

**Response to Comments  
Draft Mining Land Use Plan  
Twin Pines Minerals, LLC**

The draft Mining Land Use Plan (MLUP) For Twin Pines Minerals, LLC (TPM) was posted on the Environmental Protection Division’s (EPD) website on January 19, 2023. This initiated a 60-day comment period, which remained open until March 20, 2023. Two virtual public meetings were held on February 21 and 23, 2023. EPD received a total of approximately 78,747 comments, which included 115 verbal comments in the virtual public meetings and 78,632 written comments received by email or mail. A summary of the comments is provided below along with EPD’s responses. Since many of the responses refer to Wei Zeng’s November 16, 2023 Memorandum related to the “Summary of hydrologic analyses on Twin Pines Mineral’s (TP’s) Charlton County Project”, a copy is attached.

**1. Public Comments - Opposition to permitting a surface mine on Trail Ridge in close proximity to the Okefenokee National Wildlife Refuge (ONWR)**

**EPD Response:**

The bulk of comments received were about permitting the TPM surface mine. As a regulatory agency, EPD has the responsibility to follow the statutory and regulatory requirements of the Georgia Surface Mining Act and Rules for Surface Mining in determining if a surface mining permit shall be issued. If an application meets the requirements of the Georgia Surface Mining Act and Rules for Surface Mining, a permit is issued.

**2. Impact to ONWR**

**2.1 Public Comments- Lower Water Levels:**

- Mining will lower the swamp water level.
- Proposed mining activity will disrupt the crucial hydraulic balance within the swamp causing disruptions of the sensitive balance of both Flora and Fauna in this globally unique and essential ecological zone.
- The consumptive withdrawal of 1.128 MGD from the surficial aquifer will substantially increase drought frequency and alter the ecology of the southeastern portion of the swamp.
- Mining activities and disturbance of existing soil structure will cause less water flowing toward the Okefenokee Swamp and consequently lower water levels in the swamp.
- Downward movement of water is retarded by existing soil structure. Drilling through the layers and pumping water from depth would increase downward flow resulting in less water flowing to the swamp.
- The consumptive withdrawal of 1.128 MGD from the surficial aquifer will substantially increase drought frequency and alter the ecology of the southeastern portion of the swamp.

- TPM's groundwater withdrawals are likely to increase the frequency and severity of drought in the Okefenokee Swamp.

**EPD Response:**

The potential impact of the 1.44 MGD withdrawal from the Floridan Aquifer would have a very low impact on the Okefenokee Swamp, even if EPD makes very conservative assumptions such as placing the entire amount of the withdrawal onto the swamp's surface water. EPD's reservoir mass balance model shows a maximum impact in water level to be 0.2 inches (or 5 mm), if we assume well connectedness within the swamp and treat it as a large and shallow reservoir. The potential impact to the ONWR is even less using the same conservative assumptions for the withdrawal coming from the surficial aquifer as a result of mine dewatering (0.08 inches, 2 mm). See Zeng's November 16, 2023 Memorandum for additional information.

**2.2 Public Comments – Drought Concerns:**

- The MLUP and Water Use Plan do not recognize the drought-sensitivity of the Okefenokee Swamp.
- The MLUP does not address or estimate the social and environmental costs created by increasing the frequency and severity of drought in the swamp as a result of groundwater pumping and evaporation.
- The groundwater recharge rate used to model groundwater flow is too low and improper.

**EPD Response:**

EPD's models demonstrate that the mine should have a minimal impact on the ONWR, even during drought periods. See Zeng's November 16, 2023 Memorandum for additional information.

**2.3 Public Comment – Dewatering Effects:**

- The effects on ONWR from mine dewatering were not properly quantified.

**EPD Response:**

EPD quantified the effect of dewatering the mining pit using conservative surface water assessment. See page 6, *Pumping Groundwater from the Floridan Aquifer* in Zeng's November 16, 2023 Memorandum for more information on this assessment and its results.

**3. Evaporation System**

**3.1 Public Comments – Salt Deposits:**

- Evaporation will create saline clouds that could deposit upwards of 1.2 tons per day of salt into swamp.
- The potential for evaporated byproducts to effect plant growth both on and offsite
- No assessment or acknowledgement of downwind salt deposition from the evaporation system.

