls Church, VA (see address under **FOR FURTHER INFORMATION CONTACT**), or on our website (*http://ecos.fws.gov/tess_public/reports/candidate-species-report*). **Please submit any new information, materials, comments, or questions of a general nature on this notice to the appropriate address listed under FOR FURTHER INFORMATION CONTACT**. **Please submit any new information, materials, comments, or questions pertaining to a particular species to the address of the Endangered Species Coordinator in the appropriate Regional Office** listed in **SUPPLEMENTARY INFORMATION**. Species-specific information and materials we receive will be available for public inspection by appointment, during normal business hours, at the appropriate Regional Office listed below under Request for Information in **SUPPLEMENTARY INFORMATION**. General information we receive will be available at the Branch of Domestic Listing, Falls Church, VA (see address under **FOR FURTHER INFORMATION CONTACT**).
FOR FURTHER INFORMATION CONTACT: ***For domestic species:*** **Chief, Branch of Domestic Listing, U.S. Fish and Wildlife Service, MS: ES, 5275 Leesburg Pike, Falls Church, VA 22041–3803 (telephone 703–358–1796).**

SUPPLEMENTARY INFORMATION: We request additional status information that may be available for any of the candidate species identified in this CNOR (see Request for Information, below). We will consider this information to monitor changes in the status or LPN of candidate species and to manage candidates as we prepare listing documents and future revisions to the notice of review. We also request information on additional species to consider including as candidates as we prepare future updates of this notice.

Additional information on the proposed listing of the gopher tortoise was provided in the Background section of that USFWS public notice. That Background section, from pages 54732 and 54733 of that Federal Register Notice, include the following (emphasis added):

Background

The Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. 1531 *et seq.*), requires that we identify species of wildlife and plants that are endangered or threatened based solely on the best scientific and commercial data available. **As defined in section 3 of the ESA, an endangered species is any species that is in danger of extinction throughout all or a significant portion of its range, and a threatened species is any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.** Through the Federal rulemaking process, we add species that meet these definitions to the List of Endangered and Threatened Wildlife at 50 CFR 17.11 or the List of Endangered and Threatened Plants at 50 CFR 17.12. **As part of this program, we maintain a list of species that we regard as candidates for listing. A candidate species is one for which we have on file sufficient information on biological vulnerability and threats to support a proposal for listing as endangered or threatened, but for which preparation and publication of a proposal is precluded by higher-priority listing actions. We may identify a species as a candidate for listing after we have conducted an evaluation of**

its status—either on our own initiative, or in response to a petition we have received. If we have made a finding on a petition to list a species, and have found that listing is warranted, but precluded by other higher priority listing actions, we will add the species to our list of candidates.

We maintain this list of candidates for a variety of reasons: (1) To notify the public that these species are facing threats to their survival; (2) to provide advance knowledge of potential listings that could affect decisions of environmental planners and developers; (3) to provide information that may stimulate and guide conservation efforts that will remove or reduce threats to these species and possibly make listing unnecessary; (4) to request input from interested parties to help us identify those candidate species that may not require protection under the ESA, as well as additional species that may require the ESA's protections; and (5) to request necessary information for setting priorities for preparing listing proposals. We encourage collaborative conservation efforts for candidate species and offer technical and financial assistance to facilitate such efforts. For additional information regarding such assistance, please contact the appropriate Office listed under Request for Information, below, or visit our website, *http://www.fws.gov/endangered/what-we-do/cca.html*.

Publication of this notice has been delayed due to efforts to resolve outstanding issues. As a result, many of the candidate forms reflect that our formal analysis was conducted in fall of 2017, as shown by the date as of which the information is current on each form. However, we were able to update a small subset of the candidate forms recently to reflect additional information we have obtained on those species. We intend to publish an updated combined CNOR for animals and plants that will update all of the candidate forms, including our findings on resubmitted petitions and a description of our progress on listing actions, in the near future in the **Federal Register.**

The entire section on the gopher tortoise was provided in three paragraphs under the Reptiles section on page 54748 of that USFWS public notice. That entire section of that Federal Register Notice is as follows (emphasis added):

Reptiles

Gopher tortoise, eastern population (*Gopherus polyphemus*)—The following summary is based on information in our files. The gopher tortoise is a large, terrestrial, herbivorous turtle that reaches a total length up to 15 in (38 cm) and **typically inhabits the sandhills, pine/scrub oak uplands, and pine flatwoods associated with the longleaf pine (*Pinus palustris*) ecosystem. A fossorial animal, the gopher tortoise is usually found in areas with well– drained, deep, sandy soils; an open tree canopy; and a diverse, abundant, herbaceous groundcover.**

The gopher tortoise ranges from extreme southern South Carolina south through peninsular Florida, and west through southern Georgia, Florida, southern Alabama, and Mississippi, into extreme southeastern Louisiana. **The eastern population of the gopher tortoise in South Carolina, Florida, Georgia, and Alabama (east of the Mobile and Tombigbee Rivers) is a candidate species;** the gopher tortoise is federally listed as threatened in the western portion of its range, which includes Alabama (west of the Mobile and Tombigbee Rivers), Mississippi, and Louisiana.

The primary threat to the gopher tortoise is fragmentation, destruction, and modification of its habitat (either deliberately or from inattention), including conversion of longleaf pine forests to incompatible silvicultural or agricultural habitats, urbanization, shrub/hardwood encroachment (mainly from fire exclusion or insufficient fire management), and establishment and spread of invasive species. Other threats include disease, predation (mainly on nests and young tortoises), and inadequate regulatory mechanisms, specifically those needed to protect and enhance relocated tortoise populations in perpetuity. The magnitude of threats to the eastern range of the gopher tortoise is considered moderate to low, since populations extend over a broad geographic area and conservation measures are in place in some areas. However, since the species is currently being affected by a number of threats including destruction and modification of its habitat, disease, predation, exotics, and inadequate regulatory mechanisms, the threat is imminent. Thus, we have assigned an LPN of 8 for this species.

C. Implications of Widespread and Extensive Dewatering of the Regional Floridan Aquifer System and Southeastern Coastal Plain Ecoregion from Mining Activities and Other Groundwater Mining on the Survival and Recovery of the Proposed Federal Candidate Listing of the Gopher Tortoise, Eastern Population, the Proposed Federal Candidate Listing of the Gopher Frog, and the Federally Threatened Eastern Indigo Snake

This entire NOI and all referenced attachments are provided as public comments for the proposed Federal Candidate Listing of the Gopher Tortoise, Eastern Population, the proposed Federal Candidate Listing of the Gopher Frog, and the ramifications for the Federally Threatened Eastern Indigo Snake. The location of the Federal Candidate Listing of the Gopher Tortoise, Eastern Population described in the preceding second paragraph from page 5478 of the USFWS public notice for this species in the Federal Register, coincides with the extent of the regional Floridan Aquifer System and Southeastern Coastal Plain Ecoregion. The description of typical habitat for the Federal Candidate Listing of the Gopher Tortoise, Eastern Population, in the preceding first paragraph from page 5478 of the USFWS public notice in the Federal Register for this population, may be accurate for the historic habitat of that population, but not for the current population.

The widespread and extensive dewatering of the regional Floridan Aquifer System and Southeastern Coastal Plain Ecoregion, from mining activities and other groundwater mining, has converted those optimal habitats for the remaining gopher tortoises in that population to marginal and inadequate habitat. The USFWS public notice referenced above fails to even mention the over-arching cause of essential habitat destruction for the Federal Candidate Listing of the Gopher Tortoise, Eastern Population in the preceding third paragraph from page 5478 of the USFWS public notice for this population.

Specifically, the dewatering from those mining activities results in "**fragmentation, destruction, and modification of its habitat," "urbanization, shrub/hardwood encroachment," as well as "fire exclusion or insufficient fire management," "and establishment and spread of invasive species."** For example, the dewatering of the aquifer system associated with Jonathan Dickenson State Park in the 1990s not only resulted in an uncontrollable invasion of climbing fern and shrubby non-native plant species, but also lowered the water table so severely that the gopher tortoise in the remote sections of that state park began digging burrows in the dewatered, depressional wetlands. Presumably that switch from the preferred "**well–drained, deep, sandy soils**" to dewatered depressional wetlands was the result of those gopher tortoises attempting to burrow down to the lowered water table, where both summer and winter temperatures are moderated more stable groundwater temperatures. That presumption is supported by the characteristic

temperature stability of ground water (see **Attachment VIIh1, Attachment VIIh2, Attachment IId, Attachments Ve1-Ve3, Attachments Ve7-Ve10**).

"**Other threats**" listed in that preceding, third paragraph from page 5478 of the USFWS public notice for this population included "disease, predation ..., and inadequate regulatory mechanisms, specifically those needed to protect and enhance relocated tortoise populations in perpetuity." The recent/increasing threat of "disease" in this gopher tortoise population also may be the result of the widespread and extensive dewatering of the regional Floridan Aquifer System and Southeastern Coastal Plain Ecoregion, from groundwater and other mining, by requiring gopher tortoises to expend more energy attempting to dig deeper burrows to the new, lower levels of the water table in order to maintain favorable temperatures and humidity levels in those burrows. It is logical to presume that susceptibility to disease would increase with 1) additional expenditure of energy, combined with 2) loss of temperature moderation and favorable humidity levels in burrows during the heat of summer and cold of winter, and 3) reductions of available preferred food of **native** "**diverse, abundant, herbaceous groundcover**" that is out-competed by invasions of woody, shrubby, and climbing species of plants.

D. Gopher Tortoises as Representative Species of the Southeastern Coastal Plain Ecoregion, Characteristics of Gopher Tortoise Burrows, and Implications for the Survival and Recovery of the Federal Candidate Species Gopher Tortoise, Eastern Population, Federal Candidate Species Gopher Frog, Federally Threatened Eastern Indigo Snake, and More than 80 Other Species

In 1987, Cox et al. the published Nongame Wildlife Program Technical Report No. 4 titled, "Ecology and Habitat Protection Needs of Gopher Tortoise (*Gopherus polyphemus*) Populations Found on Lands Slated for Large-Scale Development in Florida." Although that 75-page publication did not include any specific discussion of the damage to gopher tortoises and their habitat from mining, mining is considered as "development" in Florida. Proposed mining activities were reviewed as Developments of Regional Impact ("DRI") at the time of that 1987 publication. In theory, mining activities also are regulated in Florida at the county level under individual Comprehensive Plans that were adopted by each county in Florida for county control over adverse impacts from those developments. The existing mining activities by Chemours/Dupont/Twin Pines, however, apparently never submitted an application to Bradford County for those mining activities, nor received approval from that county for those mining activities, as required in the Bradford County Comprehensive Plan.

The1987 Cox et al. publication described the essential role of gopher tortoises and their burrows for the survival and recovery of the Federally Threatened Eastern Indigo Snake and "**[M]ore than 80 species of wildlife ... known to use gopher tortoise burrows**." Those more than 80 species of wildlife known to use gopher tortoise burrows include the Federally Threatened Eastern Indigo Snake and the Federal Candidate Species Gopher Frog and are listed in Table 2 of the Cox et al. publication. Excerpts from the 1987 Cox et al. publication related to the use of gopher tortoise burrows, in addition to range information" are as follows (see **Attachment VIIh1**, emphasis added):

> The **gopher tortoise *(Gopherus polyphemus)* is one of Florida's principal wildlife benefactors**. Armed with shovel-like forelimbs and a penchant for digging, **gopher tortoises excavate deep, long-lasting burrows, which provide important refuges for tortoises and a much larger wildlife community. More than 80 species of wildlife are known to use gopher tortoise burrows (Speake 1981, Franz 1986), and tortoises have been described as Florida's unique**

"wildlife landlord" because of the close-knit relationship between burrowing tortoises and many other organisms (Gopher Tortoise Council 1984.).

The importance of preserving small, persistent gopher tortoise populations as described herein should not be undervalued. The loss of genetic diversity, for example, is one problem that typically confronts species whose total numbers and distributions are declining. One potentially important method of preserving genetic diversity (Chesser 1983) is to preserve several small, viable populations to function as reservoirs of genetic diversity. In some cases, this method of preserving genetic diversity may be a better strategy than establishing a few larger conservation areas designed to preserve larger populations (Chesser 1983). **Several small, isolated protection areas also may help to prevent the spread of diseases and reduce the chances that catastrophic events will result in the extinction of a species confined to a single larger preserve** (Soule and Simberloff 1986).

The **first section of these guidelines describes various life-history characteristics of gopher tortoises and introduces the reader to the complex biology of this species.** The **second section considers population numbers and area characteristics needed to assure that small, isolated tortoise populations will persist for biologically significant lengths of time.** [pdf page 9]

RANGE

The **gopher tortoise established itself** in Florida **hundreds of thousands of years before man** (Auffenberg and Franz 1978). **The global distribution of the gopher tortoise covers much of the Southeastern Coastal Plain of the United States** and extends from eastern Louisiana to southeastern South Carolina and throughout Florida (Auffenberg and Franz 1982) (Figure 5). The **main body of the more or less continuous portion of the gopher's current range is found in northern and central Florida, southern Georgia, and southeastern Alabama** (Auffenberg and Franz 1978). The **distribution of this animal is thought to be limited by the availability of deep sandy soils and sensitivity to colder climates** (Auffenberg and Franz 1982). [pdf page 19]

Figure 5. ***Geographic distribution of the gopher tortoise in the Southeast and Florida. Dark shading indicates general areas described by Auffenberg and Franz (1982) as containing high densities of tortoises in recent decades. Current tortoise populations in these areas may be*** **more** ***patchily distributed and*** **more** ***sparsely populated depending on the availability of favorable habitat, degree of urbanization, and the degree to which populations have been over-harvested.*** *Medium shading indicates the general statewide distribution described in Auffenberg and Franz (1978), and light shading indicates low-lying areas and major river systems where tortoise populations are generally* more *sparsely distributed in favorable habitat.* [pdf page 20]

The gopher tortoise is a prime example of another species representative of the Southeastern Coastal Plain Ecoregion that is in decline. It is important to note that the "dark shading" referenced in the caption for Figure 5 in that 1987 publication as "containing high densities of tortoises in recent decades" includes areas in northeast Florida that are in the vicinity of the existing and proposed heavy mineral sands/titanium mining by Chemours/Dupont/Twin Pines. Excerpts of the important additional details regarding the environment and importance of gopher tortoise burrows, provided in the1987 Cox et al. publication, included the following excerpts describing the burrow environment (see **Attachment VIIh2**, emphasis added):

THE BURROW ENVIRONMENT

All species of tortoises inhabiting temperate regions of the world dig some type of burrow (Auffenberg and Iverson 1979), but **no other tortoise excavates and utilizes burrows as consistently as the gopher tortoise** (Deitlein and Franz 1979). **The major portion of a gopher tortoise's lifetime is spent ensconced within the burrow** (Ernst and Barbour 1972), and **the structure serves as the focal point of many aboveground activities** (Auffenberg and Franz 1982, Ernst and Barbour 1972, McRae et al. 1981b, Alford 1980). Foraging forays, for example, are usually made in elliptical areas centered around the burrow entrance (McRae et al. 1981b). **The burrow is also important habitat to scores of other native species** (Speake 1981), and the 3-6 feet (0.9-1.8 m) wide **mound of bare excavated sand placed outside burrow entrances returns leached nutrients to the topsoil** (Kalisz and Stone 1984).

In addition to providing asylum from fire and predators, the burrow also offers protection from extremes in climate and may be essential to the survival of tortoises throughout much of Florida (Auffenberg and Iverson 1979). The **temperature at the base of the burrow is fairly constant throughout the year** (Speake 1981), **ranging from approximately 70-80° F (21-27° C) in summer and from 60-70° F (16-21° C) in winter** (Speake 1981). **In summer,** when ground-level temperatures may approach the thermal tolerances of tortoises and other reptiles (Mushinsky 1985), **tortoises often seek the cooler haunts of their burrows on hot afternoons. In winter months, extremely cold days can have a devastating effect on exposed tortoises (and other reptiles)** (Mushinsky 1985). In north Florida, tortoises are generally inactive during winter, but they may venture from burrows when daytime temperatures exceed 70° F (21° C) (McRae et al. 1981b). In the milder subtropical climate of south Florida, tortoises may be active throughout the year (Douglass and Layne 1978).

