

**ENDANGERED AND THREATENED SPECIES
PRELIMINARY BIOLOGICAL ASSESSMENT REPORT**

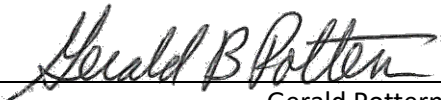
**ORANGEBURG QUARRY
EUTAWVILLE, ORANGEBURG COUNTY, SOUTH CAROLINA**

AUGUST 31, 2023

PREPARED FOR:



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- USFWS Letter, April 17, 2023
- SCNHP Letter, May 28, 2023
- Northern Long-eared Bat Effect Determination Letter, August 10, 2023

1.0 SITE DESCRIPTION

Vulcan Materials Company (VMC) contracted with SynTerra Corporation (SynTerra) to evaluate potential habitats and presence of endangered and threatened animal and plant species on an 810-acre undeveloped site where VMC is proposing to establish a limestone quarry in eastern Orangeburg County, South Carolina (**Figure 1**). The proposed Orangeburg Quarry study area (Site) is located in the coastal plain region, 4 miles southeast of Eutawville and 10 miles southwest of Lake Marion Dam. A gravel road leading eastward from Addidas Street at latitude 33.3566, longitude -80.2958 provides access to the Site. Topography on the Site ranges from approximately 85 to 95 feet in elevation (**Figure 2**).

The majority of the Site northeast of Addidas Street (700 acres) was used as a hunting club for the past several decades. This portion presently includes approximately 200 acres of fields managed as wildlife food plots, 200 acres of young pine forest less than 30 years old (former fields), and 300 acres of mature hardwood and pine forests greater than 60 years old. The remainder of the Site is southwest of Addidas Street (110 acres) and was mostly mature mixed pine and hardwood forest until it was clear-cut in 2015. This area presently contains dense sapling forest (mixed hardwood and pine) and shrub-scrub habitat. Aerial imagery of the Site is provided in **Figure 3**. The surrounding properties include forest and rural residential lands. An existing quarry operated by Martin Marietta is located 1 mile east of the Site.

Predominant soils on the Site are Goldsboro sandy loam, Lynchburg fine sandy loam, Coxville sandy loam, Rains sandy loam, Mouzon fine sandy loam, Stallings loamy sand, and Byars loam, which together comprise 90 percent of the United States Department of Agriculture (USDA) soil mapping units (**Figure 4**). Other minor soil series mapped on the Site are Blanton sand, Bonneau sand, Ellore loamy sand, Noboco loamy sand, Ocilla loamy sand, and Pantego fine sandy loam, each of which comprises 2.5 percent or less of the total area. Two-thirds of the total area has mapped soils that are associated with upland habitats (non-hydric or mostly non-hydric), and one-third of the total area has mapped soils likely to support wetland habitats (hydric, mostly hydric, or partially hydric) (**Table 1**).

The Site is drained by extensive ditches and unnamed headwater tributaries of Sandy Run, which flow southward into Four Hole Swamp and then to the Edisto River [United States Geological Survey (USGS) HUC # 03050205-0201]. The largest tributary flows onto the property through a culvert beneath Wyman Road at the northwest corner of the Site and then flows southeastward for approximately 8,000 feet to a culvert under Addidas Street where it leaves the Site. The upper 6,000-foot reach (upstream of the Site access road) flows through a 68-acre hardwood swamp wetland (**Figure 5**). Several smaller wetlands not directly adjacent to tributaries are located on the southern portions of the Site both east and west of Addidas Street. Those wetlands range from less than 1 acre to 10 acres; some of them appear to be limestone sinkhole pools. A wetland delineation and mapping were prepared in 2019 by another consultant.

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Vulcan Materials Company

Orangeburg Quarry, Eutawville, South Carolina

Table 1. Soil Mapping Units and Hydric Soil Classifications

| Orangeburg County, South Carolina (SC075) — USDA Web Soil Survey | | | | | |
|--|--|--------------|----------|-------------------|-----------|
| Map Symbol | Map Unit Name | Acres in AOI | % of AOI | Hydric Soil Class | % Hydric |
| BIB | Blanton sand, 0 to 6 percent slopes | 16.3 | 2.0 | Mostly Non-Hydric | 5 to 33 |
| BoB | Bonneau sand, 0 to 4 percent slopes | 5.7 | 0.7 | Mostly Non-Hydric | 5 to 33 |
| By | Byars loam | 41.4 | 5.0 | Hydric | 95 to 100 |
| Cx | Coxville sandy loam | 83.5 | 10.1 | Hydric | 95 to 100 |
| Eo | Ellore loamy sand | 2.6 | 0.3 | Mostly Hydric | 66 to 95 |
| GoA | Goldsboro sandy loam, 0 to 2 percent slopes | 337.0 | 40.9 | Non-Hydric | 0 to 5 |
| Ly | Lynchburg fine sandy loam, 0 to 2 percent slopes | 107.4 | 13.0 | Mostly Non-Hydric | 5 to 33 |
| Mo | Mouzon fine sandy loam | 50.8 | 6.2 | Partially Hydric | 33 to 66 |
| NoA | Noboco loamy sand, 0 to 2 percent slopes | 20.1 | 2.4 | Non-Hydric | 0 to 5 |
| OcA | Ocilla loamy sand, 0 to 2 percent slopes | 18.1 | 2.2 | Mostly Non-Hydric | 5 to 33 |
| Pa | Pantego fine sandy loam | 12.3 | 1.5 | Hydric | 95 to 100 |
| RnA | Rains sandy loam, 0 to 2 percent slopes | 87.9 | 10.7 | Mostly Hydric | 66 to 95 |
| Sa | Stallings loamy sand | 40.7 | 4.9 | Mostly Non-Hydric | 5 to 33 |
| Totals for Area of Interest | | 823.8 | 100.0 | | |

Notes:

Soil mapping units from USDA Web Soil Survey. Source: <https://websoilsurvey.nrcs.usda.gov/app/>

AOI – area of Interest

2.0 PROPOSED PROJECT AND LAND USE CHANGES

The proposed quarry pit, entrance area, office, shop, and overburden storage area will occupy approximately 460 acres on the eastern portion of the site and will involve clearing approximately 90 acres of mature mixed hardwood and pine forests (greater than 30 years old) mostly along the southern edge of the Site. The other 370 acres that will be affected by the quarry are existing fields and young pine plantation forests less than 30 years old.

No disturbance is planned for the swamp wetland and surrounding upland forest on the northwestern portion of the site, which occupies approximately 185 acres. Also, the 12-acre wetland forest area along the southeastern property line will not be disturbed. The 110-acre portion southwest of Addidas Street that was clearcut in 2015 and presently contains sapling forest may be disturbed for a future expansion of the quarry.

3.0 PROTECTED SPECIES AND HABITAT EVALUATIONS

The U.S. Fish & Wildlife Service (USFWS) Information, Planning, and Consultation System (IPaC) lists four species of animals and plants listed or proposed for listing as Endangered or Threatened under the federal Endangered Species Act (ESA) that are known to occur in the general project vicinity and could be affected directly or indirectly by the project (USFWS letter attached, April 17, 2023). The IPaC letter also identifies the monarch butterfly as a candidate for potential listing, but it is not proposed for listing and is not addressed further in this report. The South Carolina Department of Natural Resources (SCDNR) website identifies eight additional species known from Orangeburg County that are listed as Endangered or Threatened under either federal or state laws. Those 12 species are listed in **Table 2** below with their federal and state protection status and brief habitat description.

The ESA regulates the “take” of federal-listed species. “Take” according to the ESA includes incidental impacts from land development activities to federal-listed species. State-listed species are protected from intentional killing, collecting, and trade, but SCDNR laws do not regulate incidental impacts or habitat damage from land development activities. However, SCDNR encourages private landowners and land developers to avoid and minimize impacts to state-listed species to the extent practicable. The SC Department of Health and Environmental Control (SCDHEC) may consider measures to reduce impacts to state-listed species when issuing permits.

A data request was submitted to the South Carolina Natural Heritage Program (SCNHP) for rare species records within 5 miles of the Site. SynTerra environmental scientists Gerald Pottern and Brian McGann conducted a habitat evaluation for protected species in the quarry expansion area on April 19-20, 2023. This was a follow-up to a preliminary habitat survey conducted in June 2021 during which SynTerra staff noted habitat types and quality on the eastern portion of

the Site but did not conduct targeted surveys for listed species or document findings in a report.

The survey results and potential effects on each federal protected species due to quarry construction and operation are discussed below using the three USFWS effect determination categories as defined in the Endangered Species Consultation Handbook. The categories are defined as follows:

- "No effect" means that there will be no positive or negative effect to that species from the potential project.
- "May affect, but not likely to adversely affect" means that the potential project effects are beneficial, insignificant, or extremely unlikely to occur (discountable).
- "May affect, likely to adversely affect" means that the project may cause direct or indirect harm to individuals of that species.

Further discussion of these potential effects and measures to avoid and minimize adverse effects are provided where appropriate but are limited by the uncertainty of occurrence of some species. The USFWS effect determination categories legally apply only to federal-listed species. For state-listed species, SCDNR does not have an equivalent rating system for determining potential effects, but this report uses the following effect categories:

- "None" means that there will be no positive or negative potential effect on that species from the project.
- "Low Potential" means that there may be some localized negative effect on that species from the project, if the species occurs on the Site, but the affected habitat is a minor component of the total habitat available, less than 10% by area.
- "Moderate Potential" means that there may be some negative effect on that species from the project, if the species occurs on the Site, and the affected habitat is a significant component of the total habitat available, 10% to 30%.
- "High Potential" means that the species has a high probability of occurring on the Site and the habitat likely to be adversely affected is a significant component of the total habitat available, greater than 30%.
- "Unknown" means that suitable-looking habitat exists on the Site but further field sampling or consultation with agencies would be beneficial for determining potential effects and regulatory requirements.

Endangered and Threatened Species - Preliminary Biological Assessment Report

Vulcan Materials Company

Orangeburg Quarry, Eutawville, South Carolina

Table 2. Federal and State Protected Species in the Project Vicinity and Orangeburg County, SC

| Scientific Name | Common Name | Protected Status | | Source List | Habitat in Eastern South Carolina |
|--------------------------------------|----------------------------|------------------|-------|-------------|---|
| | | Federal | State | | |
| <i>Perimyotis subflavus</i> | Tricolored bat | PE | | IPaC | Woods, fields, old buildings, culverts, and bridges |
| <i>Myotis septentrionalis</i> | Northern long-eared bat | FE | SE | IPaC | Woods, fields, old buildings, culverts, and bridges |
| <i>Picoides borealis (Dryobates)</i> | Red-cockaded woodpecker | FE | SE | IPaC | Mature pine forest and open understory |
| <i>Oxypolis canbyi (Tiedemannia)</i> | Canby's cowbane | FE | | IPaC | Carolina bays, lime sinks, and pine/cypress savanna |
| <i>Haliaeetus leucocephalus</i> | Bald eagle | BGPA | ST | SCDNR | Tall trees near rivers and lake |
| <i>Corynorhinus rafinesquii</i> | Rafinesque's big-eared bat | | SE | SCDNR | Woods, fields, old buildings, culverts, and bridges |
| <i>Clemmys guttata</i> | Spotted turtle | | ST | SCDNR | Shallow pools, swamps, marshes, and small streams |
| <i>Rana capito (Lithobates)</i> | Carolina gopher frog | | SE | SCDNR | Carolina bays, vernal pools, and pine/cypress savanna |
| <i>Pseudobranchius striatus</i> | Broad-striped dwarf siren | | ST | SCDNR | Pools, swamps, and ditches with aquatic vegetation |
| <i>Noturus sp. 2</i> | Broadtail madtom | | ST | SCDNR | Rivers and large streams |
| <i>Acipenser oxyrinchus</i> | Atlantic sturgeon | FE | | SCDNR | Rivers and large streams |
| <i>Acipenser brevirostrum</i> | Shortnose sturgeon | FE | SE | SCDNR | Rivers and large streams |

Notes:

Federal Protection Status: FE = Endangered; PE = Proposed Endangered; FT = Threatened; TSA = Threatened by similarity of appearance; BGPA = Bald & Golden Eagle Protection Act; FC = Candidate for E or T listing;

SCDNR Protection Status: SE = Endangered; ST = Threatened

IPaC - U.S. Fish and Wildlife Service's Information for Planning and Consultation

USFWS IPAC LISTED SPECIES

1. Tricolored bat (*Perimyotis subflavus*) – Federal Proposed Endangered

Tricolored bats occur across much of North and South Carolina year-round, foraging in both forested and open-canopy habitats where they feed on flying insects. During daylight hours, they roost singly or in groups in cavities in live or dead trees, beneath loose bark, under bridges and culverts, rock fissures in ravines, or old buildings. Maternity group roost sites are occupied from June to July until the pups can fly. In November, they may either migrate to winter hibernaculum sites in caves, mines, and deep rock crevices in the western portion of the Carolinas or remain through the winter in their warm-season areas, roosting in rock crevices, hollow trees, bridges, or old buildings. Tricolored bats in the coastal plain have an indistinct hibernation period and may emerge to forage during warm periods in winter.