**EPD Response:**

TPM has updated the type of evaporators they will use. The EcoVap system technology mimics cloud formation by increasing convection, rapid evaporation, and high humidity within a closed system. This technology does not generate water droplets, which as a result will not trap salts or other solids. Therefore, saline clouds will not be formed and will eliminate any salt deposits outside of the pond system. Detailed information on EcoVap system can be found in the MLUP Appendix U-1 and U-2.

**3.2 Public Comment – Evaporation Plan:**

- No consideration of water chemistry, local climate, or storage dynamics in the proposed evaporation plan.

**EPD Response:**

TPM has conducted a Water Management Pond evaporation analysis using the climatological conditions of Saint George, GA water management estimates provided in the Water Management Ponds Hydrology and Hydraulic Analysis Report (Wood-May 2022), and Water Use Management Plan (Wood 2002, Revised 2023) combined with mine water seepage estimates presented in the Addendum to Modeling the Groundwater Flow System at the Proposed Twin Pines Mine on Trail Ridge (GSI-November 9, 2022). This evaporation analysis concludes that EcoVap, Inc. can meet the evaporative demand established by mine operations as described in the October 2, 2023, GSI memo (Appendix U2-GSI).

**4. Placement of Bentonite Layer**

**4.1 Public Comments – Concerns with Bentonite Layer Success:**

- The bentonite layer is unproven and will be difficult to construct as a continuous layer. There is no track record of such placement achieving its hydrologic goals provided in the reclamation plan.
- Disturbances of existing soil structure and the subsequent return of homogenized material will increase permeability of Trail Ridge and eliminate or compromise the dam effect it has on the ONWR.

- Scientists raised the concern that the hydrology of the site could be permanently altered even after the fill is replaced since its composition will be mixed and will lose its hydrophobic properties, resulting in more water being diverted into the Floridan aquifer. We also have significant concerns about the success rate of using bentonite to restore the hardpan layer – this is an experimental technique with no guarantee of success.

**EPD Response:**

The presence or absence and depth of consolidated black sand within the mine footprint will be documented prior to excavation. Procedures will be in place on the application of the bentonite layer as it was mapped. Placement of the sand/bentonite layer within the mine pit will be observed by a Georgia-Licensed Professional Engineer or Geologist. For more information, see the MLUP 2a Sheets- Soil Amendment Plan, Sheet 9; TPM MLUP Appendix M; and Section *Disturbance of Sediment Structure and TP's Groundwater Modeling of Impacts* of Zeng's November 16, 2023 Memorandum.

**4.2 Public Comment - Interaction with Bentonite:**

- The interaction of salts and other minerals with bentonite can lead to increased hydraulic conductivity.

**EPD Response:**

The MLUP includes a Groundwater Monitoring Plan that will include the monitoring of groundwater levels post-mining to ensure that the bentonite layer is working as designed. If the groundwater level falls below expected levels, a contingency plan will be developed and implemented.

**5. Impact on St. Mary's River**

**5.1 Public Comments- Withdrawals and Water Levels and Flow:**

- Have water withdrawals from the surficial aquifer been investigated on its potential impacts to the St. Mary's River to the east of Trail Ridge?
- Water levels and water flow in the main stem St. Mary's River must be monitored.

**EPD Response:**

The models were developed to look at whether near surface groundwater hydrology along Trail Ridge, especially in the area east of the Okefenokee Swamp and west of Trail Ridge, will be altered as a result of the mining operation. Using USGS gage data and very conservative parameters in the modeling analysis, EPD believes the hydrologic impact on the St. Mary's River from dewatering of the mining pit would be minimal. Since there is no surface water

withdrawal from the St. Mary's River as part of TP's mining operation, there is no direct reduction of flow in the river and its tributaries resulting from the proposed operations. An overly conservative assumption that the entire 0.87 cubic feet per second (cfs) (i.e. half of the mining pit dewatering) was treated as a flow reduction from the River. The assumption that a groundwater withdrawal from the surficial aquifer (which is another way of understanding the effect of the mining pit dewatering) is 100% translated into a reduction of flow within a stream is extremely conservative. The largest reductions are associated with the known drought years. Among these drought years, the maximum reduction in surface water elevation is 0.0212 feet (6.5 mm or roughly a quarter of an inch). Please see Appendix 2 in Zeng's November 16, 2023 Memorandum for additional details.

### **5.2 Public Comment – Saltwater Intrusion:**

- How is saltwater intrusion into the St. Mary's River being evaluated in regard to this project and is this of concern to EPD?