The humidity of the burrow environment also may help tortoises avert desiccation during drier winter months (Means 1982). Auffenberg and Weaver (1969) reported that, **among the four North American tortoise species, gopher tortoises were most susceptible to desiccation when held in captivity**. Several recent studies have found that **individuals in some populations move to old burrows excavated in mesophytic areas during drier winter months** (McRae et al. 1981b, Means 1982, Breininger et al. in prep.). [pdf pages 19-21]

Smaller tortoises may often occupy the burrows of larger individuals, however. Typically there is a single entrance for each burrow, but there are isolated reports of two entrances merging into a single subterranean shaft (Oietlein and Franz 1979). **The length and depth of burrows vary with the depth of sand and depth to the water table (Hallinan 1923).** The average adult burrow is approximately 15 feet (4.6 m) long and 6 feet (1.8 m) deep (Hansen 1963). One burrow 47 feet (14.5 m) in length was described by Ernst and Barbour (1972). The angle of descent averages 30 degrees but ranges from approximately 15-45 degrees (Speake 1981). The shaft may flatten out after a few meters of descent and curve abruptly at different points. **The tunnel usually terminates above the water table,** but in some situations it extends below average ground water levels and reaches the hardpan (Breininger et al. in prep.). **The chamber at the base of the burrow contains an accumulation of fecal matter and organic debris, which serves as an important (if not sole) food base for a wide variety of other animals.**

The burrows of juveniles are difficult to locate because of their small size, and they may be as shallow as only a few inches (McRae et al. 1981b). Some hatchlings form shallow depressions and cover themselves in sand rather than excavate burrows (Douglass 1978). **Within a year of hatching,** though, **juveniles typically have established well defined burrows** 3-4 feet (0.9-1.2 m) deep (Speake 1981). **A critical period to tortoise survival occurs during the first few years of life because shallow burrows do not provide protection from many predators.**

Individual tortoises typically will excavate more than one burrow. Auffenberg and Franz (1982) conducted a 15-year study of occupancy rates of 122 burrows in a variety of Florida habitats and found that an average of 61.4% of the burrows was occupied at any time. This estimate is considered high by studies in other habitats, however (Breininger et al. in prep.). The **co-occupancy of a single burrow is thought to be an unnatural occurrence caused primarily by human disturbance** (McRae et al 1981b), though Diemer (pers. comm.), using radio-telemetry equipment, has found tortoises co-occupying a burrow in the absence of any apparent disturbance.

The dispersion of gopher tortoise burrows within available habitats varies considerably and is poorly understood. **Many authors describe a definable aggregation or "colony" of gopher tortoise burrows in available habitat** (Auffenberg and Iverson 1979, Auffenberg and Franz 1982, McRae et al. 1981b), while **others demonstrate a random distribution of burrows throughout an area** (Kushlan and Mazzotti 1984). **It is not known whether these varying degrees of aggregation reflect historical, sociological, or environmental differences among the areas surveyed, or simply random variation in burrow placement**. [pdf page 21]

The fact that the "**length and depth of burrows vary with the ...depth to the water table"** may be the most critical factor threatening the recovery and survival of gopher tortoise populations in Florida and Georgia. That is because the natural depths of the water tables in Florida and Georgia have been lowered dramatically. That is true particularly in areas where extensive mining has occurred and/or is occurring, such as in northeast Florida and southeast Georgia. The large expanses of native trees that are dead or in various stages of premature decline in the vicinity of mining activities, in addition to water levels in streams that are so low that canoes, kayaks, and Jon boats are not able to navigate those "navigable waters of the US" are significant signs of abnormally low levels of the surficial aquifer, also known as the water table.

The abnormally lowered water table jeopardizes the stabilized temperatures and humidity in burrows excavated to the historic depths of the water table, as well as the ability for burrows to prevent desiccation of the Federal Candidate Species Gopher Tortoise, Eastern Population and other wildlife seeking refuge in those burrows. Those more than 80 wildlife species that rely on those burrows include the Federally Threatened Eastern Indigo Snake and Federal Candidate Species Gopher Frog.

The section on habitat requirements for gopher tortoises in the 1987 Cox et al. publication emphasized that gopher tortoises respond "more to a suite of physical features than to specific plant associations." The abnormal lowering of the water table not only alters that "suite of physical features" gopher tortoises require for recovery and survival, it also alters the species composition of native plant associations, resulting in the rapid invasion of non-native species, as well as invasive native species. That loss of desirable native plant species and rapid shift to invasive species create dense thickets of shrubby and vine-covered vegetation less suitable for food and reproductive success of gopher tortoises. The following excerpts from Cox et al. describe the "Longevity and Reproduction" of gopher tortoises, in addition to "Behavior," "Habitat Requirements,"

"Habitat Management," and the role of "Fire" in maintaining essential habitat characteristics for gopher tortoises (see **Attachment VIIh1**, emphasis added):

LONGEVITY AND REPRODUCTION

Few Florida species live as long as do gopher tortoises. Longevity is estimated to range from 40-60 years (Landers 1980) **and may extend for as much as 150+ years**. No precise estimate is available, which is due to the difficulty of accurately aging tortoises once they have passed 30-40 years of age....

No vertebrate species in Florida, including man, takes longer to reach reproductive maturity than the tortoise. **In north central Florida the age of sexual maturity in females occurs at 10-15 years when individuals reach a plastral length of approximately 9 inches** (22-23 cm) (Iverson 1980). **In southwest Georgia, however, female tortoises take a prolonged 19-21 years to reach sexual maturity at approximately the same plastral length** (Landers et al. 1982).... **Maturation is thus better related to size than it is to age,** and a plethora of environmental and genetic factors can produce variation in the average growth rates found among different gopher tortoise populations (Landers et al. 1982). [pdf pages 25-26]

BEHAVIOR

Gopher tortoises exhibit well-developed social structure, courtship, and territorial combat (Brode 1959, Auffenberg 1966, Douglass 1976, Landers et al. 1980)....

...**Minimum area requirement estimations should take into account the extra area needed to accommodate displaced juvenile males**.... (Douglass 1976, McRae et al. 1981b). [pdf page 26]

HABITAT REQUIREMENTS

Gopher tortoises occupy a wide range of upland habitat types (Landers 1980, Auffenberg and Franz 1982, Diemer 1986), **responding more to a suite of physical features than to specific plant associations** (Campbell and Christman 1982). Though gopher tortoises may occupy different habitats seasonally (McRae et al. 1981b, Diemer 1986), **the general physical and biotic features thought to characterize suitable adult tortoise habitat are**:
a). presence of well-drained, **sandy soils, which allow easy burrowing;**
b). **an abundance of herbaceous ground cover**; and
c). **generally open canopy and sparse shrub cover, which allow sunlight to reach the ground floor**.

Soils

Soil conditions, rather than climatic conditions, are responsible for the xerophytic nature of habitats preferred by tortoises and their burrow associates (Carr 1952, Ernst and Barbour 1972, Mount 1975, Auffenberg and Franz 1982). Rain water drains quickly through the sandy soils characteristic of some gopher tortoise habitats, leaching out many nutrients, and **ground water levels may be several feet below the surface** (Landers and Speake 1980, Auffenberg and Franz 1982). At

times these **arid conditions may exacerbate the problems of desiccation described by Auffenberg and Weaver** (1969) **for gopher tortoises.**

These soils characteristically have very low clay and organic matter content and are extremely fine-grained. A few reports describe tortoises burrowing in soils with a high clay content (Lohoefener 1982, Means 1982), but **these soil types do not appear to support large populations** (Auffenberg and Franz 1982).

Landers and Speake (1980) **reported that gopher tortoises in Georgia occupied areas where sand depths exceeded one meter**... [pdf pages 26-27]

Open Canopy

Auffenberg and Franz (1982) observed the densest gopher tortoise populations in the longleaf pine *(Pinus palustris)* and turkey oak (Quercus *laevis)* associations commonly referred to as "sandhill" or "high pine" communities (Laessle 1958). **Densities as high as 5 tortoises per acre (12 per hectare) were observed on some sites.... Longleaf pine sandhills are characterized by an over story dominated by longleaf pine and an interspersed subcanopy of turkey oak and other xerophytic oaks, a sparse, low shrub layer, and a relatively thick herbaceous ground cover dominated by wiregrass *(Aristida stricta)*** (Figure 10). **Longleaf pine-dominated communities historically extended over most of the Southeastern Coastal Plain, covering an estimated 70-80 million acres. Since the arrival of Europeans, longleaf pine associations have been reduced to approximately 10 million acres, only 400 acres of which have been left undisturbed** (Means and Grow 1986). The **longleaf pine community is a fire-maintained subclimax community that succeeds to a xeric oak hammock in the absence of fire** (Laessle 1958). [pdf page 29]

HABITAT MANAGEMENT

Gopher tortoise conservation requires active habitat management, and any recommendations developed for this species need to include a description of the management activities that will be conducted on tortoise habitat preserves. The relatively open habitats commonly inhabited by tortoises may quickly become choked with perennial shrubs and young deciduous trees if left unattended. These changes can cause gopher tortoises to emigrate from an area within 3-8 years (Landers and Speake 1980). Auffenberg and Iverson (1979) reported a decline of 1.5 gopher tortoises per hectare every five years in a sand pine habitat where management was not conducted. A detailed, long-term management plan, therefore, should be developed as part of gopher tortoise habitat protection efforts, and efforts to develop management strategies should be considered carefully in decisions regarding the size of needed protection areas.

Here we provide a general description of the major habitat management needs of gopher tortoises, but management strategies should be tailored to the topographic and physiographic conditions of the site.

Specific management plans need to be developed in conjunction with biologists who have experience with managing Florida's fire-adapted communities. Longterm management contracts with public (e.g., county park systems, state agencies) or private (e.g., research or conservation groups) institutions should be required and supported by a long-term funding source. [pdf page 58]

FIRE

Fire was one of the dominant forces shaping natural plant communities in pre-settlement Florida (Laessle 1958, Wharton 1978). **All natural upland habitats in the state are thought to have been directly influenced by fire, and many plants and animals display clear adaptations to frequent burning cycles** (Christman 1983). Wiregrass, for example, flowers only after a summer fire has swept through an area, and certain types of sand pine (Pinus *clausa)* possess serotinous cones that open only after being heated by fire.

The periodicity of 'natural' fires is thought to have varied considerably among the many habitats occupied by tortoises (Auffenberg and Franz 1982, Abrahamson et al. 1982). **For example, relatively slow-burning ground fires moved through longleaf pine-turkey oak habitats probably once every 5-10 years** (Wharton 1978). In sand pine scrub communities in the central portion of the state, catastrophic crown fires killed adult sand pines, caused the release of seeds, and reset scrub habitats to earlier successional stages once every 20-40 years (Campbell and Christman 1982). Burning frequencies in pine flatwoods, dry prairies, and xerophytic hammocks have not been as intensively studied (Platt pers. comm.).

The seasonal timing of fires among habitat types was probably less variable than yearly periodicity. **Most fires were initiated by lightning strikes common during thunderstorms from June through August,** but fires at other times also occurred. **Prescribed management burns, however, are most often set during winter months after the advance of a cold front** (Komarek 1974). **Fires set in this manner burn slowly and are generally better controlled than fires set under other conditions. Winter burning helps to control plant succession and is certainly better than no burning at all** (Landers and Buckner 1981), **but altering the season of fire to a more natural cycle affects plant species composition and therefore may indirectly affect tortoise populations** (Davis 1985). **Summer fires also tend to kill many more deciduous shrubs and small trees than winter fires.** Thus winter fires generally need to be conducted more frequently to slow the encroachment of hardwoods. **Winter fires in longleaf pine sandhills are needed every 2-4 years to preserve the herbaceous ground cover required by gopher tortoises** (Landers and Speake 1980).

The soil characteristics of an area also play a role in deciding how frequently prescribed burning is needed to impede plant succession. On extremely sandy, well-drained, sterile soils, encroachment of woody perennial shrubs occurs more slowly than on more fertile soils. In the case of sandhill communities found on poor soils, winter fires every 5-8 years and summer fires every 7-10 years may be sufficiently frequent to prevent deciduous perennials from becoming established (Mushinsky pers. comm.).

Fire as a management tool on gopher tortoise habitat is much more beneficial than other techniques because it reduces the amount of ground litter (thus reducing the chances of a catastrophic wild fire), **quickly releases nutrients bound in plant materials,** and **does not disturb soil conditions and wildlife to the same extent that other management techniques may** (Komarek 1965, Mobley and Kerr 1973, Tanner and Terry 1981, Means and Campbell 1981). **Fire is also generally less expensive to perform on larger areas** (Christman 1983).

In addition to maintaining an open vegetation structure, burning stimulates new growth in many herbaceous plants that are important foods for gopher tortoises. This renewed growth, in turn, may help to provide additional forage for gopher tortoises during certain times of the year. McRae et al. (1981b), for example, noted that herbaceous ground cover became reduced in late summer and early fall, and gopher tortoises moved over larger areas in search of food during this time. A summer fire may stimulate late-season growth in many plants, however, and thus provide additional forage. **Means** (pers. comm.) **also has suggested that summer burns provide an open vegetation structure favorable to hatchling gopher tortoises emerging from nests in late summer and early fall. This open vegetation structure may make it easier for hatchlings to move about, initiate burrows, and find food.**

... Any efforts to incorporate natural burning schedules into habitat protection areas should be strongly encouraged ... By **rotating burn times among smaller patches within preserved tortoise habitat while maintaining an appropriate frequency of burning, a slightly varying mosaic of different patches would be created that would likely benefit many wildlife species.** [pdf pages 58-59]

The importance of both the depth of a stable water table and non-catastrophic, non-destructive fires to the recovery and survival of the Federal Candidate Species Gopher Tortoise, Eastern Population, the Federal Candidate Species Gopher Frog, the Federally Threatened Eastern Indigo Snake, and the more than 80 other species that rely on the gopher tortoises and their burrows not only was conveyed in the preceding excerpts by Cox et al. Those essential factors were emphasized on the data collection form titled, "GOPHER TORTOISE HABITAT EVALUATION," included on the last page of that 75-page publication. Specifically, that form lists "Depth to Water Table" and "Time Since Last Apparent Fire" as important data-collection categories when evaluating gopher tortoise habitat. Unfortunately, in areas where the water table has been lowered directly (e.g., by activities such as mining in the surficial aquifer) or indirectly (e.g., by activities such as mining that includes groundwater pumping from the regional Floridan Aquifer System for water supply), catastrophic, destructive fires result that kill native trees such as longleaf pines.

The only other alternatives for attempting to sustain gopher tortoises that are available when beneficial, non-destructive fires no-longer are possible also were addressed in the 1987 Cox et al. publication. Specifically, those alternatives include mechanical habitat management and chemical habitat management. Excerpts of those options from the 1987 Cox et al. publication are provided as follows (see **Attachment VIIh1**, emphasis added):

MECHANICAL HABITAT MANAGEMENT

Mechanical methods of managing habitat ...are generally more destructive to soil and wildlife resources and have not been as thoroughly studied as prescribed burning.... **In addition, gopher tortoises may be killed or maimed by mowing operations** ... [pdf pages 59-60]

CHEMICAL MANAGEMENT TECHNIQUES

More recently, chemical treatment (e.g., Velpar) has been tested as a means of suppressing plant succession...**it may also be toxic to gopher tortoises and other wildlife species. There is at least one instance where gopher tortoise deaths are suspected of having been triggered by**

chemical herbicide treatment (Diemer pers. comm.). ... [pdf page 60]

The Material Safety Data Sheet ("MSDS") for Velpar indicates that Velpar is an herbicide made by Dupont that "adheres to the standards and regulatory requirements of Canada and may not meet the regulatory requirements in other countries." Note that Dupont is the same company that initiated heavy mineral sands/titanium mining decades ago in the vicinity of the general areas containing high densities of gopher tortoises in northeast Florida, as depicted in Figure 5 of the 1987 publication by Cox et al. (see **Attachment VIIi**). Note also that Dupont has expanded that mining significantly since initiating that mining decades ago. Note also that additional expansion of that mining has been proposed by Chemours/Dupont/Twin Pines south of the Okefenokee Swamp and has been permitted east of the Okefenokee Swamp as NWP 44 – Mining Category permits in Charlton County Georgia. According to the first page of Dupont's MSDS for Velspar, the following tradename synonyms are used for that Dupont herbicide (see **Attachment VIIi**, emphasis added):

Velpar 75DF
Velpar 75WG
B10238956
HEXAZINONE (3-cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4(1H,3H)-dione)
Velpar 75WG

Page 2 of that MSDS states that the composition/information on ingredients for that herbicide includes 75% hexazinone and 25% "Other Ingredients." Those "Other Ingredients" are not disclosed. That same page of Dupont's MSDS lists the following first aid measures for Velpar:

Skin contact : Take off all contaminated clothing immediately. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

Eye contact : Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

Inhalation : No specific intervention is indicated as the compound is not likely to be hazardous. Consult a physician if necessary.

Ingestion : Call a poison control center or doctor for treatment advice. Have person sip a glass of water if able to swallow. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Do not give anything by mouth to an unconscious person.

Page 3 of Dupont's MSDS includes "General advice" for exposure to the herbicide. That "General advice" for exposure to Dupont's Velpar is as follows:

Have the product container or label with you when calling a poison control center or doctor, or going for treatment.
For medical emergencies involving this product, call toll free 1-800-441-3637.
See Label for Additional Precautions and Directions for Use.

Clearly the Federal Candidate Species Gopher Tortoise, Eastern Population, the Federal Candidate Species Gopher Frog, the Federally Threatened Eastern Indigo Snake, and the more than 80 other species that rely on the gopher tortoises and their burrows are not able to have the product container or label with them or call a poison control center or doctor, or go for treatment if their habitat is sprayed with Velpar. Page 3 of that MSDS includes procedures for "ACCIDENTAL RELEASE MEASURES." Those procedures are as follows:

Safeguards (Personnel) : Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus. Wear personal protective equipment. Keep people away from and upwind of spill/leak.

Spill Cleanup : Dike spill. Prevent further leakage or spillage. Sweep up and shovel into suitable containers for disposal.

