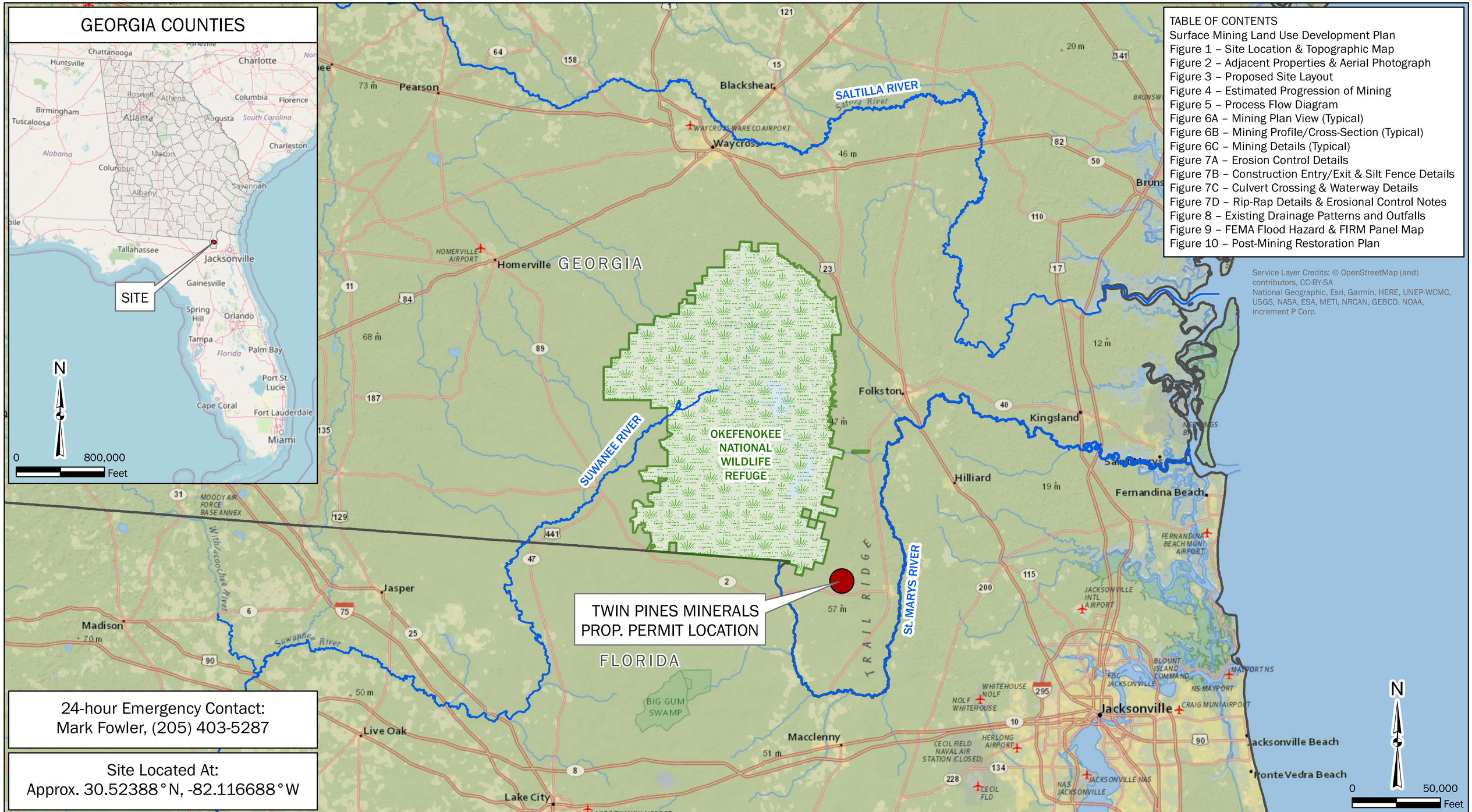


Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA
National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

TABLE OF CONTENTS

Surface Mining Land Use Development Plan
Figure 1 – Site Location & Topographic Map
Figure 2 – Adjacent Properties & Aerial Photograph
Figure 3 – Proposed Site Layout
Figure 4 – Estimated Progression of Mining
Figure 5 – Process Flow Diagram
Figure 6A – Mining Plan View (Typical)
Figure 6B – Mining Profile/Cross-Section (Typical)
Figure 6C – Mining Details (Typical)
Figure 7A – Erosion Control Details
Figure 7B – Construction Entry/Exit & Silt Fence Details
Figure 7C – Culvert Crossing & Waterway Details
Figure 7D – Rip-Rap Details & Erosional Control Notes
Figure 8 – Existing Drainage Patterns and Outfalls
Figure 9 – FEMA Flood Hazard & FIRM Panel Map
Figure 10 – Post-Mining Restoration Plan

24-hour Emergency Contact:
Mark Fowler, (205) 403-5287

Site Located At:
Approx. 30.52388°N, -82.116688°W

TTL

SAUNDERS DEMONSTRATION MINE

TWIN PINES MINERALS, LLC SAUNDERS DEMONSTRATION MINE

ST. GEORGE, CHARLTON COUNTY, GEORGIA

INSET BASEMAP: Open Street Map; BASEMAP: National Geographic World Map (See Service Layer Credits).

DRAWN BY: DEK
CHECKED BY: SGR
DRAWING DATE: 11/13/2020
REVISION DATE: N/A
TTL JOB NO.: 000180200804.00
APPROX. SCALE: 2 in = 50,000 ft

SURFACE MINING LAND USE PLAN

Twin Pines Minerals, LLC

SAUNDERS DEMONSTRATION MINE

SAINT GEORGE, CHARLTON COUNTY, GEORGIA

Prepared for:

Twin Pines Minerals, LLC
2100 Southbridge Parkway, Suite 540
Birmingham, AL 35209

Prepared by:

TTL, Inc.
2743B Gunter Park Drive West
Montgomery, Alabama

TTL Project No. 000180200804.00

November 13, 2020

TTL

PROFESSIONAL ENGINEER CERTIFICATION

I certify under penalty of law that I am a Georgia registered professional engineer experienced in hydrogeologic investigations. The information submitted herein, to the best of my knowledge and belief, is true, accurate, and complete. I am aware that there are significant penalties for submitting false information.

GEORGIA REGISTERED No. PE24021 PROFESSIONAL ENGINEER SHERYLE G. REEVES

Sheryle G. Reeves, P.E.
Principal Engineer
Georgia License No. 24021

Date

Table of Contents

I. INTRODUCTION 1
II. PURPOSE AND NEED 1
III. MINE INFORMATION 2
IV. OPERATOR AND OWNER INFORMATION 2
V. GENERAL MINING INFORMATION 2
VI. INFORMATION ON OTHER PERMITS 6
VII. PERFORMANCE CRITERIA FOR MINING PLAN AND MINING ACTIVITIES 6
VIII. PERFORMANCE CRITERIA FOR RECLAMATION 8
IX. GROUNDWATER- AND SURFACE-WATER MONITORING PLANS 10
X. ADDITIONAL OPERATOR SUBMISSIONS 10
XI. ATTACHMENTS 11

ATTACHMENTS

EXHIBIT A – FIGURES
EXHIBIT B – USACE JURISDICTIONAL DETERMINATION
EXHIBIT C – CULTURAL RESOURCES SURVEYS
EXHIBIT D – SPECIES SURVEYS AND HABITAT ASSESSMENTS
EXHIBIT E – MONITORING AND ADAPTIVE MANAGEMENT PLAN

List of Figures

Figure 1 Site Location & Topographic Map
Figure 2 Adjacent Properties & Aerial Photograph
Figure 3 Proposed Site Layout
Figure 4 Estimated Progression of Mining
Figure 5 Process Flow Diagram
Figure 6A Mining Plan View (Typical)
Figure 6B Mining Profile/Cross-Section (Typical)
Figure 6C Mining Details (Typical)
Figure 7A Erosion Control Details
Figure 7B Construction Entry/Exit & Silt Fence Details
Figure 7C Culvert Crossing & Waterway Details
Figure 7D Rip-Rap Details & Erosional Control Notes
Figure 8 Existing Drainage Patterns & Outfalls
Figure 9 FEMA Flood Hazard & FIRM Panel Map
Figure 10 Post-Mining Restoration Plan

SURFACE MINING LAND USE DEVELOPMENT PLAN
TWIN PINES MINERALS, LLC
SAUNDERS DEMONSTRATION MINE
CHARLTON COUNTY, GEORGIA

I. INTRODUCTION

Twin Pines Minerals, LLC (TPM) is submitting this Surface Mining Permit Application and associated Land Use Development Plan to secure a mining permit to conduct the proposed heavy mineral sands (HMS) mining demonstration project at the proposed Twin Pines Minerals, LLC Saunders Demonstration Mine site located near St. George, Charlton County, Georgia. The HMS sedimentary deposits occupy a portion of a relict beach ridge along Trail Ridge in Charlton County. The proposed mining project consists of approximately 739.1 acres (577.4-acre mining area) as depicted on the U.S. Geological Survey (USGS) 7.5-minute Topographic Maps of Moniac and St. George, Georgia (Figure 1). Figure 2 is an aerial photograph depicting the site location and adjacent property owners. The TPM project includes the extraction of the high-quality HMS reserves in a safe, cost effective, and environmentally sound manner for export by truck and rail to national and international customers. The principal heavy minerals to be extracted in this proposed HMS operation are zircon, titanium minerals (ilmenite, leucoxene, rutile), and staurolite.

This document is intended to provide supplemental information to the Surface Mining Land Use Plan (SMLUP) Form.

II. PURPOSE AND NEED

The purpose of this demonstration mining project proposed by TPM is to gather data required to evaluate a groundwater hydrology model completed during the development of this project. This evaluation is necessary to demonstrate that HMS mining can be accomplished in an environmentally sensitive area with negligible impact to the site and surrounding resources. An additional purpose is to develop a high-quality HMS reserve to produce HMS concentrate products including titanium mineral concentrates and zircon concentrates to meet global demands in a safe, cost effective, and environmentally sound manner.

The TPM mining plan and the associated groundwater and surface water monitoring plan will be used to confirm the ability of HMS mining to be conducted within close proximity to sensitive environmental resources. As the economically viable locations for mining HMS within the United States are becoming scarce, it is vital that new mines be developed in such a manner as to minimize environmental impacts. TPM has completed extensive geologic and hydrogeologic evaluations of the Saunders Tract which culminated with the production of a groundwater hydrology model demonstrating that mining can be safely conducted within the demonstration mine area with negligible impact to the site, the surrounding area, and the Okefenokee Swamp. Small scale projects, such as the one proposed, that can demonstrate sound environmental practices for extracting heavy mineral resources in environmentally sensitive locations, represent good stewardship of the environment.

HMS deposits contain the primary ores of titanium dioxide (TiO_2) for the pigment industry and zircon ($ZrSiO_2$) used in refractory products. TiO_2 is primarily obtained from mining and processing the minerals ilmenite, rutile, and leucoxene. Leucoxene, not technically a mineral, is a higher quality derivative of ilmenite resulting from the preferential weathering and leaching of iron therefore increasing the TiO_2 percentage to greater than 70 percent. Zircon is recovered as a co-product from the processing of HMS deposits.