#### **EPD Response:**

No saltwater intrusion has been documented at the mouth of the St. Mary's River. EPD has conducted a modeling assessment of saltwater intrusion in coastal Georgia and South Carolina using a jointly developed Coastal Sound Science Initiative (CSSI) model. The point of assessment is where known issues of saltwater intrusion arose. Modeling results indicate the lack of perceivable impact. Also see Section *Coastal Sound Science Initiative Model* (pg 8) in Zeng's November 16, 2023, Memorandum.

## **6. Model Used by Twin Pines Minerals**

### **6.1 Public Comment – Validation/Verification:**

- Model validation/verification was not completed.

#### **EPD Response:**

The TPM model has been properly calibrated against field measurements made by TPM (or TPM's contractors) in 2019. The calibration process included assessing Goodness-of-Fit between simulated water levels and measured water levels and provided 112 statistics, indicating reasonable match between simulated and observed results. See page 4, paragraph 2, of Zeng's November 16, 2023 Memorandum.

### **6.2 Public Comment – Insufficient Hydraulic Conductivity:**

- Hydraulic conductivity is insufficient to characterize the groundwater system.

### **EPD Response:**

Hydraulic conductivity used in TP's groundwater model has been determined by a vast amount of field investigation. For example, 387 boreholes have been drilled and their corresponding cores analyzed in determining representative hydraulic properties.

### **6.3 Public Comments – Omits Direct Flow Path:**

- The model omits a direct flow path between the mine and ONWR.
- Area extent of model domain omits the direct flow path between mine and ONWR.

### **EPD Response:**

The purpose of the groundwater model is to show whether altered lithology will result in significant changes in near surface groundwater hydrology. Surface features beyond the model domain do not have an effect on the essential utility of the model. See Zeng's November 16, 2023 Memorandum for a simplified and yet conservative assessment of the impact from various aspects of the mining operation on the ONWR.

### **6.4 Public Comments – General Concerns with Model:**

- Drain cell evaluations in model do not match description in report.
- The justification for use of the steady-state model is flawed.
- Constant-head boundary condition is not appropriate.
- Model is not set up to mimic the system's natural variability.

### **EPD Response:**

See Section *Disturbance of Sediment Structure and TP's Groundwater Modeling of Impacts* in Zeng's November 16, 2023 Memorandum for information on the model used and an explanation of the model's purpose and why a variety of model inputs could cover conditions that change with time.

### **6.5 Public Comment – Recharge Rates:**

- Recharge rates need to be spatially and temporally variable.

### **EPD Response:**

Given that the mining area is confined within a few hundred acres, the model recharge rates are uniform among the model's grid cells and are conservatively set by calculating the precipitation minus runoff, evaporation/transpiration, and pumping. In order to evaluate the impacts of recharge rate on model results, TP conducted a sensitivity analysis. A high recharge

rate (4.5 inches/year) and lower recharge rate (3.5 inches/year) were selected. The results of sensitivity analysis indicated that the model results will not have significant change with higher or lower recharge rates. For additional information, please see Section *Disturbance of Sediment Structure and TP's Groundwater Modeling of Impacts* in Zeng's November 16, 2023 Memorandum.

#### **6.6 Public Comment – Surface Water Dynamics:**

- The drain package was not appropriate for simulating surface water dynamics.

#### **EPD Response:**

TPM's groundwater model was not developed to address surface water dynamics. It was for the purpose of assessing how near surface groundwater hydrology might be affected by the change in soil structure and how such impact may be mitigated. See Section *Disturbance of Sediment Structure and TP's Groundwater Modeling of Impacts* in Zeng's November 16, 2023 Memorandum for a summary of EPD's assessment of surface water impact. Also see Brook and Hyatt (1981) for a water balance assessment of the Okefenokee Swamp. The authors quantified the total amount of precipitation to be 20.55 e+8 cubic meters. This is equivalent to an incoming flow at the rate of 65.2 cubic meters per second, or 2,302 cfs from precipitation alone. If surface water is the focus of an assessment, the removal of 783 gallons per minute (or 1.74 cfs) of water from the mining pit (and its subsequent impact on surface water flowing into the Okefenokee Swamp) would have a minimal impact. In other words, the maximum flow reduction (if entire 1.74 cfs had a direct impact on the Swamp) would only affect the flow by 0.076%.

#### **6.7 Public Comment – No-Flow Boundary:**

- No-flow boundary condition is not appropriate.