Accidental Release Measures : Prevent material from entering sewers, waterways, or low areas. Never return spills in original containers for re-use.

Clearly the Federal Candidate Species Gopher Tortoise, Eastern Population, the Federal Candidate Species Gopher Frog, the Federally Threatened Eastern Indigo Snake, and the more than 80 other species that rely on the gopher tortoises and their burrows are not able to conduct those "ACCIDENTAL RELEASE MEASURES" if there is an "ACCIDENTAL RELEASE" of that herbicide in their habitat. Those species of wildlife also won't be able to comply with the requirements to "Wash hands thoroughly with soap and water after handling and before eating, drinking, ... or using the toilet," as directed on page 4 of the MSDS. The Federal Candidate Species Gopher Tortoise, Eastern Population, the Federal Candidate Species Gopher Frog, the Federally Threatened Eastern Indigo Snake, and the more than 80 other species that rely on the gopher tortoises and their burrows are not able to ensure that Velpar does "not contaminate water, other pesticides, fertilizer, food or feed," as also directed on page of the MSDS.

Additionally, the Federal Candidate Species Gopher Tortoise, Eastern Population, the Federal Candidate Species Gopher Frog, the Federally Threatened Eastern Indigo Snake, and the more than 80 other species that rely on the gopher tortoises and their burrows also are not able to implement the "EXPOSURE CONTROL/PERSONAL PROTECTION," including for "Skin and body protection" and exposure limits for total Velpar dust and respirable Velpar dust that are described on page 4 of the MSDS for Velpar. In fact, page 5 of the MSDS for Velpar confirmed that Velpar causes eye irritation/was corrosive to eyes when tested on rabbits. Page 6 of the Velpar MSDS confirms that Velpar is a "Marine pollutant" and includes the following statement as the only information provided in "SECTION 12. ECOLOGICAL INFORMATION:"

> Environmental Hazards: Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters or rinsate. See product label for additional application instructions relating to environmental precautions.

Equally as disturbing is the "Waste Disposal" information provided on page 6 of Dupont's Velpar MSDS, in "SECTION 13. DISPOSAL CONSIDERATIONS." That information includes the following statement, in relevant part, but clearly disposal of Velpar "on site," as directed by Dupont's MSDS, will contaminate the water and food for the Federal Candidate Species Gopher Tortoise, Eastern Population, the

Federal Candidate Species Gopher Frog, the Federally Threatened Eastern Indigo Snake, and more that 80 other species that rely on the gopher tortoises and their burrows for survival (see **Attachment VIIi**, emphasis added):

> **Do not contaminate water, food or feed by disposal. Wastes resulting from the use of this product must be disposed of on site** „„.

E. Harm to the Survival and Recovery of the Federally Threatened Eastern Indigo Snake, Which is Reliant on Gopher Tortoise Burrows as Refuge from Desiccation, as Well as "Thermal Refugia"

Additional evidence of the essential contributions of gopher tortoise burrows as refuges from desiccation, as well as "thermal refugia" is provided in the Eastern Indigo Snake Fact Sheet from the Multi-Species Recovery Plan for South Florida. That 16-page Fact Sheet indicates that snake species was designated as a federally threatened species on January 31, 1978. The reliance of the Federally Threatened Eastern Indigo Snake on gopher tortoises and their burrows is discussed in that Fact Sheet. Specifically, that Fact Sheet describes gopher tortoise burrows as a refuge from desiccation, as well as a "thermal refugia." References in that Fact Sheet to the importance of gopher tortoise burrows to the Federally Threatened Eastern Indigo Snake for favorable temperatures, to prevent desiccation, and for protection and incubation of eggs include the following (see **Attachment VIIj1**, emphasis added):

> **In laboratory experiments, they appear to be especially susceptible to desiccation** (Bogert and Cowles 1947). **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 desiccation** (Bogert and Cowles 1947, Speake *et al*. 1978, Layne and Steiner 1996). [page 3]
>
> Reliance on xeric sandhill **habitats throughout the northern portion of the eastern indigo's range can be attributed primarily to the availability of thermal refugia afforded by gopher tortoise burrows during winter.** [page 3]
>
> **Even though thermal stress may not be a limiting factor throughout the year in South Florida, eastern indigo snakes still seek and use underground refugia in the region.** On the sandy central ridge of South Florida, **eastern indigos use gopher tortoise burrows more** (62 percent) **than other underground refugia** (Layne and Steiner 1996). [page 4]
>
> **Smith (1987) radio-marked hatchling, yearling, and gravid eastern indigo snakes and released them in different habitat types on St. Marks NWR in Wakulla County, Florida. Smith monitored the behavior, habitat use, and oviposition sites selected by gravid females and concluded that diverse habitats,** including high pineland, pine-palmetto flatwoods, and permanent open ponds, were important for seasonal activity. In this study, habitat use also differed by age-class and season; **adult snakes often used gopher tortoise burrows during April and May** .... The **eastern indigo snake used gopher tortoise burrows as oviposition sites** in high pineland areas... (Smith 1987). [page 4]
>
> **Relationship to Other Species**

> **Eastern indigo snakes require a sheltered "refuge" from winter cold and dry conditions. Wherever the eastern indigo snake occurs in xeric habitats, it is closely associated with the gopher tortoise, the burrows of which provide shelter from winter cold and the desiccating sandhill environment** (Bogert and Cowles 1947, Speake *et al.* 1978). **This dependence seems especially pronounced in Georgia,** Alabama, and the panhandle area of Florida, **where eastern indigo snakes are largely restricted in the winter to sandhill habitats occupied by gopher tortoises** (Diemer and Speake 1981, Moler 1985b, Mount 1975). [page 6]

Pages 13-15 of that Fact Sheet for the Federally Threatened Eastern Indigo Snake included a list of Species-level Recovery Actions for that species. Action "S2.5" was "Enforce available protective measures." Following is the first recovery action under "S2.5," which states, "**[B]ecause this species is found in a variety of habitats, it should be considered in almost all consultations** (see **Attachment VIIj2**, emphasis added):

> **S2.5. Enforce available protective measures.**
> **S2.5.1. Conduct section 7 consultations on Federal activities that may affect eastern indigo snakes**. **Federal agencies should consult with the FWS on any activity (authorized, funded, or carried out) that may affect the eastern indigo snake. Such activities include, but are not limited to, pesticide use, road building, construction of new facilities, military training exercises, wetland fill, clearing for new runways, etc. Because this species is found in a variety of habitats, it should be considered in almost all consultations.** [page 14]

Based on FOIA requests to both the USACOE and the USFWS, no Section 7 consultations or Biological Opinions were provided for the Federally Threatened Eastern Indigo Snake or any federally threatened or endangered species for any of the mining-related activities associated with east side of the Okefenokee Swamp and/or the south side of the Okefenokee Swamp. That includes those mining activities authorized under the NWP 44 – Mining Category and mining activities that already have been initiated without any valid USACOE permits, such as the proposed Twin Pines mining east of the Okefenokee Swamp, and the proposed HPS II mining and proposed Chemours/Dupont/Twin Pines, both located south of the Okefenokee Swamp. That apparent failure by federal agencies to enforce currently available protective measures under the CWA and ESA is the cause of the following statements from the Status and Trends of the Fact Sheet (see Attachment **VIIj2**, emphasis added):

> **Status and Trends**
>
> The wide distribution and large territory size of the eastern indigo snake complicate evaluation of its population status and trends. We believe that activities such as collecting and gassing of tortoise burrows have been largely abated through effective enforcement of protective laws. However, despite these apparent gains, **the threats described above are acting individually and synergistically against the eastern indigo snake. ... we surmise the population as a whole is declining because of current rates of habitat destruction and degradation**. [pages 6 and 7]

F. Eliminating Other Threats to the Survival and Recovery of the Federally Threatened Eastern Indigo Snake Includes Equal Protection for the Eastern Population of Gopher Tortoises and Avoidance of Pesticides

Despite the fact that the importance of gopher tortoise burrows to the Federally Threatened Eastern Indigo Snake is well documented, none of the Species-level Recovery Actions for that species listed in the Fact Sheet referenced the need to provide equal federal protection to the gopher tortoises. That includes "S2.4." to "**eliminate other threats to the survival of the indigo snake**." That translates to the elimination of threats to the gopher tortoises that create the burrows that provide favorable temperatures, prevent desiccation, and protect and incubate eggs of the Federally Threatened Eastern Indigo Snake.

Other Species-level Recovery Actions for the Federally Threatened Eastern Indigo Snake, addressed on pages 13-15 of that Fact Sheet, included "loss of habitat" and "pesticide contamination." See more detailed discussion of the use of harmful pesticides (e.g., Velpar), in habitat the Federally Threatened Eastern Indigo Snake shares with the Eastern Population of Gopher Tortoises in the subsection titled "Gopher Tortoises as Representative Species of the Southeastern Coastal Plain Ecoregion, Characteristics of Gopher Tortoise Burrows, and Implications for the Survival and Recovery of the Federal Candidate Species Gopher Tortoise, Eastern Population..." and as described in the following excerpts (see Attachment VIIj2, emphasis added):

> **Species-level Recovery Actions**
>
> **S2.4. Identify, evaluate, and eliminate other threats to the survival of the indigo snake.** Regulations are in place to control the pet trade and gassing of gopher tortoise burrows. **In addition to the outright loss of habitat ... potential threats such as ... pesticide contamination may become more problematic and threaten the continued persistence of eastern indigo snakes in some areas. Because pesticide use ... poses a potential risk to eastern indigos, management plans should consider these risks and alleviate threats whenever possible.** Trapping efforts may be needed on public lands where free-ranging domestic animals threaten this species.
>
> **S3. Continue studies on the biology and ecology of the indigo snake.** Adequate long-term protection of the eastern indigo snake depends on a thorough understanding of its life history. **Because this species occurs in low densities naturally, it is difficult to survey and study.** As a result, many aspects of its life history are poorly understood.
>
> **S3.1 Investigate techniques to effectively survey eastern indigo snakes.** The use of subterranean cameras or scopes to investigate gopher tortoise burrows, particularly during winter months, has proven useful in some circumstances. However, other methods, such as the use of pheromones to attract males, should be investigated. This information is necessary to assess population levels and status of this species, and to accurately monitor existing populations and the response to management prescriptions.
>
> **S4. Monitor populations.** Once standardized survey techniques are developed, **begin long-term monitoring on conservation lands where eastern indigo snakes are known to occur.** This information is needed to determine status and trends for the population.

G. Gopher Tortoise Relocations Not a Viable Alternative

Twin Pines has acknowledged that gopher tortoises reside on the proposed Twin Pines mine site on the east side of the Okefenokee Swamp. During Robert Holt's colloquium presentation at the University of Georgia on September 13, 2019, Holt confirmed that Twin Pine's intention simply is to relocate all of the

gopher tortoises they are able to find to some other location (see summary of in Section VIII.). The 1987 Cox et al. publication focused on gopher tortoises included the following warnings about relocation, specifically stating that relocation is "**not the best solution to the animal's conservation problems"** (see **Attachment VIIh1**, emphasis added):

> **RELOCATION**
>
> As many have pointed out (Diemer 1984b, Florida Game and Fresh Water Fish Commission 1984, Diemer 1986), **relocation is currently not the best solution to the animal's conservation problems. The principal threat to tortoise conservation in Florida is habitat destruction, and effective habitat protection programs are the best response to this threat. Furthermore, the indiscriminate mixing of isolated gopher tortoise populations may help to spread diseases and parasites, may break down locally adapted gene complexes in both the donor and recipient populations, and may disrupt existing social structure** (Diemer 1984b, Florida Game and Fresh Water Fish Commission 1984, Diemer 1986) [pdf page 66]

According to the 1-page fact sheet on gopher tortoises distributed by the Florida Fish and Wildlife Conservation Commission, upper respiratory tract disease ("URTD") "is a disease affecting gopher tortoises" that is "spread through direct contact between tortoises." Also according to the fact sheet, "[T]here is no cure for URTD" and "**[P]eople may also unintentionally add to the spread of URTD by moving tortoises.**" The URTD fact sheet also states, "tortoises with URTD may also be asymptomatic, showing no signs of the disease (see **Attachment VIIj1**). Clearly that should be sufficient to make the relocation of gopher tortoises as "mitigation" for USACOE mining and other permits illegal, rather than a routine occurrence to justify issuance of permits such as the mining activities proposed by Twin Pines and others referenced in this NOI.

Another reason to make the relocation of gopher tortoises illegal for issuance of permits for developments, including mining, is the high site fidelity of gopher tortoises. That high site fidelity of gopher tortoises was documented in the data published in 2014 by McGuire et al. (see **Attachment VIIh2**, page 754), confirming that relocation of gopher tortoises does not constitute "mitigation" of impacts from permitted activities such as mining. The additional depletion of energy reserves in relocated gopher tortoises attempting to return to their home sites also could result in susceptibility to URTD and other diseases, as well as significantly increase mortality (e.g., from predation and traffic fatalities of gopher tortoises attempting to return to original home sites). Extensive evidence is provided in the NOI that widespread and extensive dewatering of the regional Floridan Aquifer System and Southeastern Coastal Plain Ecoregion, from groundwater mining and/or other mining has occurred and continues to occur and that dewatering destroys gopher habitat. Despite that evidence and the evidence that relocation of gopher tortoises is **not a viable alternative to restoring and protecting gopher habitat where those gopher tortoises occur**, both the USACOE and the USFWS continue to turn a blind eye to those overwhelming facts, instead of enforcing the "regulatory mechanisms" already provided under the CWA and ESA, respectively.

H. Link Between Hydroperiod Alterations/Lowered Water Table and URTD in Gopher Tortoises

No gopher tortoise research appears to have evaluated the role of hydroperiod alterations from mining activities and/or other types of groundwater mining on gopher tortoise health. The results of 15-year recapture data published in 2014 by McGuire et al., however, revealed a relationship between temperature and severe URTD. Those data also revealed a relationship between distance traveled by gopher tortoises and severe

URTD. Specifically those findings included the following excerpts from page 745 (see **Attachment VIIh2**, emphasis added):

> We radiotracked 30 adult tortoises (16 males, 14 females) from a long-term study site with the use of mark–recapture methods to determine site fidelity and to compare home-range size to that of a study in 1997. An additional 10 tortoises (six males, four females) with severe clinical signs of URTD from elsewhere in the study area were radiotracked and compared to tortoises that were asymptomatic or had only mild clinical signs. **We also monitored thermoregulatory behavior of tortoises with the use of data loggers affixed to the carapace.**
>
> Home ranges of tortoises with severe URTD were significantly larger than asymptomatic or mildly affected tortoises. **Tortoises with severe clinical signs moved long distances over short periods**...
>
> **Variation in the average carapacial temperatures of tortoises with severe URTD was significantly different from carapacial temperatures of mild and asymptomatic tortoises, suggesting differences in thermoregulatory behavior of severely ill tortoises.**

The correlation between gopher tortoises with severe clinical signs of URTD that "moved long distances over short periods" may have resulted because those gopher tortoises were forced to move longer distances because of degraded habitat and food sources in that home range, in addition to the loss of temperature and humidity stability in their burrows. That relationship would be similar to the female panther with a lower success rate for kitten survival referenced in the Xu et al. study of panther den locations (see **Attachment Ve2**). The significant variation in the average carapacial temperatures of tortoises with severe URTD also could have resulted from those gopher tortoises with clinical signs of URTD being in burrows where water levels in the surfiical aquifer had been or were being altered (e.g., lowered) by mining and/or other groundwater mining activities, thus depriving those gopher tortoises of temperature and humidity stability in the winter and/or summer for those burrows.

The 2014 McGuire et al. publication confirmed that for gopher tortoises, "**homerange size is a function of resource requirements of individuals**." The statement on page 753 of that 2014 McGuire et al. publication, regarding dense patches of blackberry, add additional support to the hypothesis that gopher tortoises with severe URTD are attempting to survive in habitat degraded by mining activities and/or other groundwater mining which lowered water tables at burrow sites. That is because blackberry thickets are common native, invasive species in areas where the natural hydroperiods have been altered by mining activities and/or other groundwater mining. Additionally, the response of those severely ill gopher tortoises that "**moved through unsuitable habitat, such as hardwood bottoms**" may have been attempts by the severely ill gopher tortoises to seek areas with higher humidity after the water table was lowered at their burrow sites by mining activities and/or other groundwater mining. That statement from page 753 of the 2014 McGuire et al. publication was as follows (see **Attachment VIIh2**, emphasis added):

> **Severely ill tortoises with large home ranges moved through unsuitable habitat, such as hardwood bottoms and blackberry (*Rubus* spp.) patches, often remaining in those areas for days.**

Pages 746 and 747 of that 2014 publication by McGuire et al. indicate the study was conducted at Ichauway, an 28,644-acre (11,600-hectare), privately owned research site of the Joseph W. Jones Ecological Research Center in Baker County, Georgia. That county is located in southwest Georgia, adjacent to Dougherty County, Georgia, and within the extent of the regional Floridan Aquifer System where extensive groundwater mining and fractures have been documented and were summarized in the 2016 publication by Xu et al. (see **Attachment Ve3**). Page 752 of the 2014 McGuire et al. publication included a map indicating the general areas where the gopher tortoises with the severe URTD were located. Those locations appeared to be associated with streams/river tributaries. Streams in karst aquifer systems tend to be associated with fractures, where ground water from the aquifer system would discharge vertically upward into those streams, but preferentially dewater those areas when associated with groundwater and other mining. Although the 2014 study by McGuire et al. suggested that the extremely extended movements of gopher tortoises the "unsuitable habitat" was "likely to be more pronounced during stressful conditions, they erroneously referenced "drought," rather than anthrpogenic alterations of natural hydroperiods by groundwater mining and/or other mining activities, as one of those "stressful conditions" (see **Attachment VIIh2**, page 754).