III. MINE INFORMATION

The proposed mining area consists of one mining block (Saunders Tract) bound by Georgia Highway 94 to the south, Trail Ridge Road to the east, T-Model Road to the west, and surveyed boundaries on the north. The approximately 739.1-acre permitted area will generally consist of the approximately 577.4-acre mining area, wet processing plant, material transport road, and dry processing plant, as shown on the Site Layout Map (Figure 3). TPM expects to mine approximately 10-15 acres per month once all infrastructure is in place and produce an HMS concentrate on-site. Mineral sands, titanium minerals (ilmenite, leucoxene and rutile), zircon, and staurolite occur in the upper 50 feet of sand in the Trail Ridge physiographic landform, which is an ancient beach ridge in Charlton County. After the HMS products have been separated, the final products will be containerized, bulk shipped or loaded on truck or rail dependent upon customer requirements.

The center of the site is located near latitude 30.52388 and longitude -82.116688. According to the USGS Topographic Map, the elevation at the site ranges from approximately 140 to 175 feet above mean sea level. The proposed mine site has historically been used for silviculture operations.

IV. OPERATOR AND OWNER INFORMATION

Twin Pines Minerals, LLC will be the operator of the Saunders Demonstration Mine. The Saunders Demonstration Mine property is owned by Trail Ridge Land, LLC (which is wholly owned by Twin Pines Minerals, LLC) and joint private owners Rodney & Sidney Bell and Eli & Sharon Padgett.

V. GENERAL MINING INFORMATION

TPM expects to begin construction upon obtaining the required authorizations and mining operations are expected to be conducted for a 4-year period. The proposed mining operation is expected to provide approximately 400 direct jobs and additional supporting subcontractor jobs. An estimated mining production timeline is provided as Figure 4.

TPM is committed to protecting the environment and minimizing impacts to local citizens. TPM has completed an initial environmental screening to evaluate baseline conditions, developed an effective water management strategy, and identified other environmental and operational concerns. Ongoing activities include additional surface and ground water monitoring. The northern boundary of the site is located approximately 2.9 miles southeast from the nearest boundary of the Okefenokee National Wildlife Refuge, providing a substantial buffer of protection for this sensitive resource. TPM reclamation plans are to restore land uses to the original pre-mining conditions, planted pine, or natural conditions which existed prior to conversion to timber silviculture land usage. Within 1 to 2 weeks of mining, the drag line cut will be refilled with sand

tailings. Thereafter, topsoil will be replaced to stabilize the reclaimed area and vegetative cover will be replanted within an 18-24-month period, depending on the planting season.

The proposed mining operation is designed to be water-efficient by recycling and recirculating water to minimize the amount required from the Upper Floridan Aquifer (UFA). Water will not be withdrawn from any natural surface water body. Water within the active mining pit is anticipated to be withdrawn only during upset conditions, i.e. equipment maintenance/failure, or due to a heavy rain event. When possible, water withdrawn from the mining pit will be used for make-up water at the Pre-Concentration Plant (PCP) and Wet Concentration Plant (WCP).

TPM will operate the mine to be a low-impact neighbor to nearby residents. The active mining area will be isolated from Georgia State Highway 94 by an approximately 5-foot high berm and buffers to minimize potential disturbances (noise and dust). Other appropriate measures will be utilized along T-Model Road. TPM has been in contact with area stakeholders, including Charlton County government agencies, Georgia EPD, and concerned citizens during the planning process for the proposed mining operation.

TPM has developed a heavy mineral sand mining technique using a dragline excavator, conveyor system for materials transport, and land-based processing plants. This mining technique is different from conventional "wet mining", which utilizes a dredge and floating concentrator to mine and process heavy mineral-bearing sands. In general, a dragline is a more efficient method for moving bulk material where long mining cuts and pits can be utilized. Employing elongated cuts allows for simultaneous mining the mineral sands and tailings placement to occur in the same pit. This process will allow reclamation to occur at a faster rate as backfilling and rough grading may occur up to +/-500 feet behind the dragline dig face. This should allow reclamation to begin within days of mining, where typical methods take several months to greater than a year.

The dragline method involves a large crane-like earthmoving machine equipped with a bucket to scoop material. The large-capacity bucket swings from cables on the end of the boom, scooping material that is then moved to adjacent areas. Draglines are electrically powered and run by two employees, an operator and an oiler. When mining is occurring, measures must be taken to protect the areas adjacent to the mine property. Appropriate sediment-control measures will be utilized to ensure that sediment-laden waters do not leave the mine property and affect local waterways.

A conveyor system is utilized to transport mined material to the PCP and WCP. Trucks will be used to transport the HMS concentrate from the WCP to the Mineral Separation Plant (MSP). The locations of the mineral processing plants are depicted on Figure 3. The mineral processing plants are situated so that mineral processing activities are located close to the mining areas, which decreases material transport distances and energy demands. Process water ponds will be constructed adjacent to the processing plant creating an efficient method for process water reuse and recirculation. Figure 5 depicts a process flow diagram for the proposed mining operation.

Mining will commence after the topsoil has been removed from the initial dragline mining cut. The dragline will then excavate and temporarily stockpile the mined material. The material will then be transferred onto the conveyor system for transport to the processing plant. After processing, the tailings will be temporarily stockpiled adjacent to the processing plant. After processing, the tailings will then be transported back to the open mining cut via a tailings conveyor system. The back-filled

area will then be recontoured, covered with topsoil and revegetated to meet reclamation standards. The operation is a continuous process and while the dragline is operating, backfilling of the cut is occurring as well.

Mine Progression

The mining sequence will be divided into separate phases. These phases are described as follows:

- Site Preparation
  - Clearing
  - Topsoil removal
  - Construction of permanent processing plants and infrastructure
- Mining
  - Excavation
  - Heavy Mineral Sand processing
- Reclamation
  - Tailings placement
  - Tailings contouring to mimic pre-mining topography
  - Topsoil return
  - Vegetation planting

Site Preparation

To initiate mining activities, the project area will be delineated by survey markers, boundary markers, and flagging in the field to indicate the locations of permanent infrastructure and mining boundaries. A pre-mining survey using LiDAR will be used to create a topographic surface that will serve as a guide for design elevations for all post-mining reclamation. All merchantable timber will be harvested prior to the beginning of mining activities. Timber will be harvested on average 4 to 6 months prior to mining being conducted in that area. Timber that is not merchantable and timber scraps will be removed by TPM and all areas within the limits of clearing and mining will be root raked, windrowed, and burned in compliance with Division of Forestry and/or county permits.

The first areas to be cleared will be for the processing facilities, initial mining area, and feed and tailings conveyors. Once the areas have been cleared, the permanent facilities and infrastructure will be constructed/installed along with the berms, stormwater controls, and other best management practices for sediment control.

The permanent facilities will consist of an interior road system, PCP/WCP processing facility, and MSP, described further in the next section. Process water ponds will be constructed adjacent to the processing plant. TPM will also install 2 deep water wells to provide make-up water during times of need (locations shown on Figure 3).

The feed and tailings conveyors will be constructed for the entire east-west length of the mining corridor to near Trail Ridge Road, where they will turn to the north towards the concentration plants, located near the northeastern portion of the mining area. A berm will be constructed along Georgia State Highway 94 to mitigate erosion and contain stormwater. Berms or other facilities may be

TTL

SURFACE MINING LAND USE DEVELOPMENT PLAN (1)

TWIN PINES MINERALS, LLC SAUNDERS DEMONSTRATION MINE

ST. GEORGE, CHARLTON COUNTY, GEORGIA

DRAWN BY: DEK
CHECKED BY: SGR
DRAWING DATE: 11/13/2020
REVISION DATE: N/A
TTL JOB NO.: 000180200804.00
APPROX. SCALE:

constructed along T-Model and Trail Ridge Roads. Generally, 1 foot of topsoil within each mining cell will be removed by heavy equipment and transported to the topsoil storage piles adjacent to the pit. Additionally, silt fencing and hay bales will also be utilized in appropriate locations for additional erosion control.

The topsoil storage piles/mining perimeter berms will serve to prevent stormwater runoff and sediment-laden waters within the active cut from leaving the site as well as preserve "seed banks" for native vegetation and a planting medium for later reclamation. Topsoil removal will be conducted 2 weeks in advance of mining activities. The topsoil storage piles will be stabilized with an internal three horizontal to one vertical (3H:1V) slope and an external four horizontal to one vertical (4H:1V) slope. As noted previously, silt fences and hay bales will be utilized along the outside of the topsoil storage piles to control post construction erosion.

The first step in the mining process will be rough clearing of the mining corridor ahead of the dragline. The mining corridor will be approximately 700 feet north to south which will allow for mining of 3 pit widths before relocating the feed/tailings conveyors. This corridor will be cleared immediately ahead of the dragline. This clearing will extend +/-500 feet ahead of the mining and progress as the dragline advances. The clearing of this 700-foot north to south corridor is required to facilitate the advancement of the apron feeder and mobile conveyors as mining progresses to the east in the initial pit.

Excavation, Processing, and Tailings Return

Excavation of the mining cuts will commence after the topsoil is removed. The mining process proceeds as follows: The dragline moves through the mining area excavating approximately 100-foot wide by 50-foot deep cuts, in an east to west or west to east direction as shown on **Figure 6A**. A mining cut profile/cross-section is included as **Figure 6B**. Mining rates are anticipated to vary from approximately 100-200 feet of pit length excavation per day. The excavated material is stockpiled nearby. It is then transferred to an apron feeder which feeds to a screen. The screen removes roots and other large objects. The material is then transferred to a pit/feed conveyor system. The oversized organic material will be placed near the screen area for future deposit into the mining pit during the reclamation process. The pit/feed conveyor system feeds a mainline feed conveyor system. The mainline feed conveyor system will incline (or feed a stacker conveyor) and then feed the trommel (screen). The under-sized material from the trommel will be fed to the PCP as a slurry.

In the PCP, spiral concentrate and separate the heavy mineral sands from the lighter clays and quartz sand. The heavy mineral sands will be fed to the WCP. The WCP further separates the lighter minerals from the heavy mineral sands creating the heavy mineral sands concentrate that will be trucked to the MSP for final mineral separation. Process water is recovered from the tailings and heavy minerals sands via a series of dewatering screens and hydrocyclones throughout the process. Humates and clays are also separated from the process water as slimes within the PCP. The slimes will be separated from the process water in a thickener. The underflow from the thickener will be dewatered and temporarily stored before being transported back to and placed in the mined pit area for reclamation. TPM will utilize 3 lined process water ponds and 1 lined process water overflow pond to maintain the adequate volume needed operate the PCP/WCP. Discharge from the overflow pond may occur due to heavy rain events. Such discharge will be routed to a NPDES-permitted outfall. Two deep Upper

Floridan Aquifer make-up water wells will be used to supply makeup water as needed to maintain adequate process water reserves.

The HMS concentrate material from the WCP is transported to the MSP, via truck. Water needed for processing at the MSP will also be provided by the make-up water wells. Once water has been used in the mineral processing it may be recycled for re-use at the MSP or transported to the WCP to be used in the processing of sands.

The MSP further separates the valuable and non-valuable mineral products such as zircon, titanium minerals (ilmenite, leucoxene, rutile), and staurolite etc. After products have been separated, the final products will be containerized, bulk shipped or loaded on truck or rail dependent upon customer requirements.

The tailings from the PCP/WCP area will be temporarily stockpiled. Tailings and slimes will then be loaded onto the mainline tails conveyor system. The mainline tails conveyor system will convey material onto a reclamation conveyor. The reclamation conveyor deposits the tailings back into the mined pit area for reclamation.