The Site contains extensive forests with cracked or hollow trees, both live and dead, and loose bark that appear to be suitable roosting habitat for tricolored bats. Approximately two-thirds of the mature forest that appears suitable as roosting habitat for the tricolored bats is located in the northwestern 185 acres of the Site that will not be disturbed by mining. SCNHP has no record of tricolored bats within 5 miles of the Site. A targeted survey for bats was not conducted, and it is unknown whether tricolored bats may occur on the Site pending further survey work. Bat surveys should be conducted at night using mist-netting or acoustic receivers during the warm months when bats are most active.

Potential for effects: Unknown, pending consultation with USFWS or field sampling for bats. If tricolored bats occur on the Site, either permanently or seasonally, they could be affected by the proposed tree removal and other activities associated with mining, which could disrupt the bats' roosting and foraging habitats.

The Site is not planned to be a 24-hour operation and there will be no blasting at night. Furthermore, due to the planned mining process blasting will occur underwater and there will be no sharp loud noise or boom. Limiting land clearing and tree removal activities from November to March when bats are least likely to be roosting on the Site will mitigate adverse effects on these bats if they are present. Protecting the forests on the unused portions of the Site will further mitigate impacts.

Regulatory Conclusion: The tricolored bat is not presently protected under either federal or state law, and there is presently no legal consequence for affecting these bats or their habitats. However, as a "proposed" species for federal listing they could become protected prior to or during the project site planning and development, in which case activities that may adversely affect the bat may need to cease until USFWS consultation is completed. SynTerra recommends treating this species as if it is currently protected in order to avoid a possible stop-work order resulting from a change in protection status. Preservation of mature forests beyond the quarry impact area and clearing trees during winter in the affected areas might be sufficient to support

a “not likely to adversely affect” determination from USFWS if the tricolored bat becomes listed as an endangered species.

2. Northern long-eared bat (*Myotis septentrionalis*) – Federal Endangered, State Endangered

Northern long-eared bats occur across much of North and South Carolina from April to October, foraging in both forested and open-canopy habitats where they feed on flying insects. During daylight hours, they roost singly or in groups in cavities in live or dead trees, beneath loose bark, under bridges and culverts, rock fissures in ravines, or old buildings. Maternity group roost sites are occupied from June to July until the pups can fly. In November, northern long-eared bats in the Piedmont and mountain regions typically migrate to winter hibernaculum sites in caves, mines, and deep rock crevices, mainly in the mountains, where they roost in colonies until March. In the coastal plain, including Orangeburg County, these bats may remain year-round in their warm-season habitats, emerging to forage during warm periods in winter.

The Site contains extensive forests with cracked or hollow trees, both live and dead, and loose bark that appear to be suitable roosting habitat for northern long-eared bats. Approximately two-thirds of the mature forest that appears suitable as roosting habitat for the northern long-eared bats is located in the northwestern 185 acres of the Site that will not be disturbed by mining. SCNHP has no record of this species within 5 miles of the Site. A targeted survey for bats was not conducted, and it is unknown whether northern long-eared bats may occur on the Site, pending further survey work. Bat surveys should be conducted at night using mist-netting or acoustic receivers during the warm months when bats are most active.

Potential for effects: Unknown, pending consultation with USFWS or field sampling for bats. If northern long-eared bats occur on the Site, either permanently or seasonally, they could be affected by the proposed tree removal and other activities associated with mining, which could disrupt the bats’ roosting and foraging habitats.

The Site is not planned to be a 24-hour operation and there will be no blasting at night. Furthermore, due to the planned mining process blasting will occur underwater and there will be no sharp loud noise or boom. Limiting land clearing and tree removal activities from November to March when northern long-eared bats are less likely to occur on the Site will mitigate adverse effects on these bats, if they presently use the Site. Protecting forests on the unused portions of the Site will further mitigate impacts.

Regulatory Conclusion: USFWS has issued interim guidance for determining impacts to the Northern long-eared bat due to the recent change in protection status from threatened to endangered listing. The Interim Consultation Framework for Northern Long-eared Bat rule is valid from March 31, 2023 until April 1, 2024. Orangeburg County is outside of the USFWS-recognized white-nose syndrome (WNS) disease zone. Incidental effects on these bats due to forest clearing on the Orangeburg Quarry site may be eligible for a “not likely to adversely affect” decision if forest clearing is completed before April 1, 2024. A preliminary IPaC determination report based on the Interim Consultation Framework is attached. USFWS

consultation will be necessary to confirm this decision. A link to the interim rule is provided below Table 3, and further guidance could be issued after April 1, 2024.

3. Red-cockaded woodpecker (*Picoides borealis*) – Federal Endangered, State Endangered

The red-cockaded woodpecker (RCW) occurs in large areas of mature pine-dominated forest, typically 80 to 100 acres or more. Unlike other woodpeckers, they excavate cavities for nesting and roosting exclusively in live pines, typically 80 years or older and surrounded by an open understory with minimal hardwood encroachment or climbing vines. They live in small groups comprising a breeding pair and one to three “helpers” that are often the pair’s offspring from previous years. Foraging habitat comprises pine-dominated stands at least 10-inch diameter (generally 30 years or older) with sparse understory and within 0.5 miles from the cavity trees.

The Site contains several stands of pine and mixed pine-hardwood forest with pines 60 years or older totaling approximately 145 acres (**Figure 6**). SynTerra conducted a preliminary survey for RCW cavities and habitat quality in these stands. While many of the pines appeared suitable in terms of age, size, and spacing, the stands had excessive understory growth of hardwood trees and vines that render them unsuitable for nesting habitat in their present condition. No RCW was seen or heard, and no cavity was observed. However, the vines and hardwood understory limited the observers’ ability to view the upper portions of pine trunks, and each stand was not thoroughly searched. Abandoned RCW cavities may occur in these older stands, which are currently unsuitable but could be restored by thinning and burning. The remainder of the Site has fields, pine forests less than 30 years old, and hardwood-dominated forests that are not suitable as nesting or foraging habitat for RCW.

Three Oaks Engineering conducted an RCW survey in 2018 on several hundred acres of the Martin Marietta Quarry property, west of the existing quarry and east of the VMC-proposed Site. They found one RCW cavity tree approximately 400 feet from the former site of another cavity tree reported in 1990, which was not found. These two cavity trees are approximately 1.2 miles southeast of the VMC-proposed Site and are within the Martin Marietta quarry buffer area, which includes 336 acres actively managed for RCW conservation under a USFWS Safe Harbor agreement. A large portion of the Martin Marietta buffer land managed for RCW conservation is within 0.5 miles of the VMC-proposed Site, but most of the pines in those areas are only about 30 years old and not yet mature enough for use as cavity trees. SCNHP has no other records of RCW within 5 miles of the Site.

Potential for effects: The pine-dominated stands on the Site are presently either too young and/or have understory trees and vines too dense to provide suitable habitat for red-cockaded woodpeckers. Because adjacent land to the east is managed for RCW habitat, clearing of pine-dominated forests on the southeastern portion of the Site would prevent RCW from expanding into these areas if they become suitable in the future due to age, fire, thinning, or other factors. However, since the stands on the Site are presently not suitable habitat and RCW management on adjacent lands does not rely on the Site, adverse effects may be discountable.

Regulatory Conclusion: May affect, not likely to adversely affect.

4. Canby's cowbane (*Oxypolis canbyi* or *Tiedemannia canbyi*) – Federal Endangered

Canby's cowbane is a slender perennial groundcover plant that occurs in shallow wet depressions with an open canopy in Carolina bays, cypress savannas, wet pine savannas, and slough wetlands. Clusters of small white flowers bloom during late summer. Population decline is attributed to wetland ditching, draining, and fire suppression that allow trees and shrubs to dominate the habitat. SCNHP has no record of this plant within 5 miles of the Site.

Most of the wetlands on the Site are too densely shaded by trees to provide suitable habitat for Canby's cowbane. There is no Carolina bay, cypress or pine savanna, or slough wetland habitat on the Site. There are several apparent limesink depression pools, but most of those are also shaded by trees. One limesink depression on the southwest portion of the site near Horizon Street (**Figure 3**) appears marginally suitable at present, but this area also had dense forest cover from the 1970s until it was clear-cut in 2015. It is thus unlikely that Canby's cowbane occurs here. The field survey in April was too early in the year to observe flowering of this species.

Potential for effects: No suitable-looking habitat was found on the Site other than the depression on the southwest portion of the Site which was densely shaded and was not suitable for 40+ years prior to recent clearcutting.

Regulatory Conclusion: No effect.

SCDNR ADDITIONAL LISTED SPECIES

5. Bald eagle (*Haliaeetus leucocephalus*) – Federal BGPA, State Threatened

Bald eagles were delisted from the Federal Endangered Species Act in 2007 but remain federally protected under the Bald Eagle & Golden Eagle Protection Act (BGPA). Eagles in the coastal plain region roost and nest in tall trees near large rivers and lakes where they feed on fish, frogs, waterfowl, and other animals. Bald eagle nest-building in the Carolinas usually begins in September to October, egg-laying occurs in November to December, and the fledglings usually disperse from the nest area by May.

The ponds and streams in the Site area are too small to be attractive to eagles. Bald eagles may fly over or roost briefly on the Site during travel between larger water bodies including Lake Marion, Lake Moultrie, and Four Hole Swamp, but are not likely to use the Site for nesting or frequent foraging. SCNHP has records of eagle nests along Lake Marion approximately 4 miles from the Site.

Potential for effects: None; no suitable habitat was found on the Site.

Regulatory Conclusion: No effect.

6. Rafinesque's big-eared bat (*Corynorhinus rafinesquii*) – State Endangered

Rafinesque's big-eared bat is a non-migratory bat species that occurs across much of North and South Carolina, foraging in both forested and open-canopy habitats where they feed on flying insects. During daylight hours they roost singly or in groups in cavities in live or dead trees, beneath loose bark, under bridges and culverts, rock fissures in ravines, or old buildings. Maternity group roost sites, usually in hollow trees or old buildings, are occupied from June to July until the pups can fly. Rafinesque's big-eared bat winter roost sites are also mainly in hollow trees or old buildings, and they may emerge to forage during warm periods in winter.

The Site contains extensive forests with cracked or hollow trees, both live and dead, and loose bark that appear to be suitable roosting habitat for Rafinesque's big-eared bat. Approximately two-thirds of the mature forest that appears suitable as roosting habitat for the Rafinesque's big-eared bats is located in the northwestern 185 acres of the Site that will not be disturbed by mining. SCNHP has no record of this species within 5 miles of the Site. A targeted survey for bats was not conducted, and it is unknown whether these bats may occur on the Site pending further survey work. Bat surveys should be conducted at night using mist-netting or acoustic receivers during the warm months when bats are most active.

Potential for effects: Unknown, pending consultation with SCDNR or field sampling for bats. If Rafinesque's big-eared bats occur on the Site, they could be affected by the proposed tree removal and other activities associated with mining, which could disrupt the bats' roosting and foraging habitats.

The Site is not planned to be a 24-hour operation and there will be no blasting at night. Furthermore, due to the planned mining process blasting will occur underwater and there will be no sharp loud noise or boom. Protecting forests on the unused portions of the Site will help mitigate impacts.

Regulatory Conclusion: State-listed species (not federally listed) are protected from intentional killing, collecting, and trade, but are not protected from incidental harm during otherwise lawful land use and development activities.

7. Spotted turtle (*Clemmys guttata*) – State Threatened

Spotted turtles live in small ponds, streams, swamps, Carolina bays, and other small, mostly shallow vegetated water bodies, either with an open canopy or at least a few canopy gaps for sunning, and nearby sandy uplands for egg-laying. They feed primarily on insects, worms, fruits, and plants, and are most active in spring and fall.

The swampy stream on the northwest portion of the Site and other smaller depression wetlands appear suitable for spotted turtles. SynTerra conducted a preliminary survey in those areas but did not observe any spotted turtles. SCNHP has no record of this species within 5 miles of the Site.

