

# **BIOLOGICAL HABITAT ASSESSMENT**

**BLACK WARRIOR MINERALS, INC.**

**MINE NO. 2**

**Prepared For:  
BLACK WARRIOR MINERALS, INC.**

**1,368 acres +/-  
Section 2, 3, 9, 10, 11 & 15, Township 15 South, Range 3 West**

**ALL IN  
JEFFERSON COUNTY ALABAMA**

**April 10<sup>th</sup>, 2015**

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# **BIOLOGICAL HABITAT ASSESSMENT**

Prepared For:  
**BLACK WARRIOR MINERALS, INC.**

**MINE NO. 1**

1,368 acres +/-  
Section 2, 3, 9, 10, 11 & 15 Township 15 South, Range 3 West

**ALL IN  
JEFFERSON COUNTY ALABAMA**

Prepared by:

**MCGEHEE ENGINEERING CORP.**

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# Executive Summary

McGehee Engineering Corporation performed a biological habitat assessment survey for habitat and the possible presence of the species federally listed as endangered, threatened, or of concern for the proposed Black Warrior Minerals, Inc. – Mine No. 2 project area in October and November of 2014 and March of 2015. The proposed project area consists of approximately 1,368 acres located in Section 2, 3, 9, 10, 11 and 15, Township 15 South, Range 3 West all in Jefferson County.

The proposed Black Warrior Minerals, Inc. – Mine No. 2 project area consists of upland area disturbed through silviculture, and natural valley and stream corridors. Portions of the area have been cleared of timber within the recent past. Areas that have not been cleared of timber are vegetated with planted pine stands on upland ridges and natural hardwoods grow in valleys and stream corridors. The area has gently inclined slopes. The proposed project abuts Black Warrior Minerals - Mine No. 1 and will serve as an extension to this mine.

The biological habitat assessment survey focused in on T, E & C species listed in Jefferson County as can be found in Table 2.1 along with the Indiana bat, Northern Long-eared bat, Bald Eagle, Wood Stork and the Red Cockaded Woodpecker.

**No habitat was found for the listed aquatic threatened and endangered species. No evidence was found or observed for the presence or possible presence of these listed species. There is no continuous flowing water on this site to support the threatened and endangered aquatic species.**

**No habitat was found for the listed, threatened and endangered species, with the exception of the potential summer roosting habitat for the Indiana bat (*Myotis sodalis*) and the Northern Long-eared bat (*Myotis Septentrionalis*). Segmented areas totaling approximately 99 acres of potential summer roost habitat was found for the Indiana bat and Northern Long-eared bat along the scattered throughout the middle to east and south portions of the project area.**

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# Chapter 1. Proposed Project Review

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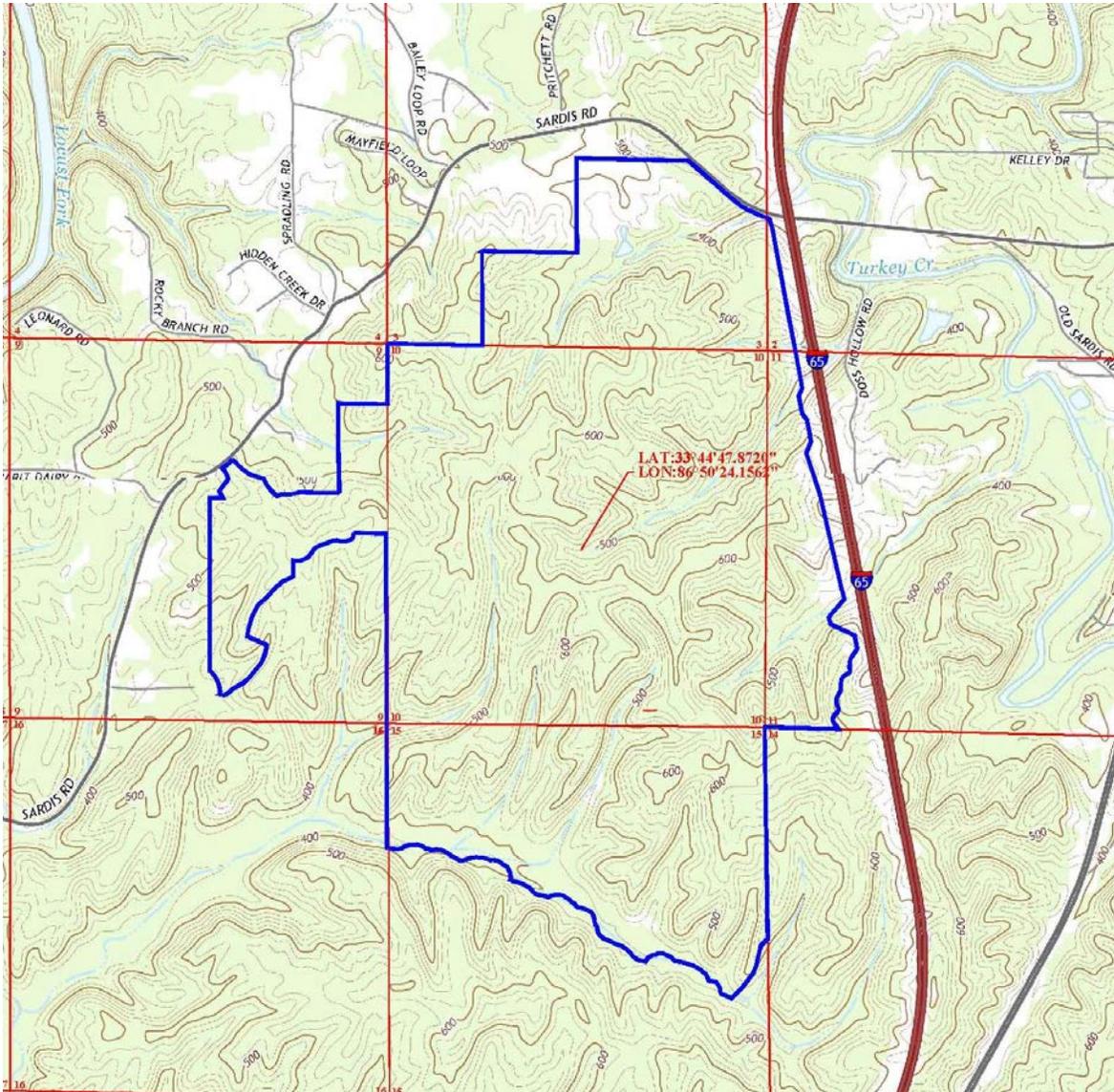
## 1.1 Introduction

McGehee Engineering Corporation performed a biological habitat assessment survey for habitat and the possible presence of the species federally listed as endangered, threatened, or of concern for the proposed Black Warrior Minerals, Inc. – Mine No. 2 project area in October and November of 2014 and March of 2015. The proposed project area consists of approximately 1,368 acres located in Section 2, 3, 9, 10, 11 and 15, Township 15 South, Range 3 West all in Jefferson County.

The proposed Black Warrior Minerals, Inc. – Mine No. 2 project area consists of upland area disturbed through silviculture, and natural valley and stream corridors. Portions of the area have been cleared of timber within the recent past. Areas that have not been cleared of timber are vegetated with planted pine stands on upland ridges and natural hardwoods grow in valleys and stream corridors. The area has gently inclined slopes. The proposed project abuts Black Warrior Minerals - Mine No. 1 and will serve as an extension to this mine.

## 1.2 Project Location

Black Warrior Minerals, Inc. – Mine No. 2 consists of approximately 1,368 acres and is located in Section 2, 3, 9, 10, 11 and 15, Township 15 South, Range 3 West as located in Jefferson County, Alabama on the Gardendale and Warrior, Alabama U.S.G.S Quadrangle. The proposed site location is shown below on the attached project area map Figure 1. (Appendix “A”)



**Figure 1. Project Area Map.** (not to scale)

# Chapter 2. Threatened & Endangered Species

## 2.1 Species Identification

The U.S. Fish and Wildlife Service (USFWS) threatened, endangered, and candidate species list for Jefferson County was reviewed by a qualified biologist in order to determine species potentially occurring in the project vicinity (Table 2.1). In addition, the Alabama Natural Heritage Section Database that contains numerous records of sensitive species in Alabama was queried to provide a list of special status species and habitats that may have been documented as occurring within the project area and/or the project vicinity.

**Table 2.1. List of Threatened, Endangered and Candidate Species for Jefferson County.**

| Common Name<br><i>Scientific Name</i>                                      | Status | General Habitat  |
|--|--------|--|
| <b>Bald eagle</b><br><i>Haliaeetus leucocephalus</i>                       | BGEPA  | Large open bodies of water where adequate food exist and human disturbance is limited  |
| <b>Wood stork</b><br><i>Mycteria americana</i>                             | E      | Freshwater and estuarine wetlands, primarily nesting in cypress or mangrove swamps. Narrow tidal creeks or flooded tidal pools where fish become concentrated  |
| <b>Red-cockaded woodpecker</b><br><i>Picoides borealis</i>                 | E      | Open, mature and old growth pine ecosystems with minimal hardwood overstory and midstory   |
| <b>Indiana Bat</b><br><i>Myotis sodalis</i>                                | E      | Lives in a variety of habitats with open canopy including floodplain, riparian zones and upland area, preferring trees with loose, scaly bark greater than 5 inch diameter at breast height for summer roost and caves and sometimes mines for winter hibernation.   |
| <b>Northern Long-Eared Bat</b><br><i>Myotis septentrionalis</i>            | T      | Lives in a variety of cluttered canopy habitats including floodplain, riparian zones and upland area, preferring trees with loose, scaly bark trees greater than 3 inch diameter at breast height for summer roost and caves and sometimes mines for winter hibernation. They will also occasionally use structures for summer roost |
| <b>Gray Bat</b><br><i>Myotis grisescens</i>                                | E      | Live in caves year-round; Winter hibernation in deep vertical caves, Summer roost in caves along rivers  |
| <b>Plicate rocksnail</b><br><i>Leptoxis plicate</i>                        | E      | Shallow gravel and cobble shoals in the flowing waters of the bottom 1/3 (20 miles) of the Locust Fork of the Black Warrior River in Jefferson County  |
| <b>Cylindrical Lioplax</b><br><i>Lioplax cyclostomaformis</i>              | E      | Isolated mud deposits found under large rocks in the rapid flowing sections of stream and river shoals   |
| <b>Round rocksnail</b><br><i>Leptoxis ampla</i>                            | T      | Cobble, gravel, or other hard substrates in the strong currents of riffles and shoals of high water quality streams and rivers   |
| <b>Fine-lined pocketbook mussel</b><br><i>Hamiota (=Lampsilis) altilis</i> | T      | Large rivers to small creek habitats swift flowing riffles and gravel-cobble substrates  |
| <b>Ovate clubshell mussel</b><br><i>Pleurobema perovatum</i>               | E      | Sand and gravel bottom free flowing streams and rivers with good water quality and stable stream channels  |
| <b>Orange-nacre mucket mussel</b><br><i>Hamiota (=Lampsilis) perovalis</i> | T      | Large rivers to small creek habitats swift flowing riffles and gravel-cobble substrates  |

|  |          |  |
|--|----------|--|
| <b>Southern clubshell</b><br><i>Pleurobema decisum</i>                             | <i>E</i> | Sand and gravel bottom free flowing streams and rivers with good water quality and stable stream channels  |
| <b>Alabama moccasinshell</b><br><i>Medionidus acutissimus</i>                      | <i>T</i> | Small to mid-sized streams with sandy-gravel and gravel substrates with moderate flow  |
| <b>Triangular kidneyshell mussel</b><br><i>Ptychobranthus greenii</i>              | <i>E</i> | Sand and gravel bottom free drainage courses and rivers with good water quality and stable stream channels   |
| <b>Southern pigtoe</b><br><i>Pleurobema georgianum</i>                             | <i>E</i> | Sand and gravel bottom riffles of free flowing streams and rivers with good water quality and stable stream channels   |
| <b>Southern acornshell mussel</b><br><i>Epioblasma othcaloogensis</i>              | <i>E</i> | Streams or rivers with fine gravel bottoms with moderate to strong currents and some shallows  |
| <b>Upland combshell mussel</b><br><i>Epioblasma metastriata</i>                    | <i>E</i> | Stable gravel and sand riffles of high water quality streams   |
| <b>Dark pigtoe mussel</b><br><i>Pluerobema furvum</i>                              | <i>E</i> | Sand/gravel/cobble shoals and rapids in small rivers and large streams; usually highly oxygenated water with moderate flow   |
| <b>Cahaba shiner</b><br><i>Notropis cahabae</i>                                    | <i>E</i> | Quiet shallow, 1.6 feet or less, shoals below swift riffle areas and downstream of boulders in sandy patches or gravel beds in the main channel of the Cahaba river  |
| <b>Goldline darter</b><br><i>Percina aurolineata</i>                               | <i>T</i> | Moderate to swift current, and water depths 2 feet or more, with gravel or sand substrates interspersed among cobble and small boulders in big and little Cahaba rivers  |
| <b>Watercress darter</b><br><i>Etheostoma nuchale</i>                              | <i>E</i> | Slow moving spring fed tributaries to Black Warrior River at mid-depths in dense aquatic vegetation with dense populations of aquatic insect larvae and microcrustaceans. Associated with watercress.  |
| <b>Vermilion darter</b><br><i>Etheostoma chermocki</i>                             | <i>E</i> | Swift currents in streams of alternating riffles and pools. Riffles with small limestone rubble and shale cobble. Clean bedrock, sometimes with sand, occurs in pools. Associated with water willow in larger riffles and shoals. Near springs, in swift runs and chutes adjacent to watercress and pondweed all in Turkey Creek |
| <b>Rush darter</b><br><i>Etheostoma phytophilum</i>                                | <i>C</i> | Lives in the reeds and rushes on the edges of small freshwater streams. It needs clear, cool, unpolluted water to survive.   |
| <b>Flattened musk turtle</b><br><i>Sternotherus depressus</i>                      | <i>T</i> | Free-flowing creek or small river with pools about 1 m deep or more, with rocks, abundant mollusks, low silt load and deposits, moderate temperature rock-bottomed to sandy substrate  |
| <b>Gentian Pinkroot</b><br><i>Spigelia gentianoides</i> Var.<br><i>alabamensis</i> | <i>E</i> | Glades, open, treeless area surrounded by woodlands, over rock formations of Ketona Dolomite. Solis high in calcium & magnesium and low in phosphorus & potassium and pH ranges from 7.4 to 7.6. Soils will also be rock exposed to very thin and prone to drought.  |
| <b>Georgia Rock-cress</b><br><i>Arabis georgiana</i>                               | <i>C</i> | Rocky (limestone, shale, granite-gneiss) bluffs and slopes along watercourses; also along sandy, eroding riverbanks  |
| <b>Mohr's Barbara's buttons</b><br><i>Marshallia mohrii</i>                        | <i>T</i> | Moist sandy clay soils, along shale bed streams, road side right-of-ways, seasonally wet low swales around natural springs and seeps   |
| <b>Georgia Aster</b><br><i>Symphotrichum georgianum</i>                            | <i>C</i> | Upland prairie grassland communities to thinned oak pine woodlands. Most remaining populations survive adjacent to roads, utility rights of way, and other openings  |

|  |                 |  |
|--|-----------------|--|
| <p><b>Tennessee Yellow-eyed Grass</b><br/><i>Xyris tennesseensis</i></p> | <p><i>E</i></p> | <p>Gravelly open wet woodlands, with calcareous rock near the surface, seep margins and wet meadows along spring-fed headwater streams</p> |
|--|-----------------|--|