#### **EPD Response:**

The model's input conditions have been developed to represent current groundwater flow conditions of the Trail Ridge area of southern Georgia. The most important boundary conditions of the model to note are the north and south boundary conditions which are no flow conditions, and this is due to the natural groundwater flow of the area being predominantly east-west, with Trail Ridge acting as a hydrogeologic divide in the area. Further, the bottom of the model, which is the confining layer overlying the Floridan Aquifer system is represented as a no flow boundary in the model. This is a common and acceptable practice because permeability of the confining layer is very low, so movement of groundwater through that layer is almost non-existent. See page 4, paragraph 1 in Zeng's November 16, 2023 Memorandum.

### **6.8 Public Comment – Combined Effects:**

- Modeling and analysis segmentation does not account for combined effects.
- Modeling did not quantify the combined impacts but instead modeled each process separately.
- Combined inappropriate modeling assumptions compromise its predictive capability with respect to the impacts on ONWR.

#### **EPD Response:**

While some of the impacts would take place simultaneously, others will not. For example, when TP experiences 783 gallons per minute (or a quantity less than this but higher than 300 gallons per minute) of groundwater entering the pit, the water will be pumped out of the mining pit and into the Water Management Pond System. This eliminates the need to pump water from the Floridan Aquifer since they will be getting enough from the mining pit.

It could be argued that the effect of mining pit dewatering and disturbances of soil structure would take place at the same time. However, the maximum amount of impact from soil structure disturbances would not take place until the end of the project, by which time mining pit dewatering will have ceased. Also, the effect of mining pit dewatering has been conservatively assessed, and it has been determined to be de minimis. See page 6, *Pumping Groundwater from the Floridan Aquifer* in Zeng’s November 16, 2023 Memorandum.

### **6.9 Public Comment – Mine Expansion:**

- Project segmentation does not consider potential mining expansion.

#### **EPD Response:**

Any additional mining operations not included in the demonstration area will be considered new and unique and will require a new set of permits and a full permitting process.

### **6.10 Public Comment – Complete Watershed:**

- Area modeled did not include the complete watershed.

#### **EPD Response:**

An impact is felt at the location of alteration and its perspective of the range of a potential impact. The farther away it is from the location of alteration, the less impact there is. The current model domain contains a substantial portion of the swamp, and it is showing the lack of a difference in hydrology between baseline scenario and post-mining scenario in areas



including portions of the swamp. It is unlikely that a larger model domain itself would cause any larger differences in near surface groundwater hydrology.

#### **6.11 Public Comment – Seasonal and Interannual Variability:**

- Modeling did not capture the seasonal and interannual variability in the system.

#### **EPD Response:**

A steady state model was used and deemed best for determining and predicting pre and post mining water levels. Seasonal variability is not included in the model since it has very little impact to the modeling results. The most conservative approach was used for interannual variability. The worst drought year was used for the model input; therefore, using any other year would predict less impact. For additional information see Page 5 of Zeng’s November 16, 2023 Memorandum.

#### **6.12 Public Comment – Multiple Watersheds:**

- Model combined data from multiple watersheds.

#### **EPD Response:**

A common practice in modeling watershed areas is to use data from neighboring watersheds with similar characteristics to fill in data gaps. Data coming from different watersheds does not render any assessments less reliable. Most, if not all, watershed areas do not have complete data sets.

#### **6.13 Public Comment - Did Not Follow the US National Academy of Sciences Recommendations:**

- They did not follow the US National Academy of Sciences recommendations for first only using high-quality site-specific measurements for environmental decision making and secondly not recognizing that modelling heterogeneous unconfined aquifers, as they have done, is technically unsound.

#### **EPD Response:**

The commenter did not specify why modeling heterogeneous unconfined aquifers would be considered “technically unsound.” Models are just technical tools that help professionals make a quantitative assessment of the physical world as it responds to perturbations, natural or anthropogenic. They follow the basic laws of physics (Newtonian, as the commenter alluded to elsewhere in the comment document). They follow the basic rule of mass balance.

As a matter of fact, the United States Geologic Survey (USGS) developed a groundwater model for the State of Georgia for modeling the Floridan Aquifer in southwest Georgia, an aquifer that has confined and unconfined portions. It is precisely because the Flint River and its tributaries flow inside the unconfined portion of the aquifer that makes the model a necessary tool to assess the hydraulic connection between surface water and groundwater. After the model's initial development, it served as the go-to model for the State of Georgia's assessment of impacts to surface water from pumping from the Floridan Aquifer. In the context of the United States Supreme Court case of Florida vs. Georgia Original 142, technical experts from both Georgia and Florida recognized this model as the best available tool, although the Floridan Aquifer is partially unconfined and heterogeneous.