Potential for effects: Low. The majority of suitable habitat on the Site is in the northwestern and southeastern wetland areas that will not be disturbed. The few small depression pools on the Site that would be affected by the quarry are small peripheral habitat patches and are probably not essential for maintaining a population of spotted turtles if they are present on the Site. The SynTerra survey and the lack of SCNHP records suggest that they are probably not present on the Site.

Regulatory Conclusion: State-listed species (not federally listed) are protected from intentional killing, collecting, and trade, but are not protected from incidental harm during otherwise lawful land use and development activities.

8. Carolina gopher frog (*Rana capito* or *Lithobates capito*) – State Endangered

The Carolina gopher frog is a toad-like terrestrial frog that lives in sandy woodlands including pine/oak sandhill woodland and pine savannas. They spend much of their time underground in stump holes or burrows created by other animals and are most active during and soon after heavy rains. They breed from February to April in fish-free ephemeral depression ponds and Carolina bays. Carolina gopher frog tadpoles metamorphose into terrestrial frogs 3 to 4 months later.

SynTerra found no pine/oak sandhill woodland or pine savanna habitat on the Site, although soil mapping suggests that these natural communities may have been present on the Site prior to clearing for use as crop fields and pine plantation. Based on current conditions, it is unlikely that Carolina gopher frogs persist on the Site if they did formerly occur here. A few of the wet depression ponds on the Site may have been suitable breeding habitat.

Potential for effects: None. No suitable habitat was found on the Site.

Regulatory Conclusion: No effect.

9. Broad-striped dwarf siren (*Pseudobranchius striatus*) – State Threatened

The broad-striped dwarf siren (northern dwarf siren) is a small permanently aquatic salamander that breathes via external gills. It occurs in swamps, creeks, and permanent ponds usually among dense aquatic plant beds or floating plants.

The swampy stream on the northwest portion of the Site and the smaller depression ponds on the south and southwest portions of the Site appear suitable for dwarf sirens. SynTerra conducted a preliminary survey in those areas using dipnets but did not observe any dwarf sirens. Several fish species that occur in dwarf siren habitat were captured in the swamp stream including eastern mud minnow, pirate perch, banded pygmy sunfish, and eastern mosquitofish. SCNHP has no record of broad-striped dwarf siren within 5 miles of the Site.

Potential for effects: Low. The majority of suitable habitat on the Site is in the northwestern and southeastern wetland areas that will not be disturbed. The few small depression pools on the Site that would be affected by the quarry are small peripheral habitat patches and are probably not essential for maintaining a population of dwarf sirens if they are present on the Site. The SynTerra survey and the lack of SCNHP records suggest that they are probably not present on the Site.

Regulatory Conclusion: State-listed species (not federally listed) are protected from intentional killing, collecting, and trade, but are not protected from incidental harm during otherwise lawful land use and development activities.

10. Broadtail madtom (*Noturus sp. 2*) – State Threatened

The broadtail madtom is a small catfish that occurs in rivers with a sandy bed and abundant woody debris. It does not ascend small headwater streams such as those near the Site. The nearest waterway large enough to provide suitable habitat for the broadtail madtom is the Edisto River more than 20 miles south of the Site. SCNHP has no record of this fish within 5 miles of the Site.

Potential for effects: None. No suitable habitat occurs on the Site or within 20 miles downstream.

Regulatory Conclusion: No effect.

11. Atlantic sturgeon (*Acipenser oxyrinchus*) – Federal Endangered

This species is discussed jointly with the Shortnose sturgeon below.

12. Shortnose sturgeon (*Acipenser brevirostrum*) – Federal Endangered, State Endangered

The Atlantic sturgeon and shortnose sturgeon are federal endangered species protected by National Marine Fisheries Service (NMFS), rather than by USFWS, and are not included on the IPaC species list. Both occur in coastal ocean waters, estuaries, and rivers. Most of their time is spent in tidal areas, but adults migrate upstream into freshwater rivers to spawn. Sturgeons do not ascend small headwater streams such as those near the Site. The nearest waterway large enough to provide suitable spawning habitat for sturgeons is the Edisto River more than 20 miles south of the Site. SCNHP has no record of either sturgeon species within five miles of the Site.

Potential for effects: No effect; no suitable habitat occurs on the Site or within 20 miles downstream.

Regulatory Conclusion: No effect.

Endangered and Threatened Species - Preliminary Biological Assessment Report

Vulcan Materials Company

Orangeburg Quarry, Eutawville, South Carolina

4.0 CONCLUSION

The potential for effects on each listed species due to the proposed quarry construction and operation is summarized in **Table 3** below. These assessments are preliminary and are based on a combination of desktop analysis using available data from agencies plus a field habitat evaluation conducted outside of the optimal survey seasons for some of these species. Further field study and consultation with USFWS and SCDNR may be required for permit approvals.

Table 3. Federal and State Protected Species Preliminary Evaluation of Potential Effects

| Scientific Name Common Name | Protected Status | | Potential for Effects | Regulatory Conclusion |
|---|------------------|-------|---------------------------------------|--|
| | Federal | State | | |
| <i>Perimyotis subflavus</i> Tricolored bat | PE | | Unknown pending USFWS consultation ** | Tentative Conclusion: Not likely to adversely affect based on interim rules ending April 1, 2024 |
| <i>Myotis septentrionalis</i> Northern long-eared bat | FE | SE | Unknown pending USFWS consultation ** | USFWS consultation not required prior to listing |
| <i>Picoides borealis (Dryobates)</i> Red-cockaded woodpecker | FE | SE | Not likely to adversely affect | Not likely to adversely affect |
| <i>Oxypolis canbyi (Tiedemannia)</i> Canby's cowbane | FE | | No effect | No effect |
| <i>Haliaeetus leucocephalus</i> Bald eagle | BGPA | ST | No effect | No effect |
| <i>Corynorhinus rafinesquii</i> Rafinesque's big-eared bat | | SE | Unknown pending SCDNR consultation | Land development effects not regulated |
| <i>Clemmys guttata</i> Spotted turtle | | ST | Low Potential | Land development effects not regulated |
| <i>Rana capito (Lithobates)</i> Carolina gopher frog | | SE | None | No effect |
| <i>Pseudobranchius striatus</i> Broad-striped dwarf siren | | ST | Low Potential | Land development effects not regulated |
| <i>Noturus sp. 2</i> Broadtail madtom | | ST | None | No effect |
| <i>Acipenser oxyrinchus</i> Atlantic sturgeon | FE | | No effect | No effect; protected by NMFS |
| <i>Acipenser brevirostrum</i> Shortnose sturgeon | FE | SE | No effect | No effect; protected by NMFS |

Notes:

Federal Protection Status: FE = Endangered; PE = Proposed Endangered; FT = Threatened; TSA = Threatened by similarity of appearance; BGPA = Bald & Golden Eagle Protection Act; FC = Candidate for E or T listing. **SCDNR Protection Status:** SE = Endangered; ST = Threatened

Endangered and Threatened Species - Preliminary Biological Assessment Report

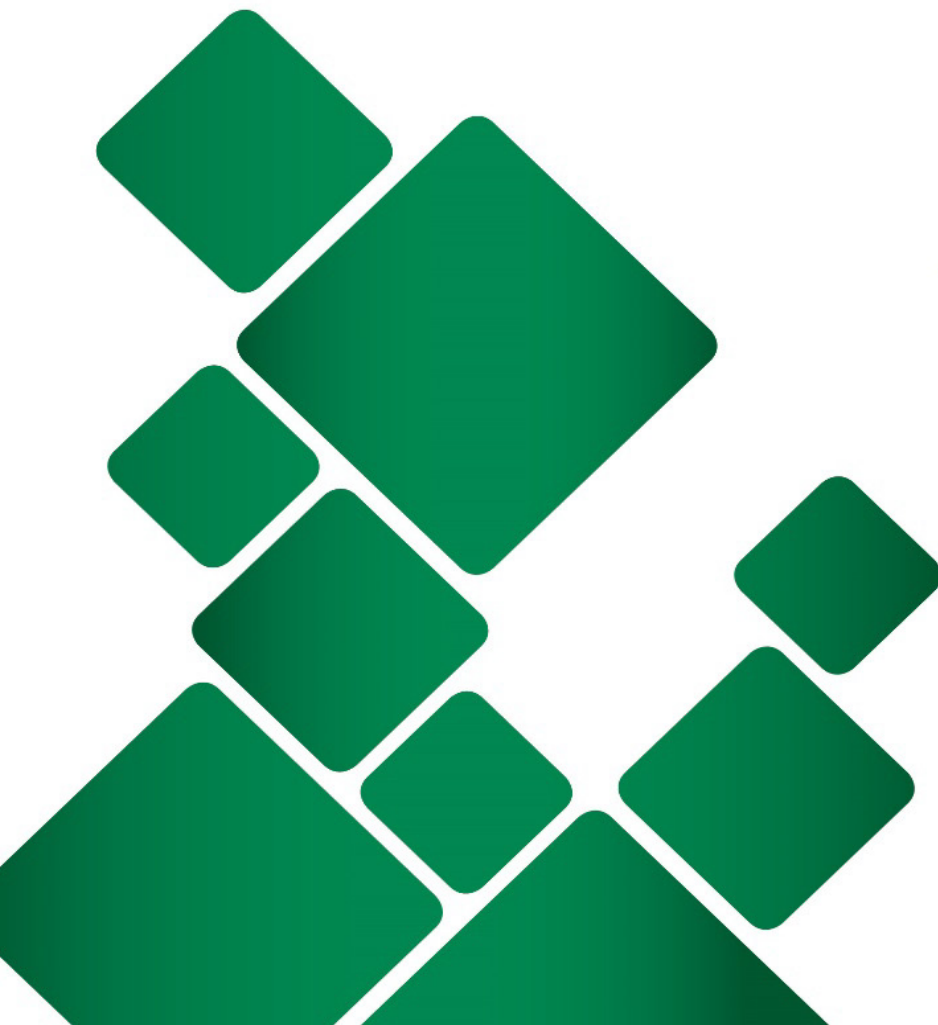
Vulcan Materials Company

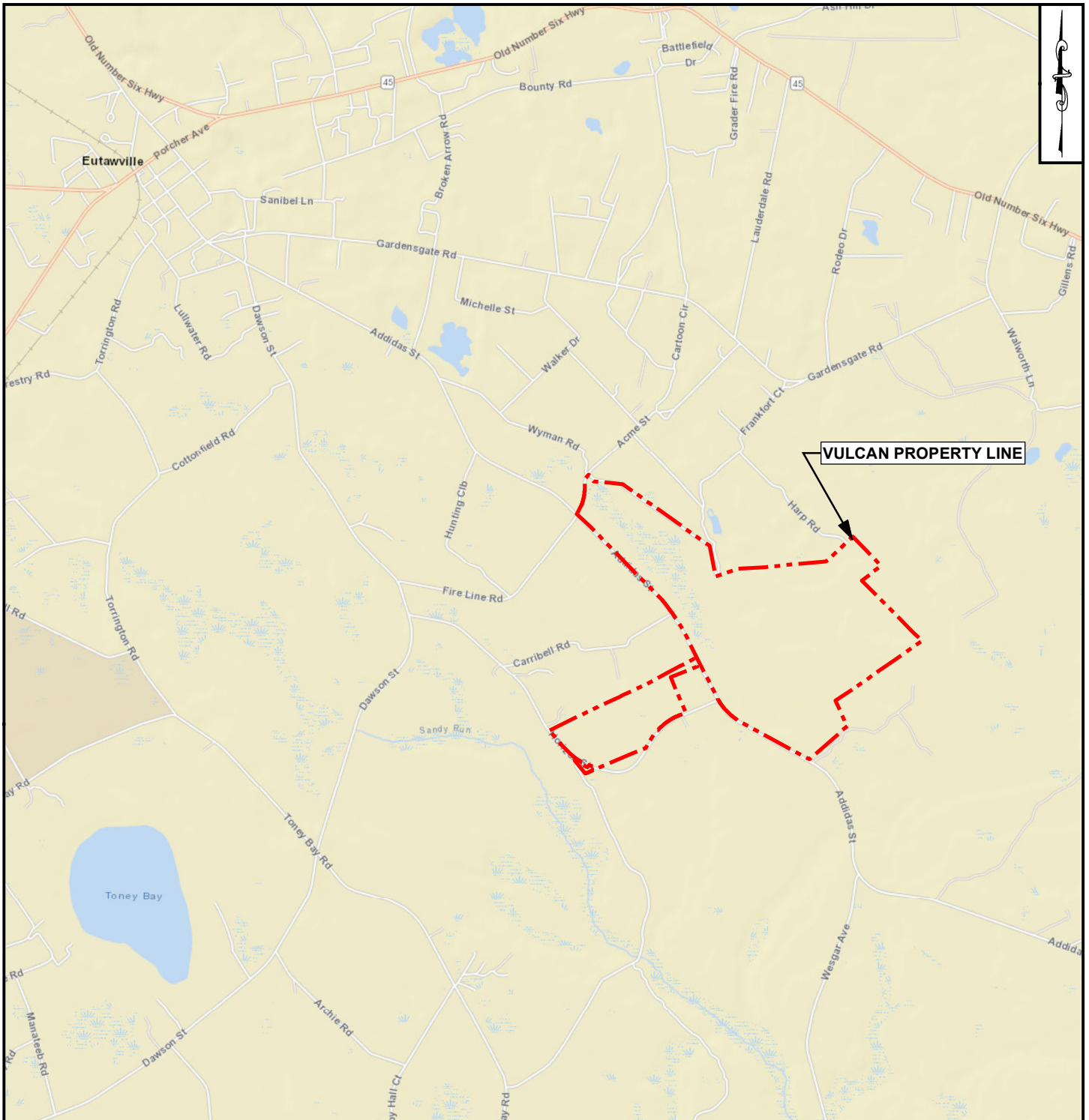
Orangeburg Quarry, Eutawville, South Carolina

