RESEARCH PROPOSAL

Monitoring Surface Water Quality and Quantity

Flowing from the Trail Ridge South Mine Site on

Suwannee River Water Management District Bradford County Property

South East of Starke, Florida

by the Bradford County Soil and Water Conservation District

9/2/2024

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**Introduction**

The Florida Department of Military Affairs manages the Suwannee River Water Management District’s (SRWMD) Double Run Tract which adjoins the Camp Blanding Property north of the Keystone Airport.  Part of the eastern part of Double Run Tract is going to be mined by Chemours to extract heavy minerals found in the Trail Ridge deposit.

DuPont began extracting heavy minerals from sands mined on Camp Blanding property east of Starke, FL, in the 1950s. The mined sands were processed sands to recovered the desired heavy mineral products in a facility also on Camp Blanding property east of Starke, FL. The primary products were minerals containing titanium that could be made into titanium dioxide, a white pigment.

In the 1960s DuPont expanded the Starke facility’s industrial wastewater system to include new treatment ponds on property owned by DuPont in Bradford County adjacent to Camp Blanding. An industrial wastewater canal was dug to carry treated industrial wastewater to Alligator Creek at SR 230. Water from Alligator Creek flows through the City of Starke to Lake Rowell then to Lake Sampson, and then via the Sampson River to a point on the Santa Fe River between Graham and Brooker, Florida. The Santa Fe River flows out of Bradford County at the confluence with the New River at a point upstream of Worthington Springs in Union County.

An Industrial Wastewater Discharge Permit for the facility establishes the discharge limits and requirements for the discharging facility is issued by the Florida Department of Environmental Protection (FDEP) and must be renewed every 5 years.

Stormwater from mined land that has not been reclaimed is industrial wastewater. Because the dredging mining method used by DuPont leaves significant amounts of humate from dredged wetlands the run off from mined areas can be black in color because of its humate content. This humate must be removed to meet water quality limits. DuPont began using ferric salt solutions to remove humates and other materials from its industrial wastewater in 1988. DuPont reported using 2,102,000 pounds of ferric chloride between December 1988 and June 1989.

Chemours Corporation was spun off from DuPont in 2015. DuPont and then Chemours used ferric solutions between 1988 and 2016.

The Industrial Wastewater discharge permit issued to Chemours in 2016 required a study of iron discharges from the Chemours operations. In two reports submitted by Chemours to meet that requirement the consulting firms appeared to be claiming the levels of iron above 5 mg/l in surface water and ground water found at the Trail Ridge treatment pond system are from external sources of iron. If a similar source of iron were to be encountered during the Trail Ridge South mining operation the mining process could result in the movement of water high in iron downstream and downgradient of the Trail Ridge South mine site. Detecting increases in iron levels in surface water down stream of the Trail Ridge South mine is a very important step in preventing downstream ecological harm from levels of iron that exceed the 1mg/l limit set for freshwater systems.

The Bradford Soil and Water Conservation District (BSWCD) is a Special District established by Florida Statues.

*FS****582.20 Powers of districts and supervisors.****—A soil and water conservation district organized under the provisions of this chapter shall constitute a governmental subdivision of this state, and a public body corporate and politic, exercising public powers, and such district and the supervisors thereof shall have the following powers, in addition to others granted in other sections of this chapter:*

*(1) To conduct surveys, studies, and research relating to soil and water resources and to publish and disseminate the results of such surveys, studies, research, and related information;*

The BSWCD is conducting a study of the iron levels and turbidity of surface waters in Bradford County.  The Chemours mining and processing operations have and are adding iron to surface waters.  The BSWCD is documenting iron levels in surface water that may be occurring due to past documented Chemours' discharges.

The BSWCD also wants to be able to monitor iron levels in surface water potentially impacted by the new Trail Ridge South Mine.   The BSWCD is currently monitoring iron levels from the surface flows from the Trail Ridge Mine site at points where the surface water flows pass under SR 100 and CR 100A.

The BSWCD would like to be able to monitor surface water flows closer to the Trail Ridge South mining operations.  The BSWCD would like to monitor surface water at the western portion of the Double Run Tract that is not to be mined.  The SRWMD has informed the BSWCD that we would need permission from the Florida Department of Military Affairs to access the SRWND Double Run Tract.

Relationship to the Larger BSWCD Study

The three locations associated with this request are a part of a larger study that includes most of Bradford County. The entire project is non regulatory and is seeking information about water levels, iron levels and turbidity of surface water in Bradford County.

Iron concentration data will be used to better understand natural levels of iron in surface water and the potential environmental impacts of iron added by DuPont and Chemours as part of its industrial waste water treatment process between August 1988 and 2016.

Turbidity measurements will help identify increases in sediment levels in Bradford County’s stream and drainage systems. This is key in designing erosion control options to reduce the sediment loads currently entering surface water systems. Sediments reduce flow and retention capacity of the drainage systems and can increase the risk of flooding.