I. "On-Site Habitat Protection" and "Off-Site Banking" Not Viable Options for Gopher Tortoise Populations Associated with Mining Activities "Similar in Nature" to Mining Activities in the Greater Okefenokee Swamp Basin

Figure 25 in the 1987 Cox et al. publication focusing on gopher tortoises described two "GFC Recommendation" options to protect gopher tortoises from destruction by developments. Those two options were: 1) "ON-SITE HABITAT PROTECTION" and 2) "OFF-SITE BANKING." Clearly "ON-SITE HABITAT PROTECTION" is not a viable option if the development in question involves mining activities that are "**similar in nature**" to any of the existing and/or proposed mining activities discussed in this NOI document and attachments. That is because the dewatering of the surficial aquifer, which lowers the water table, is most severe on mining sites. That means neither any gopher tortoise habitat nor any gopher tortoises remaining on sites permitted for mining (or previously mined) will be capable of surviving or contributing to the recovery of gopher tortoises.

Additionally, because the Southeastern Coastal Plain Ecoregion is underlain by the regional, karst Floridan Aquifer System and that karst aquifer system is covered with a dense network of fractures and other karst conduits, that means "Off-Site Banking" also is not a viable option for protecting gopher tortoises and their habitat when mining activities are in the vicinity. That is because those fractures and other karst conduits distribute the dewatering from mining activities for many miles beyond that surface footprint of the mining site.

Examples of the extent of off-site dewatering of the surficial aquifer system in the form of hydroperiod alterations by mining activities "**similar in nature**" to the existing and proposed mining activities discussed in this NOI document and attachments is provided in the 2011 publication by Bacchus et al. describing adverse impacts of phosphate mining in the Peace River Basin (see **Attachment Ve8**). Figure 25 in the 1987 Cox et al. publication suggested that simply having developments pay money to the "Wildlife Resource Mitigation Fund" to support the "RPC Mitigation Bank" (or any mitigation banks) was a viable alternative for relocating gopher tortoises. Even if none of the insurmountable problems with relocation of gopher tortoises (described in the preceding subsection) existed, "Off-Site Banking" for gopher tortoise survival and recovery is not an option for developments that involve mining activities or are in the vicinity of any groundwater mining and/or any other mining activities. Therefore, the following statement from the 1987 Cox et al. publication that future research "may necessitate changes to the recommendations presented here"

is applicable to these and other recommendations in Cox et al. that failed to consider the adverse impacts of mining activities and/or other groundwater mining on gopher tortoises and their habitat (see **Attachment VIIh1**, emphasis added):

> ...In addition, **future research on gopher tortoise biology may necessitate changes to the recommendations presented here**; however, a set of guidelines is desperately needed now to help preserve gopher tortoises throughout Florida as a functioning part of our state's unique biota. [pdf page 10]

J. Additional, Essential Information for the Survival and Recovery of the Federally Threatened Eastern Indigo Snake, the Federal Candidate Species Gopher Tortoise, Eastern Population, and the Federal Candidate Species Gopher Frog

If the USFWS intends to ensure the survival and recovery of the Federally Threatened Eastern Indigo Snake, the Federal Candidate Species Gopher Tortoise, Eastern Population, the Federal Candidate Species Gopher Frog, and the more than 80 other species dependent on the gopher tortoises and their burrows, in addition to all other federally listed species within the Southeastern Coastal Plain Ecoregion, the USFWS will have to prevent any additional mining activities in that Ecoregion that are "**similar in nature**" to the mining activities described in this NOI and attachments. The 1987 Cox et al. publication provided additional, essential information for the survival and recovery of the Federally Threatened Eastern Indigo Snake, the Federal Candidate Species Gopher Tortoise, Eastern Population, the Federal Candidate Species Gopher Frog. That information included: 1) effective population size to prevent inbreeding depression; 2) minimum area requirements; 3) assessing habitat quality; 4) estimating population density; and 5) preserve size, shape, and configuration. Following are excerpts of that additional, essential information from the 1987 Cox et al. publication (see **Attachment VIIh1**, emphasis added):

> **EFFECTIVE POPULATION SIZE AND INBREEDING DEPRESSION**
>
> **Franklin (1980) recommended that a population equal to an effective population size of 50 individuals was needed to offset the genetic problem of inbreeding depression and to provide minimum levels of protection against extinction. Effective population size** (expressed as "N_e") **is ... "the size of an idealized population that would have the same amount of inbreeding or of random gene frequency drift as the (natural breeding) population under consideration"** (Kimura and Crow 1963). **Effective population size is usually quite different from the total or censused population size because** (1) **social interactions prevent all reproductively mature individuals from breeding in any one year,** (2) **there is overlap of generations in many vertebrate species**, (3) **population size varies considerably from year to year,** and (4) **other population characteristics constrain or enhance the exchange of genes among all individuals in the population each year** (Hill 1973).
>
> Why an N_e of **50 individuals is needed** rather than 35 or 65 is **based on the genetic characteristics of animal populations and levels of inbreeding deemed acceptable by captive breeding programs for zoos and stock breeders** (Franklin 1980, Frankel and Soule 1981). **Franklin (1980) warns, however, that this estimate should be used for estimating the minimum numbers needed for continued existence. He estimated that an effective population size of approximately 500 individuals would be needed to withstand catastrophic events and provide mutation rates sufficient to offset the problem of genetic drift**....

A problem comes in translating a breeding population of approximately 40 individuals into a censused population found on potential development sites. For example, non-breeding juveniles will be censused along with adults in any survey, and this may lead to inaccurate estimates of the size of the actual breeding population (Reed et al. 1986). **If 50-75% of any given gopher tortoise population consists of reproductively active adults (Alford 1980), then a censused population of approximately 50-80 individuals will be needed to establish an effective population size of 50 individuals.** [pdf pages 32-33]

MINIMUM AREA REQUIREMENTS

Recommendations for minimum patch size are needed to translate minimum population size estimates into habitat protection recommendations for areas under consideration for development. On smaller tracts of development lands, the **area set aside for gopher tortoises should support a population of at least 40-50 individuals with appropriate management. Larger protection areas should be considered for preservation when large, relatively dense tortoise populations are distributed over much of a larger development site, or when proper habitat management is not practical.**

One method of estimating the area requirements needed by 40-50 gopher tortoises is to consider the animal's typical home range size. This value will be influenced, however, by several environmental and behavioral factors (Auffenberg and Iverson 1979, McRae et al. 1981b). **Adult males may move over several acres during the breeding season in search of potential mates; males and females may search for food over larger areas during fall when amounts of herbaceous ground cover are typically lower; younger males may be displaced by older territorial males during the breeding season; and short-distance seasonal movements from summer breeding areas to over-wintering areas may occur in some populations** (McRae et al. 1981b).

Richardson et al. (1986) estimated that the critical area requirement for a typical gopher tortoise was 1.1 acres (0.45 hectares) based on the mean home range sizes presented by McRae et al. (1981b). "Mean home range" size may not be the estimate that best predicts the long-term ecological needs of viable gopher tortoise populations, however. Such an estimate represents a "middle ground" of all extremes, but **in many instances it will be the extremes in range sizes that are most crucial to sustaining individuals in the population**. **For example, herbaceous ground cover, an important food source for tortoises, is typically at lower levels in late summer and early fall. The range size needed to meet nutritional requirements during this time may double or triple over the range size observed in early spring** (Auffenberg and Iverson 1979, McRae et al. (1981b). **If sufficient area is not allowed for these expanded forays, the population may experience lower survival and fecundity levels and eventually disappear. Providing adequate area for the characteristic wanderings of immature males (McRae et al. 1981b) also should be taken into account when estimating the area needs of a population. In a four-year study of gopher tortoise movements, for example, Douglass (1976) found that four male tortoises moved over 9.9-15.6 acres (4.0-6.3 hectares) - an area ten times larger than the critical range size estimated by Richardson et al** (1986).

McRae et al. (1981b) conducted one of the most thorough studies of home range size in gopher tortoises to date and found that a male tortoise moves over an average of 1.1 acres (0.45 hectares) in favorably managed sandhill habitat each year, with a standard deviation of 1.2 acres (0.53 hectares). Combining these values provides a more cautious estimate of the area needed by male tortoises over longer periods of time: 2.4 acres (0.98 hectares). Most of the home range sizes observed by McRae et al. (1981b) would be accounted for by this value, and the home range estimates reported by other researchers would also be better approximated (Douglass 1976, Auffenberg and Iverson 1979, Wright 1982). **Estimating female home range size from data presented in McRae et al. (1981b) is difficult because of smaller samples and their exclusion of movement data obtained from "wetter areas."** The overall mean range size for *all* females monitored by McRae et al. (1981b) was 0.5 acres (0.21 hectares), but no standard deviation was estimated about this mean value. A reasonable estimate of the standard deviation (based on data obtained for males) would be that it equals the mean value presented by McRae et al. (1981b). **Thus minimum area requirements for females would be on the order of 1.0 acre** (0.42 hectares). Combining these estimates for adults, the amount of favorable habitat needed to support each individual in a characteristic sandhill population with a 1: 1 sex ratio would be approximately 1.7 acres (0.7 hectares).

Inkley (ms.) recommended that areas smaller than 10 acres (4 hectares) are undesirable as gopher tortoise habitat protection areas because the average colony size observed by Landers and Speake (1979) was approximately 10 acres (4 hectares). Inkley (ms.) also recommended that appropriate habitat as large as 500 acres (200 hectares) might be needed for the longterm protection of gopher tortoise populations.

... **Habitat quality has an obvious influence**, and specific recommendations need to be made on a case-by-case basis after considering habitat quality and the intensity of proposed habitat management activities on habitat protection areas. We feel that an appropriate guideline for **the minimum area requirement of a gopher tortoise population of 40-50 individuals found on potential development sites is 25-50 acres (10-20 hectares), provided that proper preserve design and habitat management accompanies such a recommendation.** Within this range, the actual amount of area preserved should reflect habitat quality, the distribution of gopher tortoises on the site, and the amount of management activity proposed (Section 4). **Minimum-sized protection areas should circumscribe an estimated 40-50 individuals and include an appropriate buffer area around segments of the population that occur on edges of the protection area** (Section 4).

Large development sites containing several hundred acres of gopher tortoise habitat should commit more acreage to gopher tortoise habitat preservation than the minimum area recommended here. Large development areas will likely contain several more-or-less discrete aggregations of gopher tortoises distributed over favorable habitat, and such **larger populations will have better chances of persisting through time than smaller populations**.... [pdf pages 38-39]

ASSESSING HABITAT QUALITY USING HABITAT SUITABILITY INDICES

As noted above, low density estimates for an area do not necessarily mean that the habitat is unsuitable for gopher tortoise populations. Historically heavy predation rates in many areas of the state, for example, have lowered populations below their natural levels on areas where habitat quality is relatively high....

The inclusion of old burrows in this definition is made to provide a means of documenting recent population declines on a site. Old burrows, as defined, may persist for several months after last being "active" or "inactive." [pdf page 42]

ESTIMATING POPULATION DENSITY

An exact census of a local gopher tortoise population is difficult to obtain because of the animal's generally reclusive nature. Adults spend a relatively small amount of time outside their burrows foraging or seeking mates (McRae et al. 1981b), and **some individuals may remain in their burrows for several weeks during certain times of the year. These habits severely limit opportunities to make direct counts of individuals. Counts of burrows are often used to estimate population size indirectly, but this technique may be somewhat imprecise. An adult gopher tortoise may occupy several burrows over a short time period, the burrows of juveniles are often difficult to locate, and the relationship between burrow density and actual gopher tortoise density is not well understood for some areas** (Breininger et al. in prep.). [pdf page 45]

Video cameras have been mounted on small sleds and guided down burrow shafts to determine the occupancy of burrows (Spillers and Speake 1986, Breininger et al. in prep.). **This method offers great potential for censusing gopher tortoises and burrow commensals, and once technical refinements are made it may become the preferred method of censusing gopher tortoise and burrow commensal populations. The camera is able to detect adult or subadult tortoises in almost all cases, and a typical burrow survey averages only ten minutes** (with a range of 3-20 minutes) (Breininger et al. in prep.). **Considerable strain is usually placed on the camera system, however, and there are maintenance periods when the camera cannot be used. Furthermore, the equipment requires a water-tight housing when used in areas with high water tables, and it does not fit into some small burrows.** [pdf page 46]

... **Habitat protection efforts may well be for naught unless they are complemented by appropriate preserve design and management.** [pdf page 57]

PRESERVE SIZE, SHAPE, AND CONFIGURATION

Wilson and Willis (1974) proposed that circularly shaped preserves would better withstand the effects of surrounding habitats when compared to other preserve shapes. This shape has the smallest edge-to-area ratio and thus decreases the amount of preserve area that comes in direct contact with surrounding habitat types. In keeping with this recommendation, **areas preserved for gopher tortoises generally should be as circular as possible and centered on the densest tortoise concentrations found on the site.** The distribution of gopher tortoises within available habitat may vary, however, from approximately uniform dispersion to distinct aggregations (Alford 1980), and such situations will likely make circular preserves difficult to establish.

Extremely narrow, linear preserves should be avoided.... [pdf page 57]

K. Construction Industry's 2009 Petition to USFWS to Downlist the Wood Stork

In 2009 the USFWS received a 5-page letter dated May 27, 2009, that was a "Petition of the Florida Home Builders Association ("FHBA") to Reclassify the Wood Stork Under the Endangered Species Act. That letter was co-signed by J. Steve Godley, Biological Research Associates ("BRA"), and Steven Geofrey Gieseler, Pacific Legal Foundation, requested the downlisting of the Federally Endangered Wood Stork to Federally Threatened. Pursuant to a lawsuit by the FHBA against the USFWS, the USFWS completed a required five-year "wood stork review" in September, 2007, according to page 4 of that letter/petition. Also according to that same page of the FHBA's petition to downlist the Federally Endangered Wood Stork, the FHBA's petition was based on the "review's survey of the best available scientific information" from that USFWS's five-year "wood stork review." A synopsis of that five-year review's conclusions were included on the final two pages of that 5-page letter/petition, but failed to reference any "scientific information" to support that downlisting of the Federally Endangered Wood Stork (see **Attachment VIIk2**).

It is important to note that expansion of "home building" Florida commonly results in extensive mining activities, in addition to the direct, indirect/secondary, and cumulative impacts that dewater the regional Floridan Aquifer System and natural wetlands, in addition to the extensive discharge of dredged and fill material into Waters of the US. There was no apparent acknowledgement of that "scientific information" that was available at the time that the USFWS conducted that five-year "wood stork review," as well as in 2014, when the USFWS downlisted the Federally Endangered Wood Stork. That "available scientific information" supporting the increasing magnitude and severity of the decline and destruction of wood stork habitat essential for nesting and foraging has increased in volume in the 13 years since that review and the 5 years since the downlisting described in the following subsection.

L. USFWS's 2014 Downlisting of the Federally Endangered Wood Stork

On June 30, 2014, the USFWS published its final rule reclassifying (i.e., downlisting) the US breeding population of the wood stork from a federally endangered species to a federally threatened species under the 1973 ESA, as amended. That downlisting of the wood storks in the southeastern US occurred despite the failures of the USFWS described above.

The reclassification was published on pages 37078 through 37103 of Federal Register Volume 79, Number 125. The justification for that reclassification was, "**we establish the U.S. breeding population in** Alabama, **Florida, Georgia,** North Carolina, Mississippi, and South Carolina **as a distinct population segment (DPS).** The endangered designation no longer correctly reflects the status of the DPS due to improvement in its overall status. **This action is based on a review of the best available scientific** and commercial **data**, which indicate that the U.S. wood stork DPS is not presently in danger of extinction across its range." The "Summary," "Executive Summary," "Summary of the Major Provisions of This Final Rule," and contact information for that reclassification included the following on page 37078 (see **Attachment VIIk3**, emphasis added):

> **SUMMARY: We, the U.S. Fish and Wildlife Service (Service or USFWS), reclassify the United States (U.S.) breeding population of the wood stork from endangered to threatened under the Endangered Species Act of 1973, as amended (Act).** Further, **we establish the U.S. breeding population in** Alabama, **Florida, Georgia,** North Carolina, Mississippi, and South Carolina **as a distinct population segment (DPS).** The endangered designation no longer correctly reflects the

status of the DPS due to improvement in its overall status. **This action is based on a review of the best available scientific** and commercial data, which indicate that the U.S. wood stork DPS is not presently in danger of extinction across its range. While **habitat loss and fragmentation continues to impact the U.S. wood stork DPS,** the increase in the abundance of the breeding population and significant expansion of the breeding range reduce the severity and magnitude of these threats.