Modern-day computers have high computational capacities and modern-day computer models can handle large amounts of information reflecting heterogeneity. If a model is properly developed, it can provide insights that are not available otherwise. See Zeng's November 16, 2023 Memorandum for EPD's assessment of the TPM groundwater model.

#### **7. Public Comments - Gages Used in Modeling:**

- There are two gages in use on the upper river: one located at Moniac, GA closest to the swamp on the St Mary's River and the other some distance downstream in MacClenny, FL. To exclude the Moniac gage which is in far closer proximity to the potential impact of the proposed titanium mine makes absolutely no sense. I would argue the Moniac gage is more reliable and representative due to its proximity to impact.
- Memo: "The Moniac, GA USGS gage is the more relevant and appropriate gage for assessing the potential hydrologic effects of the proposed Twin Pines Minerals LLC mine operations on the Okefenokee Swamp".
- The Groundwater and Surface Water Monitoring Plan should be revised to include monitoring of surface water level/flow at the Moniac gage to determine if the mining operation is lowering the water levels and flow in the swamp. Monitoring at the Moniac gage should commence with the first day of mining and continue throughout the mining duration. Action criteria and an adaptive management plan, which should include stoppage of mining, for deviations should be developed and included in the plan.

#### **EPD Response:**

EPD modelers used a more direct and conservative approach in assessing the impact on the Okefenokee Swamp and, consequently, EPD did not need to use either gage for the purpose of assessing the impact on the swamp. See November 16, 2023, Memorandum pgs. 7-8 and Appendix 3 and 4 of Zeng's November 16, 2023, Memorandum.

The Groundwater and Surface Water Monitoring Plan is designed to monitor the impact of the mining activities on water levels and water quality in the vicinity of the mine (during and post-mining), including upgradient changes that could potentially impact the ONWR.

## 8. **Public Comments - Erosion and Sedimentation Plan:**

- Sediment and control plan should include a sediment filter pond to control sediment in specific areas of the property.
- Heavy rains will result in ponds overflowing into sensitive areas which will be impacted by siltation and other contaminants.
- MLUP Sheet 7 details Silt Fence Type C with “height” to be shown on erosion, sedimentation, and pollution control plan.” There is no height designation for silt fencing found on the plan as referenced. Also on Sheet 7 is the detail for Brush Barrier “with minimum base width of 5’ and no wider than 10’ and “filter fabric may be placed on the side...”<sup>24</sup> However, details for a fabric silt fence placed 2 feet from the limits of disturbance are mentioned in the Legend. Why only place a Brush Barrier around Ponds M1 – M4, P1- P4 and the Plant? Or is it to be a fabric silt fence, and at what height? If a Brush Barrier, how does the base width fit into the permit area? What is the height of the silt fence around the mining area?
- If a berm collapses during a heavy rain event, is the expectation that this silt fence will prevent the turbid water from entering and contaminating neighboring properties and local waterways?
- Will the company be implementing silt fence Stormwater Best Management Practices based on EPA’s document EPA 833-F-11-00825? How will the fencing be placed? How long is each fence run? Will there be an overlap between runs? How has the drainage area been evaluated to determine efficiency and quantity of the silt fences? What is the silt fence made of? The silt fence design and installation is unclear.

### **EPD Response:**

Erosion and sediment control plan has been updated and meets the minimum standards pursuant to the Manual for Soil and Sedimentation in Georgia. Revised Sheets 6 & 7 (revision date 10/2/2023) of the MLUP contains additional details on the Plan.

MLUP is designed to prevent sediment from leaving site. If berms fail and turbid water is allowed to leave the site, a violation will occur which will result in the development and implementation of a corrective action plan.

## 9. **Public Comments - Historic and Cultural Resources Impact:**

- It is our desire as Native people that extensive excavation or archaeological exploration should not be conducted. It is our wish that our ancestral sites of the Muscogee Creeks and the Cherokees should be left undisturbed.

- In what ways is GA EPD working with other state and federal agencies to preserve the historic significance of the mining site as part of the historic region?
- The proposed mine threatens cultural resources in the area.