Water level data will be used to help better understand flooding in Bradford County and identify where changes in drainage systems, lack of maintenance of drainage systems or alterations in flows between drainage basins may be increasing the risk of flooding or the loss of wetland and stream function due to reduced surface water levels.

**Statement of Problem**

Iron Discharges

Iron levels in excess of the 1 mg/l established for discharging industrial wastewater into freshwater systems can impact the biology and ecology of the receiving waters. Excess iron allows iron bacteria to grow on and cover the surface of aquatic plants and any other submerged materials. Prolonged discharges of water with elevated iron concentration can cause changes in the wetland plant population.

The proposed BSWCD sampling of surface water on the SRWMD property would detect a downstream increase in iron concentrations earlier than the current BSWCD surface water sampling sites that are approximately 1 mile downstream for the Prevatt Creek basin, 2.5 miles downstream for the north fork of Double Run Creek and 1.7 miles downstream for the south fork of Double Run Creek. The SRWMD sites also allow separate sampling of the two forks of Double Run Creek. The north fork receives the discharges form the Trail Ridge South Industrial Wastewater treatment system.

Turbidity

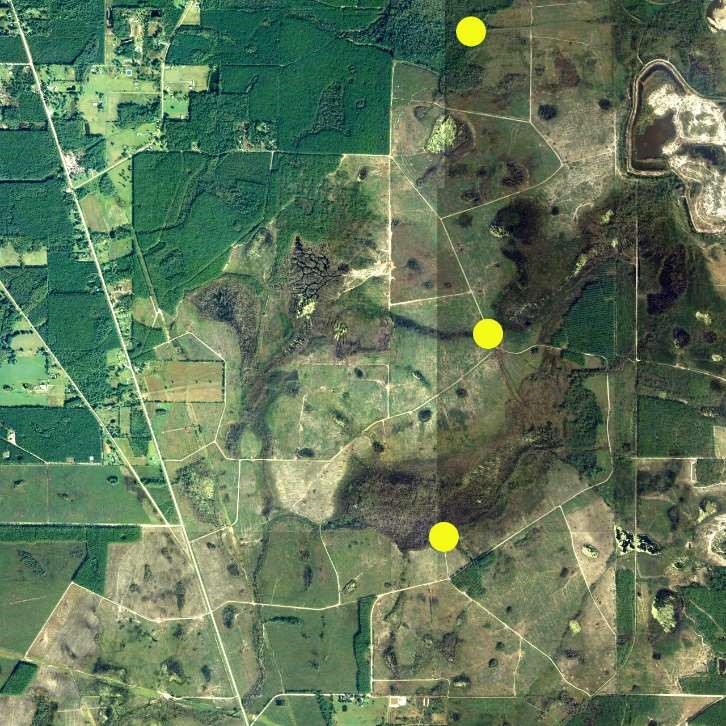
The mining operations have the potential to increase the turbidity and sediments in surface water systems. Turbidity impacts aquatic biological systems, and sediments can fill surface water drainage features. The proposed BSWCD sampling of surface water on the SRWMD property could detect the downstream increases in turbidity earlier than the current BSWCD surface water sampling sites.

Water Level

The water flow in the surface water systems will be disrupted during the mining operations by berms erected around active mined cells that have not been reclaimed and restored. This disruption could impact downstream wetlands and streams. Because of the time required to restore and have the mined areas released, this disruption could exist for years and have significant impacts on downstream ecosystem functions. The proposed BSWCD measurement of water levels on the SRWMD property could detect the downstream flow impacts earlier than the current BSWCD surface water level measuring sampling sites.

**Methodology for Double Run Tract**

The approximate location of the three sampling sites is shown below.



Chapter 4: Expected Outcomes and Timeline

Water samples will be collected from the top 6 inches of the drainage feature while standing on the bank of the drainage feature or from a bridge or culvert under a road crossing of the drainage feature using a 6-foot gripping tool. Samples will be collected in 250 ml plastic bottles that have been washed including a final rinse with distilled water. Water samples will be stored at room temperature and analyzed within 36 hours after collection.

In the event that mining operations move to a sampling location, a new location will be determined in consultation with Camp Blanding staff.

Water Analysis for Total Iron

A Hanna Fe Checker HC unit will be used following the instruction for the unit and the chemicals supplied by Hanna.

Water Analysis for Turbidity

A Sper Scientific 860040 Turbidity Meter will be used following the instructions for the meter. Samples will be disposed of after testing.

Paul Still will perform the water analysis.

Water Level Measurement

A staff gauge will be installed at the sampling sites. Digital images will be used to record the water line on the staff gage at the time water samples are collected.

Sampling Schedule

Sampling will be monthly or after rain events over 2 inches. Sampling will be done by Paul Still or, if he is not available, by Amy Morie or Sherman Carnes.

**Reports and Data Availability**

BSWCD must produce documents when requested by individuals so data will be available on request.

An annual report with 12 months of data will also be produced and made available.

Chemours, FDEP and the SRWMD will be notified if Total Iron levels exceed 1.5 mg/l, turbidity increases by over 50 NTUs, or if there is an increase in water level that does not seem to be consistent with rain events.