ADDRESSES: This final rule, as well as comments and materials received in response to the proposed rule, are available on the Internet at *http://www.regulations.gov* at Docket Number [FWS–R4–ES–2012–0020]. Comments and materials received, as well as supporting documentation used in preparation of this rule, will be available for public inspection, by appointment, during normal business hours at: U.S. Fish and Wildlife Services, North Florida Ecological Services Field Office, 7915 Baymeadows, Suite 200, Jacksonville, FL 32256.
FOR FURTHER INFORMATION CONTACT: Jay Herrington, North Florida Ecological Services Field Office, (see **ADDRESSES**); by telephone at 904–731–3336; or by facsimile (fax) at 904–731–3045.

Executive Summary

Why We Need To Publish a Rule

• **In September 2007,** we completed a 5-year status review, which included a recommendation to reclassify the U.S. breeding population of the wood stork from endangered to threatened.
• In **May 2009,** we received a petition to reclassify the U.S. breeding population of wood stork; the petition incorporated the Service's 5-year review as its sole supporting information.
• On **September 21, 2010,** we published a 90-day finding that the petition presented substantial information indicating that reclassifying the wood stork may be warranted (75 FR 57426). We requested information that would assist us in our status review.
• On **December 26, 2012**, we published a 12-month finding that the petitioned action was warranted and concurrently a proposed rule to reclassify the U.S. breeding population of the wood stork from endangered to threatened and designate this population as a distinct population segment (DPS) (77 FR 75947). We requested peer and public review of the proposed rule.

Summary of the Major Provisions of This Final Rule

• We reclassify the U.S. breeding population of wood stork from endangered to threatened.
• We determine that the U.S. breeding population of wood stork is a DPS.
• We amend the List of Endangered and Threatened Wildlife (50 CFR 17.11(h)) to reflect the status change to threatened and that the U.S. wood stork DPS is found in the States of Alabama, Florida, Georgia, Mississippi, North Carolina, and South Carolina.

The Basis for the Action

• The U.S. breeding population of wood stork was listed under the Act in 1984, prior to publication of the joint policy of the National Marine Fisheries Service and U.S. Fish and Wildlife Service (Services) regarding the recognition of distinct vertebrate population segments (61 FR 4722). We find that the U.S. breeding population of wood stork meets the elements of the Services' DPS policy

and is a valid DPS (U.S. Wood Stork DPS).
• When the U.S. breeding population of wood stork was listed in 1984, the population was known to occur in Alabama, Florida, Georgia, and South Carolina **with breeding and nesting primarily in south and central Florida with a small number of nesting colonies in north Florida, Georgia,** and South Carolina. Currently wood storks occur in Alabama, Florida, Georgia, Mississippi, North Carolina, and South Carolina, with **breeding and nesting documented in Florida, Georgia,** North Carolina, and South Carolina.
• The best available scientific and commercial data indicate that, since the U.S. breeding population of wood stork was listed as endangered in 1984, the breeding population has been increasing and its breeding range has expanded significantly.
• ... **the 5- year average number of nesting pairs is still below the benchmark of 10,000 nesting pairs identified in the recovery plan for delisting.**
• **As a result of continued loss, fragmentation, and modification of wetland habitats in parts of the wood stork's range, we determine that the U.S. wood stork DPS meets the definition of a threatened species under section 3 of the Act,** and we are reclassifying it from endangered to threatened.

Public comment (5) included on page 37079 of that Federal Register issue stated, "**[R]eclassification/downlisting should not occur when FWS lacks data to determine whether one of the criteria for reclassification/downlisting has been met**." Public comment (6), also included on page 37079 of that Federal Register issue stated, **"[W]ood stork populations in south Florida are too low and nesting success is too variable to warrant reclassification."** The USFWS's response to that comment included the following, from page 37080 of that Federal Register issue (see **Attachment VIIk3**, emphasis added):

> **We share the concern that the timing of nesting is not improving in the Everglades and productivity has been variable and in some years low. As several commenters noted, in 2012, most of the wood stork nests in Everglades National Park failed. Later nesting increases the risk of mortality of nestlings that have not fledged prior to** the onset of the wet season (Frederick 2012, p. 44). **We acknowledge that restoration of key historical hydropatterns has not fully occurred under current water management regimes. These restoration efforts take time,** and will need to be adjusted as appropriate in light of emerging information and conditions related to a changing climate.
>
> **Additionally, we share the concern regarding the lack of wood stork nesting at Corkscrew Swamp Sanctuary in recent years. Our recovery partners have indicated and documented that the loss of shallow, short hydroperiod wetlands is likely a leading factor causing or contributing to this issue....We intend to work with partners to use the best scientific information available as we develop specific recovery actions regarding mitigation and restoration of shallow, short hydroperiod wetlands within the core foraging area of Corkscrew Swamp Sanctuary and other colonies as necessary.**

Clearly the USFWS has not relied on **the best available scientific data from the USGS**, such as the USGS publications provided as Attachments to this NOI that have documented the permanent declines of water levels in the regional Floridan Aquifer System from groundwater extraction in Florida and Georgia. It is clear that the USFSW also is not working with the USGS as one of its "partners," considering the USGS

publications included as Attachments in this NOI documenting the permanent declines of water levels in the regional Floridan Aquifer System from groundwater extraction in Florida and Georgia. Those groundwater extractions are "**similar in nature**" to the groundwater extractions that are occurring from all of the existing mining activities in the Greater Okefenokee Swamp Basin that are referenced in this NOI and Attachments. Those groundwater extractions also are "**similar in nature**" to the groundwater extractions from all of the proposed mining activities in the Greater Okefenokee Swamp Basin that are referenced in this NOI and Attachments. Most importantly, those declines in the regional Floridan Aquifer System in Florida and Georgia, documented in USGS publications included in this NOI, support the conclusion that "**mitigation and restoration of shallow, short hydroperiod wetlands**" is impossible because of that dewatering of the regional Floridan Aquifer System.

Two public comments were included under "(7) Comment" on page 37080 of that Federal Register. The USFWS's response to the concern that less protection would be provided to wood storks as a downlisted species was, in relevant part**, "therefore, reclassification will not significantly change the protection afforded this species under the Act."** That response provides little comfort considering the USFWS's apparent lack of any protection for the wood stork as a federally endangered species, by allowing permanent alterations of essential natural hydroperiods for wood stork nesting and foraging habitat. Those two comments and the USFWS response was as follows (see **Attachment VIIk3**, emphasis added):

> (7) Comment: Several commenters stated that, under the Act, **less protection is afforded to a threatened species than to an endangered species, referencing the Service's ''What Is the Difference Between Endangered and Threatened?'' document** at http://www.fws.gov/endangered/esa-library/ pdf/t-vs-e.pdf. **Another commenter specifically stated that downlisting the wood storks from endangered to threatened would allow USFWS to scale back protection, expanding the circumstances under which ''take'' is permitted, and under which permits for ''take'' may be issued.**
>
> Our Response: Section 4(d) of the Act allows the Service to issue such regulations that the Secretary of the Interior deems necessary and advisable to conserve the species. It must be noted, however, that **by regulation at 50 CFR 17.31(a), the Service affords a threatened species the same protections and prohibitions under section 9 of the Act as those given to endangered species** (with an exception pertaining to take by an authorized agent of a State) unless or until a 4(d) rule is specifically promulgated. **As no 4(d) rule was proposed for the U.S. wood stork DPS, the section 9 prohibitions against take continue to apply per 50 CFR 17.31(a)** and, **therefore, reclassification will not significantly change the protection afforded this species under the Act.**

The public comment included under "(8) Comment," also on page 37080 of that Federal Register, requested, in part, that the USFWS designate, ''**Coastal Tidal Wetlands**'' as ''Significant Portions of the Range'' as the USFWS considers the next steps for recovery. That comment and the USFWS response, extending to page 37081, was as follows (see **Attachment VIIk3**, emphasis added):

(8) Comment: **The Service should ''designate''** two regions of wood stork habitat, ''South Florida'' and **''Coastal Tidal Wetlands,'' as ''Significant Portions of the Range'' as the Service considers the next steps for recovery.**

Our Response: **"Significant portion of the range," a term found in the definitions of endangered and threatened** (Section 3 of the Act), **is a consideration in the determination of whether the threats in one portion of a species' range are of such impact to the overall viability of the species that it warrants listing throughout the entire range. Current data show that the breeding range has now almost doubled in extent and shifted northward along the Atlantic coast as far as southeastern North Carolina. As a result, dependence of wood storks on any specific wetland complex has been reduced.** See the Significant Portion of the Range Analysis of this rule for our detailed discussion of **why South Florida does not represent a significant portion of the range.** In addition, **wood storks are known to utilize numerous habitat types.** These include coastal tidal wetlands and marsh, lakes, and ponds, interior marsh systems, **and manmade impoundments** (e.g., Harris Neck NWR and Washo Reserve). **This ability is advantageous for the wood stork and is one of the reasons for its improved status.**

Four additional public comments were included on page 37081 of that Federal Register notice. Those comments expressed valid concerns similar to those expressed in this section of the NOI. Those comments were provided under "(9), (10), (11), and (12)" and were as follows (see **Attachment VIIk3**, emphasis added):

> (9) Comment: **The Service should delay implementation of the proposed reclassification rule until the science questions and gaps, data analyses, and regulatory deficiencies have all been addressed.**
>
> (10) Comment: **By citing predictions that the Comprehensive Everglades Restoration Program (CERP) restoration, when fully realized, will result in large, sustainable, breeding populations of wading birds, the Service dismisses the potential for wood storks to be biologically extirpated from the Everglades.** The commenter is reluctant to consider ongoing and long-term restoration efforts due to the multigenerational timeframe of the anticipated benefits.
>
> (11) Comment: **The proposed rule did not contain analysis of any of the available models projecting sea level rise within the wood stork's breeding range.**
>
> (12) Comment: **The conservation of existing shallow wetlands and restoration of former shallow wetlands is essential to stabilizing and recovery of the wood stork in South Florida.**

M. No Logic, Facts, or Other Scientific Support for USFWS Conclusions for Downlisting the Federally Endangered Wood Storks

The USFWS's attempt at logic in the preceding response, implying that the statement, "the **breeding range has now almost doubled in extent and shifted northward along the Atlantic coast as far as southeastern North Carolina,"** is a positive sign and evidence that the federally downlisted wood stork population stabilizing, lacks logic and scientific evidence. The most logical and scientifically based reason that the wood stork population has "**shifted northward along the Atlantic coast as far as southeastern North Carolina,"** is that the natural wetlands that provided suitable nesting and foraging habitat for the wood stork population in Florida and Georgia no longer can provide those essential functions because of the permanently altered natural hydroperiods.

In fact, the USFWS's response that, "**wood storks are known to utilize numerous habitat types. These include** ... **manmade impoundments,"** is shocking, considering that "**manmade impoundments"** are not a **"habitat type."** Those impoundments, discussed previously as one of the primary factors proposed for "Everglades restoration" are all that remains after the natural wetland habitats that provided suitable nesting and foraging areas for wood storks were destroyed and the wood storks were forced to resort to impoundments in an attempt to survive. Those statements by the USFWS are tantamount to claiming that the Native Americans, forcibly removed from Florida and Georgia during the "Trail of Tears" in the 1800s, were shifting their range "**northward**" to "**utilize numerous habitat types**," such as the desolate "reservations" those Native Americans were forced to move to in the northwest.

There is an abundance of scientific evidence supporting the destruction in Florida and Georgia of "**Coastal Tidal Wetlands**" **–** an actual, bona fide "**habitat type**." Examples of that scientific evidence are included in this NOI and its Attachments, including those publications describing the dense network of fractures and other karst conduits in the regional Floridan Aquifer System that extend beyond the current coastline of Florida and Georgia to barrier islands and beyond.

N. Total Loss of Suitable Coastal Wood Stork Nesting and Foraging Habitat on Georgia Barrier Island

Ironically, or not, the 1987 publication by Ruckdeschel and Shoop titled, "Aspects of Wood Stork Nesting on Cumberland Island, Georgia," describes both the first reported wood stork nesting in Georgia in 1967 – which was in the Okefenokee Swamp – as well as the fact that wood storks were nesting in wetlands on Cumberland Island and "**feeding in salt marshes around Cumberland Island throughout the year.**" According to that publication, "Cumberland Island is Georgia's largest" and "southernmost barrier island" and "supports more diverse habitats than other Georgia islands." Although that 1987 publication did not include a map of the areas referenced on Cumberland Island (see **Attachment VIII1**), the Georgia Conservancy's 2017 Cumberland Island National Seashore Trail Map includes those areas (see **Attachment VIII2**). **Attachment VIII3** is a satellite image showing the location of Kings Bay, Georgia, where the 1987 publication by Ruckdeschel and Shoop referenced the nearest other colony of nesting wood storks. Note the proximity of that colony to Cumberland Island, due east, and the Okefenokee National Wildlife Refuge, due west.

According to the senior author of that 1987 publication, two wood stork rookeries occurred on Cumberland Island. One was in the Heron Pond nesting area, north of the Stafford airstrip, and the other was in the Sweetwater slough complex, but no wood stork nesting or foraging has occurred on Cumberland Island for years. That publication described the gruesome consequences to wood storks in rookeries with altered hydroperiods.

The 1999 publication by Bacchus titled, "Cumberland Island National Seashore: Linking offshore impacts to mainland withdrawals from a regional karst aquifer," included descriptions and photographs of numerous areas in the Cumberland Island National Seashore wilderness area indicative of dewatering of the dewatering of the regional Floridan Aquifer System in the remote areas of that barrier island. Evidence of the dewatering, significant enough to result in long-term hydroperiod alterations, included premature decline and and death of trees, and subsidence. Additional evaluations by the author included the Heron Pond wetlands that previously had been used as a wood stork rookery, prior to dewatering from excessive groundwater withdrawals on the mainland.

The September 2006 issue of the Cumberland Island Museum Newsletter included a "September Birds" article by co-editor A. Mahoney. That article included the following confirmation that wood storks previously nested on Cumberland Island, as reported in the 1987 publication by Ruckdeschel and Shoop, but no longer nested on Cumberland Island. The following excerpt from that article was as follows:

> **Wood storks used to nest on Cumberland, but no longer. The two areas in the middle of the island once used for nesting are full of scrubby undergrowth** from lack of fire. **This vegetation allows predators, such as raccoons, to climb into the nesting trees.** The storks now avoid them. **Quite a loss for the birds and the island.**

Unfortunately, that newsletter article erroneously attributed the dense "scrubby undergrowth" in the former wetland used as a wood stork rookery to fire suppression, rather than to the dewatering of the regional Floridan Aquifer in that area. The additional evidence of that dewatering throughout Cumberland Island was the attraction of Ambrosia beetles to the severely stressed trees on Cumberland Island from the dewatering of the regional Floridan Aquifer System. The preceding excerpt from that Newsletter also erroneously attributed the access of raccoons to trees previously used as nest trees by wood storks.

Raccoons are serious predators of wood stork eggs and chicks, as discussed in the 1987 publication by Ruckdeschel and Shoop. In reality, however, it was the destruction of the natural hydroperiod for those wetlands that resulted in insufficient depth and duration of water in that wetland to attract and accommodate the alligators that previously occurred in that wood stork rookery, preventing raccoons from accessing the wood stork nest trees. The 1987 publication by Ruckdeschel and Shoop addressed the important role of alligators in preventing raccoons from accessing wood stork nests. Fire suppression on Cumberland Island is a problem that is exacerbated by the dewatering of the surficial aquifer on that barrier island, primarily from excessive groundwater withdrawals on the mainland.

Attachment VIIm is the 2019 USFWS map titled, "Wood Stork Nesting Colonies and Core Foraging Areas Active Within 2009-2018 in Florida. That title is misleading because the map also includes nesting and foraging locations for Georgia and South Carolina, although only the small-scale inset map shows that entire area of Georgia and South Carolina. This 1-page color map shows the active foraging areas from 2009-2018, outlined in green. The map also includes the following 3 categories of active wood stork colonies, using dot symbols colored green, orange, and red, respectively:

Colonies Active in FL 2009-2018
Colonies Active in GA 2005-2014
Colonies Active in FL 2005-2014

Conspicuously absent from this 2019 USFWS map are the two nesting, foraging wood stork rookeries on Cumberland Island that were described in the 1987 publication by Ruckdeschel and Shoop. The reason for the failure of this 2019 map to include those two locations on Cumberland Island is because the period of record for "Colonies Active in GA" was 2005-2014 and the Cumberland Island colonies predated 2005.

This 2019 map also appears to exclude any record of the wood stork nesting activities in the Okefenokee Swamp in Georgia. The 1987 publication by Ruckdeschel and Shoop confirmed that first reported nesting of wood storks in Georgia as occurring in the Okefenokee Swamp in 1967, but did not indicate the duration of active nesting in the Okefenokee Swamp.