Water within the active mining pit is anticipated to be withdrawn only during upset conditions, i.e. equipment maintenance/failure, or due to a heavy rain event. This water will be pumped and treated, and either used as process water, or discharged through the NPDES-permitted outfall.

Reclamation

As part of reclamation, the tailings and slimes are transported from their stockpiles to the open mined area where they are deposited/backfilled. The backfilled areas will then be recontoured using bulldozers to the approximate pre-mining LiDAR topographic data (via onboard GPS technology and/or survey crew GPS technology). After the tailings are contoured and levels reach approximate pre-mining topography, the topsoil will be replaced to its approximate original thickness. The area will then be re-graded to the approximate original contour of the pre-mining condition based upon the pre-mining survey. The operation is a continuous process; while the dragline is operating, backfilling of the pit is occurring as well. A cross-section view of the dragline cut and backfill, perpendicular to the direction of the dragging movement, is shown in **Figure 6B**. A detailed discussion of the reclamation process is provided in **Section VII.**

VI. INFORMATION ON OTHER PERMITS

Other permits being applied for include National Pollutant Discharge Elimination System (NPDES) Permits, Groundwater Use Permit, and an Air Permit.

VII. PERFORMANCE CRITERIA FOR MINING PLAN AND MINING ACTIVITIES

SMLUP drawings show property to be mined, the limits of the affected acreage, the natural drainage features and water disposal, the initial mining area, the erosion and sedimentation controls, the ingress/egress areas, the direction and schedule of mining advancement, the area to be left undisturbed, and final reclamation.

Mining operations will be performed in a manner that will minimize erosion and sedimentation. Prior to initiating mining activities, TPM will implement the erosion and sedimentation prevention plan as described in the SMLUP. Depicted in the SMLUP are the placement/location of silt fencing and other necessary erosion control measures. **Figures 7A, 7B, 7C, and 7D** depict erosion control, construction entry/exit, culvert and waterway crossing, and rip-rap details and erosional control notes. Existing drainage patterns at the site are shown on **Figure 8**. For stormwater discharges, the facility will operate under a DNR-EPD General Permit No. GAR050000 Stormwater Discharges Associated with Industrial Activities.

Stormwater control structures will be constructed in accordance with the Manual for Erosion and Sedimentation Control in Georgia. Design water levels will be set to provide a minimum of 3 feet of freeboard within the containment berms.

The berm along the southern site boundary shall be constructed as depicted in typical cross-sections (**Figure 6C**). Crests will be sloped to divert stormwater toward the mine area. The top and exterior slope and toe of all berms will be grassed with quick-growing/germinated grasses. Silt fencing shall be installed along the exterior toe of the outer berms, and in all areas where deemed necessary for erosion control. Silt fencing shall be armored with stacked hay bales abutting the fence perpendicular to the direction of stormwater flow, where necessary.

Following completion of construction of auxiliary erosion and sedimentation control structures, areas shall be seeded with appropriate grasses (based on planting season) as soon as possible. Effort shall be made to utilize natural existing vegetation in those areas where buffers are proposed or where practical.

Construction of auxiliary erosion and sedimentation control structures including diversions, dikes, or berms shall be constructed to retain, direct, and control surface water runoff from affected areas into designed sediment control structures. All surface water discharge shall be controlled and released in a non-erosive velocity onto stabilized areas or into stabilized channels.

- No permanent land form changes or permanent mining support structures are proposed.
- Protective barriers, such as berms or other similar structures will be placed between jurisdictional waters of the U.S. A minimum setback of 25 feet will be maintained between barrier berms and adjacent un-impacted wetlands or streams.
- The proposed mining activity lies within areas designated as Zone A on the Flood Insurance Rate Map. **Figure 9** shows the floodplain areas in the vicinity of the proposed mine. The Zone A areas are isolated depressions within the site. No structures are proposed to be placed within these areas, and mining activities will not impact the overall floodway.
- The proposed mining operation will not impact jurisdictional wetlands or streams. A copy of the U.S. Army Corps of Engineers Approved Jurisdictional Determination is provided as Exhibit B.
- TPM will obtain all required permits and maintain compliance with the Rules and Regulations of the State of Georgia. TPM will obtain a DNR-EPD General Permit No. GAR050000 for stormwater discharges. The stormwater management system will be inspected regularly as required by the permit. Any deficiencies noted will be corrected promptly.

- No properties listed on the National Register of Historic Places are located within 1 mile of any portion of the proposed mining operation. In the event historic or archaeological resources are identified in the future, work shall cease and proper authorities shall be notified. A copy of the Cultural Resources assessment is included as Exhibit C.
- Activities within the proposed mine shall adhere to air quality requirements including the National Ambient Air Quality Standards (NAAQS) and Mine Safety and Health Administration (MSH) regulations. If these parameters are anticipated to be exceeded, a dust control or air quality abatement plan will be implemented. Mining activities will be conducted in compliance with all applicable audible element regulations.
- The Saunders Demonstration Mine site was evaluated for the presence of protected species and/or their associated critical habitat(s) during 2018 - 2020. Referenced species surveys and habitat assessment reports are provided in Exhibit D. With the exception of the (Threatened) Wood Stork (*Mycteria americana*), which may forage on-site, but are not known to rest on-site, no Federal and State protected species are known to occur on the project site. Gopher tortoise burrows are located adjacent to the proposed Saunders Demonstration Mine site and on the chip mill property, only some of which were occupied by resident tortoises at the time of the surveys. The site and mine layout have been designed to specifically avoid areas of gopher tortoise burrows. No additional federally listed plant or animal species are known to occur on the proposed demonstration project mine site (reference Exhibit D). The findings of these evaluations suggest that the proposed mining activities, including the proposed rough clearing, will not have significant consequences to protected species. Furthermore, the proposed demonstration mine site is not considered "Critical Habitat", per the U.S. Fish and Wildlife Service definition of this term, for any federally listed species.
- TPM will post an identification sign at the entrances to the mine. The sign will include the Operator's name, Mine name, Permit Number (**Figure 7D**).

VIII. PERFORMANCE CRITERIA FOR RECLAMATION

Reclamation activities shall begin within 1 to 2 weeks of the commencement of mining with the placement of sand tails into the active mining pit as it advances. The reclamation will progress following the proposed mining progression plan and will be completed in a timely manner. Final site reclamation will be completed within 24 months following the completion of mining. Following completion of all mining activities, all structures, equipment, and material associated with the operation shall be removed (**Figure 10**). Backfilling of mined areas will use post-processed sands, spoil material and stockpiled topsoil.

To ensure long term reclamation success, TPM intends to observe hydrologic regimes post-mining to determine which areas will be planted with trees and which areas will be managed as treeless wet meadows similar to the wet prairie or seepage slope community types (FNAI Natural Community Classification Guide 2010). In a pine flatwoods landscape, small differences in elevation (just a few centimeters) and soil saturation can produce quite different plant communities. The best assurance of successful reclamation is to work with current (i.e. post-mining) conditions. TPMs groundwater modeling indicates that areas designated as mesic pine flatwoods will have similar surface hydrology post-mining, so those areas will likely be replanted to pine. Areas currently designated as wetlands will

likely remain wetlands post-mining, although specific wetland community goals (e.g. trees versus treeless) will need to be established as post-mining conditions dictate. Areas currently designated as wet pine flatwoods will likely be a mosaic of fine-scale elevational and hydrologic conditions, some of which may be appropriate sites for tree planting, and some of which will be more successful as wet meadows.

The goal of reclamation will be to produce functional communities that are resistant to the invasion of exotic species as quickly as possible. TPM will begin observing hydrologic regimes, soil characteristics and plant community development immediately after the mining pit is backfilled. TPM expects plant communities to develop from the seedbank in the topsoil (which will be preserved and replaced) and we will address issues with community development as they arise (e.g. invasive species control, native 'weedy' species dominance). TPM expects to determine which areas will be planted with trees within one-year post-mining. Trees will be planted in late fall/winter which is common forestry practice and best ensures planting success. Active growing season varies by plant species, but many species are dormant for some period in the winter.

TPM does not anticipate using fertilizers because pine flatwoods systems and their embedded wetlands are naturally nutrient deficient; the addition of fertilizers would degrade rather than enhance reclamation by encouraging exotic and native 'weedy' species.

Timing of stable, mature growth of plant communities post-mining is also somewhat unpredictable as there will be multiple potential successional trajectories (see Chapter 9 The Dynamic Nature of Ecological Systems: Multiple States and Restoration Trajectories by Suding and Gross, in Foundations of Restoration Ecology, eds. Falk, Palmer and Zedler). Species turnover rates will undoubtedly be high in the first 2-3 years, but we expect some stabilization after that. Some systems are in a state of dynamic equilibrium in which species turnover will continue to occur into the foreseeable future; they are still functioning ecosystems. Mature meadows may be established in a relatively short period of time (< 10 years), whereas pines may not reach maturity for 30-40 years.

Estimated final contours will approximate pre-mining contours; T-Model and Trail Ridge Roads will remain post-mining.

Erosion control measures shall remain in place until adequate vegetative cover has been established. The operator will restore all grades to mimic pre-mining topography and be blended into the existing landscape. Reclamation shall mimic approximate pre-mining topography and restore surface water flow to approximate pre--mining drainage basins. Constructed slopes shall not exceed 3:1. No highwalls will remain.

Reclamation objectives are depicted on the reclamation plan sheet of this submittal and will be adhered to unless circumstances dictate amendments to the plan. Reclamation objectives for the proposed mining activity include re-establishment of vegetation and post-mining topography, which will mimic pre-mining topography.

Specific requirements that TPM will adhere to are:

A. Grade all peaks, ridges, and valleys resulting from surface mining and backfill all pits and trenches resulting from same in a manner to minimize any hazardous effects of mining adjacent to any State or county maintained public road.

B. Backfill all affected lands as stated in the Reclamation Objective of this Plan utilizing post-processed sands, spoil material, and/or borrow from affected (permitted) land unless approval from the Division is obtained to utilize other materials. Sound engineering principles shall be applied to ensure that affected lands, as reclaimed, meet the intended use.

C. Apply immediate erosion control measures to protect the topsoil cover until an adequate vegetative cover is established. Erosion control measures may include scarifying the land surface parallel to contours.

D. There will be no highwalls remaining on site.

E. All affected land shall be graded to mimic pre-mining topography and blended into the existing landscape, unless otherwise amended.

F. Constructed slopes shall not exceed three horizontals to one vertical (3:1) except where may be approved otherwise in this Plan. Fill and cut slopes shall be designed and constructed to prohibit slumping or shear failures. Prior to final grading, all slopes will be blended in with the original existing topography. Slope grades shall be uniform. Mechanical or vegetative or both stabilization measures shall be employed as soon as practical to prevent erosion.

G. Spoil or refuse, when used as backfill material, for berm or other construction, will be segregated as necessary, emplaced and compacted in accordance with sound engineering practices to provide for the purpose intended. All new landform structures created with the use of spoil or refuse materials shall be constructed in a manner to protect against failure, subsidence and/or erosion and will be permanently stabilized upon completion of construction.

H. No lakes or ponds are proposed as part of the reclamation plan.

I. Any proposal for the construction of wetlands as a reclamation objective shall be consistent with accepted practices utilizing the best available technology and include the best management practices to attain the desired result.

J. The Operator will file a Final Reclamation Report and Request for Release upon completion of reclamation responsibilities on affected acreage.