**EPD Response:**

A Cultural Resources Survey (MLUP Appendix B) was conducted by TerraXplorations, Inc. If any previously unknown historic or archaeological remains are discovered during mining activity, TPM will immediately stop work and notify the Georgia State Historic Preservation Officer to determine the appropriate course of action before proceeding. See Sheet 15 of the MLUP.

Historical properties will not be disturbed by the project. No properties listed on the National Register of Historic Places are located on or adjacent to the proposed mining operation. See MLUP Appendix B, Cultural Resources Assessments.

**10. Public Comments - Light and Noise Pollution:**

- Light pollution impact study needs to be completed and reviewed.
- Light pollution from the proposed mine will impair the visitor experience in the ONWR.
- Sound from truck traffic and mining operations may impair the visitor experience in the ONWR.

**EPD Response:**

Light effects are discussed in an insert to the narrative on Sheet 15 of the MLUP, which states that TPM will adhere to specific recommendations to ensure light from the mining operation will not affect wildlife or visitors to the Okefenokee National Wildlife Refuge or cause any change to the parks' Dark Sky rating. The measures to be implemented are detailed in Section 3 of the MLUP Appendix Y.

TPM has completed a noise analysis. The model predicted sound level at the boundary of the ONWR is comparable to the sound level inside a quiet library or office. See the MLUP Appendix Z- Jacobs Noise Analysis 10.2.2023.

**11. Reclamation Plan**

**11.1 Public Comment - Well Abandonment:**

- What is to become of the wells after this four-year mining project – will they be capped or used in future mining operations? Once TPM has mined all they are permitted to mine,

does the company have a plan for maintaining those wells to ensure no cracks or general wear and tear over time?

**EPD Response:**

Sheet 10 of the MLUP explains that at the conclusion of the reclamation the wells will be properly abandoned in accordance with the State of Georgia Water Well Standards Act.

**11.2 Public Comments - Plan Assurances, Details, and Metrics:**

- Require a results-based reclamation plan. Assurances should be in place on pages 9 and 10 to commit to reclamation until the pre-mining state is achieved.
- The MLUP does not provide sufficient detail concerning the reclamation plan.
- The reclamation plan does not have a measurable follow-up plan to measure success (e.g., at 1 year, 5 years, etc.).

**EPD Response:**

Permits are not released until reclamation and monitoring is completed, and the request to release is approved by EPD. MLUP Reclamation Plan Sheets 9 & 10 provides details on how the site will be reclaimed in accordance with the Georgia Surface Mining Act and Rules. Information on the Adaptive Management plans can be found on Sheet 11. These plans go over the monitoring of the success of the bentonite layer and the triggers for developing and implementing contingency measures.

**12. Public Comment – Overflow to the East of the Project:**

- No plan for overflow monitoring.

**EPD Response:**

Modeling results indicate that the capacity of the storage space in the system can handle the mine dewatering of the mine pit and historical precipitation events without the risk of discharging. See page 10 of Zeng’s November 16, 2023 Memorandum.

**13. Endangered Species and Habitats**

**13.1 Public Comments – Birds and Habitat in ONWR:**

- More than 200 species of resident and migratory birds rely on Okefenokee Swamp for their survival. Okefenokee is designated an Important Bird Area of global significance by Audubon and contains protected habitats for threatened and endangered bird species during

all seasons, such as red-cockaded woodpecker, wood stork, and sandhill crane. Of exceptional note, the Okefenokee Swamp is home to nearly the entire nesting population of Florida sandhill cranes in Ga.

- Seek an incidental take permit and develop a Habitat Conservation Plan

**EPD Response:**

Since minimal affects are anticipated in the ONWR from mining activities, the resident and migratory birds are not expected to be impacted. Please see comment 2 for more details on the mine's impact to the ONWR. TPM evaluated the site for the presence of protected species and/or their associated critical habitat(s) during 2018-2020. Surveys and reports can be found in Appendix C and on page 11 of the Environmental Checklist document of the MLUP.

**13.2 Public Comments - Sturgeon:**

- In what ways is GA EPD working with other state agencies to protect designated critical habitat for federally endangered sturgeon from the impacts of mining in the St. Mary's River watershed?

**EPD Response:**

EPD is working with the US Fish and Wildlife Service, the National Marine Fishery Service, and the St. Mary's Riverkeeper in conducting a bathymetric survey and sonar scan of the St. Mary's River. An open-channel hydraulic model and a water quality model will be developed for the River. These models will be calibrated against field data and, in the future, may be used to provide more detailed assessment on impacts from alterations (not limited to the mining operations by TP) to the River.