The failure of that 2019 map to include the locations of those early nest sites masks the difficulty the wood storks have encountered since the late 1980s in establishing and maintaining viable nesting colonies and foraging areas in southeast Georgia. Those missing data also raise questions regarding the reliability of scientific data provided by the USFWS regarding the current listing of the Federally Threatened Wood Storks. Inferences from the data provided on this map also are limited because the map does not include any information for each of the mapped colonies regarding: 1) total number of wood storks; 2) total number of adult breeding pairs of wood storks; 3) fledglings success rates for the colonies; and 4) health of the adult and fledgling wood storks.

VIII.
Robert Holt's Twin Pines Hydrology
UGA Geology Colloquium Presentation on September 13, 2019

This section incorporates herein, by reference, all preceding and other paragraphs and Attachments of this Notice of Intent to Sue ("NOI") document regarding mining activities, the regional Floridan Aquifer System, the Southeastern Coastal Plain Ecoregion, and/or the Okefenokee Swamp.

A. Proposed Approach for Twin Pines Mining of Trailridge on East Side of the Okefenokee Not "Novel"

On September 13, 2019, Dr. Robert Holt, from the University of Mississippi's Department of Geology and Geological Engineering, presented a Geology Colloquium titled "Hydrology of the Twin Pines Mine Site, GA" at the University of Georgia in Athens ("UGA"). **Attachment VIIIa.** That Colloquium occurred the day after the USACOE closed the public comment period for the proposed Twin Pines mining of Trailridge east of the Okefenokee Swamp, despite the fact that the application under review included **no data** regarding the impacts of the proposed mining on the hydrology of the regional Floridan aquifer system or the Greater Okefenokee Swamp Basin. During the presentation, Holt stated that he had been involved with the Twin Pines proposed mining since January 2019:

> Twin Pines Minerals is proposing to use a novel approach to mine heavy minerals along Trail Ridge in Charlton County, Georgia. Twin Pines will use mobile draglines to excavate mineralized sands from a small mine pit (500 feet long, 100 feet wide, and 25 – 70 feet deep). After processing, 98% of the mined sand will then be returned to the inactive portion of the mine pit. The mine pit will advance approximately 100 feet per day. The inactive portion of the pit will be filled with spoil, at the same rate the pit advances, and reclaimed. Any portion of the pit will remain open approximately 5 days. The topography of the reclaimed mine spoils will be returned as close to pre-project elevations as possible, with the final elevations determined from recovered groundwater levels. The post-project wetland area will be equivalent to the pre-project wetland area, and upland areas will be constructed for Long-Leaf Pine.

Attachment VIIIa.

The Trailridge mining "approach" proposed by Twin Pines for the east side of the Okefenokee Swamp is not "novel." and is in fact the same approach that has been used by Chemours/Dupont south of the Okefenokee Swamp for decades. **Attachment Vu**. Specifically, Twin Pines proposes to mine/excavate and process the entire surficial aquifer where the dragline operates, which will homogenize the entire surficial aquifer in that area. **Attachment VIg; *see also* Twin Pine's USACOE Permit Application, already in the administrative record**. That mining/excavation includes homogenizing the lower-permeability zones, known as aquitards. **Attachments Vu; VIIIb3.** Those lower-permeability zones perch water in streams and wetlands proposed for mining, as well as in surrounding wetlands and streams. *Id.* Those lower-permeability zones are essential for maintaining the natural hydroperiods of wetlands and streams within the Greater Okefenokee Swamp Basin, and for restoration and enhancement of suitable habitat throughout the mosaic of habitat types used by the Federally Threatened Wood Storks. **Attachments IId; Ve1-Ve4; Ve7-Ve10; Ve12-Ve13; Ve15-Ve17.**

The map provided as **Attachment VIIl3** shows the proximity of the eastern Okefenokee Swamp/National Wildlife Refuge, where the USACOE issued a Nationwide Permit ("NWP") to Jim Renner/Southern Ionics last year to expand titanium mining and where Twin Pines is proposing additional titanium mining, to the wood stork rookery at Kings Bay, and to Cumberland Island, where the wood stork rookeries were dewatered from groundwater withdrawals.

The colloquium presentation stated that Twin Pines intended for all of the "well consolidated humate sands" to be removed during the mining process and that those humate sands are discontinuous, differ in thickness, and are acidic, but that the humate is immobile in acidic water. That mining approach is also is not "novel" because the mining of Trailridge south of the Okefenokee Swamp by Chemours/Dupont also removes the humate layers with similar characteristics. **Attachment Vu.** ***See also*** **Twin Pine's USACOE Permit Application, already in the administrative record.**

Twin Pines also planned three processing plants, but Holt did not identify where those processing plants would be, despite the mining of Trailridge south of the Okefenokee Swamp by Chemours/Dupont also having processing plants, which have been the source of multiple violations of permit conditions.

Holt stated that Twin Pines would be withdrawing groundwater from "wells" drilled into the "Florida aquifer" (sic), but also stated that it was "unlikely that pumping from the Florida aquifer systems (sic) will affect the surficial aquifer." He further stated that, if our assumptions that the aquifer is isotropic and homogeneous is correct, then recovery is rapid."

Those statements are concerning as the regional, karst Floridan aquifer system: a) is **not** isotropic, but is anisotropic; b) is **not** homogeneous, but is heterogeneous; and c) that groundwater withdrawals from the Floridan aquifer system affect the overlying surficial aquifers and surface waters (e.g., waters of the US) throughout the entire range of that regional karst aquifer system. *See* **Attachments IId; Ve1-Ve11; Ve13-Ve17; Vo; VIIIb1-VIIIb11.**

Proposed groundwater withdrawals from wells drilled into the Floridan aquifer system east of the Okefenokee Swamp mirror the groundwater withdrawals from the Floridan aquifer system for the Trailridge mining south of the Okefenokee Swamp by Chemours/Dupont that were initiated in 1949. **Attachments Io**; **IVf**. The combined destruction of the lower-permeability zones throughout the Greater Okefenokee Swamp Basin area proposed for mining and the proposed industrial-level groundwater withdrawals from the Floridan aquifer by the proposed Twin Pines mining of Trailridge east of the Okefenokee Swamp will produce the same adverse direct, indirect/secondary, and cumulative effects as have occurred from the Chemours/Dupont mining in the same area.

Holt also stated that a "change would be where the water would enter the swamp." This also is not "novel." The same result has been documented in the Chemours/Dupont mining and has resulted in both abnormal dewatering and abnormal flooding in associated streams and other surface waters. **Attachments Im; Vg; VIIl.**

Therefore, the proposed "approach" by Twin Pines is not "novel" and is typical for the Chemours/Dupont mining of Trailridge south of the Okefenokee Swamp which has continued since 1949. Presumably it is the same approach that Chemours/Dupont will be using to mine Trailridge east of the Okefenokee Swamp under a NWP issued to Southern Ionics last year (see **Attachments Ic** and **Id**).

Presumably, it also is the same approach that Chemours/Dupont/Twin Pines would be using for the 2,106.11 acre proposed expansion in Bradford County, Florida of heavy mineral sands/titanium mining, as described in the 17-page Application for Special Use Permit submitted to Bradford County by Chemours/Dupont/Twin Pines on September 19, 2019 (see **Attachment Vt1**). The Bradford County mining activities already have been initiated without any valid federal, state, or county permits. *See* **Attachments VIk; Vt3.** Those mining activities that have been initiated without valid federal permits are similar to the initiation of mining activities by Twin Pines on the east side of the Okefenokee Swamp and the initiation of mining activities by HPS II south of the Okefenokee Swamp, both without valid federal permits for those mining activities (see **Attachment If**).

The adverse direct, indirect/secondary, and cumulative effects for the proposed Twin Pines mining east of the Okefenokee Swamp, from what Holt claims is a "novel approach," will be the same/typical adverse direct, indirect/secondary, and cumulative effects as those that have occurred from all of the existing and proposed mining in the Greater Okefenokee Swamp Basin, as well as those effects that have occurred from the phosphate mining in the Greater Peace River Basin, that were not considered in the Areawide Environmental Impact Statement ("AEIS") for that mining. **Attachments If; IVg**.

Accordingly, and further proposals for Twin Pines mining east of the Okefenokee Swamp must be evaluated with an AEIS to ensure that direct, indirect, and cumulative impacts area properly assessed under NEPA to prevent violations of federal laws such as the CWA, ESA, and SWDA.

B. Novel Treatment of Removed Humates Proposed

Following the conclusion of Holt's presentation, a member of the audience and UGA faculty raised the following issue: "What concerns me is that the organic layer is removed so that the pit will hold more water."

In response, Holt stated,

> Those humates are a big problem for miners – they have to separate the humates and clays. Dupont just pumped that into pits. The solution is to add surfactants and mix with the humates and clay and dump that back into the pits as the fill.

Another UGA faculty asked, "What is your plan for the humates."

Holt's response was, "Lay it down in a target area. They [Twin Pines] would use a surfactant."

Apparently, the addition of surfactants to the humates and clay to use as fill in the pits is a novel approach by Twin Pines for the mining of titanium. Unfortunately, surfactants have been shown to have adverse environmental impacts, which also adds additional adverse impacts to the proposed Twin Pines mining (**Attachment VIIIc**), that must be evaluated in an AEIS for its cumulative impacts in the Greater Okefenokee Swamp Basin.

C. Groundwater Flow Direction, Hydrologic Divide, and Whether the Mining Drain the Okefenokee Swamp

Holt stated that the groundwater flow direction "follows the topography – that's what you would expect." That statement may be valid in cases where neither pumping from the Floridan aquifer nor mining of the surficial aquifer is occurring; however, the proposed Twin Pines mining would involve both groundwater withdrawals from the Floridan aquifer and mining the entire surficial aquifer within the proposed mining area.

Industrial groundwater withdrawals from the Floridan aquifer for the proposed Twin Pines mining will cause ground water to flow horizontally toward the pumping well surrounding the mining, through fractures and other karst conduits, as has occurred within the existing Chemours/Dupont/Twin Pines south of the Okefenokee Swamp. **Attachments IId; Ve1-Ve2; Ve4-Ve5; Ve7-Ve8, Ve10-Ve13, Ve17; VIIIb8.** The greatest volume of preferential flow in response to the pumping would occur through the dense network of fractures that is characteristic of the Floridan aquifer system. *Id.* Cumberland Island is within the range of established lengths of fractures through the Okefenokee Swamp, as well as the distance for preferential flow through those fractures. **Attachments Ve6; VIIm.** That supports the conclusion that the proposed groundwater withdrawals from the Floridan aquifer for Twin Pines mining east of the Okefenokee not only would divert groundwater from the Okeefenokee Swamp, but also from the Cumberland Island National Seashore and Wilderness Area (*see* subsection VIIG).

Holt also stated that Trail Ridge separates the swamp on the west from the springs and streams on the east and is the "hydrologic divide." That statement may be valid in cases where no pumping from the Floridan aquifer nor mining of the surficial aquifer is occurring but would not be valid if the proposed Twin Pines mining, with groundwater withdrawals from the Floridan aquifer, is permitted. **Attachments Ve1; Ve15.**

The map of the Greater Okefenokee Swamp Basin (*see* **Attachment Ia**) clearly shows that eastern basin divide does not occur along the east side of the Okefenokee Swamp. In fact, along the east side of the Okefenokee Swamp there is no sub-basin divide associated with Trail Ridge. *Id.* That is significant because the published literature confirms that pumping from the Floridan aquifer has resulted in breaching both basin divides and sub-**regional** divides in the Floridan aquifer, and is known as "pirating" water (as described in the 2019 publication by Bernardes et al.) (*see* **Attachments Ve1; Ve15**).

Holt also stated that the "equipotentionals are almost vertical, so flow is horizontal." This is contradicted by the 1999 Kitchens and Rasmussen publication which, presented extensive evidence that vertical flow is occurring in the Okefenokee Swamp (see **Attachment VIIIb3**).

According to Holt, two of the questions asked during public discussions in Folkston, organized by Twin Pines, were:

1. How long will it take before there are effects on the Okefenokee Swamp?
2. Will the moving mine pit allow the Okefenokee Swamp to be drained?

In response to those questions, Holt indicated that "a time constant can reveal the aquifer response time" and that response time is 38 years. "The pit would have to be maintained for 38 years and we'll only be there for 8 years."

The aquifer response time of 38 years provided by Holt during the colloquium has no basis in fact. Holt has made several invalid assumptions, including the assumption the Floridan aquifer system is both isotropic and homogeneous, and the assumption that Trailridge is a hydrologic divide that cannot be breached by industrial groundwater pumping and mining of the entire surficial aquifer in the proposed mine area.

In reality, the proposed mining of Trailridge and industrial groundwater withdrawals east of the Okefenokee Swamp will result in immediate alterations of the hydroperiods in the Okefenokee Swamp and associated wetlands, streams and uplands in the Greater Okefenokee Swamp Basin, as well as in Cumberland Island National Seashore and Wilderness Area. Those hydroperiod alterations would be long-term and irreversible, even if all of the mining was completed in a single year, rather than the 8-year period maintained by Holt. **Attachments IId; Ve1-Ve13; Ve17.**

D. Determination of Groundwater Discharge

Holt's claims during the colloquium presentation that (1) the groundwater discharge can be determined using a steady-state 1-D vertically averaged flow and that the potential and governing equation is a single aquifer (upper and lower aquifer) versus a dual aquifer flow that is horizontal, and (2) what is seen in heads with the impermeable layer is a mound (e.g., before mining), but no groundwater mound after mining, does not comport with other scientific publications, **Attachment VIIIb3**, but rather supports the conclusion that the mining will dewater the surficial aquifer because the groundwater "mound" before mining no longer exists after mining.

Groundwater mounding associated with even slight topographic relief has been documented in the Floridan aquifer system, in addition to areas with coastal dunes, presumably due to lower permeability zones or lenses underlying those elevated topographic features. **Attachment VIIIb1.** Even a relatively small area with a mounded water table can provide essential groundwater flow supporting hydroperiod conditions for specific types of habitat (e.g., cut-throat seeps), which can be dewatered by comparably small excavations (*see* **Attachment VIIIb2**).

That dewatering is consistent with the loss of the groundwater mound after mining referenced by Holt, but is not consistent with his subsequent statement following his discussion of groundwater mounding during the colloquium presentation, "So we shouldn't expect much change." For example, a predictive Modflow model was used to evaluate water-level impacts in three wetlands associated with a 3-year groundwater withdrawal and excavation from the proposed mining of 35 acres of sandhill habitat in the Floridan aquifer system that was responsible for a groundwater mound known locally as the Geneva bubble. **Attachment VIIIb2**

The Modflow model revealed the recovery period would extend for 10 years following the proposed excavation and that the pre-mining water levels in none of those three wetlands would regain pre-mining established water levels, confirming permanent alteration of the pre-mining hydroperiods in those wetlands (*see* **Attachment VIIIb2**). That model's proposed mining was considerably smaller than the proposed Twin Pines mining, which according to Holt would continue almost three times as many years as that proposed 3-year mining project. Additionally, no scientific support was provided for Holt's claim that, "Under no circumstances will this pit reverse the flow away from the Okefenokee Swamp."

In his concluding remarks, Holt confirmed that the "moving pit" proposed by Twin Pines requires water from the Floridian aquifer and that the drawdowns beneath the Okefenokee Wildlife Refuge would be "less than 7 feet," which is greater than the drawdown in the wetlands associated predictive Modflow model discussed above wherein pre-mining water levels were never regained. Drawdowns of that magnitude also exceed the established root zone of wetland vegetation and are tantamount to dewatering the Okefenokee Swamp.

Last, Holt was asked, "What type of equipment is being used now to mine Trailridge south of the Okefenokee Swamp in Florida." Holt responded, "Dupont is just using heavy equipment to reprocess spoils." If that is the case, then the NPDES permit issued by the Florida Department of Environmental Protection ("FDEP") to Chemours/Dupont for 40 Million Gallons per Day (MGD) daily permitted maximum of heavy mineral mining wastewater from outfall D-001 or D-002 in Bradford County, Florida could be presumed as representative of the volume of aquifer system dewatering that would occur from the proposed Twin Pines mining and processing. **Attachment Im.** Additionally, there have been numerous documented violations of that NPDES permit condition exceeding that 40 MGD maximum by more than 10 MGD. *Id*.

E. Unsupported Claims that Twin Pines Will "Restore" the Wetlands After the Trailridge Mining Activities

Holt stated that Twin Pines would "restore" the wetlands, however provided no information regarding how that would be done. In fact, it will be impossible to "restore" the mined wetlands and streams or even the surrounding wetlands and streams that are not mined. That is because the standard mining procedure that Twin Pines would use will mine the entire surficial aquifer in the mining area, including homogenizing the lower-permeability zones that are required to perch the water for the wetlands and streams.

No information was provided regarding how that removal and homogenization of the "well consolidated humate sands," subsequently replaced with clay and surfactants, would influence the proposed attempts to "restore" the natural biochemical or hydrologic characteristics of the wetlands and streams that Twin Pines proposes to mine.

F. Eliminating Gopher Tortoises and Habitat for the Federally Threatened Eastern Indigo Snake

Holt stated that there were gopher tortoises in the area and gopher frogs, specifically in the west tract proposed for mining by Twin Pines, but that those gopher tortoises would be captured and released where someone was trying to create gopher tortoise habitat. Holt failed to state that gopher tortoise burrows are used by Federally Threatened Eastern Indigo Snakes as shelter from cold winter temperatures and from desiccation.