Key to codes on list:

- **E** – Endangered
- **T** - Threatened
- **BGEPA** - Bald & Golden Eagle Protection Act
- **C** - Candidate Species
- **(P)** - Possible Occurrence

# Chapter 3. Methodology

## 3.1 Methodology

The subject property was surveyed by McGehee Engineering Corp. (MEC) for the occurrence and potential for occurrence for species protected or listed by the U.S. Fish and Wildlife Service (USFWS), based on known habitat preferences and geographical distribution. The principal surveyor for this site was Biologist Wes Lamon of McGehee Engineering Corp.

The study site was surveyed by completely traversing the site in a zigzag pattern at approximately 20 meter intervals. Survey conditions are described in Table 3.1. Prior to performing the field reconnaissance, MEC performed a review of aerial photographs of the project site and a pedestrian survey was conducted by MEC biologist to identify vegetation communities and land uses, perform general habitat assessment for plants and animals; assess the potential for nesting or roosting activity by birds and/or bats within the general study area. Focused surveys for sensitive aquatic species were not performed; however, the potential for habitat for these species was assessed during the survey by visually examining the water and randomly checking substrate throughout stream reaches.

Plots were characterized using United States Forestry Department guidelines. Individual vegetation plots were assessed by taking random plots within similarly vegetated areas. Areas were grouped as similar stands of timber using aerial imagery from Google Earth. These similar stands of timber are then assessed. Plot size is typically 1/20<sup>th</sup> of an acre, but may be adjusted based on tree density of the plot. Each tree of dominance was measured to attain an average DBH of dominant tree species and total basal area. Special attention was given to trees with loose exfoliating bark, trees with cavities or crevices, and snags over 9 feet in height.

**Table 3.1. Survey Conditions**

**Date: March 6<sup>th</sup>, 2015**

| Temperature (°F) | Wind (MPH) | Sky Cover % |
|------------------|------------|-------------|
| 45°              | 4-8        | 20%         |

**Date: March 19<sup>th</sup>, 2015**

| Temperature (°F) | Wind (MPH) | Sky Cover % |
|------------------|------------|-------------|
| 65°              | 2-5        | 90%         |

**Date: March 23<sup>rd</sup>, 2015**

| Temperature (°F) | Wind (MPH) | Sky Cover % |
|------------------|------------|-------------|
| 66°              | 4-8        | 60%         |

**Date: March 24<sup>th</sup>, 2015**

| Temperature (°F) | Wind (MPH) | Sky Cover % |
|------------------|------------|-------------|
| 66°              | 2-5        | 20%         |

**Date: March 25<sup>th</sup>, 2015**

| <b>Temperature (°F)</b> | <b>Wind (MPH)</b> | <b>Sky Cover %</b> |
|-------------------------|-------------------|--------------------|
| 75°                     | 3-8               | 50%                |

**Date: March 26<sup>th</sup>, 2015**

| <b>Temperature (°F)</b> | <b>Wind (MPH)</b> | <b>Sky Cover %</b> |
|-------------------------|-------------------|--------------------|
| 73°                     | 7-12              | 90%                |

As part of the field reconnaissance, MEC also conducted a delineation of potentially jurisdictional wetlands and waters of the U.S. as it relates to Section 404 of the Clean Water Act in accordance to the 1987 “*Corps of Engineers Wetlands Delineation Manual*”: Wetlands Research Program Technical Report Y-87-1. Additional Data sources other than mentioned within the report include the following:

- USGS Quadrangle Map & Quad Revised                      Gardendale and Warrior, Alabama USGS & NWI
- National Wetlands Inventory Map    1981
- SCS Soil Survey                      Jefferson County NRCS Web Survey
- Aerial Photos                        Google Image Dated: 2-26-2015
- Plant Database                        United States Department of Agriculture / Natural Resources Conservation Services Web Database
- FEMA Flood Map                      Federal Emergency Management DFIRM Database FIRMettes 01073C0205G Jefferson County

# Chapter 4. Environmental Setting

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## 4.1 General Habitat Description

The proposed Black Warrior Mineral, Inc. – Mine No. 2 project area is located near Gardendale, AL and lies along Sardis Road. The area consists of upland area disturbed through silviculture, and natural valley and stream corridors. Portions of the area have been cleared of timber within the recent past. Areas that have not been cleared of timber are vegetated with planted pine stands on upland ridges and natural hardwoods grow in valleys and stream corridors. The project site of approximately 1,388 acres mostly consists of the following plant species:

### Tree Stratum

American Beech (*Fagus grandifolia*)  
Black Cherry (*Prunus serotina*)  
Black Gum (*Nyssa sylvatica*)  
Chestnut Oak (*Quercus prinus*)  
Eastern Red Cedar (*Juniperus virginiana*)  
Loblolly Pine (*Pinus taeda*)  
Mockernut Hickory (*Carya tomentosa*)  
Northern Red Oak (*Quercus rubra*)  
Red Maple (*Acer rubrum*)  
Shagbark Hickory (*Carya ovata*)  
Sourwood (*Oxydendrum arboreum*)  
Southern Red Oak (*Quercus falcata*)  
Sweet Gum (*Liquidambar styraciflua*)  
Virginia Pine (*Pinus virginiana*)  
White Oak (*Quercus alba*)  
Yellow Poplar (*Liriodendron tulipifera*)

### Sapling Stratum

American Hornbeam (*Carpinus caroliniana*)  
Black Cherry (*Prunus serotina*)  
Bur Oak (*Quercus macrocarpa*)  
Eastern Hophornbeam (*Ostrya virginiana*)  
Eastern Red Cedar (*Juniperus virginiana*)  
Eastern Redbud (*Cercis canadensis*)  
Fanleaf Hawthorn (*Crataegus flabellata*)  
Flowering Dogwood (*Cornus florida*)  
Loblolly Pine (*Pinus taeda*)  
Mockernut Hickory (*Carya tomentosa*)  
Post Oak (*Quercus stellata*)  
Red Maple (*Acer rubrum*)  
Sourwood (*Oxydendrum arboreum*)  
Southern Red Oak (*Quercus falcata*)

Sugar Maple (*Acer sacchrum*)  
Sweet Gum (*Liquidambar styraciflua*)  
Virginia Pine (*Pinus virginiana*)  
Water Oak (*Quercus nigra*)  
White Oak (*Quercus alba*)  
Winged Elm (*Ulmus alata*)  
Yellow Poplar (*Liriodendron tulipifera*)

### **Shrub Stratum**

American Holly (*Ilex opaca*)  
Blackberry (*Rubus betulifolius*)  
Chinese Privet (*Ligustrum sinense*)  
Deer Berry (*Vaccinium stamineum*)  
Eastern Redbud (*Cercis canadensis*)  
Elliot's Blueberry (*Vaccinium elliottii*)  
Fanleaf Hawthorn (*Crataegus flabellata*)  
Loblolly Pine (*Pinus taeda*)  
Mockernut Hickory (*Carya tomentosa*)  
Oakleaf Hydrangea (*Hydrangea quercifolia*)  
Red Buckeye (*Aesculus pavia*)  
Red Maple (*Acer rubrum*)  
River Cane (*Arundinaria gigantea*)  
Smooth Sumac (*Rhus glabra*)  
Southern Red Oak (*Quercus falcata*)  
Sparkle Berry (*Vaccinium arboreum*)  
Sugar Maple (*Acer sacchrum*)  
Sweet Gum (*Liquidambar styraciflua*)  
Virginia Pine (*Pinus virginiana*)  
White Oak (*Quercus alba*)  
Yellow Poplar (*Liriodendron tulipifera*)  
Yucca (*Yucca aloifolia*)

### **Herbaceous Stratum**

Annual Ragweed (*Ambrosia artemisiifolia*)  
Blackberry (*Rubus betulifolius*)  
Bloodroot (*Sanguinaria canadensis*)  
Carolina Geranium (*Geranium caroliniana*)  
Christmas Fern (*Polystichum acrostichoides*)  
Daisy Fleabane (*Rigeron philadelphicus*)  
Dog Fennel (*Eupatorium capillifolium*)  
Horseweed (*Conyza canadensis*)  
Little Brown Jug (*Hexastylis arifolia*)  
Purple Trillium (*Trillium erectum*)  
Southern Dewberry (*Rubus trivialis*)  
Tall Fescue (*Festuca arundinacea*)  
Yankee weed (*Eupatorium compostifolium*)  
Yellow Trillium (*Trillium luteum*)

Yucca (*Yucca aloifolia*)

### **Woody Vine Stratum**

Eastern Poison Ivy (*Toxicodendron radicans*)

Japanese Honeysuckle (*Lonicera japonica*)

Laurel-leaved Green Briar (*Smilax laurifolia*)

Muscadine (*Vitis rotundifolia*)

Roundleaf Green Briar (*Smilax rotundifolia*)

Saw Briar (*Smilax bona-nox*)

Virginia Creeper (*Parthenocissus quinquefolia*)

Yellow Jessamine or Carolina Jasmine (*Gelsemium sempervirens*)

The proposed Black Warrior Minerals, Inc. – Mine No. 2 project consists of gently inclined upland slopes to valley and stream corridors. Sardis Road allows access to the proposed project area via a timber removal road. The project has had extensive timber removal and remaining vegetation is sparse in these areas. Upland ridges and slopes consist primarily of planted pines and pioneering hardwood species. Valley and stream corridors and vegetated naturally with deciduous hardwood species. The proposed project abuts Black Warrior Minerals - Mine No. 1 and will serve as an extension to this mine.

There are several soil groups within the project. The first is Montevallo-Nauvoo association, steep that are well drained. The second is Palmerdale complex, steep which are somewhat excessively drained. The third is Nauvoo fine sandy loam, 2 to 15 percent slopes which are well drained. The fourth is Sullivan-State complex, 0 to 2 percent slopes which are also well drained. All soil types are predominantly non hydric. The soils identified in the field matched the USDA Soil data profile therefore a more detailed description of the soil as well as the soil maps can be found in Appendix C.

# Chapter 5. Habitat Study Results

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## 5.1 Terrestrial and Terrestrial Habitat Species

- a. **Bald eagle** (*Haliaeetus leucocephalus*) - There was no potential nesting habitat for the Bald Eagles. There were no large trees near open water on this site.
- b. **Red-cockaded woodpecker** (*Picoides borealis*) - There were no isolated mature pines of the age and required size that would harbor the Red-cockaded woodpecker on or adjacent to the project site.
- c. **Wood stork** (*Mycteria americana*) - There was no potential nesting habitat for the Wood stork. There were no large trees near open water on this site.
- d. **Indiana bat** (*Myotis sodalis*) – Potential Summer Roosting Habitat for this species does exist. Valley and stream corridors of natural hardwood growth have preferred roosting trees greater than 5 inches DBH with exfoliating bark, crevices or hollows or multiple snags. No caves, underground mine openings or spanned bridges are located within or adjacent to the proposed boundary. Plot summery and Potential Summer Roost Map are in Appendices E and F.
- e. **Northern Long-eared bat** (*Myotis septentrionalis*) – Potential Summer Roosting Habitat for this species does exist. Many valley and stream corridors of natural hardwood growth have preferred roosting trees greater than 5 inches DBH with exfoliating bark, crevices or hollows or multiple snags. No caves, underground mine openings or spanned bridges are located within or adjacent to the proposed boundary. Plot summery and Potential Summer Roost Map are in Appendices E and F.
- f. **Gray Bat** (*Myotis grisescens*) – Habitat for this species does not exist. There are no caves located within or adjacent to the proposed project boundary.
- g. **Georgia Aster** (*Symphotrichum georgianum*) – Habitat for this species does exist. This area historically consisted of hardwoods; also consistent silvaculture practices have left significant disturbance.
- h. **Mohr's Barbara's buttons** (*Marshallia mohrii*) – Habitat for this species does not exist. Onsite wetlands within the proposed boundary are highly disturbed through previous mining.
- i. **Gentian Pinkroot** (*Spigelia gentianoides* var. *alabamensis*) – Habitat for this species does not exist. There are no glades located within the project boundary.