TP will not be withdrawing water directly from the St. Mary's River and will not be discharging wastewater into the River. Based on best available information from USGS and the assessments of TP's plans, the potential indirect impacts on the River and the sturgeon species making use of the River will be minimal (roughly ¼ inch reduction in surface water elevation based on overly conservative assumptions – actual reductions expected to be less).

**14. Water Management Pond System**

**14.1 Public Comment - Quantity of Wastewater:**

- How much wastewater is expected to be produced from the MSP and has that been included in the water budget of the process ponds?

**EPD Response:**

TPM stated in its Water Management Plan that 3,000 gallons per minute of water will be involved in the industrial process. Of those 3,000 gallons per minute, 300 gallons per minute will be lost. This means that 2,700 gallons per minute of wastewater will be generated in the process. It is noted that this water comes from various possible combinations of existing storage, water pumped into storage from the mining pit (i.e. dewatering), and/or water pumped from the Floridan Aquifer. It is also noted that industrial wastewater would go back to the Water Management Pond System and stored for reuse.

The management of water (e.g. water pumped from mining pit dewatering, historical precipitation, historical evaporation, loss to industrial process, and artificial evaporation) has been modeled with historical hydrologic conditions. Modeling results indicate feasibility of the proposed Water Management Plan, the system's ability to handle historical high precipitation events, and very little need for water from the Floridan Aquifer. See Zeng's November 16, 2023, Memorandum, *Water Management at the Mining Facility* (page 9) for a summary of this assessment.

**14.2 Public Comment – Pond Maintenance:**

- Can the other berms withstand the additional volume of water added by an out-of-commission pond? What is the backup plan if the remaining ponds do not have the capacity or are in fact compromised themselves and cannot take in additional water?
- How is the liner going to be inspected and repaired?

**EPD Response:**

Pond procedures will be put into place outlining installation and maintenance protocols if a permit is granted, and operations begin. If part of the Water Management Pond System is compromised for any reasons, then the total volume of storage available for managing water will be much lower than assessed by EPD. This would constitute a substantial deviation from permits conditions and result in violations, which would require a corrective action plan to be developed and implemented.

**14.3 Public Comment – Jurisdictional Wetlands:**

- Are the wetlands that are outside of the permitted boundary northwest and east of the Management Ponds considered jurisdictional under the new rules?

**EPD Response:**

EPD understands the term “new rules” as referencing a potential federal rule on Waters of the US (WOTUS) determination. Please contact the U.S. Army Corps of Engineers or the U.S. Environmental Protection Agency for determinations on jurisdictional wetlands.

#### **14.4 Public Comment – Wastewater Discharge Permit:**

- Considering the lessons learned at nearby heavy mineral sand mines and the likelihood of spills or overflow events, why is Ga EPD not requiring TPM to pursue a wastewater discharge permit?

#### **EPD Response:**

Each application is reviewed on its own. In TP’s case, a demonstration has been made in the MLUP that the Water Management Pond System will be able to handle the wastewater generated on site.

#### **15. Public Comment - Additional Site South of Hwy 94:**

- Has the additional site south of Highway 94 been taken into consideration regarding plans to be reviewed and wastewater storage capacity?

#### **EPD Response:**

The area south of Highway 94 that contains the Mineral Separation Plan plant has been added to the MLUP. Water will be transported via trucks to and from the plant. No discharge is permitted.

#### **16. Groundwater and Surface Water Monitoring Plan**

##### **16.1 Public Comment – Mercury:**

- No mention of mercury and what to do if it is found during monitoring.

#### **EPD Response:**

Natural low concentrations of mercury on the site have been found to be below the drinking water standard for groundwater. Additional details related to groundwater monitoring can be found on Sheet 11 of the MLUP.

##### **16.2 Public Comments – Groundwater Level:**

- Groundwater level measurements in the “Project Study Area” should be commenced at all locations on Table 2.1 with the start of mining and continued throughout mining. These measurements should be compared immediately to historical norms and, in the case of deviations outside the norm, mining should be stopped, and a corrective action plan should be submitted to EPD for approval.



- The Twin Pines plan states that no monitoring and no assessment of water levels will be done until dragline excavation has proceeded 1000 feet to the north (Section 2.3), which would appear to be approximately 16 months from the start of mining. This is simply too late to ensure the protection of the groundwater regime linked to the Okefenokee swamp. Only those piezometers that are within 1000 ft of the immediate influence of the active mining pit should be exempt from groundwater level measurement at any given time.
- Model and analysis did not consider re-mining of bentonite layer in dragline overlap areas.