IX. GROUNDWATER- AND SURFACE-WATER MONITORING PLANS

TPM developed a groundwater and surface monitoring plan to assess water levels and water quality throughout the life of the mining operation. A copy of the Monitoring and Adaptive Management Plan is provided as Exhibit E.

X. ADDITIONAL OPERATOR SUBMISSIONS

- Bonding – Bonding will be completed upon approval of this application for surface mining.
- Annual Permit Status Report – An annual status report will be prepared by the Operator and submitted to the Division as required.

- Amendments to Plan – The Operator will submit any future proposed changes in this proposed plan to the Division for approval.
- Change of Ownership of Mining Operation – Should a change in Operator ownership of this mining operation occur, the new owner(s) will submit a new application and a new bond within 60 days from the date of consummation of the ownership change.

XI. ATTACHMENTS

Exhibit A	Figures
Exhibit B	USACE Jurisdictional Determination
Exhibit C	Cultural Resources Surveys
Exhibit D	Species Surveys and Habitat Assessments
Exhibit E	Monitoring and Adaptive Management Plan

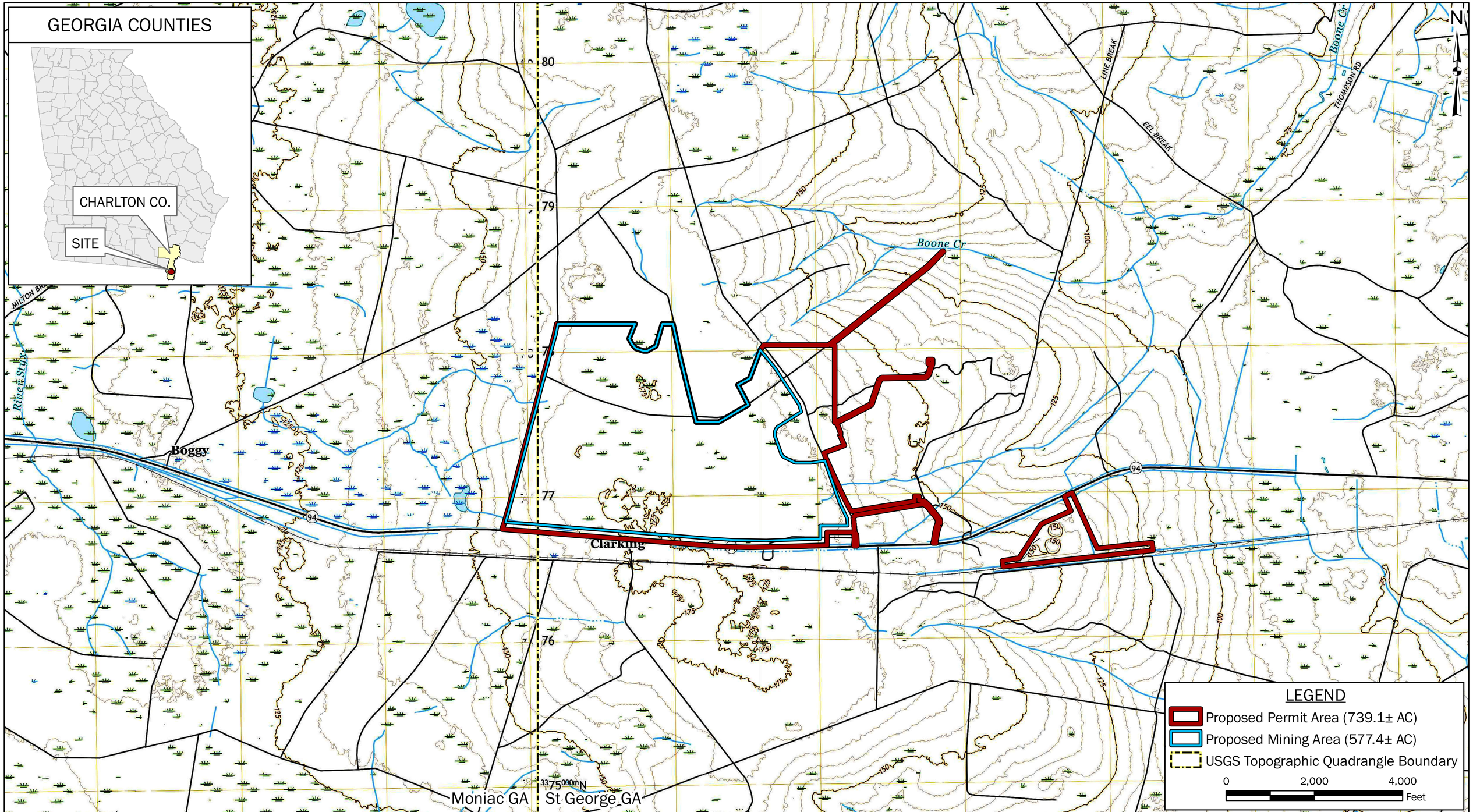
TTL

SURFACE MINING LAND USE DEVELOPMENT PLAN (2)

TWIN PINES MINERALS, LLC SAUNDERS DEMONSTRATION MINE

ST. GEORGE, CHARLTON COUNTY, GEORGIA

DRAWN BY: DEK
CHECKED BY: SGR
DRAWING DATE: 11/13/2020
REVISION DATE: N/A
TTL JOB NO.: 000180200804.00
APPROX. SCALE:



TTL

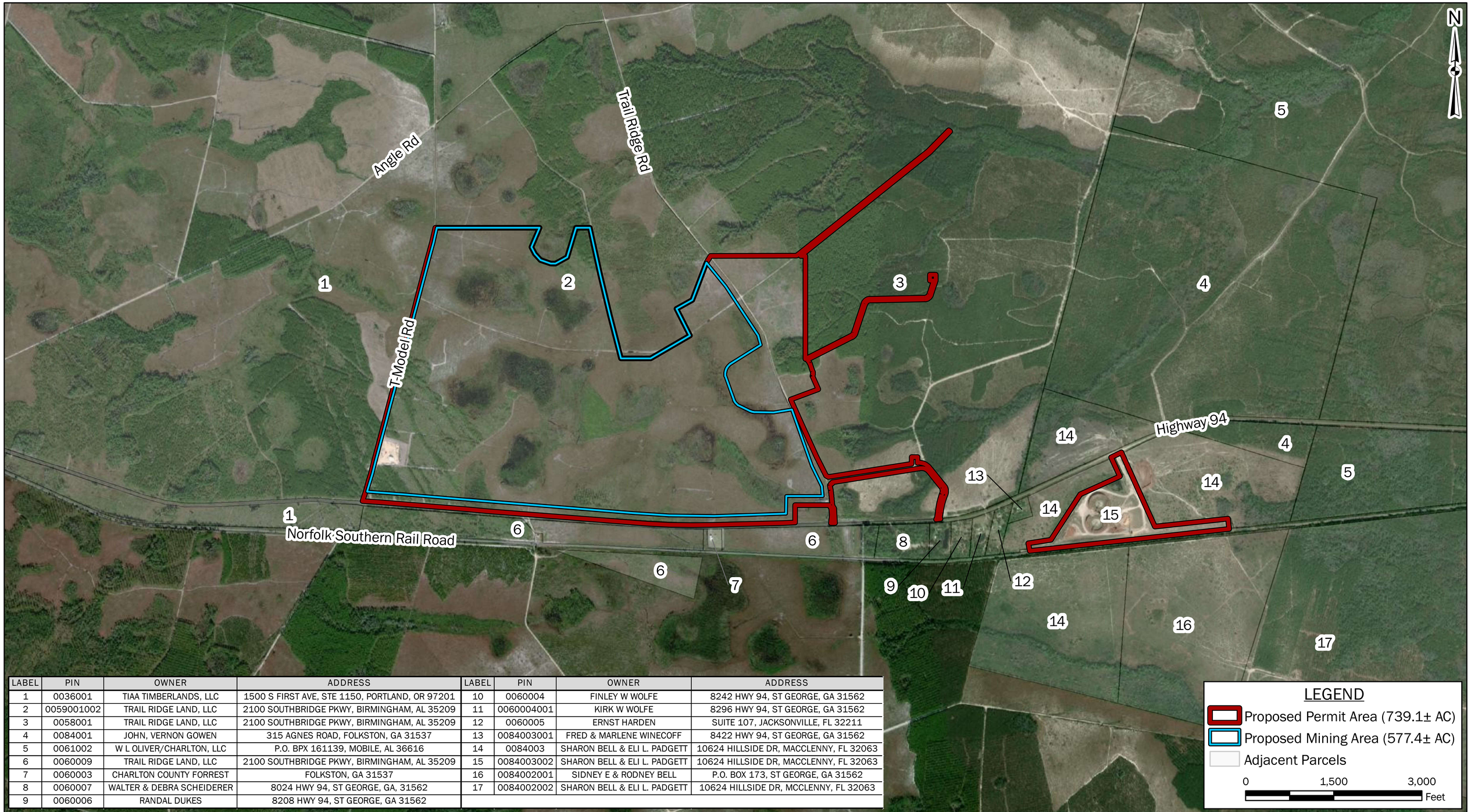
FIGURE 1: SITE LOCATION & TOPOGRAPHIC MAP

TWIN PINES MINERALS, LLC SAUNDERS DEMONSTRATION MINE

ST. GEORGE, CHARLTON COUNTY, GEORGIA

BASEMAP: Moniac (W) & Saint George (E), Georgia, USGS 7.5 Minute Quadrangle Map, 2020 (5-ft Contour Interval).

DRAWN BY: DEK
CHECKED BY: SGR
DRAWING DATE: 11/13/2020
REVISION DATE: N/A
TTL JOB NO.: 000180200804.00
APPROX. SCALE: 1 in = 1,000 ft



LABEL	PIN	OWNER	ADDRESS
1	0036001	TIAA TIMBERLANDS, LLC	1500 S FIRST AVE, STE 1150, PORTLAND, OR 97201
2	0059001002	TRAIL RIDGE LAND, LLC	2100 SOUTHBRIDGE PKWY, BIRMINGHAM, AL 35209
3	0058001	TRAIL RIDGE LAND, LLC	2100 SOUTHBRIDGE PKWY, BIRMINGHAM, AL 35209
4	0084001	JOHN, VERNON GOWEN	315 AGNES ROAD, FOLKSTON, GA 31537
5	0061002	W L OLIVER/CHARLTON, LLC	P.O. BPX 161139, MOBILE, AL 36616
6	0060009	TRAIL RIDGE LAND, LLC	2100 SOUTHBRIDGE PKWY, BIRMINGHAM, AL 35209
7	0060003	CHARLTON COUNTY FORREST	FOLKSTON, GA 31537
8	0060007	WALTER & DEBRA SCHEIDERER	8024 HWY 94, ST GEORGE, GA, 31562
9	0060006	RANDAL DUKES	8208 HWY 94, ST GEORGE, GA 31562
10	0060004	FINLEY W WOLFE	8242 HWY 94, ST GEORGE, GA 31562
11	0060004001	KIRK W WOLFE	8296 HWY 94, ST GEORGE, GA 31562
12	0060005	ERNST HARDEN	SUITE 107, JACKSONVILLE, FL 32211
13	0084003001	FRED & MARLENE WINECOFF	8422 HWY 94, ST GEORGE, GA 31562
14	0084003	SHARON BELL & ELI L. PADGETT	10624 HILLSIDE DR, MACCLENNY, FL 32063
15	0084003002	SHARON BELL & ELI L. PADGETT	10624 HILLSIDE DR, MACCLENNY, FL 32063
16	0084002001	SIDNEY E & RODNEY BELL	P.O. BOX 173, ST GEORGE, GA 31562
17	0084002002	SHARON BELL & ELI L. PADGETT	10624 HILLSIDE DR, MCCLENNY, FL 32063