- j. Georgia Rock-cress** (*Arabis georgiana*) -- Habitat for this species does not exist within the proposed boundary. There are no sandstone outcrops.
- k. Tennessee Yellow-eyed grass** (*Xyris tennesseensis*) – Habitat for this species does not exist. There are no groundwater seeps in the area with calcareous rock or required soils for this species to survive.

### 5.1.1 Summary

Potential summer roost habitat for Indiana and Northern Long-eared bats is present within the proposed project boundary and is detailed in the attached plot summary and maps. No habitat was found for the remainder of the listed, threatened and endangered terrestrial species. No evidence was found or observed for the presence or possible presence of these listed species.

## 5.2 Aquatic and Aquatic Habitat Species

- a. Flattened musk turtle** (*Sternotherus depressus*) – Habitat for this species does not exist. There are no perennial streams associated with this proposed project site.
- b. Fine-lined pocketbook mussel** (*Hamiota (=Lampsilis) altilis*) – Habitat for this species does not exist. There are no perennial streams associated with this proposed project site.
- c. Ovate clubshell mussel** (*Pleurobema perovatum*) – Habitat for this species does not exist. There are no perennial streams associated with this proposed project site.
- d. Triangular kidneyshell mussel** (*Ptychobranhus greenii*) – Habitat for this species does not exist. There are no perennial streams associated with this proposed project site.
- e. Southern clubshell mussel** (*Pleurobema decisum*) – Habitat for this species does not exist. There are no perennial streams associated with this proposed project site.
- f. Orange-nacre mucket mussel** (*Hamiota (=Lampsilis) perovalis*) -- Habitat for this species does not exist. There are no perennial streams associated with this proposed project site.
- g. Alabama moccasinshell mussel** (*Medionidus acutissimus*) -- Habitat for this species does not exist. There are no perennial streams associated with this proposed project site.

- h. Upland combshell mussel** (*Epioblasma metastriata*) - Habitat for this species does not exist. There are no perennial streams associated with this proposed project site.
- i. Dark pigtoe mussel** (*Pleurobema perovatum*) -- Habitat for this species does not exist. There are no perennial streams associated with this proposed project site.
- j. Southern acornshell Mussel** (*Epioblasma othcaloogensis*) -- Habitat for this species does not exist. There are no perennial streams associated with this proposed project site.
- k. Southern pigtoe mussel** (*Pleurobema georgianum*) - Habitat for this species does not exist. There are no perennial streams associated with this proposed project site.
- l. Goldline darter** (*Percina aurolineata*) -- Habitat for this species does not exist. There are no perennial streams associated with this proposed project site. Also this species is only found in the cobble and small boulder area of the big and little Cahaba River.
- m. Cahaba shiner** (*Notropis cahabae*) -- Habitat for this species does not exist. There are no perennial streams associated with this proposed project site. Also this species is only found in the main channel of the Cahaba River.
- n. Watercress darter** (*Etheostoma nuchale*) -- Habitat for this species does not exist. There are no perennial streams associated with this proposed project site. Also they are associated with spring fed tributaries to the Black Warrior River.
- o. Vermilion darter** (*Etheostoma chermocki*) -- Habitat for this species does not exist. There are no perennial streams associated with this proposed project site. Also they are associated with springs, specifically in Turkey Creek.
- p. Plicate rocksnail** (*Leptoxis plicate*) - Habitat for this species does not exist. There are no perennial streams associated with this proposed project site.
- q. Cylindrical Lioplax** (*Lioplax cyclostomaformis*) – Habitat for this species does not exist. There are no perennial streams associated with this proposed project site.
- r. Round Rocksnail** (*Leptoxis ampla*) - Habitat for this species does not exist. There are no perennial streams associated with this proposed project site.

### 5.2.1 Summary

No habitat was found for the listed, threatened and endangered aquatic species within the project boundary. No evidence was found or observed for the presence or possible presence of these listed species within the project boundary. There are no perennial streams associated with this proposed project site

## 5.3 Wetlands and Streams

### 5.3.1 Wetlands

The project area was evaluated according to the 1987 “*Corps of Engineers Wetlands Delineation Manual*” and the April 2012 Version 2.0 Eastern Mountain & Piedmont COE Regional Supplement to the COE Wetland Delineation Manual. Wetlands were discovered. Wetlands were located in areas of previous mining and are highly disturbed

### 5.3.2 Streams

The project area was evaluated for jurisdictional waters using the North Carolina Method for determining intermittent and perennial streams. No perennial streams were discovered within the proposed boundary. A detailed determination is discussed in the wetland delineation report sent to ACOE.

**NOTE:** The below photographic log and photographic log point map represents the points within the habitat assessment area. Any numerical anomalies occur because those points are represented in maps used for other regulatory agencies.

## Chapter 6. References

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# Chapter 7. Signatures of Preparers

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Prepared by:

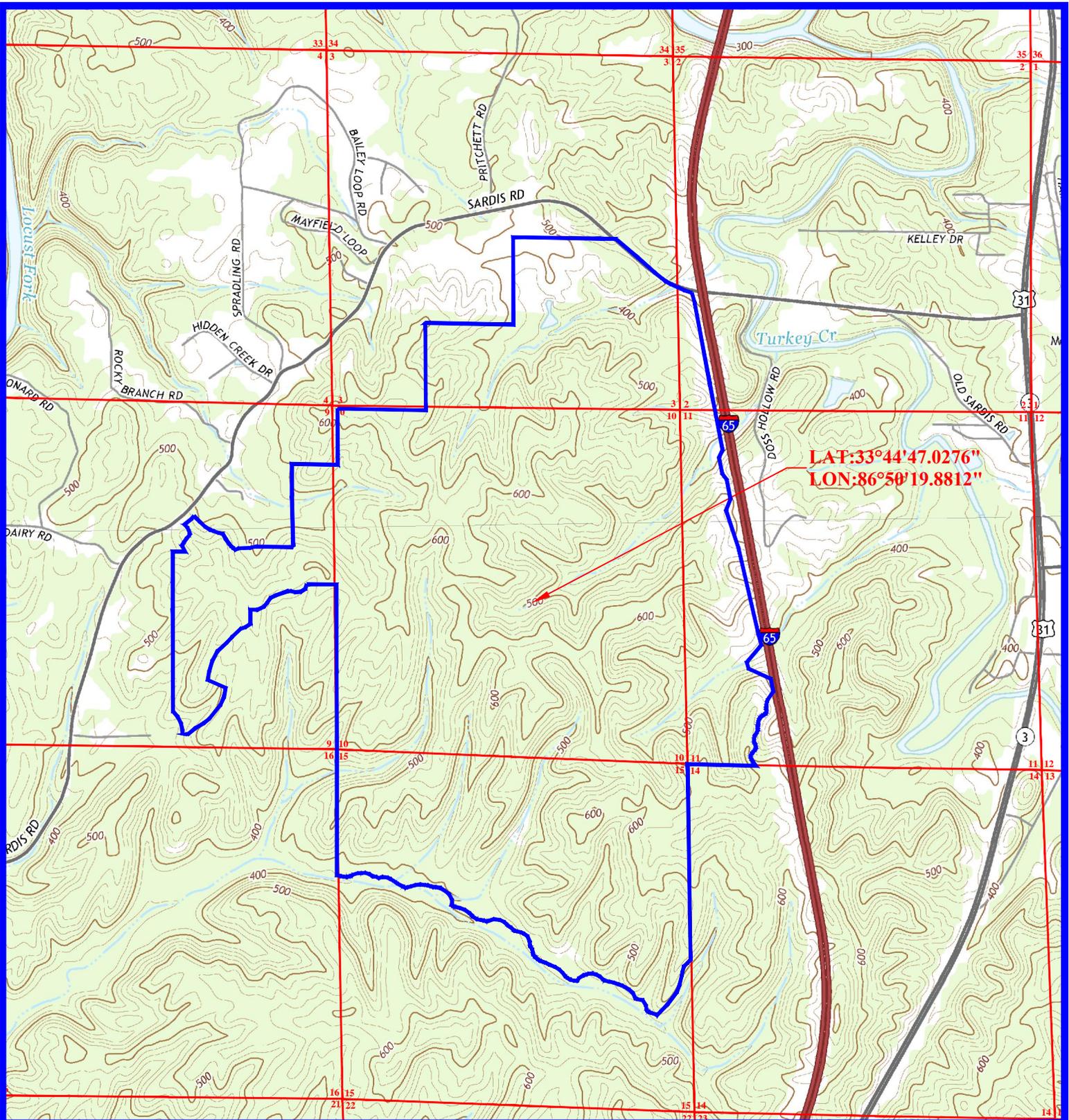
Reviewed by:

**Wes Lamon**  
*Biologist*

**L. Stephen Blankenship**  
*Environmental Engineering Manager*

# **Appendix A — Project Area Map**

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SCALE: 1" = 2000'  
 April 15th, 2015  
 Map Size: 8.5"x11"

**BLACK WARRIOR MINERALS, INC.**  
**MINE NO. 2**  
 (APPROXIMATELY 1,368 ACRES TOTAL)

**PROJECT AREA MAP**

SECTIONS 2, 3, 9, 10, 11, & 15, TOWNSHIP 15 SOUTH, RANGE 3 WEST,  
 ALL IN JEFFERSON COUNTY, ALABAMA  
 AS FOUND ON THE GARDENDALE & WARRIOR, ALABAMA USGS QUAD.

 PROJECT BOUNDARY



Latitude: 33°44'47" N  
 Longitude: 86°50'20" W

**MEC**  
 mcgehee engineering corp  
 post office box 3431  
 jasper, alabama 35502-3431  
 telephone: (205) 221-0686 fax: 221-7721  
 email: staff@mcgehee.org

# **Appendix B — Photographic Log**

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**McGehee Engineering**

**Photographic Log**

**Client Name:**

**Site Location:**

*Mine No. 2*

*Black Warrior Minerals, Inc.*

**Date:** 03-05-15

**Photo No.** 100\_6297

**Point No.** 001

**Description:**

This is a view of an access road and clear cut at point 001.

**Dominant Vegetation:**

- *Pinus taeda*
- *P. virginiana*
- *Liquidambar styraciflua*
- *Carya glabra*
- *Quercus alba*
- *Acer rubrum*



**McGehee Engineering**

**Photographic Log**

**Client Name:**

**Site Location:**

*Mine No. 2*

*Black Warrior Minerals, Inc.*

**Date:** 03-05-15

**Photo No.** 100\_6299

**Point No.** 001

**Description:**

This is a view of at point 001.

**Dominant Vegetation:**

Same as above.



| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>   |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-06-15  |          |  |                   |
| <b>Photo No.</b>   | 100_6303 |  |                   |
| <b>Point No.</b>   | 002      |  |                   |
| <b>Description:</b><br>This is a view of an area that has been clear cut at point 002.   |          |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Pinus taeda</i></li> <li>• <i>P. virginiana</i></li> </ul> |          |  |                   |

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i> |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-06-15                                      |          |  |                   |
| <b>Photo No.</b>   | 100_6305 |  |                   |
| <b>Point No.</b>   | 002      |  |                   |
| <b>Description:</b><br>This is a view at point 002.        |          |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.              |          |  |                   |

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>   |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-06-15  |          |  |                   |
| <b>Photo No.</b>   | 100_6310 |  |                   |
| <b>Point No.</b>   | 003      |  |                   |
| <b>Description:</b><br>This is a view of an area that has been clear cut at point 003.   |          |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Acer rubrum</i></li> <li>• <i>Ligustrum sinense</i></li> <li>• <i>Pinus taeda</i></li> <li>• <i>P. virginiana</i></li> </ul> |          |  |                   |

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>                             |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-06-15  |          |  |                   |
| <b>Photo No.</b>   | 100_6317 |  |                   |
| <b>Point No.</b>   | 058      |  |                   |
| <b>Description:</b><br>This is a view of an area that has been clear cut at point 003. |          |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.  |          |  |                   |

| McGehee Engineering  |                       | Photographic Log   |  |  |
|--|-----------------------|--|--|--|
| <b>Client Name:</b>  | <b>Site Location:</b> | <b>Mine No. 2</b>  |  |  |
| <i>Black Warrior Minerals, Inc.</i>  |                       |  |  |  |
| <b>Date:</b>   | <i>03-06-15</i>       |  |  |  |
| <b>Photo No.</b>   | <i>100_6320</i>       |  |  |  |
| <b>Point No.</b>   | <i>004</i>            |  |  |  |
| <b>Description:</b>  |                       |  |  |  |
| <p>This is a view of an area that has been clear cut at point 004.</p>                                 |                       |  |  |  |
| <b>Dominant Vegetation:</b>  |                       |  |  |  |
| <ul style="list-style-type: none"> <li>• <i>Pinus taeda</i></li> <li>• <i>P. virginiana</i></li> </ul> |                       |  |  |  |

| McGehee Engineering  |                       | Photographic Log   |  |  |
|--|-----------------------|--|--|--|
| <b>Client Name:</b>  | <b>Site Location:</b> | <b>Mine No. 2</b>  |  |  |
| <i>Black Warrior Minerals, Inc.</i>                                    |                       |  |  |  |
| <b>Date:</b>   | <i>03-06-15</i>       |  |  |  |
| <b>Photo No.</b>   | <i>100_6323</i>       |  |  |  |
| <b>Point No.</b>   | <i>004</i>            |  |  |  |
| <b>Description:</b>  |                       |  |  |  |
| <p>This is a view of an area that has been clear cut at point 004.</p> |                       |  |  |  |
| <b>Dominant Vegetation:</b>  |                       |  |  |  |
| <p>Same as above.</p>  |                       |  |  |  |