Following are excerpts from the USFWS Eastern Indigo Snake fact sheet related to the reliance of that federally threatened snake on gopher tortoise burrows (*see* **Attachment VIIj2**):

> The eastern indigo snake was listed as a threatened species as a result of dramatic population declines caused by over-collecting for the domestic and international pet trade as well as mortalities caused by rattlesnake collectors who gassed gopher tortoise burrows to collect snakes.

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 desiccation (Bogert and Cowles 1947, Speake *et al*. 1978, Layne and Steiner 1996). This dependence seems especially pronounced in Georgia, Alabama, and the panhandle area of Florida, where eastern indigo snakes are largely restricted to the vicinity of sandhill habitats occupied by gopher tortoises (Diemer and Speake 1981, Moler 1985b, Mount 1975). Few such refugia are widely available off of the sandhill regions of southern Georgia and northern Florida.

Even though thermal stress may not be a limiting factor throughout the year in South Florida, eastern indigo snakes still seek and use underground refugia in the region. On the sandy central ridge of South Florida, eastern indigos use gopher tortoise burrows more (62 percent) than other underground refugia (Layne and Steiner 1996).

Smith (1987) radio-marked hatchling, yearling, and gravid eastern indigo snakes and released them in different habitat types on St. Marks NWR in Wakulla County, Florida. Smith monitored the behavior, habitat use, and oviposition sites selected by gravid females and concluded that diverse habitats, including high pineland, pine-palmetto flatwoods, and permanent open ponds, were important for seasonal activity. In this study, habitat use also differed by age-class and season; adult snakes often used gopher tortoise burrows during April and May, while juveniles used root and rodent holes. The eastern indigo snake used gopher tortoise burrows as oviposition sites in high pineland areas, but stump holes were chosen in flatwoods and pond edge habitats (Smith 1987).

An adult eastern indigo snake's diet may include fish, frogs, toads, snakes (venomous as well as nonvenomous), lizards, turtles, turtle eggs, juvenile gopher tortoises, small alligators, birds, and small mammals (Keegan 1944, Babis 1949, Kochman 1978, Steiner *et al*. 1983).

Eastern indigo snakes require a sheltered refuge from winter cold and dry conditions. Wherever the eastern indigo snake occurs in xeric habitats, it is closely associated with the gopher tortoise, the burrows of which provide shelter from winter cold and the desiccating sandhill environment (Bogert and Cowles 1947, Speake *et al.* 1978). This dependence seems especially pronounced in Georgia, Alabama, and the panhandle area of Florida, where eastern indigo snakes are largely restricted in the winter to sandhill habitats occupied by gopher tortoises (Diemer and Speake 1981, Moler 1985b, Mount 1975).

As stated earlier, the eastern indigo snake was listed because of a population decline caused by habitat loss, over-collecting for the pet trade, and mortality from gassing gopher tortoise burrows to collect rattlesnakes (Speake and Mount 1973, Speake and McGlincy 1981) (43 FR 4028).

[Species-level Recovery Actions]

S2.4. Identify, evaluate, and eliminate other threats to the survival of the indigo snake. Regulations are in place to control the pet trade and gassing of gopher tortoise burrows. In addition to the outright loss of habitat associated with conversion to residential or agricultural uses, potential threats such as predation from domestic animals and pesticide contamination may become more problematic and threaten the continued persistence of eastern indigo snakes in some areas. Because pesticide use on adjacent agricultural and residential lands poses a potential risk to eastern indigos,

management plans should consider these risks and alleviate threats whenever possible. Trapping efforts may be needed on public lands where free-ranging domestic animals threaten this species.

A discussion of gopher tortoises, as a Federal Candidate Species, as well as a keystone species for the Federally Threatened Eastern Indigo Snake, the Federal Candidate Species Gopher frog and a host of other species that utilize gopher tortoise burrows is detailed further in Appendix VII.A.

G. Twin Pines Trailridge Mining Activities Prior to Issuance of a Mining Permit by the USACOE

Holt outlined the following unpermitted activity at the Twin Pines site: (a) "**drilled and took cores in the Hawthorne**;" (b) "**drilled holes" throughout the proposed Twin Pines mine site "using sonic drilling rigs**;" and (c) that "**most holes were drilled in the last three months**." Those included holes for "**86 piezometers**" and "**457 exploratory borings**," in addition to installing "**23 staff gages in streams**." He also stated that **two 24-hour pumping tests were conducted, using 22 observation wells** and that "**short-term data were collected at staff gages,**" **which started in January of 2019**. Soils lab data included "soil moisture retention." *See Twin Pines Phase I Plan,* already in the administrate file for the application; *see also* **Attachment VIi.**

All of those mining-related activities were done prior to any public review, in violation of the NEPA process, and constituting segmentation of the mining activities to avoid federal oversight of those activities. In addition to inability of the public to provided comments on the potential adverse effects of: (a) **drilling 543 holes into the aquifer system in an area the size of the proposed mine site**; (b) **drilling and removing cores from the Hawthorne**; and (c) **the use of "sonic drilling rigs" to drill those holes**, there was no opportunity for the public to provide comments on the validity for the locations or total numbers of those holes, while ignoring other, more vulnerable areas of the proposed Twin Pines mining site where no data were collected. *See Twin Pines Phase I Plan,* already in the administrate file for the application; *see also* **Attachment VIi.**

It is important to note that the Hawthorne group often is referenced as the "upper confining unit" between the surficial aquifers and upper Floridan aquifer. **Attachments VIIIb3; VIIIb5; VIIIb9.** In reality, the term "confining" is misleading because the extensive networks of fractures and non-linear karst conduits characteristic of this regional karst aquifer system means that all lower permeability zones in this aquifer system are "semiconfining" or "leaky," rather than impermeable. *Id.* Despite the semiconfining nature of the Hawthorne, 457 borings, including drilling and cores in the Hawthorne could result in significant vertical exchange of water between the surficial aquifer and the upper Floridan aquifer resulting in un-mitigatable adverse direct, indirect/secondary, and cumulative effects to wetlands, streams and required habitat for federally endangered and threatened species in the absence of any federal permits, and will most likely affect the surficial aquifer. ***See*** **Sections V, VI, VII, preceding Section VIII.**

Holt also mentioned that kriging was being used, presumably for spatial interpolation for the hydrologic model he is attempting to create for the proposed mining site. **Attachment VIIId**. According to research by Zimmerman et al. (1998), ordinary kriging assumes an unknown constant mean, but in some cases there are valid scientific reasons to reject that assumption. *Id.* Examples of valid scientific reasons to reject that assumption include aquifer systems, like the regional, karst Floridan Aquifer System that are **<u>not</u>** isotropic, are **<u>not</u>** homogenous, and transmissivity/hydraulic conductivity can vary by orders of magnitude via flow through fractures and non-linear karst conduits. **Attachment IVf** and preceding **Sections V-VII**.

In a major attempt to compare seven different inverse approaches for identifying aquifer transmissivity, that 1998 publication by Zimmerman et al. found that nonstationarity of the "true" transmissivity field, or the presence of "anomalies" such as high-permeability fracture zones is a problem for linearized methods, such as linearized cokriging. **Attachment VIIId**. They also concluded that the use of additional transient information from pumping tests did not result in major changes in the outcome. *Id.*

H. Additional False Claims by Twin Pines, Unsupported by Scientific Facts, and Evidence of Segmentation

On February 4, 2020, Chip Stewart, with Cookerly Public Relations, distributed a 2-page press release for Twin Pines. The press release was entitled, "Groundwater modeling of Charlton County mining project shows Okefenokee Swamp will be protected - Study provided to state and federal agencies to address permit application requirements." The first page of that press release included the following statement (see **Attachment VIIIe**, emphasis added):

> **During the latter stages of the study, Holt shared his research and methodology with peers at the University of Georgia** and the University of Alabama, two of the Deep South's most respected geologic research institutions. In both instances, **his results were well received by contemporaries who engaged in discussions about the technical points of his findings.** The audience at the University of Georgia posed thoughtful questions about the modeling and the project's planned water use.

On the contrary, the UGA faculty expressed numerous concerns regarding the proposed model assumptions, design, and data. **Attachment VIIIf.** One UGA Hydrology professor pointed out at the conclusion of Holt's powerpoint presentation, that Holt's presentation actually **supported** the conclusion that vertical flow was occurring on the proposed Twin Pines mine site, rather than refuted that conclusion, as Holt was claiming. That professor, who specializes in hydrologic modeling, also has co-authored at least one peer-reviewed publication addressing the vertical flow of water between the surficial aquifer and the underlying parts of the Floridan Aquifer System. **Attachment VIIIb3**.

Holt also stated during the presentation on September 13, 2020, that he was in the **initial stages of data collection and modeling**. Those statements are a direct contradiction to the claims in the attached press release that, "**During the latter stages of the study, Holt shared his research and methodology with peers at the University of Georgia.**"

That press release is additional evidence of the USACOE's segmentation of the permitting process by allowing Twin Pines to design and complete hydrologic modeling, including installation of wells and conducting hydrologic testing adjacent to the Okefenokee Swamp prior to requiring and conducting a comprehensive AEIS. In fact, that segmentation was conducted without **any** public notice or review of those mining-related activities.

On February 8, 2020, a news release was issued by the Atlanta Journal Constitution. **Attachment VIIIf**:

— **Twin Pines Minerals, the Alabama-based company that hopes to mine acres of land near the Okefenokee National Wildlife Refuge, has withdrawn its permit application,** said Billy E. Birdwell, spokesman of the U.S. Army Corps of Engineers for the Savannah district.

The company filed notice with regulators late Friday but could resubmit the application at any time with new information, Birdwell said.

In July, Twin Pines applied for a permit to extract titanium and zirconium through mining along **2,400 acres of Trail Ridge located a few miles from the Okefenokee Refuge. The mining project would ultimately have extended to 12,000 acres near the Charlton County attraction.**

During the period for public comment, the Army Corps of Engineers, the agency charged with reviewing the permit application, received more than 22,000 letters.

The news release included a graphic image of the location of that proposed mining and the proximity of that proposed mining to the Okefenokee National Wildlife Refuge and the St. Mary's River, which is the boundary between northeast Florida and southeast Georgia. Dr. Todd Rasmussen's quotes in the press release further refute the statements in the Twin Pines Press Release (see **Attachment VIIIf**, emphasis added), to wit:

Twin Pines said the findings, when presented to peers at the University of Georgia and the University of Alabama, were "well-received." But **Todd Rasmussen, Professor of Hydrology and Water Resources at the University of Georgia who reviewed the study and shared it with other modelers, said some of the prediction methods used in the study created large uncertainties in the data.**

"The general consensus is that a rigorous review is needed. But from first impressions, there are many components that are unclear, incomplete, or lacking," Rasmussen said.

On February 10, 2020, WABE.org released an update on the status of the USACOE permit application for Twin Pines which further evidenced USACOE's pattern and practice of segmentation for permitting mining activities in the Greater Okefenokee Swamp Basin. A copy of that second paragraph, claiming that the USACOE directed Twin Pines to reduce the size of the initial permit and resubmit the application as soon as possible, is as follows (see **Attachment VIIIg**, emphasis added):

Steve Ingle, president of the mining company Twin Pines, said to be more conservative, "**we have agreed with the U.S. Army Corps of Engineers to reduce the size of the permit area and resubmit new documentation for further review and evaluation as soon as possible.**"

The USACOE's five-month delay (from its September 12, 2019 deadline for comments on Twin Pines' incomplete permit application), in requiring a comprehensive AEIS for the proposed mine expansions by Twin Pines (east of the Okefenokee Swamp) and by Chemours/Dupont/Twin Pines (south of the Okefenokee Swamp), in addition to the proposed mining by HPS II (south of the Okefenokee Swamp), and the mining authorized by the USACOE under the invalid NWP 44 – Mining Category permits (east of the Okefenokee Swamp), and the existing mining by Chemours/Dupont/Twin Pines (south of the Okefenokee

Swamp), **is a continuation of the USACOE's attempt to circumvent the requirements of NEPA, depriving the public of their right to provide public comments under a formal AEIS process on all of the adverse impacts from all of those mining activities.** Every additional day of delay represents another day of violations of NEPA requirements, the CWA, the ESA, and other federal laws. **That comprehensive AEIS must be initiated without any further delay.**

IX.
CONCLUSION

Based upon the NOI Sections, Attachments, and public records referenced herein, the mining activities within the Greater Okefenokee Swamp Basin must be stayed until an Areawide Environmental Impact Statement can be conducted.

Mr. Lyons and CAPM have substantial interest that are adversely affected, and will continue to be adversely affected, by the mining operations, present and proposed, and unassessed cumulative environmental impacts that are degrading the use and enjoyment of the Greater Okefenokee Swamp Basin, a life for source wetlands and habitats of many listed species as will be discussed herein.

Accordingly, Mr. Lyons and CAPM respectfully request that the deficiencies described herein are corrected and in the interim the following relief be granted:

(1) Rescission of the NWP 44 Mining Permits issued east of the Okefenokee Swamp, including the Southern Ionic Minerals, LLC/Chemours Company (SAS-2012-01042) and the Indian Boundary Mine (SAS-2017-00669);

(2) Immediate initiation by the USACOE, USEPA, and USFWS of an Area Wide Environmental Impact Statement ("AEIS") to include the following: Southern Ionic Minerals, LLC/Chemours Company's southern expansion of the Mission Mine (SAS-2012-01042); Indian Boundary Mine (SAS-2017-00669); all current and proposed heavy mineral sands/titanium mining activities by Chemours/Dupont/Twin Pines south of the Okefenokee Swamp within the Greater Okefenokee Swamp Basin, without valid individual USACOE permits; all proposed phosphate mining activities by HPS II south of the Okefenokee Swamp within the Greater Okefenokee Swamp Basin; and any resubmitted application from Twin Pines Minerals, LLC, former SAS-2018-00554;

(3) Immediate issuance of a recommendation by USACOE, USEPA, and USFWS to Florida Department of Environmental Protection ("FDEP") to rescind all permits, including but not limited to General Permits, National Pollutant Discharge Elimination System ("NPDES") Permits, and Environmental Resource Permits ("ERP") for all Trailridge Mining Activities south of the Okefenokee Swamp by Chemours Company (aka Dupont)/Twin Pines Minerals, LLC, including but not limited to FDEP Permit File No. FL000051-012-IW3S;

(4) Immediate issuance of a recommendation by the USACOE, ESEPA, and USFWS to the FDEP to rescind all permits, including but not limited to all General Permits, NPDES Permits, and ERPs, for any activities related to the proposed phosphate mining by HPS II in Bradford County, Florida and Union County, Florida;

(5) Immediate issuance of a recommendation by the USACOE, ESEPA, and USFWS to the Georgia Department of Natural Resources ("GDNR") to rescind all permits, including but not limited to all General Permits and NPDES Permits, for any activities related to the proposed Trailridge Mining Activities, including, but not limited to activities by Twin Pines, Chemours/Dupont, and Southern Ionics;

(6) Immediate issuance of an order for restoration of mining related activities by Twin Pines Minerals, LLC east of the Okefenokee Swamp to be restored to its previous state, and exploratory wells to be plugged;

(7) Immediate issuance of an order for restoration of mining related activities by Twin Pines Minerals, LLC south of the Okefenokee Swamp to be restored to its previous state, and exploratory wells to be plugged;

(8) Immediate issuance of an order stopping all exploratory wells and ordering restoration of mining related activities by HPS Enterprises II, LLC south of the Okefenokee Swamp to be restored to its previous state, and exploratory wells to be plugged; and

(9) NWP 44 Mining Category to be declared null and void for the entire area of the Southeast Coastal Plain Ecoregion as such unique areas cannot be similar to mining activities not in environmentally sensitive areas and thus would require individual environmental assessments for permit issuance.

All documents referenced herein are available electronically via the following link: https://hartsell-law.sharefile.com/d-se9357dc920e43e2b, and a hard copy of this NOI will be mailed to the USACOE, USEPA, and USFWS, with a thumb drive including electronic copies of all the referenced attachments. This NOI, its attachments, and public documents referenced herein should be maintained in the administrative record. The USACOE, USEPA, and USFWS, is hereby on notice of the intent to initiate legal action pursuant to NEPA, CWA, ESA, and SWDA if the deficiencies herein are not corrected and the above relief granted.