TTL

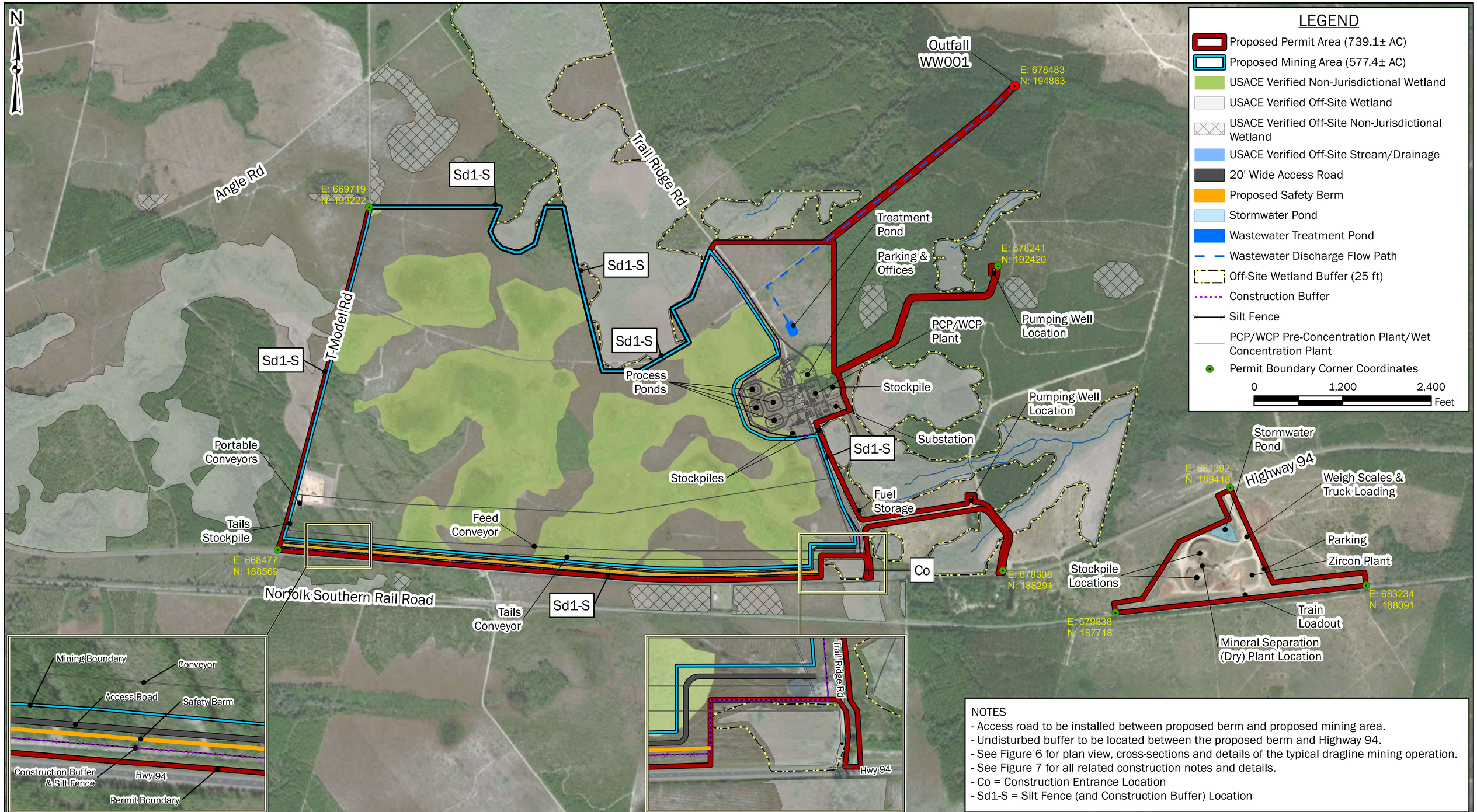
FIGURE 2: ADJACENT PROPERTIES & AERIAL PHOTOGRAPH

TWIN PINES MINERALS, LLC SAUNDERS DEMONSTRATION MINE

ST. GEORGE, CHARLTON COUNTY, GEORGIA

BASEMAP: Maxar, Vivid Imagery, 11/20/2019 (West, 0.5 m Resolution) & 3/24/2018 (East, 0.46 m Resolution).

DRAWN BY: DEK
CHECKED BY: SGR
DRAWING DATE: 11/13/2020
REVISION DATE: N/A
TTL JOB NO.: 000180200804.00
APPROX. SCALE: 1 in = 750 ft



NOTES
- Access road to be installed between proposed berm and proposed mining area.
- Undisturbed buffer to be located between the proposed berm and Highway 94.
- See Figure 6 for plan view, cross-sections and details of the typical dragline mining operation.
- See Figure 7 for all related construction notes and details.
- Co = Construction Entrance Location
- Sd1-S = Silt Fence (and Construction Buffer) Location

TTL

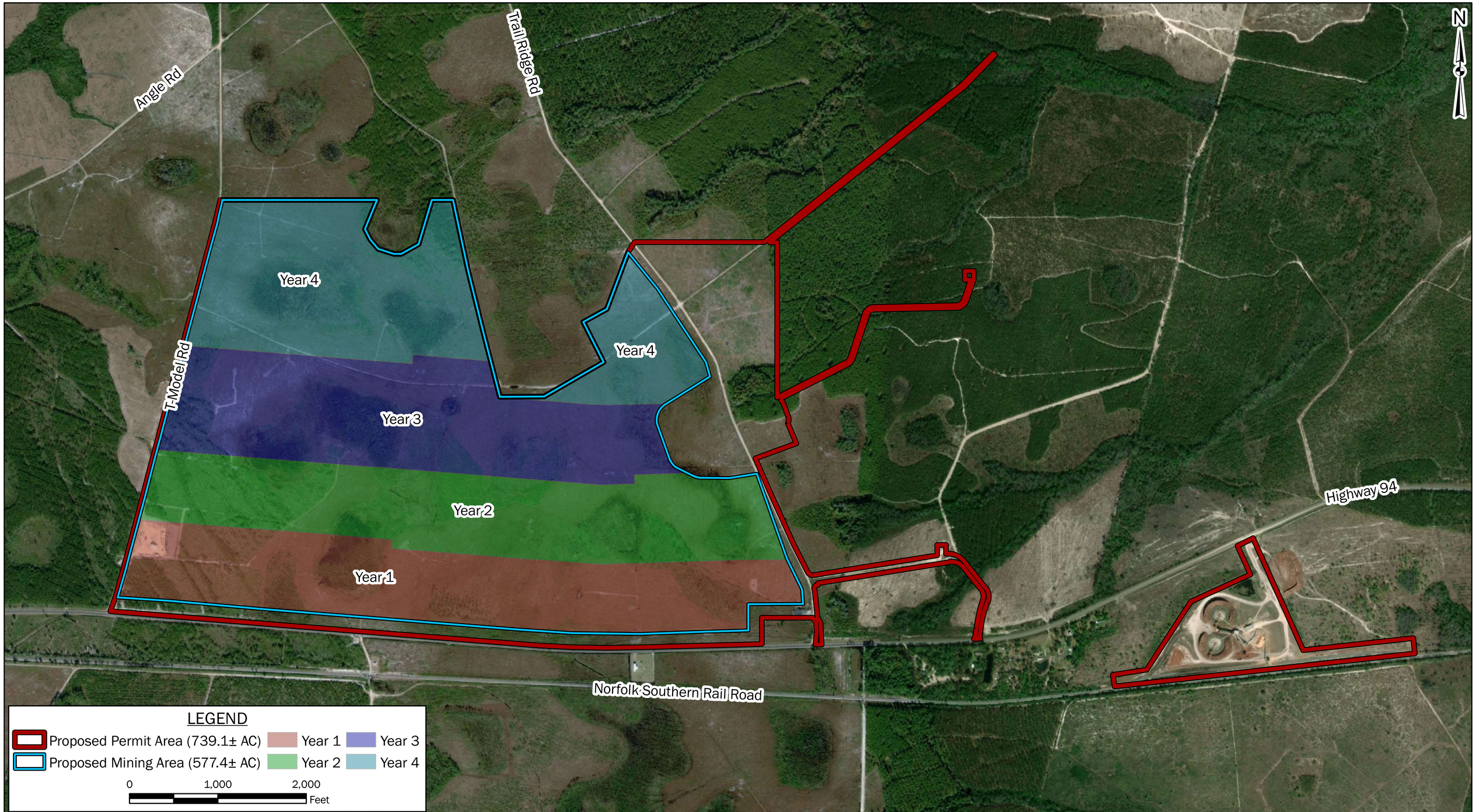
FIGURE 3: PROPOSED SITE LAYOUT

TWIN PINES MINERALS, LLC SAUNDERS DEMONSTRATION MINE

ST. GEORGE, CHARLTON COUNTY, GEORGIA

BASEMAP: Maxar, Vivid Imagery, 11/20/2019 (West, 0.5 m Resolution) & 3/24/2018 (East, 0.46 m Resolution).

DRAWN BY: DEK
CHECKED BY: SGR
DRAWING DATE: 11/13/2020
REVISION DATE: N/A
TTL JOB NO.: 000180200804.00
APPROX. SCALE: 1 in = 600 ft



TTL

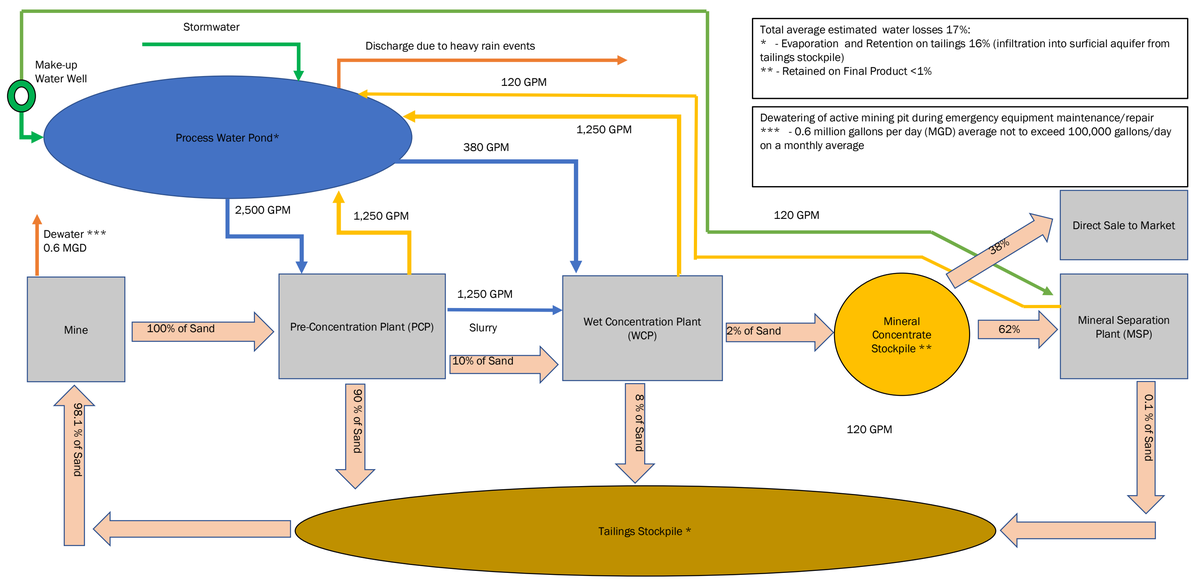
FIGURE 4: ESTIMATED PROGRESSION OF MINING

TWIN PINES MINERALS, LLC SAUNDERS DEMONSTRATION MINE

ST. GEORGE, CHARLTON COUNTY, GEORGIA

BASEMAP: Maxar, Vivid Imagery, 11/20/2019 (West, 0.5 m Resolution) & 3/24/2018 (East, 0.46 m Resolution).