| McGehee Engineering   |                       | Photographic Log   |  |  |
|---|-----------------------|--|--|--|
| <b>Client Name:</b>   | <b>Site Location:</b> | <b>Mine No. 2</b>  |  |  |
| <i>Black Warrior Minerals, Inc.</i>   |                       |  |  |  |
| <b>Date:</b>  | <i>03-06-15</i>       |  |  |  |
| <b>Photo No.</b>  | <i>100_6326</i>       |  |  |  |
| <b>Point No.</b>  | <i>005</i>            |  |  |  |
| <b>Description:</b>   |                       |  |  |  |
| <p>This is a view of clear cut along ridges at point 005.</p>   |                       |  |  |  |
| <b>Dominant Vegetation:</b>   |                       |  |  |  |
| <ul style="list-style-type: none"> <li>• <i>Pinus taeda</i></li> <li>• <i>P. virginiana</i></li> <li>• <i>Quercus stellata</i></li> </ul> |                       |  |  |  |

| McGehee Engineering   |                       | Photographic Log   |  |  |
|---|-----------------------|--|--|--|
| <b>Client Name:</b>   | <b>Site Location:</b> | <b>Mine No. 2</b>  |  |  |
| <i>Black Warrior Minerals, Inc.</i>                           |                       |  |  |  |
| <b>Date:</b>  | <i>03-06-15</i>       |  |  |  |
| <b>Photo No.</b>  | <i>100_6327</i>       |  |  |  |
| <b>Point No.</b>  | <i>005</i>            |  |  |  |
| <b>Description:</b>   |                       |  |  |  |
| <p>This is a view of clear cut along ridges at point 005.</p> |                       |  |  |  |
| <b>Dominant Vegetation:</b>                                   |                       |  |  |  |
| <p>Same as above.</p>   |                       |  |  |  |

| McGehee Engineering  |                       | Photographic Log   |  |
|--|-----------------------|--|--|
| <b>Client Name:</b>  | <b>Site Location:</b> | <b>Mine No. 2</b>  |  |
| <i>Black Warrior Minerals, Inc.</i>  |                       |  |  |
| <b>Date:</b>   | <i>03-06-15</i>       |  |  |
| <b>Photo No.</b>   | <i>100_6330</i>       |  |  |
| <b>Point No.</b>   | <i>006</i>            |  |  |
| <b>Description:</b>  |                       |  |  |
| This is a view of clear cut at point 006.  |                       |  |  |
| <b>Dominant Vegetation:</b>  |                       |  |  |
| <ul style="list-style-type: none"> <li>• <i>Pinus taeda</i></li> <li>• <i>P. virginiana</i></li> </ul> |                       |  |  |

| McGehee Engineering                       |                       | Photographic Log   |  |
|---|-----------------------|--|--|
| <b>Client Name:</b>                       | <b>Site Location:</b> | <b>Mine No. 2</b>  |  |
| <i>Black Warrior Minerals, Inc.</i>       |                       |  |  |
| <b>Date:</b>                              | <i>03-06-15</i>       |  |  |
| <b>Photo No.</b>                          | <i>100_6332</i>       |  |  |
| <b>Point No.</b>                          | <i>006</i>            |  |  |
| <b>Description:</b>                       |                       |  |  |
| This is a view of clear cut at point 006. |                       |  |  |
| <b>Dominant Vegetation:</b>               |                       |  |  |
| Same as above.                            |                       |  |  |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>  |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-06-15   |          |  |                   |
| <b>Photo No.</b>  | 100_6335 |  |                   |
| <b>Point No.</b>  | 007      |  |                   |
| <b>Description:</b><br>This is a view of clear cut at point 007.  |          |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Prunus serotina</i></li> <li>• <i>Pinus taeda</i></li> <li>• <i>Pinus virginiana</i></li> <li>• <i>Liquidambar styraciflua</i></li> </ul> |          |  |                   |

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>       |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-06-15  |          |  |                   |
| <b>Photo No.</b>   | 100_6337 |  |                   |
| <b>Point No.</b>   | 007      |  |                   |
| <b>Description:</b><br>This is a view of clear cut at point 007. |          |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.                    |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>  |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-06-15   |          |  |                   |
| <b>Photo No.</b>  | 100_6340 |  |                   |
| <b>Point No.</b>  | 008      |  |                   |
| <b>Description:</b><br>This is a view of clear cut at point 008.  |          |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Prunus serotina</i></li> <li>• <i>Pinus taeda</i></li> <li>• <i>Pinus virginiana</i></li> <li>• <i>Liquidambar styraciflua</i></li> </ul> |          |  |                   |

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>       |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-06-15  |          |  |                   |
| <b>Photo No.</b>   | 100_6345 |  |                   |
| <b>Point No.</b>   | 008      |  |                   |
| <b>Description:</b><br>This is a view of clear cut at point 008. |          |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.                    |          |  |                   |

| McGehee Engineering   |                       | Photographic Log   |  |  |
|---|-----------------------|--|--|--|
| <b>Client Name:</b>   | <b>Site Location:</b> | <b>Mine No. 2</b>  |  |  |
| <i>Black Warrior Minerals, Inc.</i>   |                       |  |  |  |
| <b>Date:</b>  | <i>03-06-15</i>       |  |  |  |
| <b>Photo No.</b>  | <i>100_6350</i>       |  |  |  |
| <b>Point No.</b>  | <i>009</i>            |  |  |  |
| <b>Description:</b>   |                       |  |  |  |
| <p>This is a view of clear cut at point 009.</p>  |                       |  |  |  |
| <b>Dominant Vegetation:</b>   |                       |  |  |  |
| <ul style="list-style-type: none"> <li>• <i>Pinus taeda</i></li> <li>• <i>Pinus virginiana</i></li> </ul> |                       |  |  |  |

| McGehee Engineering                              |                       | Photographic Log   |  |  |
|--|-----------------------|--|--|--|
| <b>Client Name:</b>                              | <b>Site Location:</b> | <b>Mine No. 2</b>  |  |  |
| <i>Black Warrior Minerals, Inc.</i>              |                       |  |  |  |
| <b>Date:</b>                                     | <i>03-06-15</i>       |  |  |  |
| <b>Photo No.</b>                                 | <i>100_6353</i>       |  |  |  |
| <b>Point No.</b>                                 | <i>009</i>            |  |  |  |
| <b>Description:</b>                              |                       |  |  |  |
| <p>This is a view of clear cut at point 009.</p> |                       |  |  |  |
| <b>Dominant Vegetation:</b>                      |                       |  |  |  |
| <p>Same as above.</p>                            |                       |  |  |  |

| McGehee Engineering   |                       | Photographic Log  |  |  |
|---|-----------------------|-------------------|--|--|
| <b>Client Name:</b>   | <b>Site Location:</b> | <b>Mine No. 2</b> |  |  |
| <i>Black Warrior Minerals, Inc.</i>   |                       |                   |  |  |
| <b>Date:</b>  | <i>03-06-15</i>       |                   |  |  |
| <b>Photo No.</b>  | <i>100_6354</i>       |                   |  |  |
| <b>Point No.</b>  | <i>010</i>            |                   |  |  |
| <b>Description:</b>   |                       |                   |  |  |
| This is a view of clear cut at point 010.   |                       |                   |  |  |
| <b>Dominant Vegetation:</b>   |                       |                   |  |  |
| <ul style="list-style-type: none"> <li>• <i>Pinus taeda</i></li> <li>• <i>Pinus virginiana</i></li> <li>• <i>Liquidambar styraciflua</i></li> </ul> |                       |                   |  |  |

| McGehee Engineering                       |                       | Photographic Log  |  |  |
|---|-----------------------|-------------------|--|--|
| <b>Client Name:</b>                       | <b>Site Location:</b> | <b>Mine No. 2</b> |  |  |
| <i>Black Warrior Minerals, Inc.</i>       |                       |                   |  |  |
| <b>Date:</b>                              | <i>03-06-15</i>       |                   |  |  |
| <b>Photo No.</b>                          | <i>100_6355</i>       |                   |  |  |
| <b>Point No.</b>                          | <i>010</i>            |                   |  |  |
| <b>Description:</b>                       |                       |                   |  |  |
| This is a view of clear cut at point 010. |                       |                   |  |  |
| <b>Dominant Vegetation:</b>               |                       |                   |  |  |
| Same as above.                            |                       |                   |  |  |

| McGehee Engineering                       |                       | Photographic Log   |  |  |
|---|-----------------------|--|--|--|
| <b>Client Name:</b>                       | <b>Site Location:</b> | <b>Mine No. 2</b>  |  |  |
| <i>Black Warrior Minerals, Inc.</i>       |                       |  |  |  |
| <b>Date:</b>                              | <i>03-06-15</i>       |  |  |  |
| <b>Photo No.</b>                          | <i>100_6359</i>       |  |  |  |
| <b>Point No.</b>                          | <i>011</i>            |  |  |  |
| <b>Description:</b>                       |                       |  |  |  |
| This is a view of clear cut at point 011. |                       |  |  |  |
| <b>Dominant Vegetation:</b>               |                       |  |  |  |
|   |                       |  |  |  |

| McGehee Engineering                       |                       | Photographic Log   |  |  |
|---|-----------------------|--|--|--|
| <b>Client Name:</b>                       | <b>Site Location:</b> | <b>Mine No. 2</b>  |  |  |
| <i>Black Warrior Minerals, Inc.</i>       |                       |  |  |  |
| <b>Date:</b>                              | <i>03-06-15</i>       |  |  |  |
| <b>Photo No.</b>                          | <i>100_6362</i>       |  |  |  |
| <b>Point No.</b>                          | <i>011</i>            |  |  |  |
| <b>Description:</b>                       |                       |  |  |  |
| This is a view of clear cut at point 011. |                       |  |  |  |
| <b>Dominant Vegetation:</b>               |                       |  |  |  |
| Same as above.                            |                       |  |  |  |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>  |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-19-15   |          |  |                   |
| <b>Photo No.</b>  | 100_6672 |  |                   |
| <b>Point No.</b>  | 012      |  |                   |
| <b>Description:</b><br><br>This is a view of a mixed hardwood/pine stand at point 012.  |          |  |                   |
| <b>Dominant Vegetation:</b>   |          |  |                   |
| <ul style="list-style-type: none"> <li>• <i>Prunus serotina</i></li> <li>• <i>Pinus taeda</i></li> <li>• <i>Pinus virginiana</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Liriodendron tulipifera</i></li> <li>• <i>Quercus falcata</i></li> <li>• <i>Quercus rubra</i></li> </ul> |          |  |                   |

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>                             |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-19-15  |          |  |                   |
| <b>Photo No.</b>   | 100_6672 |  |                   |
| <b>Point No.</b>   | 012      |  |                   |
| <b>Description:</b><br><br>This is a view of a mixed hardwood/pine stand at point 012. |          |  |                   |
| <b>Dominant Vegetation:</b>  |          |  |                   |
| Same as above.   |          |  |                   |

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>   |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-19-15  |          |  |                   |
| <b>Photo No.</b>   | 100_6677 |  |                   |
| <b>Point No.</b>   | 013      |  |                   |
| <b>Description:</b><br>This is a view of a pine stand at point 013.  |          |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Pinus virginiana</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Quercus prinus</i></li> </ul> |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>          |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-19-15   |          |  |                   |
| <b>Photo No.</b>  | 100_6679 |  |                   |
| <b>Point No.</b>  | 013      |  |                   |
| <b>Description:</b><br>This is a view of a pine stand at point 013. |          |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.                       |          |  |                   |

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>   |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-19-15  |          |  |                   |
| <b>Photo No.</b>   | 100_6681 |  |                   |
| <b>Point No.</b>   | 014      |  |                   |
| <b>Description:</b><br>This is a view of a pine stand at point 014.  |          |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Prunus serotina</i></li> <li>• <i>Quercus prinus</i></li> <li>• <i>Pinus virginiana</i></li> <li>• <i>Liquidambar styraciflua</i></li> <li>• <i>Quercus rubra</i></li> <li>• <i>Carya tomentosa</i></li> </ul> |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>          |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-19-15   |          |  |                   |
| <b>Photo No.</b>  | 100_6685 |  |                   |
| <b>Point No.</b>  | 014      |  |                   |
| <b>Description:</b><br>This is a view of a pine stand at point 014. |          |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.                       |          |  |                   |

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>   |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-19-15  |          |  |                   |
| <b>Photo No.</b>   | 100_6686 |  |                   |
| <b>Point No.</b>   | 015      |  |                   |
| <b>Description:</b><br>This is a view of an upland access road and surrounding vegetation at point 015.  |          |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Prunus serotina</i></li> <li>• <i>Pinus taeda</i></li> <li>• <i>Pinus virginiana</i></li> <li>• <i>Quercus alba</i></li> <li>• <i>Quercus rubra</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Liquidambar styraciflua</i></li> </ul> |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>  |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-19-15   |          |  |                   |
| <b>Photo No.</b>  | 100_6686 |  |                   |
| <b>Point No.</b>  | 015      |  |                   |
| <b>Description:</b><br>This is a view of an upland access road and surrounding vegetation at point 015. |          |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.   |          |  |                   |

**McGehee Engineering**

**Photographic Log**

**Client Name:**

**Site Location:**

*Mine No. 2*

*Black Warrior Minerals, Inc.*

**Date:** 03-06-15

**Photo No.** 100\_6720

**Point No.** 016

**Description:**

This is a view of a pine stand at point 016.

**Dominant Vegetation:**

- *Prunus serotina*
- *Pinus taeda*
- *Pinus virginiana*
- *Liquidambar styraciflua*
- *Acer rubrum*



**McGehee Engineering**

**Photographic Log**

**Client Name:**

**Site Location:**

*Mine No. 2*

*Black Warrior Minerals, Inc.*

**Date:** 100\_6721

**Photo No.** 100\_6337

**Point No.** 016

**Description:**

This is a view of a pine stand at point 016.