** USFWS has issued interim guidance for determining impacts to the Northern long-eared bat due to the transition from threatened listing to endangered listing. The Interim Consultation Framework for Northern Long-eared Bat rule is valid from March 31, 2023 until April 1, 2024. Orangeburg County is outside of the USFWS-recognized white-nose syndrome (WNS) disease zone. Therefore, incidental effects on these bats due to forest clearing on the Orangeburg Quarry site may be eligible for a “not likely to adversely affect” decision if forest clearing is completed before April 1, 2024. USFWS consultation will be necessary to confirm this decision. A link to the interim rule is provided below:

https://www.fws.gov/sites/default/files/documents/Interim%20Consultation%20Framework_17Mar23.pdf

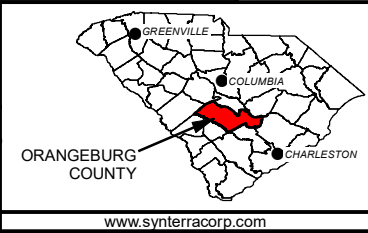
FIGURES





NOTES:

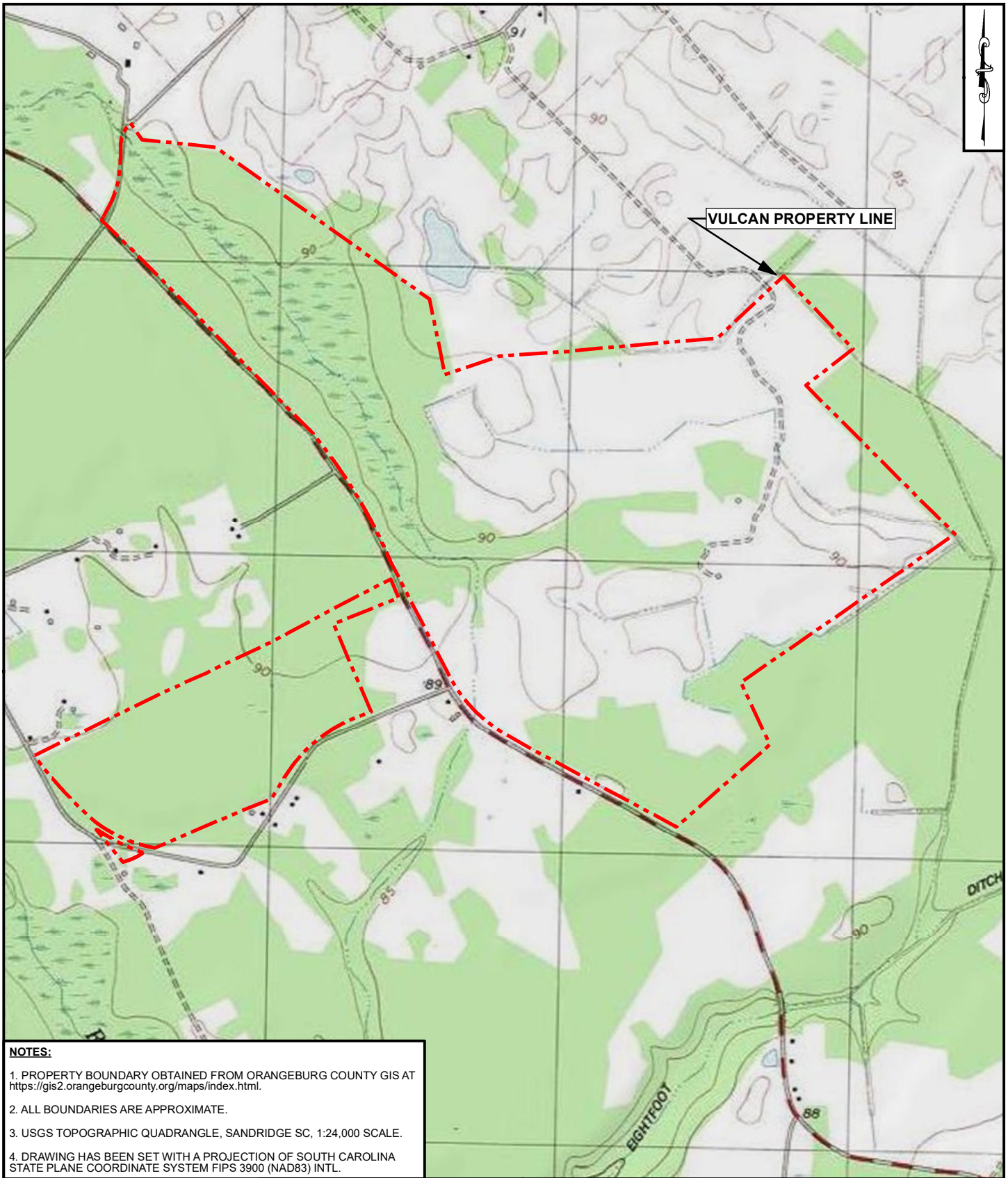
1. PROPERTY BOUNDARY OBTAINED FROM ORANGEBURG COUNTY GIS AT <https://gis2.orangeburgcounty.org/maps/index.html>.
2. ALL BOUNDARIES ARE APPROXIMATE.
3. WORLD STREET MAP PROVIDED BY ESRI WORLD IMAGERY MAP SERVICE
4. DRAWING HAS BEEN SET WITH A PROJECTION OF SOUTH CAROLINA STATE PLANE COORDINATE SYSTEM FIPS 3900 (NAD83) INTL.



**FIGURE 1
SITE LOCATION MAP
ENDANGERED AND THREATENED SPECIES
PRELIMINARY BIOLOGICAL ASSESSMENT REPORT
ORANGEBURG QUARRY
VULCAN MATERIALS COMPANY
ORANGEBURG, SOUTH CAROLINA**

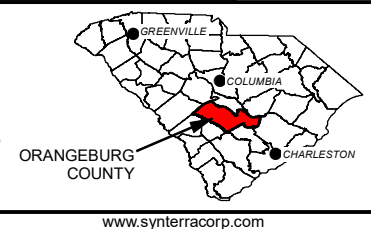
| | |
|--|---|
| <p>DRAWN BY: B. MCGANN REVISED BY: B. MCGANN CHECKED BY: G. POTTERN APPROVED BY: G. POTTERN PROJECT MANAGER: B. MCGANN</p> | <p>DATE: 6/1/2023 DATE: 6/1/2023 DATE: 6/1/2023 DATE: 6/1/2023</p> |
|--|---|

GRAPHIC SCALE
 0 800 1,600 3,200 4,800
 (IN FEET)



NOTES:

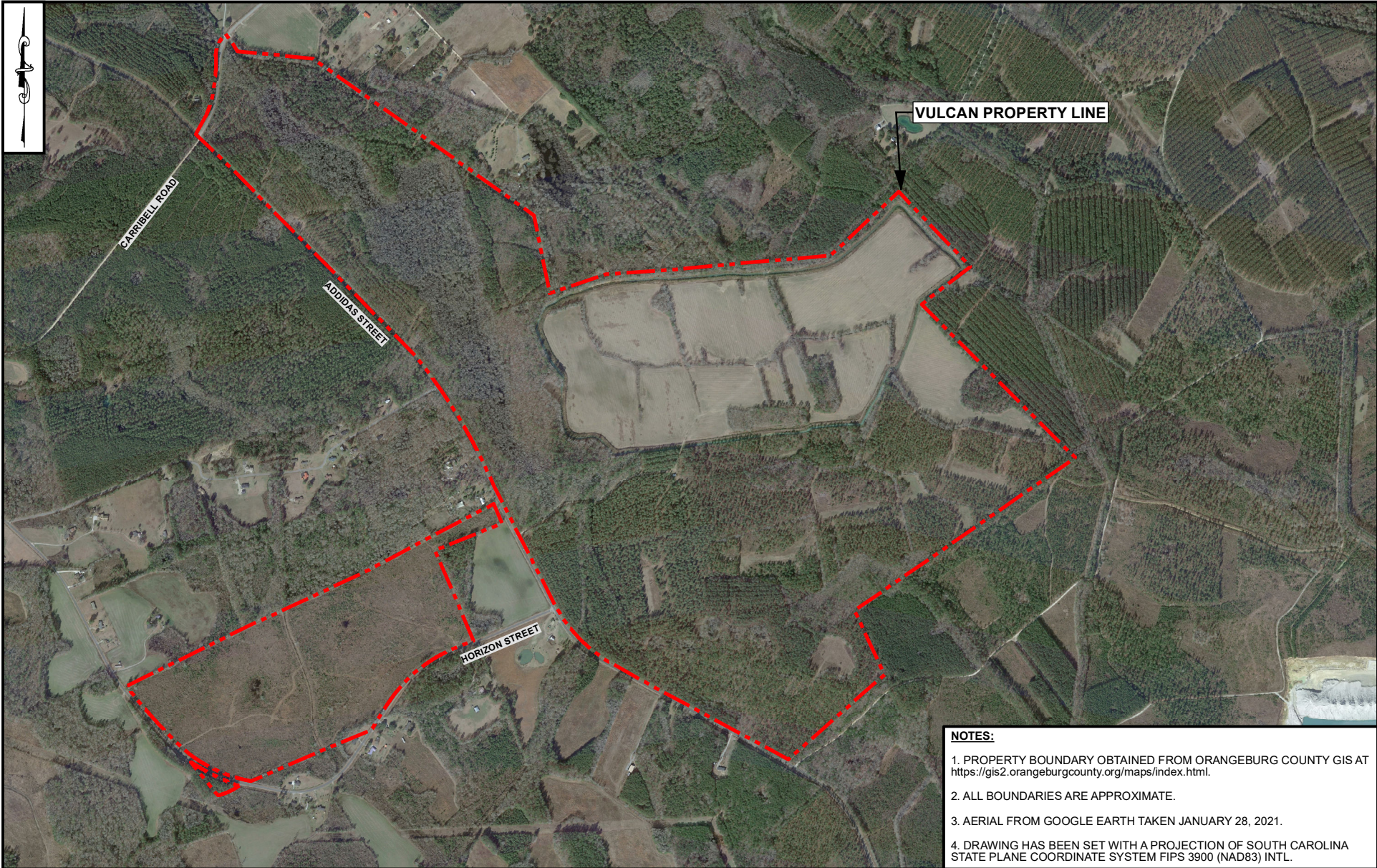
1. PROPERTY BOUNDARY OBTAINED FROM ORANGEBURG COUNTY GIS AT <https://gis2.orangeburgcounty.org/maps/index.html>.
2. ALL BOUNDARIES ARE APPROXIMATE.
3. USGS TOPOGRAPHIC QUADRANGLE, SANDRIDGE SC, 1:24,000 SCALE.
4. DRAWING HAS BEEN SET WITH A PROJECTION OF SOUTH CAROLINA STATE PLANE COORDINATE SYSTEM FIPS 3900 (NAD83) INTL.