DRAWN BY:	DEK
CHECKED BY:	SGR
DRAWING DATE:	11/13/2020
REVISION DATE:	N/A
TTL JOB NO.:	000180200804.00
APPROX. SCALE:	1 in = 500 ft



Total average estimated water losses 17%:
* - Evaporation and Retention on tailings 16% (infiltration into surficial aquifer from tailings stockpile)
** - Retained on Final Product <1%

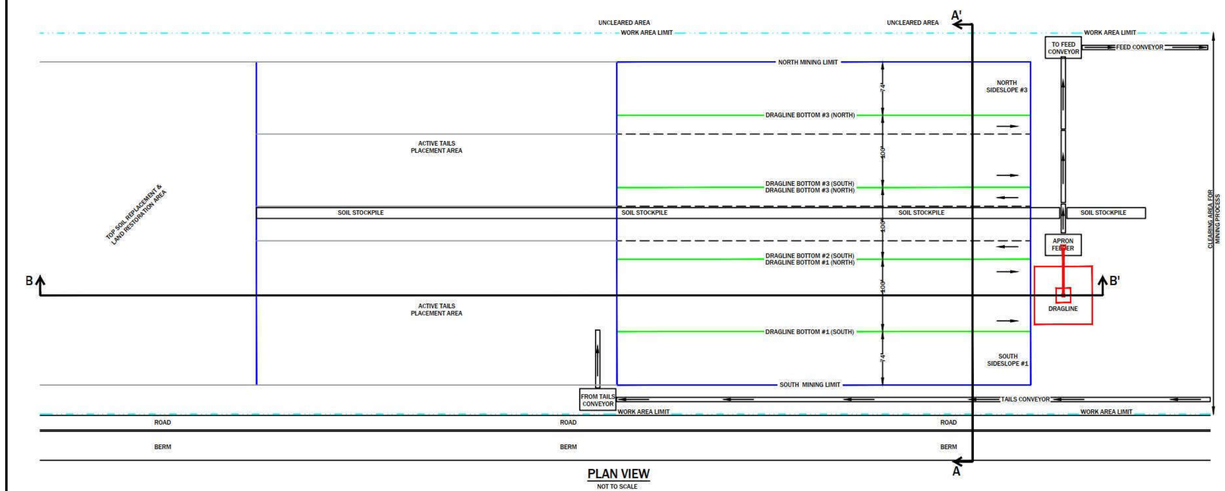
Dewatering of active mining pit during emergency equipment maintenance/repair
*** - 0.6 million gallons per day (MGD) average not to exceed 100,000 gallons/day on a monthly average

FIGURE 5: PROCESS FLOW DIAGRAM

TWIN PINES MINERALS, LLC SAUNDERS DEMONSTRATION MINE

ST. GEORGE, CHARLTON COUNTY, GEORGIA

DRAWN BY: DEK
CHECKED BY: SGR
DRAWING DATE: 11/13/2020
REVISION DATE: N/A
TTL JOB NO.: 000180200804.00
APPROX. SCALE:



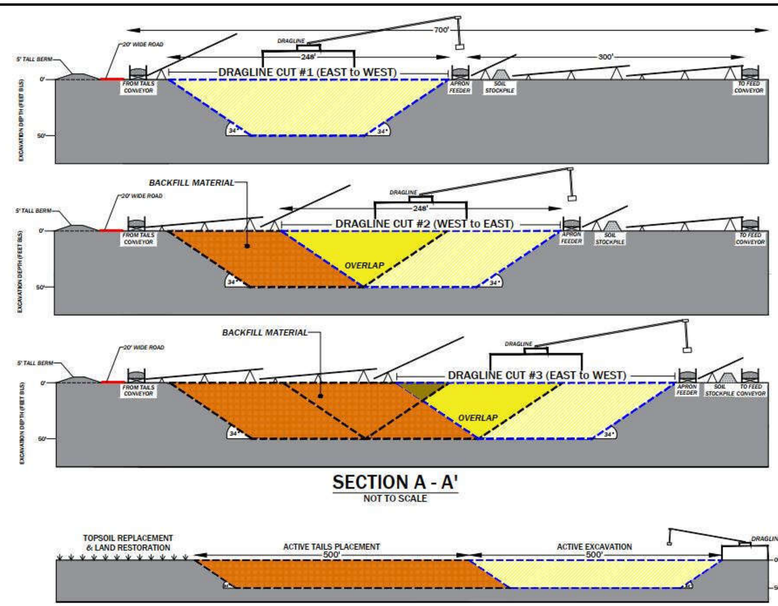
PLAN VIEW
NOT TO SCALE

FIGURE 6A: MINING PLAN VIEW (TYPICAL)

TWIN PINES MINERALS, LLC SAUNDERS DEMONSTRATION MINE

ST. GEORGE, CHARLTON COUNTY, GEORGIA

DRAWN BY: DEK
CHECKED BY: SGR
DRAWING DATE: 11/13/2020
REVISION DATE: N/A
TTL JOB NO.: 000180200804.00
APPROX. SCALE:



SECTION A - A'
NOT TO SCALE

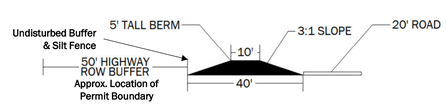
SECTION B - B'
NOT TO SCALE

FIGURE 6B: MINING PROFILE/CROSS-SECTION (TYPICAL)

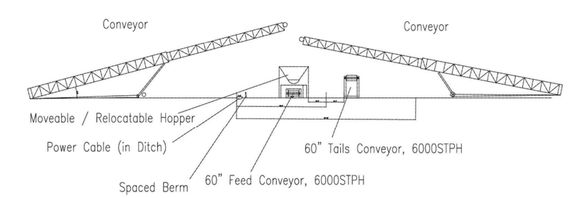
TWIN PINES MINERALS, LLC SAUNDERS DEMONSTRATION MINE

ST. GEORGE, CHARLTON COUNTY, GEORGIA

DRAWN BY: DEK
CHECKED BY: SGR
DRAWING DATE: 11/13/2020
REVISION DATE: N/A
TTL JOB NO.: 000180200804.00
APPROX. SCALE:



EXCAVATION PERIMETER & SAFETY BERM (Typ.)
NOT TO SCALE



CONVEYOR DETAIL (Typical)

FIGURE 6C: MINING DETAILS (TYPICAL)

TWIN PINES MINERALS, LLC SAUNDERS DEMONSTRATION MINE

ST. GEORGE, CHARLTON COUNTY, GEORGIA

DRAWN BY: DEK
CHECKED BY: SGR
DRAWING DATE: 11/13/2020
REVISION DATE: N/A
TTL JOB NO.: 000180200804.00
APPROX. SCALE:

GEORGIA
UNIFORM CODING SYSTEM

FOR SOIL EROSION AND SEDIMENT CONTROL PRACTICES

GEORGIA SOIL AND WATER CONSERVATION COMMISSION

STRUCTURAL PRACTICES

CODE	PRACTICE	DETAIL	MAP SYMBOL	DESCRIPTION
Cd	CHECKDAM			A small temporary barrier or dam constructed across a swale, drainage ditch or area of concentrated flow.
Ch	CHANNEL STABILIZATION			Improving, constructing or stabilizing an open channel, existing stream, or ditch.
Co	CONSTRUCTION EXIT		Co (LABEL)	A crushed stone pad located at the construction site exit to provide a place for removing mud from tires thereby protecting public streets.
Sd1	SEDIMENT BARRIER		(INDICATE TYPE)	A barrier to prevent sediment from leaving the construction site. It may be sandbags, bales of straw or hay, brush, logs and poles, gravel, or a silt fence.
Sd3	TEMPORARY SEDIMENT BASIN		Sd3 (LABEL)	A basin created by excavation or a dam across a waterway. The surface water runoff is temporarily stored allowing the bulk of the sediment to drop out.
Sk	FLOATING SURFACE SKIMMER		Sk (LABEL)	A buoyant device that releases/drains water from the surface of sediment ponds, traps, or basins at a controlled rate of flow.
St	STORMDRAIN OUTLET PROTECTION		St	A paved or short section of riprap channel at the outlet of a storm drain system preventing erosion from the concentrated runoff.

VEGETATIVE PRACTICES

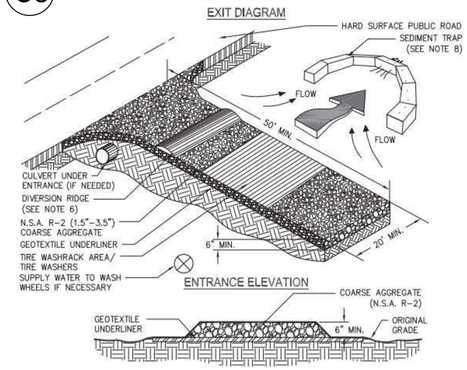
CODE	PRACTICE	DETAIL	MAP SYMBOL	DESCRIPTION
Ds1	DISTURBED AREA STABILIZATION (WITH MULCHING ONLY)		Ds1	Establishing temporary protection for disturbed areas where seedlings may not have a suitable growing season to produce an erosion retarding cover.
Ds2	DISTURBED AREA STABILIZATION (WITH TEMP SEEDING)		Ds2	Establishing a temporary vegetative cover with fast growing seedings on disturbed areas.
Ds3	DISTURBED AREA STABILIZATION (WITH PERM SEEDING)		Ds3	Establishing a permanent vegetative cover such as trees, shrubs, vines, grasses, or legumes on disturbed areas.
Ds4	DISTURBED AREA STABILIZATION (SODDING)		Ds4	A permanent vegetative cover using sods on highly erodable or critically eroded lands.
Du	DUST CONTROL ON DISTURBED AREAS		Du	Controlling surface and air movement of dust on construction site, roadways and similar sites.