**Dominant Vegetation:**

Same as above.



| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>   |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-23-15  |          |  |                   |
| <b>Photo No.</b>   | 100_6723 |  |                   |
| <b>Point No.</b>   | 017      |  |                   |
| <b>Description:</b><br>This is a view of an intermittent stream corridor and vegetation at point 017.  |          |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Quercus alba</i></li> <li>• <i>Nyssa sylvatica</i></li> <li>• <i>Carpinus caroliniana</i></li> <li>• <i>Ostrya virginiana</i></li> <li>• <i>Quercus rubra</i></li> <li>• <i>Fagus grandifolia</i></li> <li>• <i>Acer rubrum</i></li> </ul> |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>  |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-23-15   |          |  |                   |
| <b>Photo No.</b>  | 100_6723 |  |                   |
| <b>Point No.</b>  | 017      |  |                   |
| <b>Description:</b><br>This is a view of an intermittent stream corridor and vegetation at point 017. |          |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.   |          |  |                   |

**McGehee Engineering**

**Photographic Log**

**Client Name:**

**Site Location:**

*Mine No. 2*

*Black Warrior Minerals, Inc.*

**Date:** 03-23-15

**Photo No.** 100\_6730

**Point No.** 018

**Description:**

This is a view of dense pine stand at point 018.

**Dominant Vegetation:**

- *Pinus taeda*
- *Pinus virginiana*
- *Liquidambar styraciflua*
- *Carya tomentosa*
- *Lonicera japonica*
- *Ligustrum sinense*



**McGehee Engineering**

**Photographic Log**

**Client Name:**

**Site Location:**

*Mine No. 2*

*Black Warrior Minerals, Inc.*

**Date:** 03-23-15

**Photo No.** 100\_6733

**Point No.** 018

**Description:**

This is a view of dense pine stand at point 018.

**Dominant Vegetation:**

Same as above.



| McGehee Engineering  |                       | Photographic Log   |  |
|--|-----------------------|--|--|
| <b>Client Name:</b>  | <b>Site Location:</b> | <b>Mine No. 2</b>  |  |
| <i>Black Warrior Minerals, Inc.</i>  |                       |  |  |
| <b>Date:</b>   | <i>03-23-15</i>       |  |  |
| <b>Photo No.</b>   | <i>100_6736</i>       |  |  |
| <b>Point No.</b>   | <i>019</i>            |  |  |
| <b>Description:</b>  |                       |  |  |
| <p>This is a view of dense pine stand at point 019.</p>  |                       |  |  |
| <b>Dominant Vegetation:</b>  |                       |  |  |
| <ul style="list-style-type: none"> <li>• <i>Pinus virginiana</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Quercus prinus</i></li> <li>• <i>Quercus rubra</i></li> <li>• <i>Acer rubrum</i></li> </ul> |                       |  |  |

| McGehee Engineering                                     |                       | Photographic Log   |  |
|---|-----------------------|--|--|
| <b>Client Name:</b>                                     | <b>Site Location:</b> | <b>Mine No. 2</b>  |  |
| <i>Black Warrior Minerals, Inc.</i>                     |                       |  |  |
| <b>Date:</b>  | <i>03-23-15</i>       |  |  |
| <b>Photo No.</b>  | <i>100_6738</i>       |  |  |
| <b>Point No.</b>  | <i>019</i>            |  |  |
| <b>Description:</b>                                     |                       |  |  |
| <p>This is a view of dense pine stand at point 019.</p> |                       |  |  |
| <b>Dominant Vegetation:</b>                             |                       |  |  |
| <p>Same as above.</p>                                   |                       |  |  |

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>   |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-23-15  |          |  |                   |
| <b>Photo No.</b>   | 100_6739 |  |                   |
| <b>Point No.</b>   | 020      |  |                   |
| <b>Description:</b><br>This is a view of dense pine stand at point 020.  |          |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Pinus virginiana</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Quercus prinus</i></li> <li>• <i>Prunus serotina</i></li> </ul> |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>              |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-23-15   |          |  |                   |
| <b>Photo No.</b>  | 100_6735 |  |                   |
| <b>Point No.</b>  | 020      |  |                   |
| <b>Description:</b><br>This is a view of dense pine stand at point 020. |          |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.                           |          |  |                   |

**McGehee Engineering**

**Photographic Log**

**Client Name:**

**Site Location:**

**Mine No. 2**

*Black Warrior Minerals, Inc.*



**Date:** 03-24-15

**Photo No.** 100\_6755

**Point No.** 021

**Description:**

This is a view of ephemeral hardwood corridor at point 021.

**Dominant Vegetation:**

- *Quercus alba*
- *Pinus taeda*
- *Fagus grandifolia*
- *Carpinus caroliniana*
- *Ostrya virginiana*
- *Nyssa sylvatica*
- *Quercus prinus*
- *Liriodendron tulipifera*

**McGehee Engineering**

**Photographic Log**

**Client Name:**

**Site Location:**

**Mine No. 2**

*Black Warrior Minerals, Inc.*



**Date:** 03-24-15

**Photo No.** 100\_6758

**Point No.** 021

**Description:**

This is a view of ephemeral hardwood corridor at point 021.

**Dominant Vegetation:**

Same as above.

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>   |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-23-15  |          |  |                   |
| <b>Photo No.</b>   | 100_6742 |  |                   |
| <b>Point No.</b>   | 022      |  |                   |
| <b>Description:</b><br><br>This is a view of dense pine stand at point 022.  |          |  |                   |
| <b>Dominant Vegetation:</b><br><br><ul style="list-style-type: none"> <li>• <i>Pinus virginiana</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Prunus serotina</i></li> <li>• <i>Ligustrum sinense</i></li> <li>• <i>Acer rubrum</i></li> </ul> |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>                                    |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-23-15   |          |  |                   |
| <b>Photo No.</b>  | 100_6743 |  |                   |
| <b>Point No.</b>  | 022      |  |                   |
| <b>Description:</b><br><br>This is a view of the canopy of the dense pine stand at point 022. |          |  |                   |
| <b>Dominant Vegetation:</b><br><br>Same as above.   |          |  |                   |

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>   |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-23-15  |          |  |                   |
| <b>Photo No.</b>   | 100_6747 |  |                   |
| <b>Point No.</b>   | 023      |  |                   |
| <b>Description:</b><br>This is a view of dense pine stand at point 023.  |          |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Pinus virginiana</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Quercus alba</i></li> <li>• <i>Liquidambar styraciflua</i></li> <li>• <i>Prunus serotina</i></li> </ul> |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>              |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-23-15   |          |  |                   |
| <b>Photo No.</b>  | 100_6747 |  |                   |
| <b>Point No.</b>  | 023      |  |                   |
| <b>Description:</b><br>This is a view of dense pine stand at point 023. |          |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.                           |          |  |                   |

| McGehee Engineering  |                 | Photographic Log   |                   |  |
|--|-----------------|--|-------------------|--|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>   |                 | <b>Site Location:</b>  | <i>Mine No. 2</i> |  |
| <b>Date:</b> 03-24-15  |                 |  |                   |  |
| <b>Photo No.</b>   | <i>100_6750</i> |  |                   |  |
| <b>Point No.</b>   | <i>024</i>      |  |                   |  |
| <b>Description:</b><br>This is a view of dense pine stand at point 023.  |                 |  |                   |  |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Pinus virginiana</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Quercus prinus</i></li> <li>• <i>Prunus serotina</i></li> </ul> |                 |  |                   |  |

| McGehee Engineering   |                 | Photographic Log   |                   |  |
|---|-----------------|--|-------------------|--|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>              |                 | <b>Site Location:</b>  | <i>Mine No. 2</i> |  |
| <b>Date:</b> 03-24-15   |                 |  |                   |  |
| <b>Photo No.</b>  | <i>100_6754</i> |  |                   |  |
| <b>Point No.</b>  | <i>024</i>      |  |                   |  |
| <b>Description:</b><br>This is a view of dense pine stand at point 023. |                 |  |                   |  |
| <b>Dominant Vegetation:</b><br>Same as above.                           |                 |  |                   |  |

**McGehee Engineering**

**Photographic Log**

**Client Name:**

**Site Location:**

*Mine No. 2*

*Black Warrior Minerals, Inc.*

**Date:** 03-24-15

**Photo No.** 100\_6759

**Point No.** 025

**Description:**

This is a view of mixed hardwood/ pine valley at point 025.

**Dominant Vegetation:**

- *Quercus alba*
- *Carya ovata*
- *Pinus taeda*
- *Ostrya virginiana*
- *Acer rubrum*
- *Nyssa sylvatica*



**McGehee Engineering**

**Photographic Log**

**Client Name:**

**Site Location:**

*Mine No. 2*

*Black Warrior Minerals, Inc.*

**Date:** 03-24-15

**Photo No.** 100\_6760

**Point No.** 025

**Description:**

This is a view of mixed hardwood/ pine valley at point 025.

**Dominant Vegetation:**

Same as above.



**McGehee Engineering**

**Photographic Log**

**Client Name:**

**Site Location:**

*Mine No. 2*

*Black Warrior Minerals, Inc.*

**Date:** 03-24-15

**Photo No.** 100\_6767

**Point No.** 026

**Description:**

This is a view of mixed hardwood/ pine valley at point 026.

**Dominant Vegetation:**

- *Quercus alba*
- *Ostrya virginiana*
- *Acer saccharum*
- *Liquidambar styraciflua*
- *Cornus florida*
- *Oxydendrum arboreum*
- *Fagus grandifolia*
- *Quercus falcata*
- *Pinus taeda*



**McGehee Engineering**

**Photographic Log**

**Client Name:**

**Site Location:**

*Mine No. 2*

*Black Warrior Minerals, Inc.*

**Date:** 03-24-15

**Photo No.** 100\_6768

**Point No.** 026

**Description:**

This is a view of mixed hardwood/ pine valley at point 026.

**Dominant Vegetation:**

Same as above.



**McGehee Engineering**

**Photographic Log**

**Client Name:**

**Site Location:**

*Mine No. 2*

*Black Warrior Minerals, Inc.*

**Date:** 03-24-15

**Photo No.** 100\_6769

**Point No.** 027

**Description:**

This is a view of dense pine stand at point 027.

**Dominant Vegetation:**

- *Pinus taeda*
- *Pinus virginiana*
- *Carya tomentosa*
- *Quercus alba*
- *Prunus serotina*
- *Liriodendron tulipifera*
- *Juniperus virginiana*



**McGehee Engineering**

**Photographic Log**

**Client Name:**

**Site Location:**

*Mine No. 2*

*Black Warrior Minerals, Inc.*

**Date:** 03-24-15

**Photo No.** 100\_6771

**Point No.** 027

**Description:**

This is a view of dense pine stand at point 027.

**Dominant Vegetation:**

Same as above.



| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>   |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-24-15  |          |  |                   |
| <b>Photo No.</b>   | 100_6776 |  |                   |
| <b>Point No.</b>   | 028      |  |                   |
| <b>Description:</b><br><br>This is a view of dense pine stand at point 028.  |          |  |                   |
| <b>Dominant Vegetation:</b><br><br><ul style="list-style-type: none"> <li>• <i>Pinus virginiana</i></li> <li>• <i>Pinus taeda</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Prunus serotina</i></li> </ul> |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>                  |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-24-15   |          |  |                   |
| <b>Photo No.</b>  | 100_6777 |  |                   |
| <b>Point No.</b>  | 028      |  |                   |
| <b>Description:</b><br><br>This is a view of dense pine stand at point 028. |          |  |                   |
| <b>Dominant Vegetation:</b><br><br>Same as above.                           |          |  |                   |

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>   |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-24-15  |          |  |                   |
| <b>Photo No.</b>   | 100_6787 |  |                   |
| <b>Point No.</b>   | 029      |  |                   |
| <b>Description:</b><br>This is a view of mixed hardwood valley at point 029.   |          |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Quercus alba</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Prunus serotina</i></li> <li>• <i>Ostrya virginiana</i></li> <li>• <i>Acer rubrum</i></li> <li>• <i>Cornus florida</i></li> </ul> |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>                        |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-24-15   |          |  |                   |
| <b>Photo No.</b>  | 100_6788 |  |                   |
| <b>Point No.</b>  | 029      |  |                   |
| <b>Description:</b><br>This is a view of mixed hardwood/pine valley at point 029. |          |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.                                     |          |  |                   |

| McGehee Engineering   |                       | Photographic Log   |  |
|---|-----------------------|--|--|
| <b>Client Name:</b>   | <b>Site Location:</b> | <b>Mine No. 2</b>  |  |
| <i>Black Warrior Minerals, Inc.</i>   |                       |  |  |
| <b>Date:</b>  | <i>03-25-15</i>       |  |  |
| <b>Photo No.</b>  | <i>100_6792</i>       |  |  |
| <b>Point No.</b>  | <i>030</i>            |  |  |
| <b>Description:</b>   |                       |  |  |
| <p>This is a view of dense loblolly pine stand at point 030.</p>  |                       |  |  |
| <b>Dominant Vegetation:</b>   |                       |  |  |
| <ul style="list-style-type: none"> <li>• <i>Pinus virginiana</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Liquidambar styraciflua</i></li> <li>• <i>Quercus rubra</i></li> <li>• <i>Acer rubrum</i></li> </ul> |                       |  |  |

| McGehee Engineering                                     |                       | Photographic Log   |  |
|---|-----------------------|--|--|
| <b>Client Name:</b>                                     | <b>Site Location:</b> | <b>Mine No. 2</b>  |  |
| <i>Black Warrior Minerals, Inc.</i>                     |                       |  |  |
| <b>Date:</b>  | <i>03-25-15</i>       |  |  |
| <b>Photo No.</b>  | <i>100_6793</i>       |  |  |
| <b>Point No.</b>  | <i>030</i>            |  |  |
| <b>Description:</b>                                     |                       |  |  |
| <p>This is a view of dense pine stand at point 030.</p> |                       |  |  |
| <b>Dominant Vegetation:</b>                             |                       |  |  |
| <p>Same as above.</p>                                   |                       |  |  |