**FIGURE 2
TOPOGRAPHIC MAP
ENDANGERED AND THREATENED SPECIES
PRELIMINARY BIOLOGICAL ASSESSMENT REPORT
ORANGEBURG QUARRY
VULCAN MATERIALS COMPANY
ORANGEBURG, SOUTH CAROLINA**

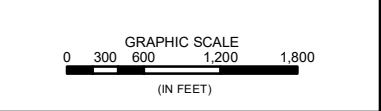
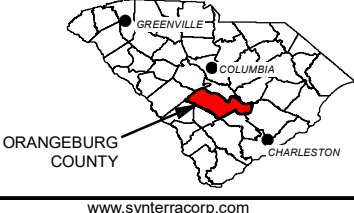
| | |
|---|---|
| <p>DRAWN BY: B. MCGANN REVISED BY: B. MCGANN CHECKED BY: G. POTTERN APPROVED BY: B. MCGANN PROJECT MANAGER: B. MCGANN</p> | <p>DATE: 6/1/2023 DATE: 6/1/2023 DATE: 6/1/2023 DATE: 6/1/2023</p> |
|---|---|

GRAPHIC SCALE
 0 300 600 1,200 1,800
 (IN FEET)



NOTES:

1. PROPERTY BOUNDARY OBTAINED FROM ORANGEBURG COUNTY GIS AT <https://gis2.orangeburgcounty.org/maps/index.html>.
2. ALL BOUNDARIES ARE APPROXIMATE.
3. AERIAL FROM GOOGLE EARTH TAKEN JANUARY 28, 2021.
4. DRAWING HAS BEEN SET WITH A PROJECTION OF SOUTH CAROLINA STATE PLANE COORDINATE SYSTEM FIPS 3900 (NAD83) INTL.



DRAWN BY: B. MCGANN DATE: 6/2/2023
 REVISED BY: B. MCGANN DATE: 6/2/2023
 CHECKED BY: G. POTTERRN DATE: 6/2/2023
 APPROVED BY: B. MCGANN DATE: 6/2/2023
 PROJECT MANAGER: B. MCGANN

FIGURE 3
AERIAL IMAGERY
ENDANGERED AND THREATENED SPECIES
PRELIMINARY BIOLOGICAL ASSESSMENT REPORT
ORANGEBURG QUARRY
VULCAN MATERIALS COMPANY
ORANGEBURG, SOUTH CAROLINA



Notes:

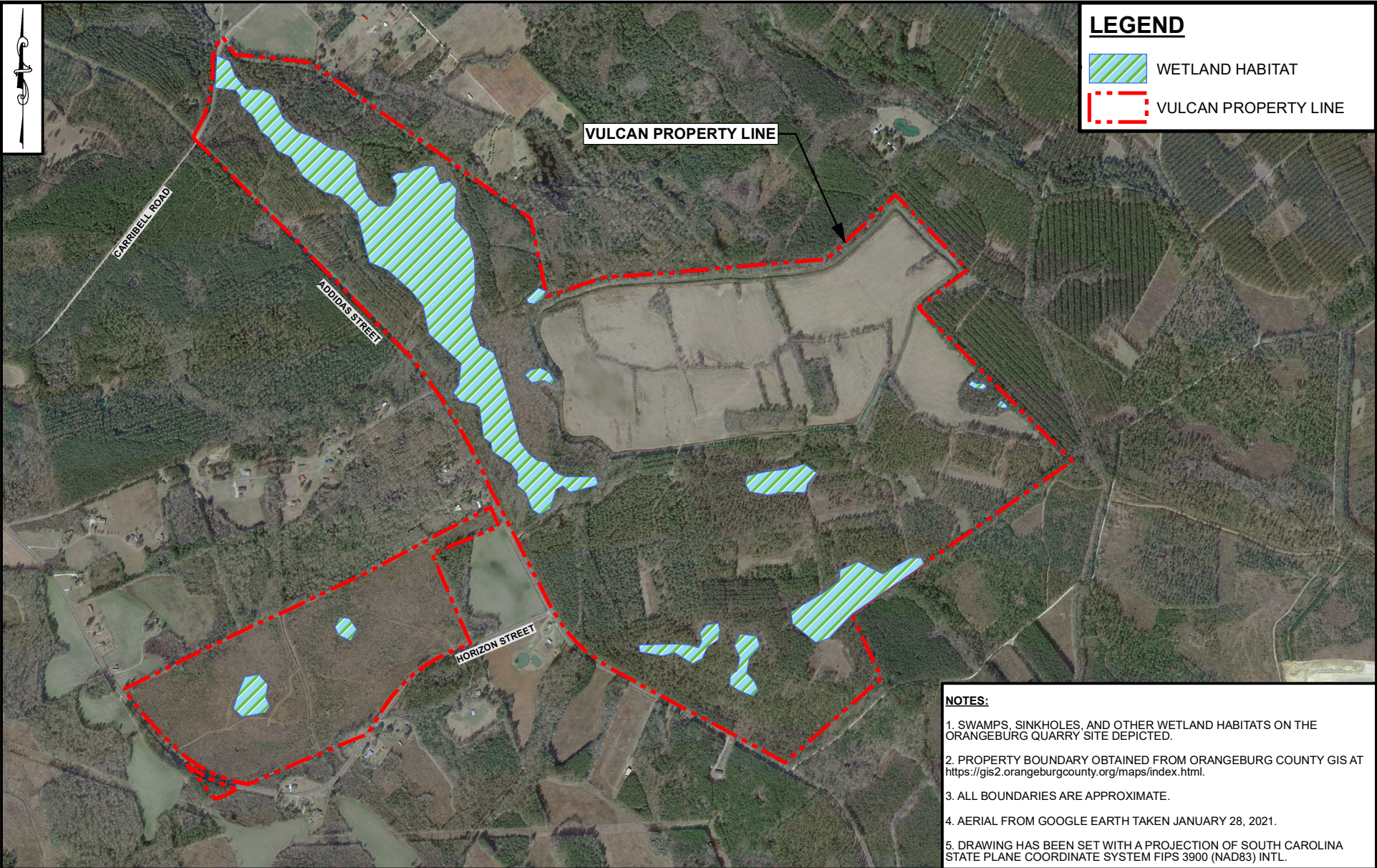
1. USDA WEB SOIL SURVEY, CURRENT SOIL MAP. SOURCE: <https://websoilsurvey.nrcs.usda.gov/app/>
2. SOIL MAPPING UNITS DEFINED IN TABLE 1.
3. AREA OF INTEREST (ORANGEBURG QUARRY SITE) DEPICTED AS BLUE LINE.




DRAWN BY: G. POTTERN DATE: 6/01/2023
 REVISED BY: B. MCGANN
 CHECKED BY: B. MCGANN
 APPROVED BY: B. MCGANN
 PROJECT MANAGER: B. MCGANN


www.synTerracorp.com

FIGURE 4
SOIL SURVEY
ENDANGERED AND THREATENED SPECIES
PRELIMINARY BIOLOGICAL ASSESSMENT REPORT
ORANGEBURG QUARRY
VULCAN MATERIALS COMPANY
EUTAWVILLE, SOUTH CAROLINA



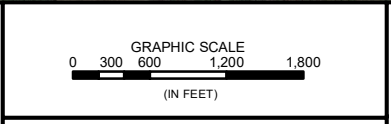
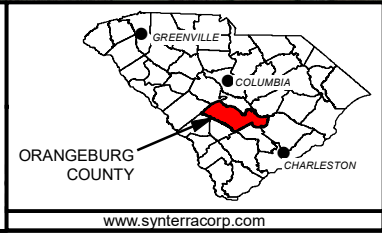
LEGEND

 WETLAND HABITAT

 VULCAN PROPERTY LINE

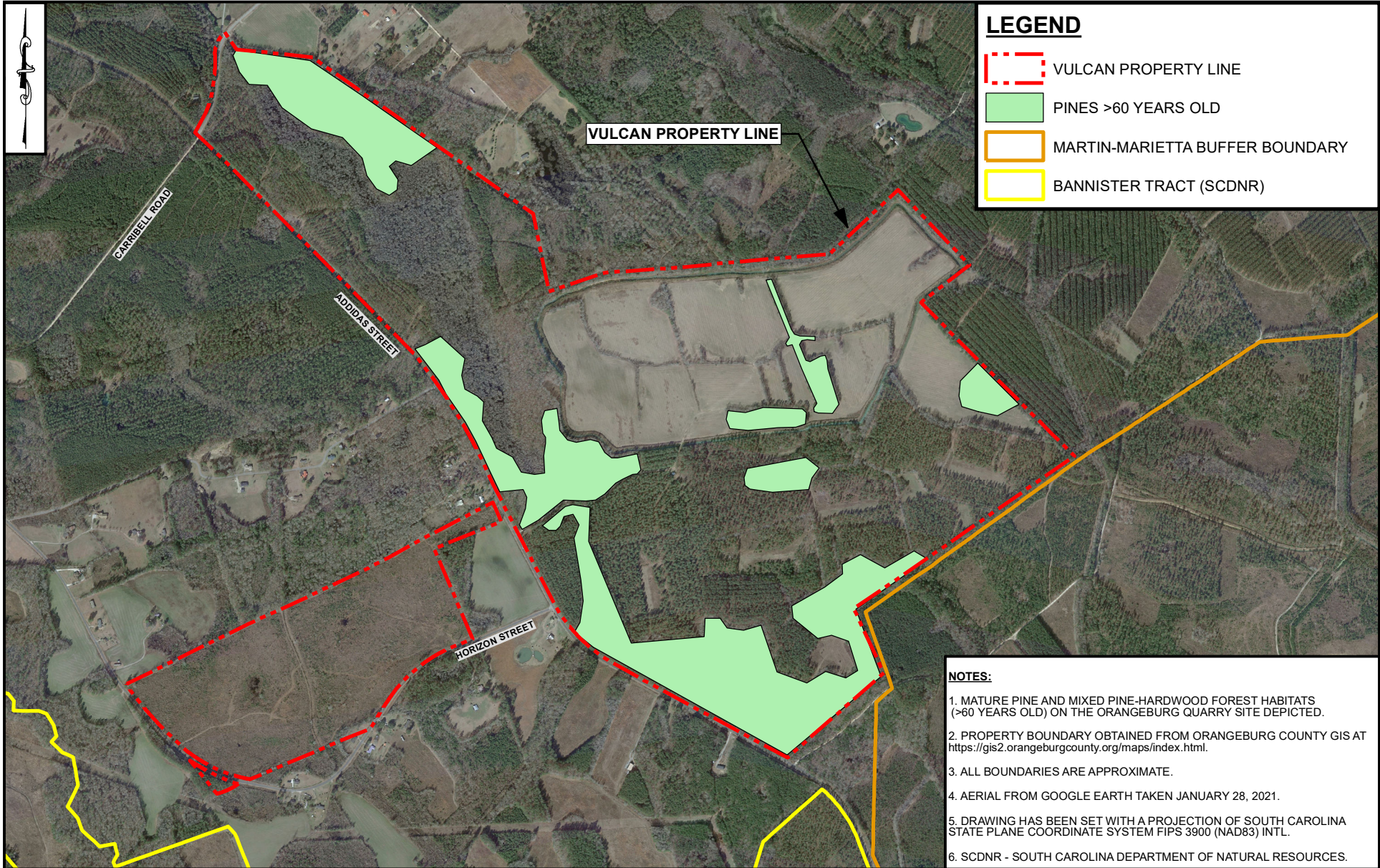
NOTES:

1. SWAMPS, SINKHOLES, AND OTHER WETLAND HABITATS ON THE ORANGEBURG QUARRY SITE DEPICTED.
2. PROPERTY BOUNDARY OBTAINED FROM ORANGEBURG COUNTY GIS AT <https://gis2.orangeburgcounty.org/maps/index.html>.
3. ALL BOUNDARIES ARE APPROXIMATE.
4. AERIAL FROM GOOGLE EARTH TAKEN JANUARY 28, 2021.
5. DRAWING HAS BEEN SET WITH A PROJECTION OF SOUTH CAROLINA STATE PLANE COORDINATE SYSTEM FIPS 3900 (NAD83) INTL.