TTL

FIGURE 7A: EROSION CONTROL DETAILS
TWIN PINES MINERALS, LLC SAUNDERS DEMONSTRATION MINE
ST. GEORGE, CHARLTON COUNTY, GEORGIA

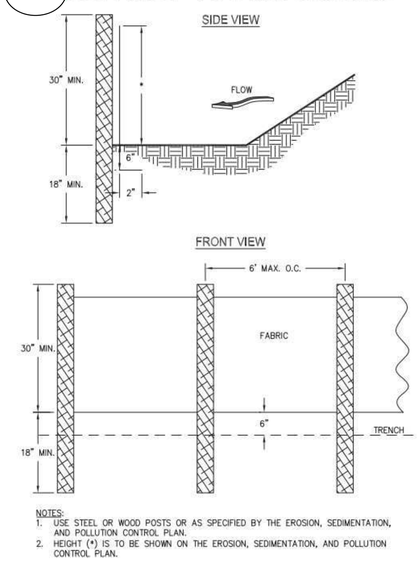
DRAWN BY: DEK
CHECKED BY: SGR
DRAWING DATE: 11/13/2020
REVISION DATE: N/A
TTL JOB NO.: 000180200804.00
APPROX. SCALE:

Co CRUSHED STONE CONSTRUCTION EXIT



NOTES:
1. AVOID LOCATING ON STEEP SLOPES OR AT CURVES ON PUBLIC ROADS.
2. REMOVE ALL VEGETATION AND OTHER UNSUITABLE MATERIAL FROM THE FOUNDATION AREA, GRADE, AND CROWN FOR POSITIVE DRAINAGE.
3. AGGREGATE SIZE SHALL BE IN ACCORDANCE WITH NATIONAL STONE ASSOCIATION R-2 (1.5"-3.5" STONE).
4. GRAVEL PAD SHALL HAVE A MINIMUM THICKNESS OF 6".
5. PAD WIDTH SHALL BE EQUAL FULL WIDTH AT ALL POINTS OF VEHICULAR EGRESS, BUT NO LESS THAN 20'.
6. A DIVERSION RIDGE SHOULD BE CONSTRUCTED WHEN GRADE TOWARD PAVED AREA IS GREATER THAN 2%.
7. INSTALL PIPE UNDER THE ENTRANCE IF NEEDED TO MAINTAIN DRAINAGE DITCHES.
8. WHEN WASHING IS REQUIRED, IT SHOULD BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN (DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE ENTRANCE TO A SEDIMENT CONTROL DEVICE).
9. WASHRACKS AND/OR TIRE WASHERS MAY BE REQUIRED DEPENDING ON SCALE AND CIRCUMSTANCE. IF NECESSARY, WASHRACK DESIGN MAY CONSIST OF ANY MATERIAL SUITABLE FOR TRUCK TRAFFIC THAT REMOVE MUD AND DIRT.
10. MAINTAIN AREA IN A WAY THAT PREVENTS TRACKING AND/OR FLOW OF MUD ONTO PUBLIC RIGHTS-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.

Sd1-S SILT FENCE - TYPE NON-SENSITIVE



NOTES:
1. USE STEEL OR WOOD POSTS OR AS SPECIFIED BY THE EROSION, SEDIMENTATION, AND POLLUTION CONTROL PLAN.
2. HEIGHT (*) IS TO BE SHOWN ON THE EROSION, SEDIMENTATION, AND POLLUTION CONTROL PLAN.

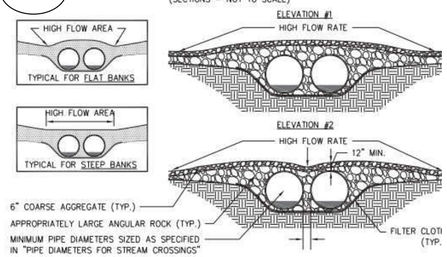
TTL

FIGURE 7B: CONSTRUCTION ENTRY/EXIT & SILT FENCE DETAILS
TWIN PINES MINERALS, LLC SAUNDERS DEMONSTRATION MINE
ST. GEORGE, CHARLTON COUNTY, GEORGIA

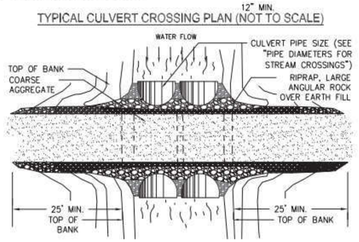
DRAWN BY: DEK
CHECKED BY: SGR
DRAWING DATE: 11/13/2020
REVISION DATE: N/A
TTL JOB NO.: 000180200804.00
APPROX. SCALE:

Sr-C CONFIGURATION OF TEMPORARY CULVERT CROSSINGS

(SECTIONS - NOT TO SCALE)

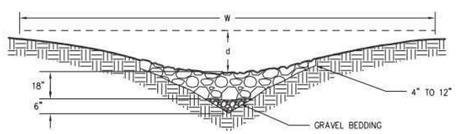


TYPICAL CULVERT CROSSING PLAN (NOT TO SCALE)

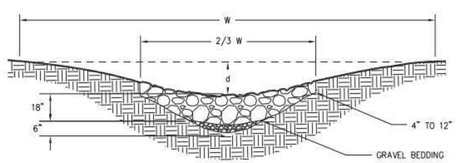


NOTES:
1. THIS TYPE OF CROSSING CAN BE INSTALLED IN BOTH A WET OR DRY WEATHER STREAM CONDITION WHERE THE DRAINAGE AREA EXCEEDS 10 ACRES.
2. REMOVE DURING CLEANUP.

Wt WATERWAY WITH STONE CENTER DRAIN AND V-SECTION SHAPED BY MOTOR GRADER



WATERWAY WITH STONE CENTER DRAIN AND ROUNDED SECTION SHAPED BY BULLDOZER



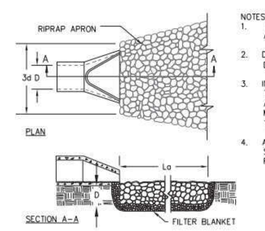
TTL

FIGURE 7C: CULVERT CROSSING & WATERWAY DETAILS
TWIN PINES MINERALS, LLC SAUNDERS DEMONSTRATION MINE
ST. GEORGE, CHARLTON COUNTY, GEORGIA

DRAWN BY: DEK
CHECKED BY: SGR
DRAWING DATE: 11/13/2020
REVISION DATE: N/A
TTL JOB NO.: 000180200804.00
APPROX. SCALE:

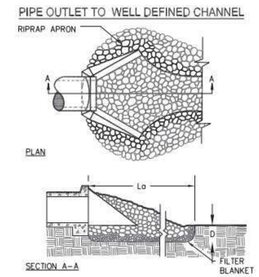
St RIPRAP OUTLET PROTECTION

PIPE OUTLET TO FLAT AREA -- NO WELL DEFINED CHANNEL



NOTES:
1. Lo IS THE LENGTH OF THE RIPRAP APRON.
2. D = 1.5 TIMES THE MAXIMUM STONE DIAMETER BUT NOT LESSHAN 6".
3. IN A WELL-DEFINED CHANNEL, EXTEND THE APRON UP THE CHANNEL BANKS TO AN ELEVATION OF 6" ABOVE THE MAXIMUM TAILWATER DEPTH OR TO THE TOP OF THE BANK (WHICHEVER IS LESS).
4. A FILTER BLANKET OR FILTER FABRIC SHOULD BE INSTALLED BETWEEN THE RIPRAP AND THE SOIL FOUNDATION.

PIPE OUTLET TO WELL DEFINED CHANNEL



EROSION CONTROL NOTES:

1. THE ESCAPE OF SEDIMENT FROM THE SITE SHALL BE PREVENTED BY THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES AND PRACTICES PRIOR, OR CONCURRENT WITH LAND DISTURBING ACTIVITIES.
2. EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE.
3. ANY DISTURBED AREA LEFT EXPOSED FOR PERIOD GREATER THAN 14 DAYS SHALL BE STABILIZED WITH MULCH OR TEMPORARY SEEDING.
4. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL CONFORM WITH THE GUIDELINES OF THE "MANUAL FOR EROSION AND SEDIMENT CONTROL."
5. FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) PANEL _____ DATED _____ INDICATES NO SPECIAL FLOOD HAZARD AREAS WITHIN THE PROJECT AREA.
6. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY OTHER CONSTRUCTION/MINING ACTIVITY AND MAINTAINED UNTIL PERMANENT GROUND COVER IS ESTABLISHED.
7. DURING CONSTRUCTION AND MINING ACTIVITIES, THE OPERATOR SHALL MAINTAIN CAREFUL SCHEDULING AND PERFORMANCE TO ENSURE THAT LAND STRIPPED OF IT'S NATURAL GROUND COVER IS EXPOSED ONLY IN SMALL QUANTITIES, AND PROTECTION IS ESTABLISHED.
8. SEDIMENT AND EROSION CONTROL MEASURES MUST BE CHECKED AFTER EACH RAIN EVENT. EACH DEVICE IS TO BE MAINTAINED OR REPLACED IF SEDIMENT ACCUMULATION HAS REACHED HALF THE CAPACITY OF THE DEVICE. ADDITIONAL DEVICES MUST BE INSTALLED IF NEW CHANNELS HAVE DEVELOPED.
9. OPERATOR SHALL INSPECT EROSION CONTROL MEASURES AT THE END OF EACH WORKING DAY TO ENSURE PROPER FUNCTIONING.

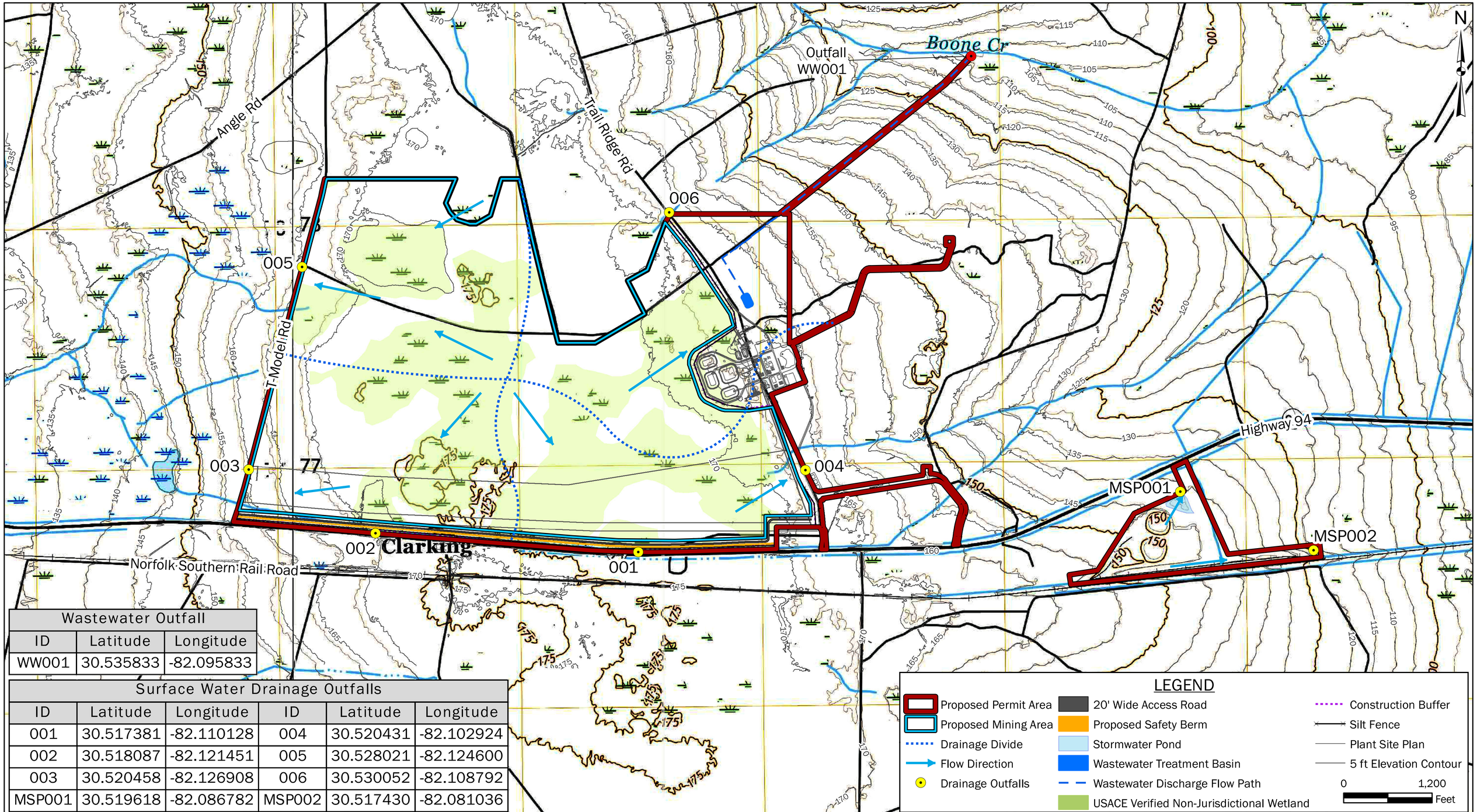
[OPERATOR'S NAME]
[MINE NAME]
[PERMIT NUMBER]
[CONTACT INFORMATION]