ATTACHMENT LIST:

Section I

Ia. Map of the Greater Okefenokee Swamp Basin in Florida and Georgia
Ib. 7/15 background of the founding of Chemours as a "spin-off" company of Dupont
Ic. 4/20/18 NWP issued to Jim Renner/Southern Ionics Minerals, LLC to expand Trailridge mining at Mission Mine
Id. 8/2/19 Chemours acquisition of NWP expansion of Trailridge mining at Mission Mine
Ie. 8/22/16 Brookes Comment Letter
If. 7/6/18 Reiner - Notice of Intent to Sue
Ig. 8/8/18 Brookes - Comment Letter
Ih. 8/13/18 Brookes - Comment Letter and Public Records Request
Ii. 8/17/18 Brookes - Comment Letter
Ij. 10/9/18 Brookes - Public Records Request
Ik. 11/5/18 Brookes - Eludra Request
Il1. 1986 USGS Miller Regional Floridan aquifer system Figure 1 Map
Il2. 1986 USGS Miller Regional Floridan aquifer system Plate 1
Il3. 1986 USGS Miller Regional Floridan aquifer system Plate 2
Il4. 1986 USGS Miller Regional Floridan aquifer system Plate 3
Im. 6/29/17 FDEP NPDES Chemours 012-IW3WS-NR-Final Permit Renewal Violations
In. 3/23/18 FDEP Warning Letter to Chemours re: four Trailridge mining operations south of the Okefenokee Swamp including permit violations and unpermitted actions by Twin Pines
Io. 4/4/97 Dewatered Lakes - Mining a Controversy Babbitt Asks That DuPont Halt Plans Florida Times Union

Ip. 8/21/19 Keystone Heights Sinkhole Princeton St & Auburn Ave zoom in - Google Maps
Iq. 8/21/19 Photographs of the Keystone Heights Sinkhole Princeton Street and Auburn Avenue vicinity
Ir. 8/21/19 new Apple Card does not wear well! Apple issues instructions on care – which includes microfiber cleaning and not storing it like any other credit card
Is. 5/29/14 Reiner - Notice of Intent to Sue

Section II

IIa. 2012 USEPA Water Quality Standards Handbook Chapter 4: Antidegradation Standards (EPA-823-B-12-002)
IIb. 4/10/03 comments submitted to USEPA by 85 scientists with broad knowledge and expertise in the physical structure, chemistry, and biology of stream ecosystems in more than 40 states
IIc. 2019 Colvin et al. Headwater Streams and Wetlands are Critical for Sustaining Fish, Fisheries, and Ecosystem Services
IId. 2014 Bernardes et al. Mining Mitigation Conservation paper
IIe1. 8/16/19 Chemours application for Bradford County Special Exception mining expansion ~1,877 acres
IIe2. 8/16/19 Maps for Chemours application for Bradford County Special Exception mining expansion
IIf. 9/9/19 For Okefenokee supporters, proposed mining too close to the Okefenokee
IIg1. USGS OFR 80-406 Johnston et al predevelopment aquifer levels 1980 plate-1-preview
IIg2. USGS OFR 80-406 Johnston et al predevelopment aquifer levels 1980 plate enlargement
IIg3. USGS Johnston Healy and Hayes aquifer levels May1980 plate enlargement

Section III

IIIa. 2/18/11 Federal Register Notice of AEIS for multiple mining projects
IIIb. 5/23/13 AEIS FAQ Phosphate mining
IIIc. 1985 Brook and Hyatt Okefenokee paper
IIId. 1988 Sun and Brook coastal plain model paper
IIIe. 1990 Garcia Brook and Carver predicting well production
IIIf. 1988 Brook Sun and Carver Predicting Water Well
IIIg. 2015 Georgia's State Wildlife Action Plan synopsis
IIIh. Georgia's State Wildlife Action Plan Appendix F aquatic habitat high priority watersheds
IIIi. 2/20/19 USFWS comments on proposed Trailridge mining by Twin Pines along east side of the Okefenokee Swamp
IIIj 2002 Economic Reasons for Conserving Wild Nature

Section IV

IVa. 1988 Okefenokee Narrative Report
IVb. Proposed No Mining Scenario
IVc. 1/7/99 Charlton County Minutes
IVd. 2/7/19 Chemours Consent Order
IVe. 6/18/19 Toxicity Report Trailridge
IVf. 9/12/19 Comment Letter on Twin Pines Permit Application

IVg. March 10, 2010 USEPA letter to USACOE Peace River Watershed AEIS

Section V

Va1. 1/6/17 Federal Register USACOE NWP 2016-31355
Va2. Guidelines for preparation of analysis of Section 404 permit applications pursuant to the section 404(b)(1) guidelines of the clean water act (40 CFR, section 230)
Vb1. 8/16/17 NWP 44 Preconstruction Notice (PCN) for Indian Boundary Mine (SAS-2017-00669)
Vb2. 4/20/18 NWP 44 USACOE PCN "Certificate of Compliance" for Mission Mine (SAS-2012-01042)
Vb3. Application for Mission Mine (SAS-2012-01042)
Vb4. 2017 NWP 44 Mining Activities
Vb5. Decisional Documents for Mission Mine (SAS-2012-01042) / Indian Boundary Mine (SAS-2017-00669)
Vc. 2/24/97 Red & Black Renner Dupont Consultant
Vd. 4/4/97 ACJ Babbitt Don't Mine Near Swamp
Ve1. 2019 Bernardes et al. Analysis and Extent of Santa Fe River Flooding in North Florida Attributed to Rainfall and Wind Damage Associated with Hurricane Irma
Ve2. 2018 Xu et al. Management Implications of Aquifer Fractures on Ecosystem and Habitat Suitability for Panthers in Southern Florida
Ve3. 2016 Xu et al. Mapped Fractures and Sinkholes in the Coastal Plain of Florida and Georgia to Infer Environmental Impacts from Aquifer Storage and Recovery (ASR) and Supply Wells in the Regional Karst Floridan Aquifer System
Ve4. 2015a Bacchus et al. Fractures as preferential flowpaths for aquifer storage and recovery (ASR) injections and withdrawals: implications for environmentally sensitive near-shore waters, wetlands of the Greater Everglades Basin and the regional karst aquifer system
Ve5. 2015b Bacchus et al. What Georgia Can Learn from Aquifer Storage and Recovery (ASR) in Florida
Ve6. 2014 Bacchus et al. Benthic macroalgal blooms as indicators of nutrient loading from aquifer-injected sewage effluent in environmentally sensitive near-shore waters associated with the South Florida Keys
Ve7. 2012 Lines et al. Preferential Groundwater Flow Pathways and Hydroperiod Alterations Indicated by Georectified Lineaments and Sinkholes at Proposed Karst Nuclear Power Plant and Mine Sites
Ve8. 2011 Bacchus et al. Geospatial analysis of depressional wetlands near Peace River watershed phosphate mines, Florida, USA
Ve9. 2006 Bacchus. Nonmechanical dewatering of the regional Floridan aquifer system
Ve10. 2006 Bacchus. Nonmechanical dewatering of the regional Floridan aquifer system
Ve11. 2005 Bacchus and Barile. Discriminating sources and flowpaths of anthropogenic nitrogen discharges to Florida springs, streams and lakes
Ve12. 2005 Bacchus et al. Near infrared model development for pond-cypress subjected to chronic water stress and Botryosphaeria rhodina
Ve13. 2003 Near infrared spectroscopy of a hydroecological indicator: New tool for determining sustainable yield for Floridan aquifer system
Ve14. 2001 Knowledge of groundwater responses - A critical factor in saving Florida's threatened and endangered species. Part I: Marine ecological disturbances

Ve15. 2000 Bacchus Uncalculated impacts of unsustainable aquifer yield including evidence of subsurface interbasin flow
Ve16. 2000 Bacchus et al. Soluble sugar composition of pond-cypress: A potential hydroecological indicator of groundwater perturbations. Journal of American Water Resources Association 36(1)
Ve17. 1999 Bacchus Cumberland Island National Seashore: Linking offshore impacts to mainland withdrawals from a regional karst aquifer
Ve18. 1993 Miller et al. Chemical differences between stressed and unstressed individuals of baldcypress (Taxodium distichum)
Vf1. 5/5/99 RESOLVE Okefenokee No Mining Agreement Listed Species and Habitat Protection
Vf2. Preliminary Trail Ridge addition to ONWR Map
Vg. 2/14/20 Declaration of Mark Lyons
Vh1. 7/19 Economic Impacts USFWS Banking on Nature 2017
Vh2. 5/19 Economic Benefits of Okefenokee
Vh3. 5/19 Economic Benefits of Okefenokee
Vi. [Intentionally Omitted]
Vj. [Intentionally Omitted]
Vk. 4/27/16 HPSII Bradford County Mining Master Plan Application Form
Vl1. 2/22/10 Weisskoff Economic Impacts
Vl2. 3/17/16 Weisskoff Economic Effects of Mining on Florida Communities
Vl3. 4/13/16 Weisskoff Final Report on Long term Adverse Economic Effects of Mining in Communities
Vm1. 2005 Foley et al Global Consequences of Land Use
Vm2. 2001Paul and Meyer Streams in the Urban Landscape
Vn. [Intentionally Omitted]
Vo. 2003 USGS Barlow Saltwater Intrusion preferential flow circ1262
Vp. [Intentionally Omitted]
Vq. 3/19/17 NWP Nationwide Permit 44 - Mining Activities
Vr. [Intentionally Omitted]
Vs1. 1/7/20 Declaration of Steve Lodle
Vs2. 2/8/20 Declaration of Carol Burton
Vt1. 9/19/19 BC CHEMOURS Special Use Application for Mining
Vt2. 10/17/19 BC BOCC - MINING CHEMOURS 2019 Special Use Permit for Mining
Vt3. 9/12/19 USACOE FOIA response cover letter confirming no other mining permits/applications in the following basins in Georgia and Florida: Alapaha, Little Withlacoochee, Lower Suwannee, Santa Fe, Satilla, St. Marys, Upper Suwannee, and Withlacoochee River
Vu. USFWS Okefenokee Report

Section VI

VIa. EPA RCRA Special Wastes: Hazardous Waste
VIb1. 10/28/19 Mining in Wayne County GA - Google Maps
VIb2. 3/18/17 JEA Wayne County residents say coal ash - FTU - Jacksonville, FL 800,000 tons
VIb3. Coal Ash-timeline-2 800,000 tons
VIb4. 8/9/16 Jimmy Carter asks Bill Gates not to dump coal ash in Wayne County - FTU - Jacksonville, FL 150 million tons
VIb5. 3/16/16 Jesup health alert thin lining FCN snapshot

VIb6. 6/28/19 Targeted as a Coal Ash Dumping Ground, This Georgia Town Fought Back Climate News 800,000 tons loophole
VIb7. 5/3/19 GA paper wins fight against coal ash dump - millions of tons
VIc. 5/4/19 USACOE Renewal of Jurisdictional Determination for Jim Renner Southern Ionics (SAS-2012-01041 aka SAS-2012-00140)
VId. 2/2/17 DuPont, Chemours spinoff settle PFOA suits | Vol. 95 Issue 8 | Chemical & Engineering News
VIe. 11/5/19 PFAS and PFOS N.Y. Sues Chemours, DuPont, 3M Over PFAS Contamination
VIf. 1/6/16 PFOA AND PFOS The Lawyer Who Became DuPont's Worst Nightmare - The New York Times
VIg. 7/12/19 Public Notice of Twin Pines Permit application
VIh1. 9/12/19 USACOE closes public comment period for proposed Twin Pines Mining
VIh2. 10/25/19 USACOE FOIA response letter confirming comments re: proposed Twin Pines mining exceeded 20,500
VIh3. 9/10/19 email comments from Cherokee of Georgia Chief to USACOE
VIh4. 9/10/19 email comments from Cherokee of Georgia Tribal Council to USACOE
VIi. 11/22/19 USEPA's FOIA response re: email documents between Eric Sommerville (USEPA) and Holly Ross (USACOE) re proposed Twin Pines mining
VIj. 5/22/13 AEIS FAQ Phosphate AEIS
VIk. 10/15/19 letter to Bradford County attorney from Hartsell re: illegal procedures for vote on Chemours Special Use Permit for mining expansion
VIl. 12/10/19 Paul Still Complaint re: Flooding Chemours Bradford County violations
VIm. [Intentionally Omitted]
VIn. 6/28/18 Reta et al Phosphate Mining Fluorapatite IJH-02-00106
VIo1. 2012 ACC Athens fluoride contaminant added summer
VIo2. 2012 ACC Fluoride MSDS Mosaic Hydrofluosilicic_Acid_12_09 83111
VIp1. 7/16/13 EPA fluoride toxicity chart 48P Mundy TDAS
VIp2. 6/26/14 EPA Drinking Water Contaminants USEPA
VIq1. 2013 Sauerheber Fluoride Toxicity paper
VIq2. 2013 Sauerheber Fluoride and Racehorse Breakdowns paper
VIq3. 2013 Li et al Association of vascular fluoride uptake with 31 paper
VIq4. 2013 Hirzy et al fluoride arsenic cost benefit analysis paper
VIq5. 2006 Krook and Justus fluoride poisoning of horses v39_1
VIq6. 2018 Sauerheber AVID Toxicity of Fluoride
VIq7. 8/30/19 Fluoride 2019.08_WeToo
VIq8. 11/11/14 Fluoride Intake Leads to Increase Risk of Bone Fractures
VIr. 1/30/20 Declaration of Audrey Adams
VIs1. 1/9/20 Declaration of Lynn Williams
VIs2. 1/30/20 Declaration of Cara Campbell
VIs3. 1/30/20 Declaration of Gary Hecker
VIt. 11/6/16 Map of mandatory fluoridation states
VIu1. 12/15/08 ACC WWTP Middle Oconee River MOR permit NPDES
VIu2. 3/16 ACC Athens-Clark_041416_1621
VIv. 6/29/17 CB PS DEP NPDES DuPont Chemours 012-IW3WS-NR-Final Permit Renewal (2)

Section VII

VIIa. 6/29/95 Babbitt v Sweet Home - Scotus ruling antidegradation harm - ESA62996
VIIb. 112719 Suwannee Moccasinshell Proposed critical habitat mussel listing Federal Register - Endangered and Threatened Wildlife and Plants
VIIc. 2/6/20 USDA BC funding they call it the big ditch
VIId1. 3/16/98 Federal Register Oval Pigtoe Mussel Final Listing Rule
VIId2. 111507 Federal Register Critical Habitat designation - Oval Pigtoe and 6 others final rule 111507
VIId3. Multi-Species Recovery Plan for South Florida Panthers (USFWS, May 1999)
VIId4. Logan, Florida Panther Habitat Preservation Plan (Nov. 1993)
VIId5. 48 Federal Register 16756 (April 19, 1983)
VIIe. 9/12/19 SELC Twin Pines - Comments
VIIf1. 4/11/19 Federal Register USFWS Gulf subspecies of Atlantic Sturgeon 2019-07174
VIIf2. 2001 FNAI Field Guide to the Rare Animals of Florida - Atlantic Sturgeon Gulf subspecies
VIIg. Federal Register Gopher Tortoise candidate for listing in GA 2019-21478
VIIh1. 12/87 Cox et al report 1987 062015 SEARCHABLE 123119
VIIh2. 2014 URTD McGuire et al temperature 2013-11-306
VIIi. 10/21/16 MSDS for Velpar by DuPont cp PSD-59 Velpar DF 130000000589 20161021 MSDS E 200201
VIIj1. FFWC Gopher Tortoise URTD fact sheet 080719
VIIj2. USFWS Eastern Indigo Snake fact sheet
VIIk1. 2/28/84 USFWS Wood Stork fact sheet
VIIk2. 5/27/09 USFWS Wood Stork downlisting 20090528_ltr_PLF_WOST_Petition
VIIk3. 6/30/14 USFWS Federal Register 2014-14761 Word Stork Rule
VIIl1. 1987 Ruckdeschel Shoop Wood Stork Nesting Ecology on Cumberland Island
VIIl2. 2017 Georgia Conservancy Cumberland Island Map
VIIl3. 2019 ONWR Kings Bay Wood Stork Rookery - Google Maps
VIIm. USFWS 2019-WOST_FL_colonies_map_update_20190508

Section VIII

VIIIa. 9/13/19 Robert Holt Hydrology of the Twin Pines Mine Site, GA | Department of Geology
VIIIb1. 1927 USGS Meinzer Plants as Indicators of Ground Water water supply paper 577
VIIIb2. 1995 Bacchus Burns Cut throat seeps Tall Timbers
VIIIb3. 1995 Kitchens and Rasmussen Okefenokee Swamp vertical flow
VIIIb4. 1999 USGS Alley et al. Sustainability of Ground-water Resources circ1186
VIIIb5. 1999 USGS Kindinger Flocks Geologic Controls on the Formation of Florida Sinkhole Lakes
VIIIb6. 2001 USGS Karst Interest Group Proceedings
VIIIb7. 2001 USGS Martin Screaton Exchange of Matrix and Conduit Water in FAS 2001
VIIIb8. 2001 USGS Reich et al Direct Linkages Between Onshore Karst Aquifers and Offshore Marine Environments Spring
VIIIb9. 2001 USGS Spechler Saltwater Intrusion in FAS
VIIIb10. 2001 USGS Tihansky Knochemus Karst Features and Hydrogeology
VIIIb11. 2011 USGS Kinnaman and Dixon Potentiometric Surface 2010 sim3182
VIIIc. 2006 Renner Fluorine surfactants es062612a
VIIId. 1998 Zimmerman et al. kriging - seven geostatistically based inverse approaches to estimate

transmissivities - Water Resources Research

VIIIe. 2/4/20 ML PR Twin Pines Release - Holt modeling

VIIIf. 2/8/20 Mining company withdraws application for project near Okefenokee

VIIIg. 2/10/20 Twin Pines vows to resubmit WABE