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>   |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-25-15  |          |  |                   |
| <b>Photo No.</b>   | 100_6795 |  |                   |
| <b>Point No.</b>   | 031      |  |                   |
| <b>Description:</b><br>This is a view of mixed hardwood/ pine valley at point 031.   |          |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Pinus virginiana</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Quercus alba</i></li> <li>• <i>Quercus stellata</i></li> <li>• <i>Quercus prinus</i></li> <li>• <i>Prunus serotina</i></li> <li>• <i>Pinus taeda</i></li> <li>• <i>Fagus grandifolia</i></li> </ul> |          |  |                   |

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>                         |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-25-15  |          |  |                   |
| <b>Photo No.</b>   | 100_6798 |  |                   |
| <b>Point No.</b>   | 031      |  |                   |
| <b>Description:</b><br>This is a view of mixed hardwood/ pine valley at point 031. |          |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.                                      |          |  |                   |

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>   |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-25-15  |          |  |                   |
| <b>Photo No.</b>   | 100_6810 |  |                   |
| <b>Point No.</b>   | 032      |  |                   |
| <b>Description:</b><br>This is a view of mixed hardwood/pine valley at point 032.  |          |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Pinus virginiana</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Quercus prinus</i></li> <li>• <i>Quercus alba</i></li> <li>• <i>Prunus serotina</i></li> <li>• <i>Quercus falcata</i></li> <li>• <i>Quercus rubra</i></li> <li>• <i>Juniperus virginiana</i></li> </ul> |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>                        |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-25-15   |          |  |                   |
| <b>Photo No.</b>  | 100_6811 |  |                   |
| <b>Point No.</b>  | 032      |  |                   |
| <b>Description:</b><br>This is a view of mixed hardwood/pine valley at point 032. |          |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.                                     |          |  |                   |

| McGehee Engineering   |                 | Photographic Log   |                   |
|---|-----------------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>  |                 | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-26-15   |                 |  |                   |
| <b>Photo No.</b>  | <i>P3260002</i> |  |                   |
| <b>Point No.</b>  | <i>033</i>      |  |                   |
| <b>Description:</b><br>This is a view of mixed hardwood/ pine valley at point 033.  |                 |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Pinus virginiana</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Quercus alba</i></li> <li>• <i>Prunus serotina</i></li> <li>• <i>Acer rubrum</i></li> <li>• <i>Cornus florida</i></li> </ul> |                 |  |                   |

| McGehee Engineering  |                 | Photographic Log   |                   |
|--|-----------------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>                         |                 | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-26-15  |                 |  |                   |
| <b>Photo No.</b>   | <i>P3260006</i> |  |                   |
| <b>Point No.</b>   | <i>033</i>      |  |                   |
| <b>Description:</b><br>This is a view of mixed hardwood/ pine valley at point 033. |                 |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.                                      |                 |  |                   |

**McGehee Engineering****Photographic Log****Client Name:****Site Location:****Mine No. 2***Black Warrior Minerals, Inc.***Date:** 03-26-15**Photo No.** P3260014**Point No.** 034**Description:**

This is a view of mixed hardwood/ pine valley at point 034.

**Dominant Vegetation:**

- *Quercus alba*
- *Carya ovata*
- *Carya tomentosa*
- *Carpinus caroliniana*
- *Ostrya virginiana*
- *Acer saccharum*
- *Liriodendron tulipifera*

**McGehee Engineering****Photographic Log****Client Name:****Site Location:****Mine No. 2***Black Warrior Minerals, Inc.***Date:** 03-26-15**Photo No.** P3260017**Point No.** 034**Description:**

This is a view of mixed hardwood/ pine valley at point 034.

**Dominant Vegetation:**

Same as above.



**McGehee Engineering**

**Photographic Log**

**Client Name:**

**Site Location:**

*Mine No. 2*

*Black Warrior Minerals, Inc.*



**Date:** 03-26-15

**Photo No.** P3260010

**Point No.** 035

**Description:**

This is a view of dense pine stand at point 035.

**Dominant Vegetation:**

- *Pinus virginiana*
- *Carya tomentosa*
- *Quercus falcata*
- *Acer rubrum*

**McGehee Engineering**

**Photographic Log**

**Client Name:**

**Site Location:**

*Mine No. 2*

*Black Warrior Minerals, Inc.*



**Date:** 03-26-15

**Photo No.** P3260013

**Point No.** 035

**Description:**

This is a view of dense pine stand at point 035.

**Dominant Vegetation:**

Same as above.

**McGehee Engineering**

**Photographic Log**

|  |                 |
|--|-----------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i> |                 |
| <b>Date:</b>   | <i>03-26-15</i> |
| <b>Photo No.</b>   | <i>P3260018</i> |
| <b>Point No.</b>   | <i>036</i>      |

|                       |                   |
|-----------------------|-------------------|
| <b>Site Location:</b> | <i>Mine No. 2</i> |
|-----------------------|-------------------|



**Description:**  
This is a view of mixed hardwood/ pine valley at point 036.

- Dominant Vegetation:**
- *Quercus alba*
  - *Carya tomentosa*
  - *Pinus virginiana*
  - *Fagus grandifolia*
  - *Acer rubrum*
  - *Quercus prinus*
  - *Liquidambar styraciflua*

**McGehee Engineering**

**Photographic Log**

|  |                 |
|--|-----------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i> |                 |
| <b>Date:</b>   | <i>03-26-15</i> |
| <b>Photo No.</b>   | <i>P3260018</i> |
| <b>Point No.</b>   | <i>036</i>      |

|                       |                   |
|-----------------------|-------------------|
| <b>Site Location:</b> | <i>Mine No. 2</i> |
|-----------------------|-------------------|



**Description:**  
This is a view of mixed hardwood/ pine valley at point 036.

**Dominant Vegetation:**  
Same as above.

| McGehee Engineering   |  | Photographic Log   |                   |
|---|--|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>  |  | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-23-15   |  |  |                   |
| <b>Photo No.</b> 100_5612   |  |  |                   |
| <b>Point No.</b> 037  |  |  |                   |
| <b>Description:</b><br>This is a view of a radio flyer airport at point 037.                              |  |  |                   |
| <b>Dominant Vegetation:</b><br><ul style="list-style-type: none"> <li><i>Festuca pratensis</i></li> </ul> |  |  |                   |

| McGehee Engineering  |  | Photographic Log   |                   |
|--|--|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>                       |  | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 03-23-15  |  |  |                   |
| <b>Photo No.</b> 100_5615  |  |  |                   |
| <b>Point No.</b> 037   |  |  |                   |
| <b>Description:</b><br>This is a view from the radio flyer airport at point 037. |  |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.                                    |  |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>  |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 10-29-14   |          |  |                   |
| <b>Photo No.</b>  | 100_5184 |  |                   |
| <b>Point No.</b>  | 038      |  |                   |
| <b>Description:</b><br>This is a view of a highwall pond at point 038.  |          |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Acer negundo</i></li> <li>• <i>Albizia julibrissin</i></li> <li>• <i>Pinus taeda</i></li> <li>• <i>Salix nigra</i></li> <li>• <i>Acer rubrum</i></li> </ul> |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>                        |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 10-29-14   |          |  |                   |
| <b>Photo No.</b>  | 100_5190 |  |                   |
| <b>Point No.</b>  | 038      |  |                   |
| <b>Description:</b><br>This is a view of an access road and wetland at point 038. |          |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.                                     |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>  |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 11-04-14   |          |  |                   |
| <b>Photo No.</b>  | 100_5471 |  |                   |
| <b>Point No.</b>  | 039      |  |                   |
| <b>Description:</b><br>This is a view of mixed hardwood valley at point 039.  |          |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Quercus alba</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Quercus prinus</i></li> <li>• <i>Quercus rubra</i></li> <li>• <i>Acer rubrum</i></li> <li>• <i>Acer saccharum</i></li> <li>• <i>Prunus serotina</i></li> </ul> |          |  |                   |

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>                   |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 11-04-14  |          |  |                   |
| <b>Photo No.</b>   | 100_5473 |  |                   |
| <b>Point No.</b>   | 039      |  |                   |
| <b>Description:</b><br>This is a view of mixed hardwood valley at point 039. |          |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.                                |          |  |                   |

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>   |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 11-04-14  |          |  |                   |
| <b>Photo No.</b>   | 100_5463 |  |                   |
| <b>Point No.</b>   | 040      |  |                   |
| <b>Description:</b><br>This is a view of a green field at point 040.   |          |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Pinus virginiana</i></li> <li>• <i>Pinus taeda</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Quercus alba</i></li> <li>• <i>Quercus stellata</i></li> <li>• <i>Quercus prinus</i></li> <li>• <i>Quercus rubra</i></li> <li>• <i>Acer rubrum</i></li> </ul> |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>        |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 11-04-14   |          |  |                   |
| <b>Photo No.</b>  | 100_5468 |  |                   |
| <b>Point No.</b>  | 040      |  |                   |
| <b>Description:</b><br>This is a view of vegetation at point 040. |          |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.                     |          |  |                   |

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>   |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 11-05-14  |          |  |                   |
| <b>Photo No.</b>   | 100_5503 |  |                   |
| <b>Point No.</b>   | 041      |  |                   |
| <b>Description:</b><br>This is a view of mixed hardwood stand along an ephemeral drain at point 041.   |          |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Liquidambar styraciflua</i></li> <li>• <i>Quercus alba</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Quercus prinus</i></li> <li>• <i>Quercus rubra</i></li> <li>• <i>Acer rubrum</i></li> </ul> |          |  |                   |

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>   |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 11-05-14  |          |  |                   |
| <b>Photo No.</b>   | 100_5504 |  |                   |
| <b>Point No.</b>   | 041      |  |                   |
| <b>Description:</b><br>This is a view of mixed hardwood stand along an ephemeral drain at point 041. |          |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.  |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>  |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 10-30-14   |          |  |                   |
| <b>Photo No.</b>  | 100_5320 |  |                   |
| <b>Point No.</b>  | 042      |  |                   |
| <b>Description:</b><br>This is a view of high wall pond at point 042.   |          |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Pinus virginiana</i></li> <li>• <i>Pinus taeda</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Acer rubrum</i></li> </ul> |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>                                |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 10-30-14   |          |  |                   |
| <b>Photo No.</b>  | 100_5323 |  |                   |
| <b>Point No.</b>  | 042      |  |                   |
| <b>Description:</b><br>This is a view of the vegetation at a high wall pond at point 042. |          |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.   |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>  |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 10-31-14   |          |  |                   |
| <b>Photo No.</b>  | 100_5337 |  |                   |
| <b>Point No.</b>  | 043      |  |                   |
| <b>Description:</b><br>This is a view of green field in an area of previous clear cutting at point 043.   |          |  |                   |
| <b>Dominant Vegetation:</b>   |          |  |                   |
| <ul style="list-style-type: none"> <li>• <i>Pinus virginiana</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Rhus glabra</i></li> <li>• <i>Pinus taeda</i></li> <li>• <i>Acer rubrum</i></li> </ul> |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>  |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 10-31-14   |          |  |                   |
| <b>Photo No.</b>  | 100_5340 |  |                   |
| <b>Point No.</b>  | 043      |  |                   |
| <b>Description:</b><br>This is a view of green field in an area of previous clear cutting at point 043. |          |  |                   |
| <b>Dominant Vegetation:</b>   |          |  |                   |
| Same as above.  |          |  |                   |

| McGehee Engineering   |                 | Photographic Log   |                   |
|---|-----------------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>  |                 | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 11-20-14   |                 |  |                   |
| <b>Photo No.</b>  | <i>IMG_4134</i> |  |                   |
| <b>Point No.</b>  | <i>044</i>      |  |                   |
| <b>Description:</b><br>This is a view of intermittent drain at point 044.   |                 |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Pinus taeda</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Quercus prinus</i></li> <li>• <i>Quercus rubra</i></li> <li>• <i>Acer rubrum</i></li> </ul> |                 |  |                   |

| McGehee Engineering   |                 | Photographic Log   |                   |
|---|-----------------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>                |                 | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 11-20-14   |                 |  |                   |
| <b>Photo No.</b>  | <i>IMG_4140</i> |  |                   |
| <b>Point No.</b>  | <i>044</i>      |  |                   |
| <b>Description:</b><br>This is a view of intermittent drain at point 044. |                 |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.                             |                 |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>  |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 10-31-14   |          |  |                   |
| <b>Photo No.</b>  | 100_5357 |  |                   |
| <b>Point No.</b>  | 045      |  |                   |
| <b>Description:</b><br><br>This is a view of and NPDES permitted pond at point 045.   |          |  |                   |
| <b>Dominant Vegetation:</b><br><br><ul style="list-style-type: none"> <li>• <i>Pinus virginiana</i></li> <li>• <i>Carya tomentosa</i></li> <li>• <i>Quercus prinus</i></li> <li>• <i>Quercus rubra</i></li> <li>• <i>Acer rubrum</i></li> </ul> |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>                          |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 10-31-14   |          |  |                   |
| <b>Photo No.</b>  | 100_5368 |  |                   |
| <b>Point No.</b>  | 045      |  |                   |
| <b>Description:</b><br><br>This is a view of and NPDES permitted pond at point 045. |          |  |                   |
| <b>Dominant Vegetation:</b><br><br>Same as above.                                   |          |  |                   |