IDENTIFICATION SIGN (Typical)

TTL

FIGURE 7D: RIP-RAP DETAILS & EROSIONAL CONTROL NOTES
TWIN PINES MINERALS, LLC SAUNDERS DEMONSTRATION MINE
ST. GEORGE, CHARLTON COUNTY, GEORGIA

DRAWN BY: DEK
CHECKED BY: SGR
DRAWING DATE: 11/13/2020
REVISION DATE: N/A
TTL JOB NO.: 000180200804.00
APPROX. SCALE:



Wastewater Outfall		
ID	Latitude	Longitude
WW001	30.535833	-82.095833

Surface Water Drainage Outfalls					
ID	Latitude	Longitude	ID	Latitude	Longitude
001	30.517381	-82.110128	004	30.520431	-82.102924
002	30.518087	-82.121451	005	30.528021	-82.124600
003	30.520458	-82.126908	006	30.530052	-82.108792
MSP001	30.519618	-82.086782	MSP002	30.517430	-82.081036

TTL

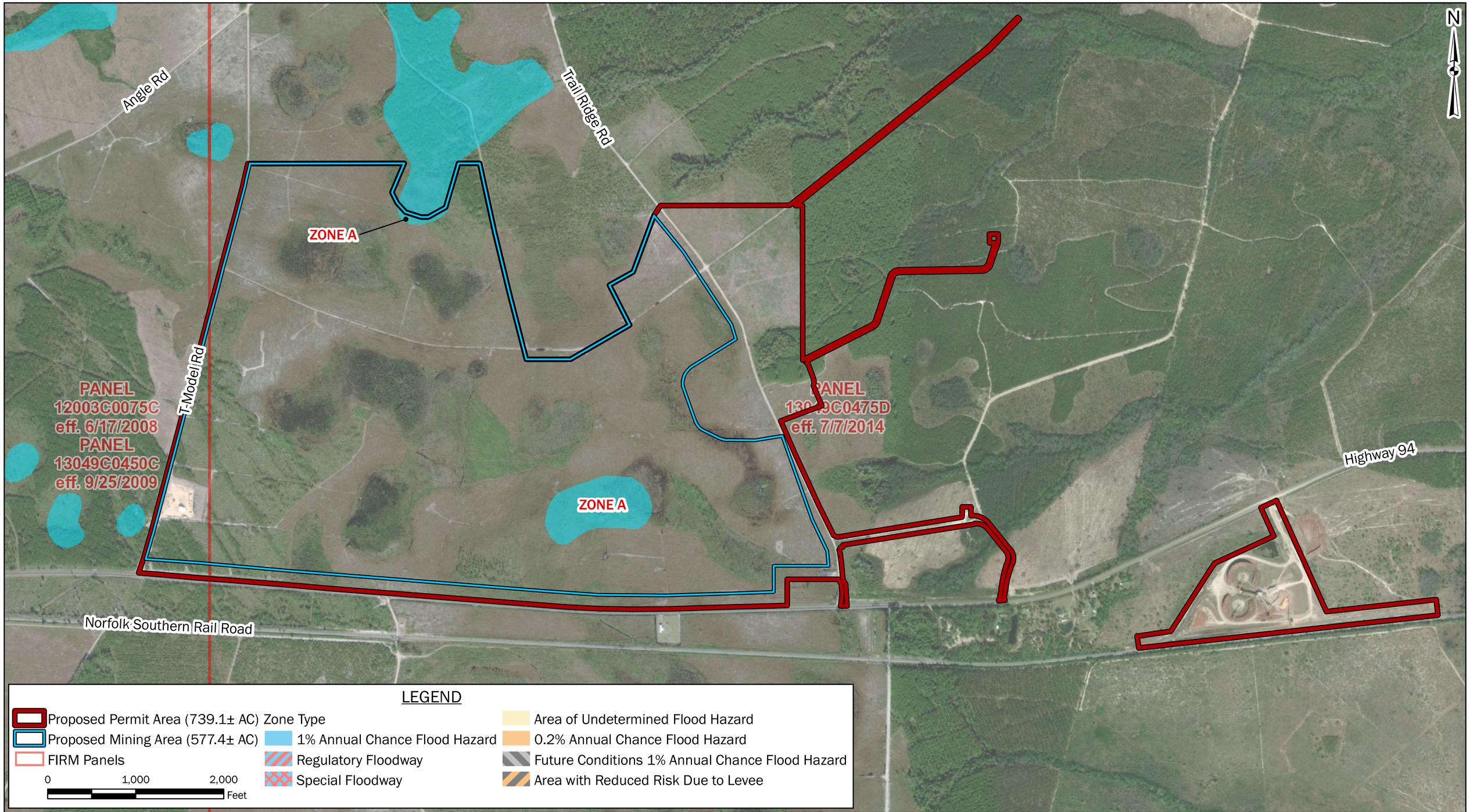
FIGURE 8: EXISTING DRAINAGE PATTERNS & OUTFALLS

TWIN PINES MINERALS, LLC SAUNDERS DEMONSTRATION MINE

ST. GEORGE, CHARLTON COUNTY, GEORGIA

BASEMAP: Moniac (W) & Saint George (E), Georgia USGS 7.5 Minute Quadrangle Map, 2020 (5-ft Contour Interval).

DRAWN BY: DEK
CHECKED BY: SGR
DRAWING DATE: 11/13/2020
REVISION DATE: N/A
TTL JOB NO.: 000180200804.00
APPROX. SCALE: 1 in = 600 ft



TTL

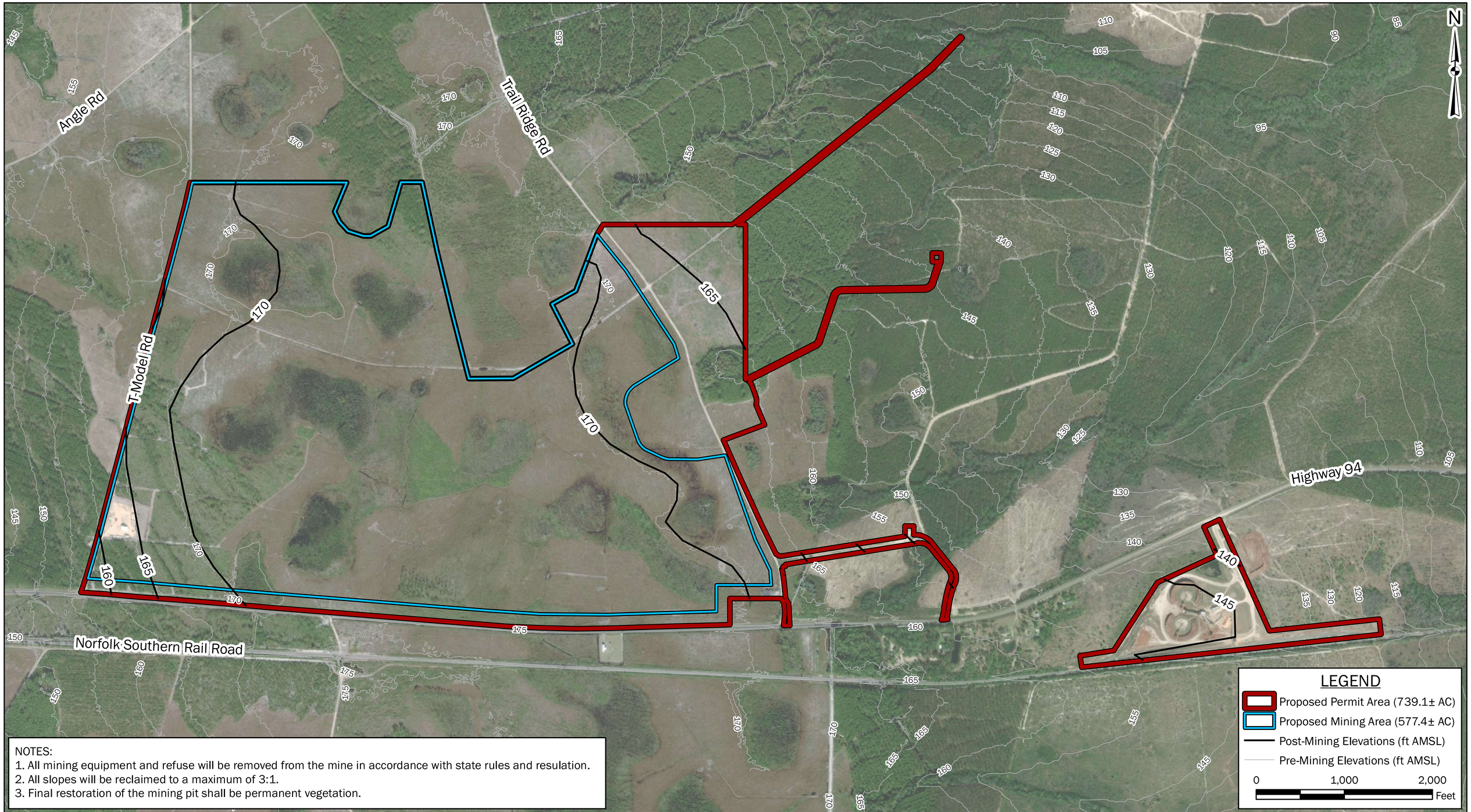
FIGURE 9: FEMA FLOOD HAZARD & FIRM PANEL MAP

TWIN PINES MINERALS, LLC SAUNDERS DEMONSTRATION MINE

ST. GEORGE, CHARLTON COUNTY, GEORGIA

BASEMAP: Maxar, Vivid Imagery, 11/20/2019 (West, 0.5 m Resolution) & 3/24/2018 (East, 0.46 m Resolution).

DRAWN BY:	DEK
CHECKED BY:	SGR
DRAWING DATE:	11/13/2020
REVISION DATE:	N/A
TTL JOB NO.:	000180200804.00
APPROX. SCALE:	1 in = 500 ft



NOTES:
1. All mining equipment and refuse will be removed from the mine in accordance with state rules and resulation.
2. All slopes will be reclaimed to a maximum of 3:1.
3. Final restoration of the mining pit shall be permanent vegetation.

TTL

FIGURE 10: POST-MINING RESTORATION PLAN

TWIN PINES MINERALS, LLC SAUNDERS DEMONSTRATION MINE

ST. GEORGE, CHARLTON COUNTY, GEORGIA

BASEMAP: Maxar, Vivid Imagery, 11/20/2019 (West, 0.5 m Resolution) & 3/24/2018 (East, 0.46 m Resolution).

DRAWN BY:	DEK
CHECKED BY:	SGR
DRAWING DATE:	11/13/2020
REVISION DATE:	N/A
TTL JOB NO.:	000180200804.00
APPROX. SCALE:	1 in = 500 ft