**EPD Response:**

For comparing pre- and post-mining groundwater levels, sufficient time must elapse after the dragline excavator has passed to ensure the post-mining data is not influenced by the on-going mining to the north. TPM estimates that groundwater impacts will extend approximately 1,000 ft from the edge of the mining pit. Therefore, comparison of pre- and post-mining groundwater levels will be made after the dragline excavator has moved approximately 1,000 feet to the north of the mined transect. Sheet 11 of the MLUP contains additional information for Groundwater and Surface Water Monitoring and discusses the monitoring frequency and triggers when a contingency (corrective action) plan is developed and implemented.

**16.3 Public Comments – Surface and Groundwater Contamination:**

- The frequency of analysis should be increased to twice per month and deviations from the norm should be reported more quickly to EPD.
- The Water Quality Monitoring and Adaptive Management Plan is insufficient to ensure protection of contiguous natural resources. Action levels, based on historical data, should be added for all of the “constituents of potential concern” listed in Table 3.2-4. An action plan should be added that includes the stoppage of mining and submittal of a corrective action plan for Georgia EPD’s approval.
- How will TPM ensure the contaminants and by-products of heavy mineral sands mining do not contaminate 1) the St Mary’s River used heavily for fishing, recreation, and water supply and 2) the groundwater sources used by many for drinking water supplies?
- Poor management of materials, especially chemicals and solvents (for example, motor oil and gasoline), can easily lead to contamination of surface water and groundwater during storm events. The MLUP must be revised to address proper management of materials and the prevention and cleanup of spills of chemicals and other materials.

**EPD Response:**

Extensive site characterization activities, including groundwater and surface water quality monitoring has been performed in March 2019 and February, March, April, June, July, August, September, October 2020, January, and April 2021. This data and future water quality monitoring performed pre-mining, during mining, and post-mining will be used to assess water quality impacts as a result of mining activities. A corrective action plan will be developed and

implemented if contamination above drinking water and groundwater protection standards are discovered.

See MLUP 2a Sheets- Groundwater and Surface Water Monitoring Plan (Sheet 11) for more details.

17. **Public Comment - Withdrawal of 1.44 MGD Impacting Water Supplies For Surrounding Communities:**

- How will the withdrawal of 1.44 MGD from the Floridan aquifer over the life of the mine impact the availability of water supplies for surrounding communities especially during drought conditions.

**EPD Response:**

The primary use of the permitted 1.44 MGD groundwater withdrawal from the Floridan aquifer will be to charge the Process Water Ponds at the beginning of the process. After the Process Water Ponds have been charged and mining begins, seepage water removed from the active mine pit will provide most if not all of the required process water, substantially reducing pumping from the Upper Floridan Aquifer. See MLUP Appendix P Water Use Management Plan, pg. 6.

18. **Public Comment - Illegally Drilled Wells:**

- Many, if not most, borings and monitoring wells at the Saunders Demonstration Mine area site were ILLEGALLY drilled (i.e. the Georgia Water Well Standards Act) and constructed by TPM employees for mineral exploration purposes. My examination of boring logs prepared by these employees, is that they do not reflect site stratigraphy and only reflect the employee's visual peculiarities.

**EPD Response:**

Pre- mining field investigations are not the only way of obtaining correct lithology of the site. Lithology will be confirmed and recorded by the actual excavation process, particularly on the location of the black sand layer.

Enforcement action has been taken in regard to the bore hole drilling without a license.

19. **Public Comments - Land Use:**

- The MLUP does not ensure "the protection of contiguous natural and other resources." 3. The proposed mine is not consistent with "land use in the area of the mine."
- The proposed project is inconsistent with state and local land use plans.
- The proposed mine is inconsistent with the Joint Comprehensive Plan for Charlton County and the cities of Folkston and Homeland. 3a.ii. The proposed mine is inconsistent with the State Wildlife Action Plan.
- The proposed mine is incompatible with ecotourism associated with the ONWR.
- Why is GA EPD entertaining a land use that would allow heavy industrial activity in an area intended to be for residential and commercial use and in such close proximity to a resource of regional significance?

**EPD Response:**

TPM has provided documentation from Charlton County which complies with Georgia's Surface Mining Act. Interpretation of zoning ordinances, and determinations of compatible land use, are the jurisdiction of local governments.