DRAWN BY: B. MCGANN DATE: 6/2/2023
 REVISED BY: B. MCGANN DATE: 6/2/2023
 CHECKED BY: G. POTTERN DATE: 6/2/2023
 APPROVED BY: B. MCGANN DATE: 6/2/2023
 PROJECT MANAGER: B. MCGANN

FIGURE 5
WETLAND HABITAT
ENDANGERED AND THREATENED SPECIES
PRELIMINARY BIOLOGICAL ASSESSMENT REPORT
ORANGEBURG QUARRY
VULCAN MATERIALS COMPANY
ORANGEBURG, SOUTH CAROLINA

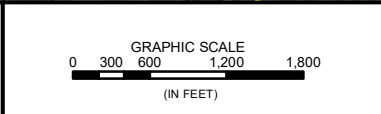
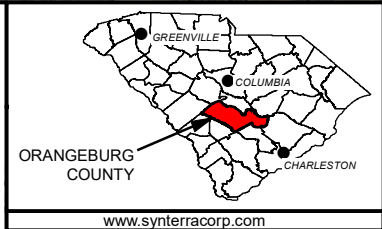


LEGEND

- VULCAN PROPERTY LINE
- PINES >60 YEARS OLD
- MARTIN-MARIETTA BUFFER BOUNDARY
- BANNISTER TRACT (SCDNR)

NOTES:

1. MATURE PINE AND MIXED PINE-HARDWOOD FOREST HABITATS (>60 YEARS OLD) ON THE ORANGEBURG QUARRY SITE DEPICTED.
2. PROPERTY BOUNDARY OBTAINED FROM ORANGEBURG COUNTY GIS AT <https://gis2.orangeburgcounty.org/maps/index.html>.
3. ALL BOUNDARIES ARE APPROXIMATE.
4. AERIAL FROM GOOGLE EARTH TAKEN JANUARY 28, 2021.
5. DRAWING HAS BEEN SET WITH A PROJECTION OF SOUTH CAROLINA STATE PLANE COORDINATE SYSTEM FIPS 3900 (NAD83) INTL.
6. SCDNR - SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES.



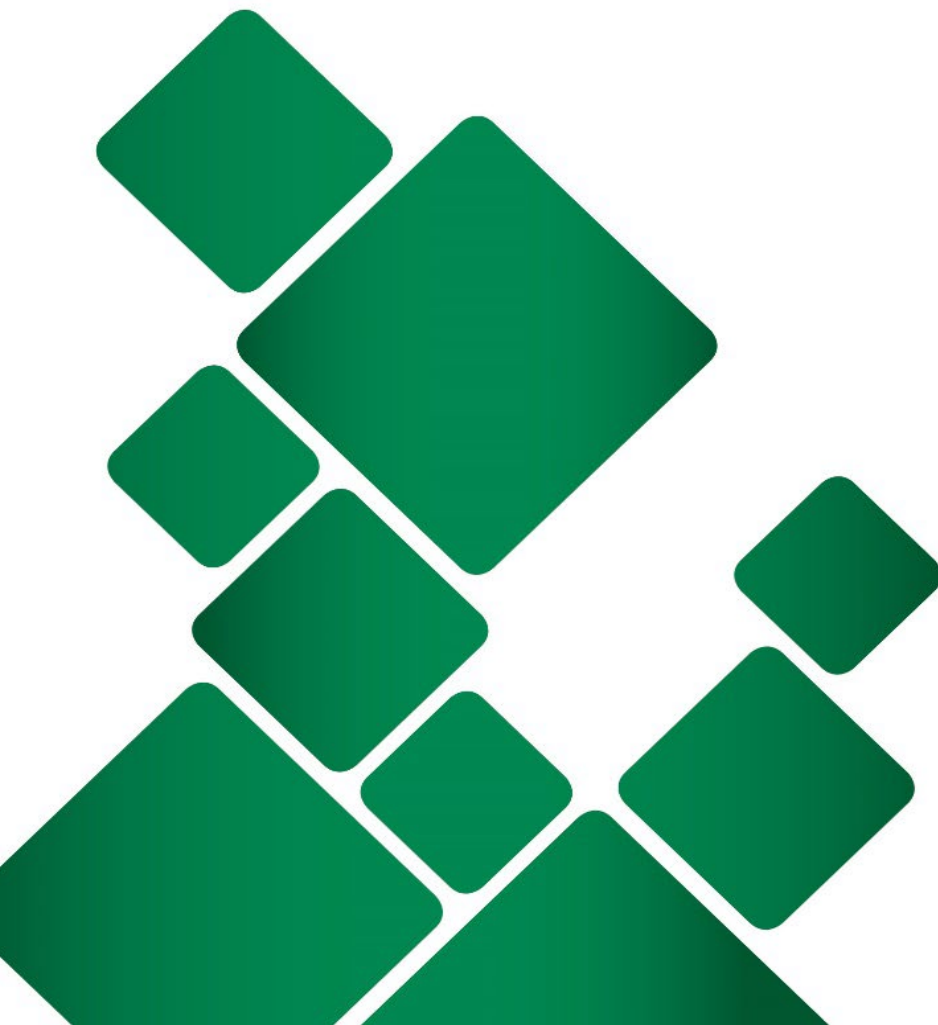
DRAWN BY: B. MCGANN
 REVISED BY: B. MCGANN
 CHECKED BY: G. POTTERN
 APPROVED BY: B. MCGANN
 PROJECT MANAGER: B. MCGANN

DATE: 6/2/2023
 DATE: 6/2/2023
 DATE: 6/2/2023
 DATE: 6/2/2023

FIGURE 6
PINE HABITAT
ENDANGERED AND THREATENED SPECIES
PRELIMINARY BIOLOGICAL ASSESSMENT REPORT
ORANGEBURG QUARRY
VULCAN MATERIALS COMPANY
ORANGEBURG, SOUTH CAROLINA

USFWS IPAC SPECIES LIST LETTER

APRIL 17, 2023



Science & Engineering Consultants



United States Department of the Interior



FISH AND WILDLIFE SERVICE
South Carolina Ecological Services
176 Croghan Spur Road, Suite 200
Charleston, SC 29407-7558
Phone: (843) 727-4707 Fax: (843) 727-4218

In Reply Refer To:
Project Code: 2023-0070148
Project Name: Vulcan Orangeburg Quarry

April 17, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see <https://www.fws.gov/birds/policies-and-regulations.php>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see <https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
 - USFWS National Wildlife Refuges and Fish Hatcheries
 - Migratory Birds
 - Wetlands
-

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

South Carolina Ecological Services

176 Croghan Spur Road, Suite 200

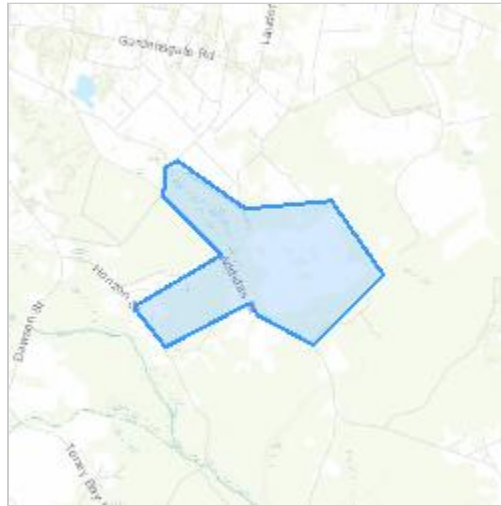
Charleston, SC 29407-7558

(843) 727-4707

PROJECT SUMMARY

Project Code: 2023-0070148
Project Name: Vulcan Orangeburg Quarry
Project Type: Commercial Development
Project Description: Proposed rock quarry
Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@33.35938785000005,-80.28859269504862,14z>



Counties: Orangeburg County, South Carolina

ENDANGERED SPECIES ACT SPECIES

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

| NAME | STATUS |
|--|------------------------|
| Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045 | Endangered |
| Tricolored Bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515 | Proposed Endangered |

BIRDS

| NAME | STATUS |
|---|------------|
| Red-cockaded Woodpecker <i>Picoides borealis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7614 | Endangered |

INSECTS

| NAME | STATUS |
|--|-----------|
| Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743 | Candidate |

FLOWERING PLANTS

| NAME | STATUS |
|--|------------|
| Canby's Dropwort <i>Oxypolis canbyi</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7738 | Endangered |

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

-
1. The [Migratory Birds Treaty Act](#) of 1918.
 2. The [Bald and Golden Eagle Protection Act](#) of 1940.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern \(BCC\) list](#) or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

| NAME | BREEDING SEASON |
|---|------------------------|
| American Kestrel <i>Falco sparverius paulus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9587 | Breeds Apr 1 to Aug 31 |
| Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. | Breeds Sep 1 to Jul 31 |

| NAME | BREEDING SEASON |
|--|-------------------------|
| Chimney Swift <i>Chaetura pelagica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. | Breeds Mar 15 to Aug 25 |
| Painted Bunting <i>Passerina ciris</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA | Breeds Apr 25 to Aug 15 |
| Prothonotary Warbler <i>Protonotaria citrea</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. | Breeds Apr 1 to Jul 31 |

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

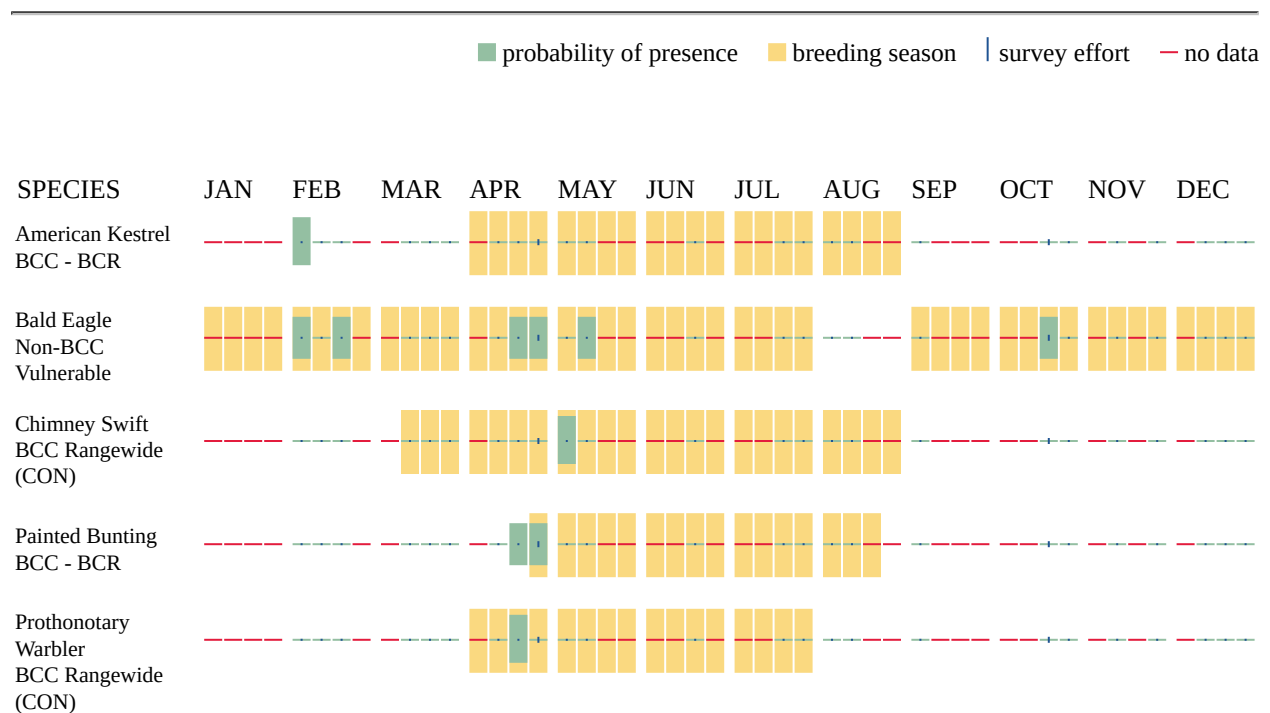
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (—)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

MIGRATORY BIRDS FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point

within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no

data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

WETLANDS

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER FORESTED/SHRUB WETLAND

- [PFO1C](#)
- [PFO1A](#)
- [PSS1C](#)
- [PFO1/4A](#)

FRESHWATER EMERGENT WETLAND

- [PEM1Cd](#)