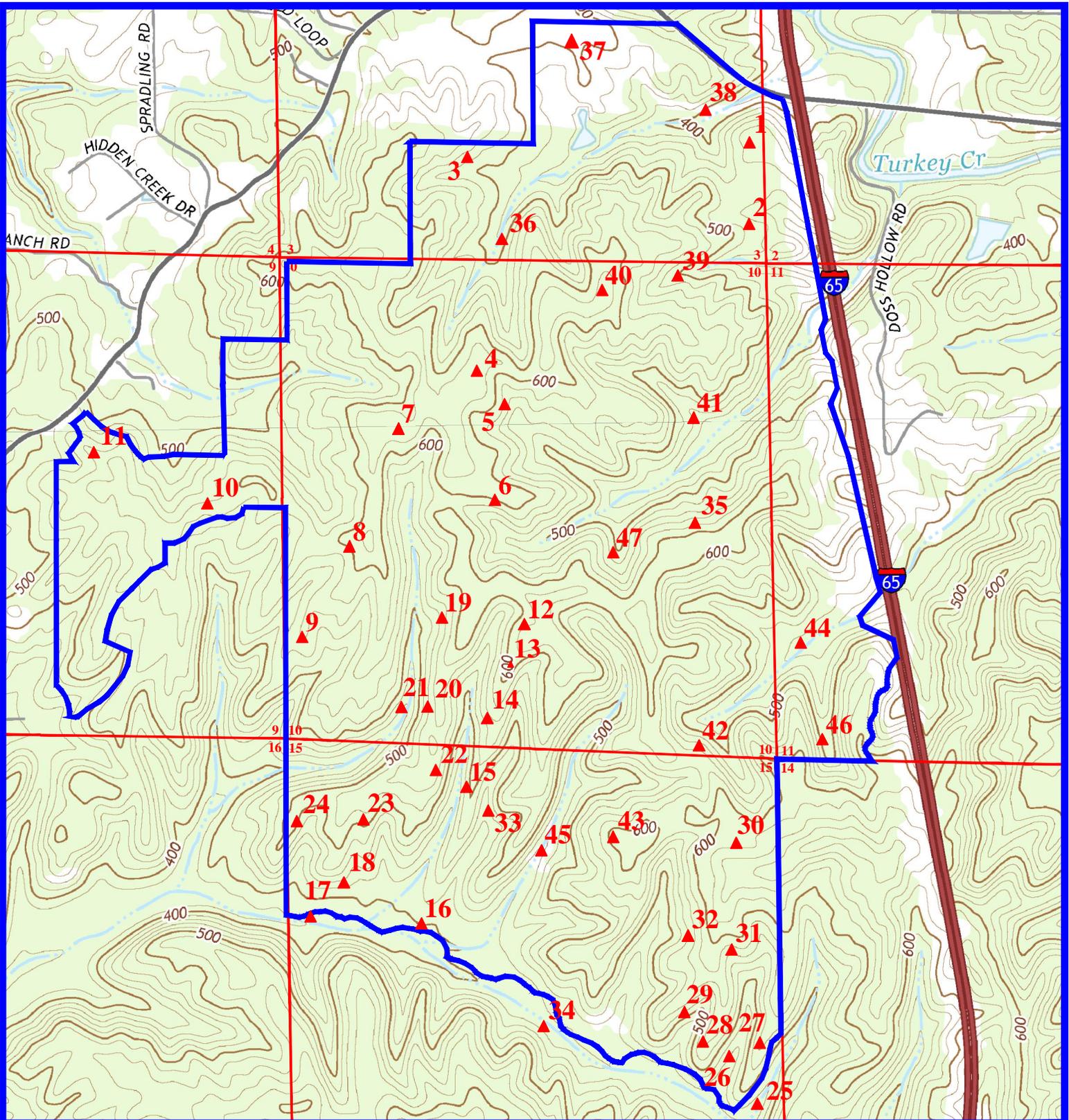
| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>   |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 11-06-14  |          |  |                   |
| <b>Photo No.</b>   | 100_5597 |  |                   |
| <b>Point No.</b>   | 046      |  |                   |
| <b>Description:</b><br>This is a view of the mixed hardwood stand at point 046.  |          |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Quercus alba</i></li> <li>• <i>Carya ovata</i></li> <li>• <i>Quercus prinus</i></li> <li>• <i>Quercus rubra</i></li> <li>• <i>Acer rubrum</i></li> </ul> |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>                    |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 11-06-14   |          |  |                   |
| <b>Photo No.</b>  | 100_5601 |  |                   |
| <b>Point No.</b>  | 046      |  |                   |
| <b>Description:</b><br>This is a view of the intermittent drain at point 046. |          |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.                                 |          |  |                   |

| McGehee Engineering  |          | Photographic Log   |                   |
|--|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>   |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 11-05-14  |          |  |                   |
| <b>Photo No.</b>   | 100_5533 |  |                   |
| <b>Point No.</b>   | 047      |  |                   |
| <b>Description:</b><br>This is a view of a mixed hardwood stand along and ephemeral drain at point 047.  |          |  |                   |
| <b>Dominant Vegetation:</b> <ul style="list-style-type: none"> <li>• <i>Quercus alba</i></li> <li>• <i>Carya ovata</i></li> <li>• <i>Quercus prinus</i></li> <li>• <i>Quercus rubra</i></li> <li>• <i>Acer rubrum</i></li> <li>• <i>Liriodendron tulipifera</i></li> </ul> |          |  |                   |

| McGehee Engineering   |          | Photographic Log   |                   |
|---|----------|--|-------------------|
| <b>Client Name:</b><br><i>Black Warrior Minerals, Inc.</i>  |          | <b>Site Location:</b>  | <i>Mine No. 2</i> |
| <b>Date:</b> 11-05-14   |          |  |                   |
| <b>Photo No.</b>  | 100_5536 |  |                   |
| <b>Point No.</b>  | 047      |  |                   |
| <b>Description:</b><br>This is a view of a mixed hardwood stand along and ephemeral drain at point 047. |          |  |                   |
| <b>Dominant Vegetation:</b><br>Same as above.   |          |  |                   |

# **Appendix C — Photo Log Point Location Map**



SCALE: 1" = 1500'  
 April 15th, 2015  
 Map Size: 8.5"x11"

**BLACK WARRIOR MINERALS, INC.**  
**MINE NO. 2**  
 (APPROXIMATELY 1,368 ACRES TOTAL)



**PHOTOGRAGHC LOG POINTS**

SECTIONS 2, 3, 9, 10, 11, & 15, TOWNSHIP 15 SOUTH, RANGE 3 WEST,  
 ALL IN JEFFERSON COUNTY, ALABAMA  
 AS FOUND ON THE GARDENDALE (2014) & WARRIOR (2014)  
 ALABAMA USGS QUAD.



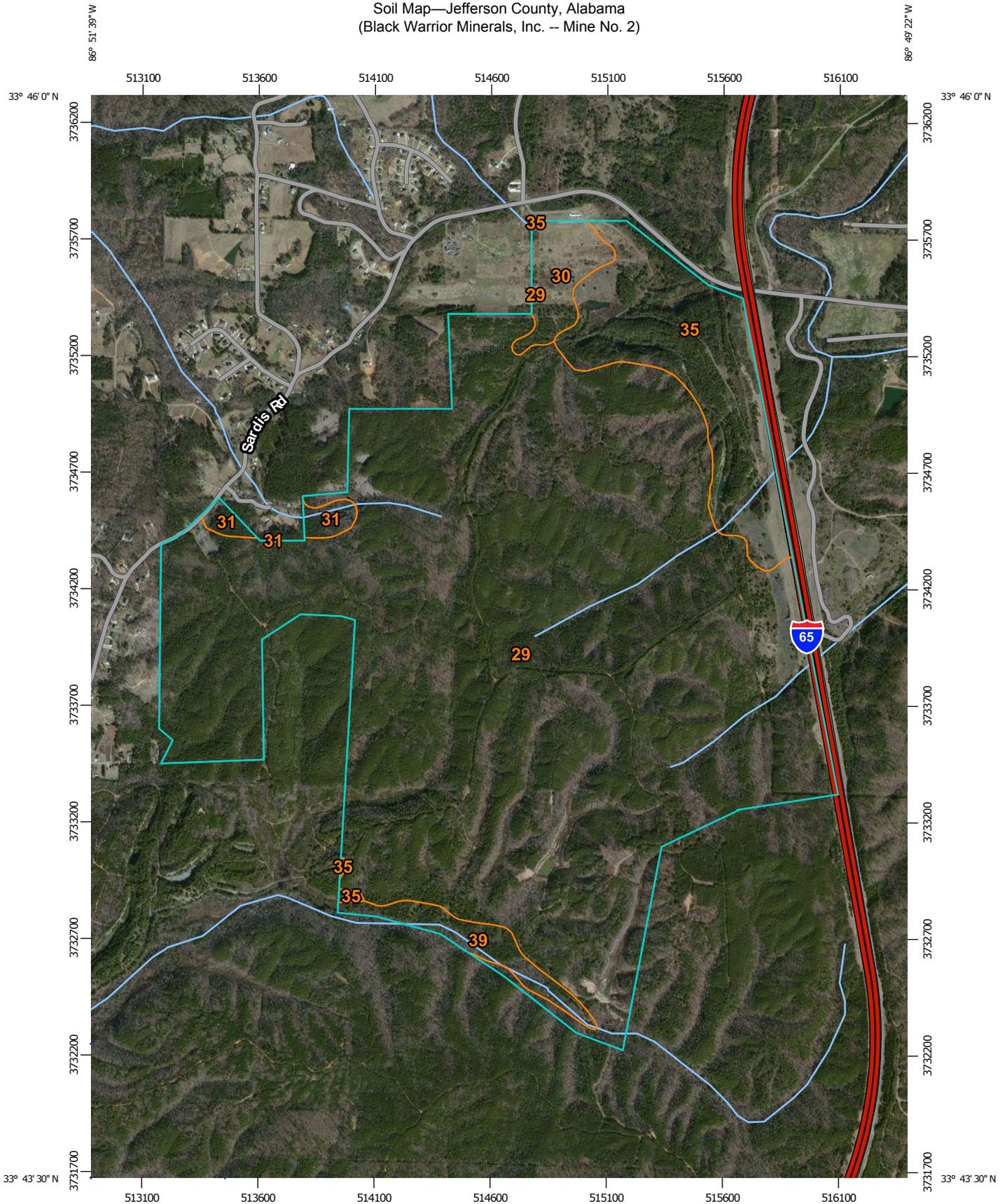
- PROJECT BOUNDARY
- ▲ PHOTOGRAGHC LOG POINTS

Latitude: 33°44'47" N  
 Longitude: 86°50'20" W

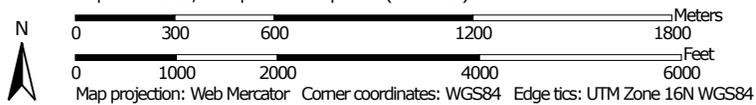
# Appendix D — Soil Map

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Soil Map—Jefferson County, Alabama  
(Black Warrior Minerals, Inc. -- Mine No. 2)



Map Scale: 1:22,700 if printed on A portrait (8.5" x 11") sheet.



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Jefferson County, Alabama

Survey Area Data: Version 7, Sep 15, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 13, 2011—Mar 17, 2011

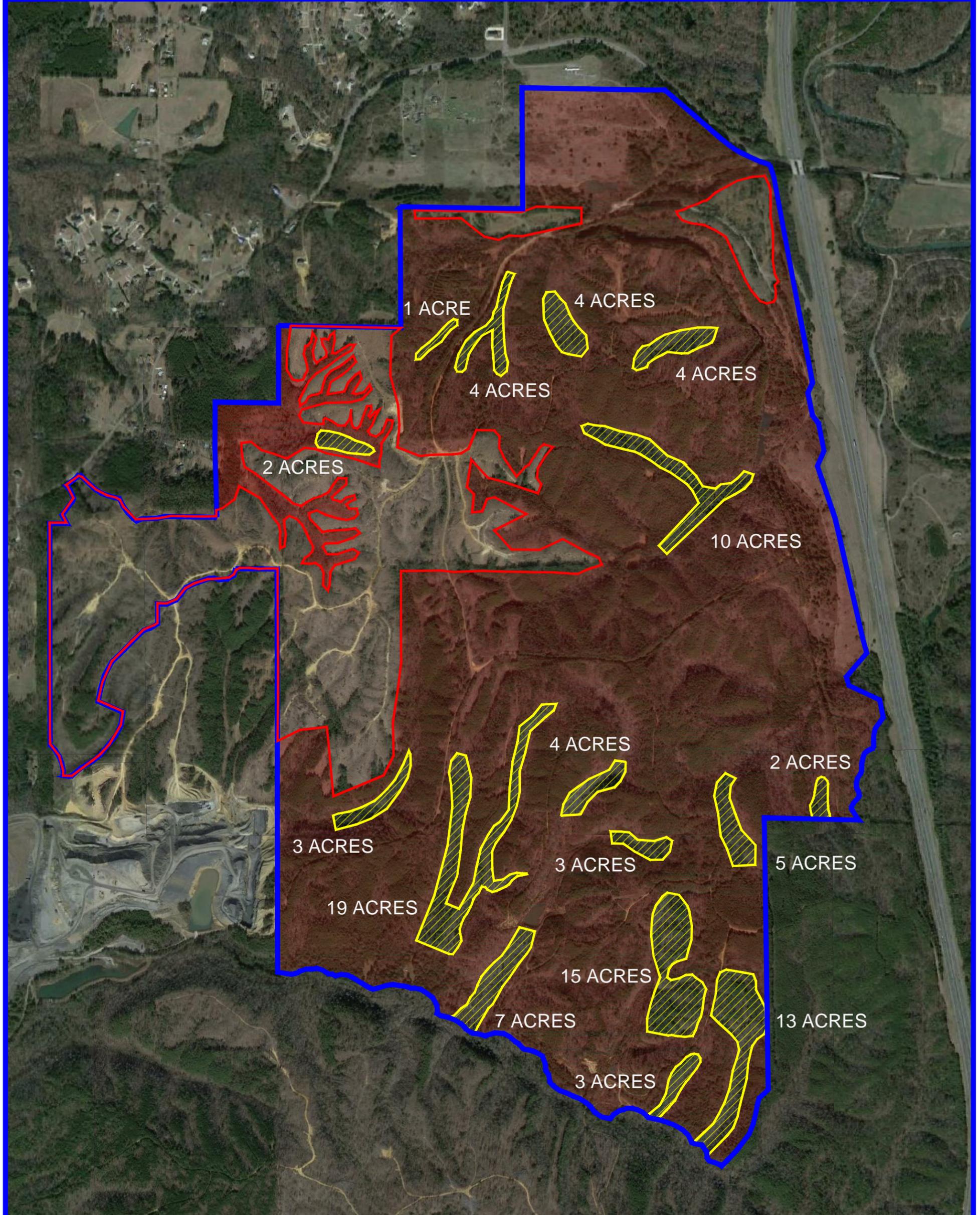
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

| Jefferson County, Alabama (AL073)  |  |                |                |
|------------------------------------|--|----------------|----------------|
| Map Unit Symbol                    | Map Unit Name                                  | Acres in AOI   | Percent of AOI |
| 29                                 | Montevallo-Nauvoo association, steep           | 1,201.0        | 84.6%          |
| 30                                 | Nauvoo fine sandy loam, 2 to 8 percent slopes  | 31.2           | 2.2%           |
| 31                                 | Nauvoo fine sandy loam, 8 to 15 percent slopes | 12.6           | 0.9%           |
| 35                                 | Palmerdale complex, steep                      | 146.5          | 10.3%          |
| 39                                 | Sullivan-State complex, 0 to 2 percent slopes  | 28.6           | 2.0%           |
| <b>Totals for Area of Interest</b> |  | <b>1,419.9</b> | <b>100.0%</b>  |