RIVERINE

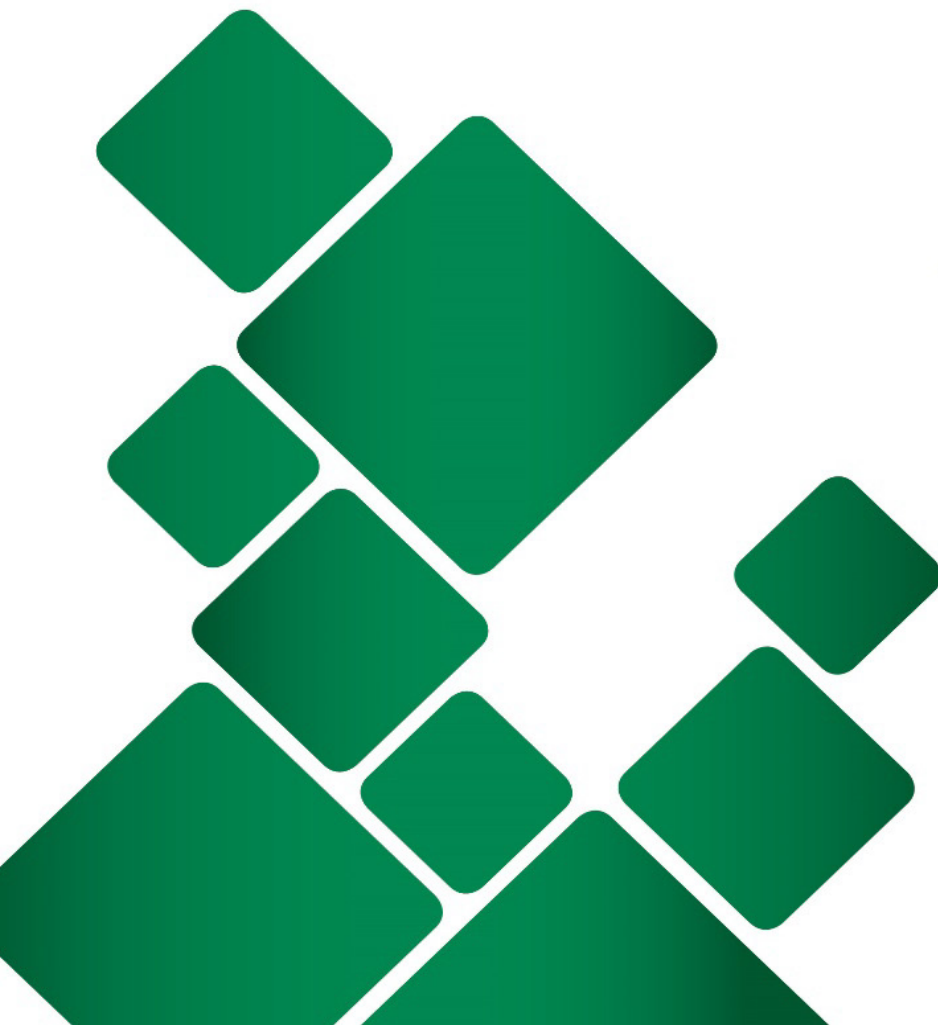
- [R4SBC](#)
-

IPAC USER CONTACT INFORMATION

Agency: Mogensen Mitigation Inc.
Name: Gerald Pottern
Address: 104 East Chestnut Ave
City: Wake Forest
State: NC
Zip: 27587
Email: gpottern@rjgacarolina.com
Phone: 9195568845

SCNHP LETTER

MAY 28, 2023



Science & Engineering Consultants



South Carolina Department of Natural Resources

Robert H. Boyles, Jr.
Director

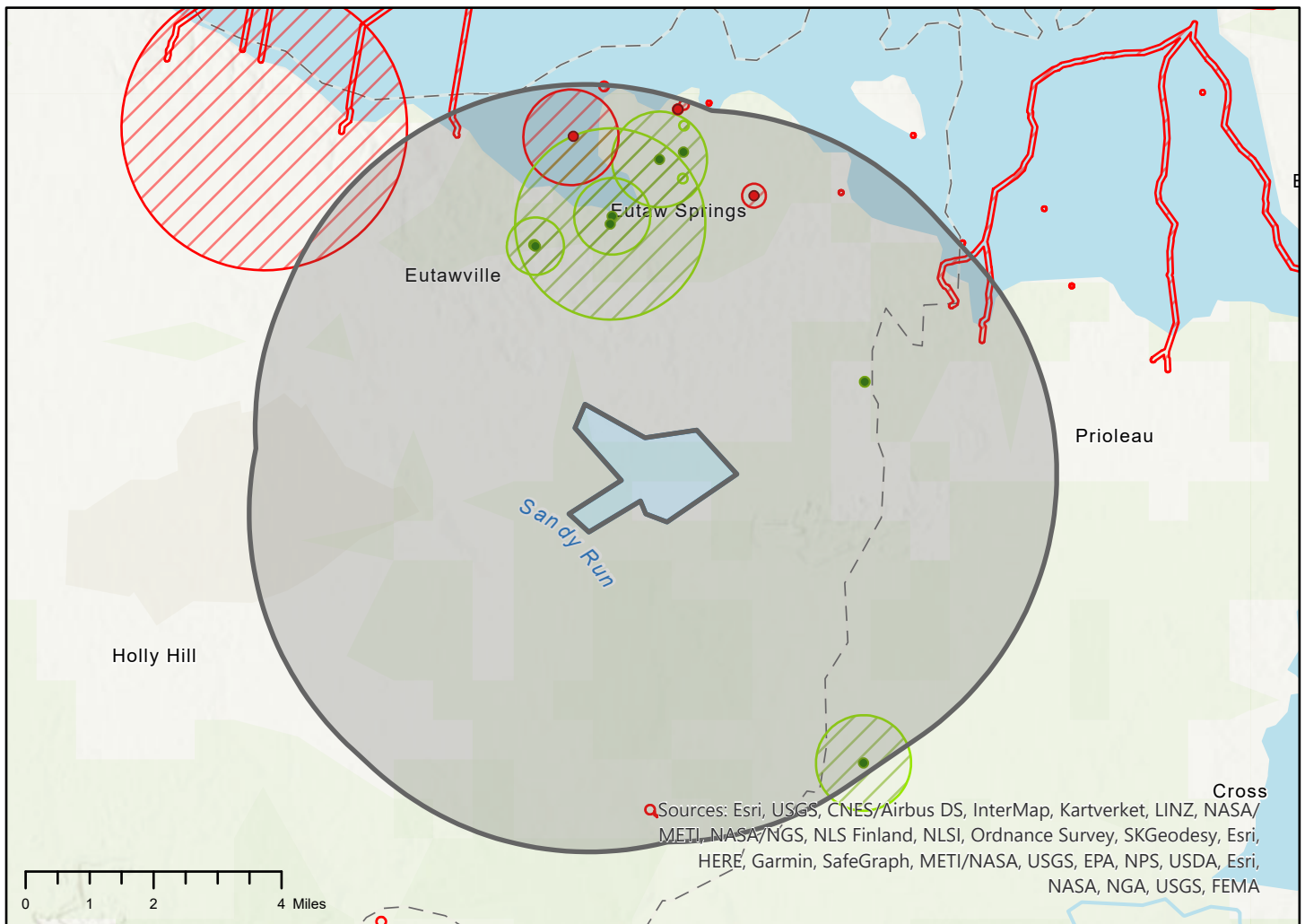
Emily C. Cope
Deputy Director for Wildlife and Freshwater Fisheries

PO Box 167
Columbia, SC 29202
(803) 734-1396
speciesreview@dnr.sc.gov

Requested on Sunday, May 28, 2023 by Gerald Pottern.

Re: Request for Threatened and Endangered Species Consultation
Gerald Pottern - Vulcan Orangeburg Quarry - Mine - Orangeburg County, South Carolina

The South Carolina Department of Natural Resources (SCDNR) has received your request for threatened and endangered species consultation of the above named project in Orangeburg County, South Carolina. The following map depicts the project area and a 5 mile buffer surrounding:



Live Life Outdoors



www.dnr.sc.gov



1000 Assembly St. P.O. Box 167 Columbia, S.C. 29202



803-734-3886

Equal Opportunity Agency



South Carolina Department of Natural Resources

Robert H. Boyles, Jr.
Director

Emily C. Cope
Deputy Director for Wildlife and Freshwater Fisheries

This report includes the following items:

- A - A report for species which intersect the project area
- B - A report for species which intersect the buffer around the project area
- C - A list of best management practices relevant to species near to or within the project area
- D - A list of best management practices relevant to the project type
- E - A list of state & federally listed species within the county of the project area
- F - Instructions to submit new species observation records to the SC Natural Heritage Program

Please be advised:

The contents of this report, including all tables, maps, recommendations, and various other text, are produced as a direct result of the information a user provides at the time of submission. The SCDNR assumes that all information submitted by the user represents the project scope as proposed, and recommends that additional reports be requested should the scope deviate from how the project was initially represented to the SCDNR.

The technical comments outlined in this report are submitted to speak to the general impacts of the activities as described through inquiry by parties outside the South Carolina Department of Natural Resources. These technical comments are submitted as guidance to be considered and are not submitted as final agency comments that might be related to any unspecified local, state or federal permit, certification or license applications that may be needed by any applicant or their contractors, consultants or agents presently under review or not yet made available for public review. In accordance with its policy 600.01, Comments on Projects Under Department Review, the South Carolina Department of Natural Resources, reserves the right to comment on any permit, certification or license application that may be published by any regulatory agency which may incorporate, directly or by reference, these technical comments.

Interested parties are to understand that SCDNR may provide a final agency position to regulatory agencies if any local, state or federal permit, certification or license applications may be needed by any applicant or their contractors, consultants or agents. For further information regarding comments and input from SCDNR on your project, please contact our Office of Environmental Programs by emailing environmental@dnr.sc.gov or by visiting www.dnr.sc.gov/environmental. Pursuant to Section 7 of the Endangered Species Act, requests for formal letters of concurrence with regards to federally listed species should be directed to the USFWS.

Should you have any questions or need more information, please do not hesitate to contact our office by email at speciesreview@dnr.sc.gov or by phone at 803-734-1396.

Sincerely,

A handwritten signature in black ink, appearing to read "Joe Lemeris, Jr.", is written over a light blue horizontal line.

Joseph Lemeris, Jr.
Heritage Trust Program
SC Department of Natural Resources

Live Life Outdoors

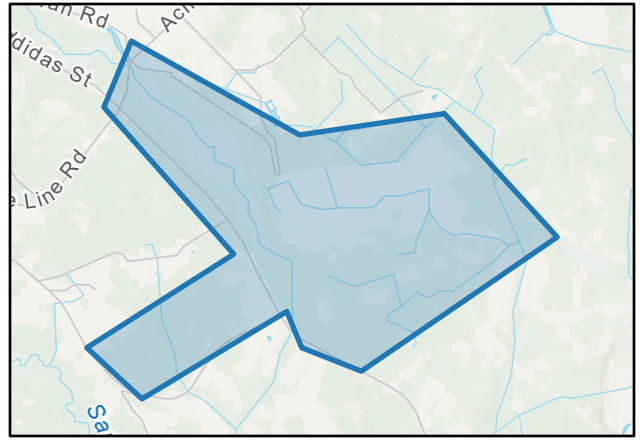


A. Project Area - Species Report

There are 1 tracked species records found within the project foot print. The following table outlines occurrences found within the project footprint (if any), sorted by listing status and species name. Please keep in mind that this information is derived from existing databases and do not assume that it is complete. Areas not yet inventoried may contain significant species or communities. You can find more information about global and state rank status definitions by visiting Natureserve's web page. Please note that certain sensitive species found on site may be listed in this table but are not represented on the map. Please contact speciesreview@dnr.sc.gov should you have further questions related to sensitive species found within the project area.



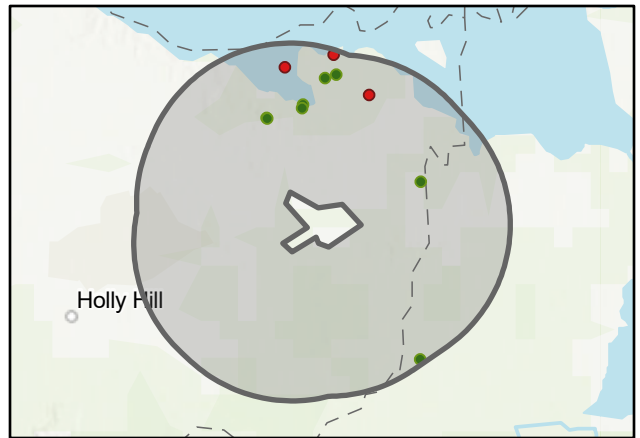
Map Credits: Sources: Esri, USGS, CNES/Airbus DS, InterMap, Kartverket, LINZ, NASA/METI, NASA/NGS, NLS Finland, NLSI, Ordnance Survey, SKGeodesy, Esri, NASA, NGA, USGS, FEMA, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA



| Scientific Name | Common Name | Federal Protection Status | State Protection Status | G Rank | S Rank | Last Obs. Date | Type |
|----------------------------------|---------------------------|---------------------------|-------------------------|--------|--------|----------------|-----------|
| <i>Asplenium heteroresiliens</i> | Marl Spleenwort, Carolina | Not Applicable | Not Applicable | G2 | S1 | 1959-01-01 | Botanical |

B. Buffer Area - Species Report

The following table outlines rare, threatened or endangered species found within 5 miles of the project footprint, arranged in order of protection status and species name. Please keep in mind that this information is derived from existing databases and do not assume that it is complete. Areas not yet inventoried may contain significant species or communities. You can find more information about global and state rank status definitions by visiting NatureServe's web page. Please note that certain sensitive species found within the buffer area may be listed in this table but are not represented on the map.