# Appendix E — Potential Bat Summer Roosting Habitat Map

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SCALE: 1" = 1000'  
 April 15th, 2015  
 Map Size: 8.5"x11"

**BLACK WARRIOR MINERALS, INC.**  
**MINE NO. 2**  
 (APPROXIMATELY 1,368 ACRES TOTAL)



**POTENTIAL SUMMER ROOSTING  
 HABITAT ASSESSMENT MAP**

SECTIONS 2, 3, 9, 10, 11, & 15, TOWNSHIP 15 SOUTH, RANGE 3 WEST,  
 ALL IN JEFFERSON COUNTY, ALABAMA  
 AS FOUND ON THE GARDENDALE (1979) & WARRIOR (1986)  
 ALABAMA USGS QUAD.



- PROJECT BOUNDARY (1368 Acres)
- POTENTIAL SUMMER ROOSTING HABITAT (99 Acres)
- NON-POTENTIAL SUMMER ROOSTING HABITAT (1,005 Acres)
- CLEAR CUT AREA (264 Acres)

Latitude: 33°44'47" N  
 Longitude: 86°50'20" W

# Appendix F — Dominant Vegetation Plot Summary

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## Summer Habitat - Assessment

### Point Exam Summary

| Point ID | Primary Tree Species   | Basal Area/Acre | Average Size (DBH)   | Description/ Landscape Position      |
|----------|--|-----------------|--|--------------------------------------|
| 1        | N/A  | N/A             | N/A  | Clear Cut Area                       |
| 2        | N/A  | N/A             | N/A  | Clear Cut Area                       |
| 3        | N/A  | N/A             | N/A  | Clear Cut Area                       |
| 4        | N/A  | N/A             | N/A  | Clear Cut Area                       |
| 5        | N/A  | N/A             | N/A  | Clear Cut Area                       |
| 6        | N/A  | N/A             | N/A  | Clear Cut Area                       |
| 7        | N/A  | N/A             | N/A  | Clear Cut Area                       |
| 8        | N/A  | N/A             | N/A  | Clear Cut Area                       |
| 9        | N/A  | N/A             | N/A  | Clear Cut Area                       |
| 10       | N/A  | N/A             | N/A  | Clear Cut Area                       |
| 11       | N/A  | N/A             | N/A  | Clear Cut Area                       |
| 12       | Pinus taeda, Liriodendron tulipifera, Carya tomentosa, Quercus rubra, Quercus falcata, Prunus serotina, Pinus virginiana, Cornus florida | 111             | 14.3 Pt<br>3.44 Lt<br>2.36 Ct<br>2.96 Qr<br>4.33 Qf<br>2.64 Ps<br>5.09 Pv<br>2.23 Cf | Mixed Mature Deciduous/Pine          |
| 13       | Pinus virginiana, Carya tomentosa, Quercus prinus  | 77              | 3.72 Pv<br>1.39 Ct<br>2.61 Qp  | Pine Stand<br>(5-15 Years Old)       |
| 14       | Liquidambar styraciflua, Fagus grandifolia, Pinus virginiana, Prunus serotina, Quercus rubra, Quercus prinus                             | 62              | 2.86 Ls<br>0.83 Fg<br>3.79 Pv<br>2.23 Ps<br>2.23 Qr<br>3.63 Qp                       | Mixed Mature Deciduous/Pine          |
| 15       | Pinus virginiana, Prunus serotina, Quercus rubra, Quercus alba, Carya tomentosa, Pinus taeda   | 106             | 4.04 Pv<br>2.15 Ps<br>4.71 Qr<br>1.91 Qa<br>1.61 Ct<br>10.19 Pt                      | Pine Stand<br>(10-15 Years Old)      |
| 16       | Pinus taeda, Pinus virginiana, Liquidambar styraciflua, Prunus serotina  | 102             | 7.19 Pt<br>5.35 Pv<br>3.5 Ls<br>2.86 Ps  | Mature Pine Stand<br>(30+ Years Old) |
| 17       | Quercus alba, Nyssa sylvatica, Carpinus caroliniana, Ostrya virginiana, Quercus rubra, Fagus grandifolia, Acer rubrum                    | 116             | 12.89 Qa<br>13.24 Ns<br>2.26 Cc<br>2.31 Ov<br>7.96 Qr<br>1.15 Fg<br>1.05 Ar          | Mixed Mature Deciduous               |
| 18       | Pinus taeda, Pinus virginiana, liquidambar styraciflua, Carya tomentosa  | 72              | 7.00 Pt<br>2.61 Pv<br>1.43 Ls<br>1.31 Ct   | Pine Stand<br>(5-15 Years Old)       |
| 19       | Pinus virginiana, Carya tomentosa, Acer rubrum, Quercus prinus, Quercus rubra  | 74              | 3.98 Pv<br>1.08 Ct<br>0.64 Ar<br>2.74 Qp<br>2.55 Qr                                  | Pine Stand<br>(5-15 Years Old)       |
| 20       | Pinus virginiana, Carya tomentosa, Prunus serotina, Quercus prinus   | 124             | 4.77 Pv<br>0.99 Ct<br>2.55 Ps<br>2.07 Qp   | Pine Stand<br>(5-15 Years Old)       |

|    |   |     |   |  |
|----|---|-----|---|--|
| 21 | Quercus alba, Pinus taeda, Fagus grandifolia, Ostrya virginiana, Nyssa sylvatica, Quercus prinus, Carpinus caroliniana, Liriodendron Tulipifera | 124 | 5.22 Qa<br>19.10 Pt<br>1.08 Fg<br>1.51 Ov<br>14.32 Ns<br>1.15 Qp<br>1.59 Cc<br>10.50 Lt | Mixed Mature Deciduous                               |
| 22 | Pinus virginiana, Prunus serotina, Carya tomentosa, Acer rubrum, Liquidambar styraciflua,   | 102 | 4.39 Pv<br>3.18 Ps<br>1.52 Ct<br>0.67 Ar<br>1.27 Ls                                     | Pine Stand<br>(10-15 Years Old)                      |
| 23 | Pinus virginiana, Carya tomentosa, Liquidambar styraciflua, Quercus alba, Prunus serotina   | 118 | 3.91 Pv<br>1.24 Ct<br>1.46 Ls<br>2.28 Qa<br>4.14 Ps                                     | Pine Stand<br>(10-15 Years Old)                      |
| 24 | Pinus virginiana, Carya tomentosa, Prunus serotina, Quercus prinus  | 186 | 4.23 Pv<br>1.37 Ct<br>3.58 Ps<br>3.34 Qp  | Pine Stand<br>(10-20 Years Old)                      |
| 25 | Quercus alba, Ostrya virginiana, Pinus taeda, Acer rubrum, Carya tomentosa, Carpinus caroliniana, Nyssa sylvatica                               | 143 | 16.74 Qa<br>2.18 Ov<br>3.92 Pt<br>1.62 Ar<br>0.95 Ct<br>1.27 Cc<br>8.44 Ns              | Mixed Mature Deciduous/Pine                          |
| 26 | Quercus alba, Ostrya virginiana, Acer saccharum, Cornus florida, Liquidambar styraciflua  | 66  | 12.89 Qa<br>2.81 Ov<br>2.05 As<br>1.75 Cf<br>10.19 Ls                                   | Mixed Mature Deciduous                               |
| 27 | Pinus taeda, Pinus virginiana, Carya tomentosa, Carya glabra, Quercus alba, Fagus grandifolia, Prunus serotina, Cornus florida                  | 74  | 3.50 Pt<br>3.65 Pv<br>2.09 Ct<br>2.12 Cg<br>0.89 Qa<br>1.03 Fg<br>5.73 Ps<br>1.17 Cf    | Pine Stand w/Emerging Hardwoods<br>(10-20 Years Old) |
| 28 | Pinus taeda, Pinus virginiana, Prunus serotina, Carya tomentosa   | 158 | 8.59 Pt<br>4.17 Pv<br>3.98 Ps<br>0.80 Ct  | Pine Stand<br>(10-20 Years Old)                      |
| 29 | Quercus alba, Carya tomentosa, Acer rubrum, Ostrya virginiana, Cornus florida, Prunus serotina  | 68  | 5.97 Qa<br>6.94 Ct<br>1.20 Ar<br>3.66 Ov<br>3.58 Cf<br>0.64 Ps                          | Mixed Mature Deciduous                               |
| 30 | Pinus virginiana, Carya tomentosa, Liquidambar styraciflua,   | 104 | 3.52 Pv<br>0.86 Ct<br>0.95 Ls   | Pine Stand<br>(5-15 Years Old)                       |
| 31 | Quercus alba, Carya tomentosa, Prunus serotina, Quercus prinus, Pinus virginiana, Pinus taeda   | 111 | 4.64 Qa<br>1.10 Ct<br>3.82 Ps<br>14.32 Qp<br>3.44 Pv<br>4.77 Pt                         | Mixed Mature Deciduous/Pine                          |

|    |   |     |   |                                 |
|----|---|-----|---|---------------------------------|
| 32 | Quercus alba, Quercus prinus, Carya tomentosa, Prunus serotina, Pinus virginiana  | 64  | 6.64 Qa<br>7.16 Qp<br>1.33 Ct<br>2.39 Ps<br>2.90 Pv                                   | Mixed Mature Deciduous/Pine     |
| 33 | Quercus alba, Carya tomentosa, Acer rubrum, Prunus serotina, Cornus florida, Pinus virginiana   | 91  | 7.21 Qa<br>2.00 Ct<br>1.85 Ar<br>4.30 Ps<br>1.21 Cf<br>3.29 Pv                        | Mixed Mature Deciduous/Pine     |
| 34 | Quercus alba, Pinus taeda, Liriodendron tulipifera, Carpinus caroliniana, Ostrya virginiana, Acer saccharum, Carya tomentosa, Carya ovata | 146 | 8.41 Qa<br>10.06 Pt<br>3.10 Lt<br>1.27 Cc<br>3.13 Ov<br>1.19 As<br>3.34 Ct<br>9.23 Co | Mixed Mature Deciduous/Pine     |
| 35 | Pinus virginiana, Acer rubrum, Carya tomentosa, Quercus falcata   | 97  | 4.66 Pv<br>2.55 Ar<br>1.81 Ct<br>2.90 Qf  | Pine Stand<br>(10-20 Years Old) |
| 36 | Quercus alba, Pinus virginiana, Acer rubrum, Fagus grandifolia, Quercus prinus, Liquidambar styraciflua, Carya tomentosa                  | 160 | 10.01 Qa<br>16.87 Pv<br>0.77 Ar<br>0.64 Fg<br>6.49 Qp<br>3.18 Ls<br>0.89 Ct           | Mixed Mature Deciduous          |
| 37 | N/A   | N/A | N/A   | Clear Cut Area                  |
| 38 | N/A   | N/A | N/A   | Ponded Area                     |
| 45 | N/A   | N/A | N/A   | Ponded Area                     |

|  |   |
|--|---|
| Plots<br>13, 15, 16, 18,<br>19, 20, 22, 23,<br>24, 27, 28, 30,<br>35, 40*, 42*, 43*  | <b>Assessment:</b> Due to a lack of trees with exfoliating bark, cavities, and crevices, relatively small tree size, and stocking rates that provide no allowance for flight through these stands (except along access roads); these areas do not constitute potential summer roosting habitat. |
| Plots<br>12, 14, 44*, 47*  | <b>Assessment:</b> Due to a lack of trees with exfoliating bark, cavities, and crevices, relatively small tree size, and stocking rates that provide no allowance for flight through these stands (except along access roads); these areas do not constitute potential summer roosting habitat. |
| Plots<br>25, 31, 32, 33<br>34, 41*   | <b>Assessment:</b> Due to the abundance of snags in and around these plots, an abundance of trees with exfoliating bark and cavities, and relatively large tree size these areas do constitute potential summer roosting habitat.   |
| Plots<br>17, 21, 26, 29,<br>36, 39*, 46*   | <b>Assessment:</b> Due to the abundance of snags in and around these plots, an abundance of trees with exfoliating bark and cavities, and relatively large tree size these areas do constitute potential summer roosting habitat.   |
| Plots<br>1-11, 37*, 38*,<br>45*  | <b>Assessment:</b> These areas are non-forested (clear-cut and ponded areas) and do not constitute potential summer roosting habitat.   |
| * Note: These points did not have a plot assessment performed on them. However, they are similarly vegetated by species and size to the other plots they are currently grouped with, and represent the same type of habitat. All points are represented in the photographic log. |   |