Map Credits: Sources: Esri, USGS, CNES/Airbus DS, InterMap, Kartverket, LINZ, NASA/METI, NASA/NGS, NLS Finland, NLSI, Ordnance Survey, SKGeodesy, Esri, NASA, NGA, USGS, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS

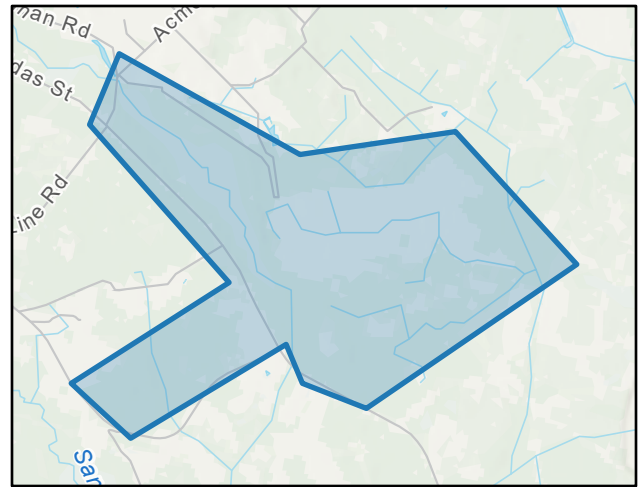
| Scientific Name | Common Name | Federal Protection Status | State Protection Status | G Rank | S Rank | Last Obs. Date | Type |
|--------------------------------------|--------------------------------|---------------------------|-------------------------|----------|---------|----------------|------------|
| <i>Haliaeetus leucocephalus</i> | Bald Eagle | Bald & Golden Eagle | ST: State Threatened | G5 | S3B,S3N | 2021 | Zoological |
| <i>Dryobates borealis</i> | Red-cockaded Woodpecker | LE: Federally Endangered | SE: State Endangered | G3 | S2 | 2018-10-31 | Zoological |
| <i>Ardea herodias</i> | Great Blue Heron | MBTA: Migratory Bird | Not Applicable | G5 | S5 | 2016 | Zoological |
| <i>Alosa aestivalis</i> | Blueback Herring | Not Applicable | Not Applicable | G3G4 | S5 | 2021 | Zoological |
| <i>Anguilla rostrata</i> | American Eel | Not Applicable | Not Applicable | G4 | S3S4 | 2020-06-03 | Zoological |
| <i>Bombus fervidus</i> | Yellow Bumble Bee | Not Applicable | Not Applicable | G3G4 | SNR | 1970-08-25 | Zoological |
| <i>Etheostoma serrifer</i> | Sawcheek Darter | Not Applicable | Not Applicable | G5 | S4 | 2020-06-03 | Zoological |
| <i>Morone saxatilis</i> | Striped Bass | Not Applicable | Not Applicable | G5 | S4S5 | No Date | Zoological |
| <i>Pyganodon cataracta</i> | Eastern Floater | Not Applicable | Not Applicable | G5 | S4S5 | 2005-09-19 | Zoological |
| <i>Utterbackia imbecillis</i> | Paper Pondshell | Not Applicable | Not Applicable | G5 | S5 | 2005-09-25 | Zoological |
| <i>Waterbird Colony</i> | Waterbird Colony | Not Applicable | Not Applicable | GNR | S3S4 | 1998 | Zoological |
| <i>Asplenium heterochroum</i> | Bicolored Spleenwort | Not Applicable | Not Applicable | G3G5 | SX | 1899-12-29 | Botanical |
| <i>Asplenium heteroresiliens</i> | Marl Spleenwort, Carolina | Not Applicable | Not Applicable | G2 | S1 | 1959-01-01 | Botanical |
| <i>Asplenium resiliens</i> | Blackstem Spleenwort | Not Applicable | Not Applicable | G5 | S1 | 1941 | Botanical |
| <i>Bacopa innominata</i> | Tropical Water-hyssop | Not Applicable | Not Applicable | G3G5 | S1 | 1967-09-16 | Botanical |
| <i>Litsea aestivalis</i> | Pondspice | Not Applicable | Not Applicable | G3? | S3 | 1984-04-01 | Botanical |
| <i>Plantago sparsiflora</i> | Pineland Plantain | Not Applicable | Not Applicable | G3 | S2 | 1986-06-01 | Botanical |
| <i>Ruellia strepens</i> | Limestone Wild-petunia | Not Applicable | Not Applicable | G4G5 | S1 | 1885-05-01 | Botanical |
| <i>Schoenoplectiella erecta ssp.</i> | Sharp-scale Bulrush | Not Applicable | Not Applicable | G4G5T4T5 | SH | 1960-10-01 | Botanical |
| <i>Triadenum tubulosum</i> | Southern Marsh St. John's-wort | Not Applicable | Not Applicable | G4? | S1 | 1998-11-12 | Botanical |
| <i>Tridens carolinianus</i> | Carolina Triodia, Carolina | Not Applicable | Not Applicable | G3G4 | S1 | 2000-08-31 | Botanical |

C. Species Best Management Practices (1 of 1)

SCDNR offers the following comments and best management practices (BMPs) regarding this project's potential impacts to species of concern which may be found on or near to the project area. Please contact speciesreview@dnr.sc.gov should you have further questions with regard to survey methods, consultation, or other species-related concerns.



Map Credits: Sources: Esri, USGS, CNES/Airbus DS, InterMap, Kartverket, LINZ, NASA/METI, NASA/NGS, NLS Finland, NLSI, Ordnance Survey, SKGeodesy, Esri, NASA, NGA, USGS, FEMA, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA



One or more occurrences of state listed species are found within or near to your project area. Please note that take of these species are prohibited under S.C. Code of Laws §50-15-30.

The SCDNR recommends that water construction-related activities such as dredging or piling installation be avoided during the months of February through April to limit disturbance to american shad, hickory shad, or blueback herring migrations that occur during this time.

An active bald eagle nest(s) is known to occur within or near to your project area. Surveys during the nesting season (October through May) to rule out nests in the project area are advised to avoid negative impacts to bald eagles. Eagle nests may occur in areas which have not yet been surveyed where suitable habitat is present, as the SCDNR does not survey every nest every year. Bald eagles are a state listed threatened species and are federally protected under the Bald and Golden Eagle Protection Act. If bald eagle nests are found to be within 660 feet of the project area, please consult with the U.S. Fish and Wildlife Service and the National Bald Eagle Management Guidelines to ensure that impacts are avoided to this species before proceeding with any construction activities.. <https://www.dnr.sc.gov/wildlife/baldeagle/pdf/NationalBaldEagleManagementGuidelines.pdf> <https://www.fws.gov/sites/default/files/documents/bald-eagle-monitoring-guidelines-2007.pdf>

Red-cockaded woodpecker, a federally endangered and state endangered species, is known to occur within or near your project area. Surveys of mature pine trees (50-years or older) to rule out RCW within the project footprint is advised, regardless of habitat condition, and use of heavy machinery is prohibited within 200-feet of a cavity tree during the breeding season (April through July). If RCW are found within the project area, please consult with the U.S. Fish and Wildlife Service before proceeding with any construction activities. Please note the take of this state listed species is prohibited under S.C. Code of Laws §50-15-30.

In the interest of preserving plant diversity, the South Carolina Plant Conservation Alliance performs native plant rescues in order to protect and preserve our diversity of native plants. If you are interested in assisting with this important endeavor please contact Mrs. April Punsalan at (843) 727-4707 ext. 218, or by email: scpca@lists.fws.gov before any development occurs onsite. There may be plants of interest on the project site that the Alliance would like to preserve.

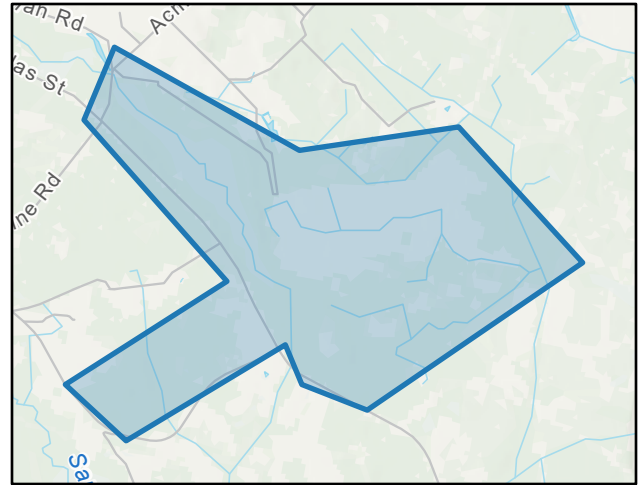
Species in the above table with SWAP priorities of High, Highest or Moderate are designated as having conservation priority under the South Carolina State Wildlife Action Plan (SWAP). SWAP species are those species of greatest conservation need not traditionally covered under any federal funded programs. Species are listed in the SWAP because they are rare or designated as at-risk due to knowledge deficiencies; species common in South Carolina but listed rare or declining elsewhere; or species that serve as indicators of detrimental environmental conditions. SCDNR recommends that appropriate measures should be taken to minimize or avoid impacts to the aforementioned species of concern.

D. Project Best Management Practices (1 of 2)

SCDNR offers the following comments and best management practices (BMPs) regarding this project's potential impacts to natural resources within or surrounding the project area. Please contact our Office of Environmental Programs at environmental@dnr.sc.gov should you have further questions with regard to best management practices related to this project area.



Map Credits: Sources: Esri, USGS, CNES/Airbus DS, InterMap, Kartverket, LINZ, NASA/METI, NASA/NGS, NLS Finland, NLSI, Ordnance Survey, SK Geodesy, Esri, NASA, NGA, USGS, FEMA, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA



Review of available data, National Wetlands Inventory and hydric soils, indicate that wetlands or waters of the United States are present within your project area. These areas may require a permit from the U.S. Army Corps of Engineers (USACE), as well as a compensatory mitigation plan. SCDNR advises that you consult with the USACE Regulatory to determine if jurisdictional wetlands are present and if a permit and mitigation is required for any activities impacting these areas. For more information, please visit their website at www.sac.usace.army.mil/Missions/Regulatory. Additionally, a 401 Water Quality Certification may also be required from the SC Department of Health & Environmental Control. For more information, please visit their website at <https://www.scdhec.gov/environment/water-quality/water-quality-certification-section-401-clean-water-act>.

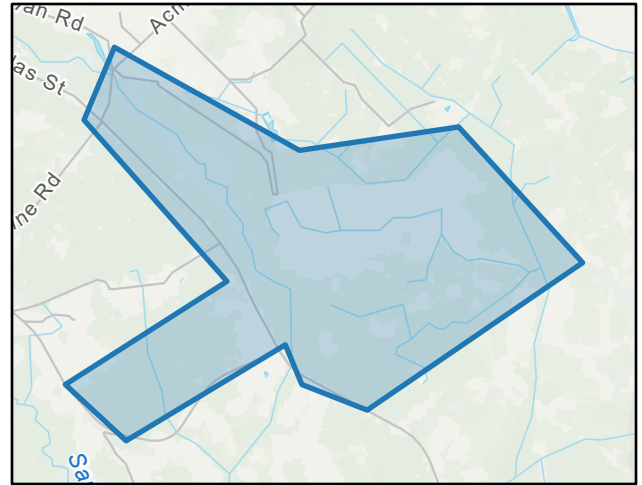
- All necessary measures must be taken to prevent oil, tar, trash and other pollutants from entering the adjacent offsite areas/wetlands/water.
- Once the project is initiated, it must be carried to completion in an expeditious manner to minimize the period of disturbance to the environment.
- Upon project completion, all disturbed areas must be permanently stabilized with vegetative cover (preferable), riprap or other erosion control methods as appropriate.
- The project must be in compliance with any applicable floodplain, stormwater, land disturbance, shoreline management guidance or riparian buffer ordinances.
- Prior to beginning any land disturbing activity, appropriate erosion and siltation control measures (e.g. silt fences or barriers) must be in place and maintained in a functioning capacity until the area is permanently stabilized.
- Materials used for erosion control (e.g., hay bales or straw mulch) will be certified as weed free by the supplier.
- Inspecting and ensuring the maintenance of temporary erosion control measures at least:
 - a. on a daily basis in areas of active construction or equipment operation;
 - b. on a weekly basis in areas with no construction or equipment operation; and
 - c. within 24 hours of each 0.5 inch of rainfall.
- Ensuring the repair of all ineffective temporary erosion control measures within 24 hours of identification, or as soon as conditions allow if compliance with this time frame would result in greater environmental impacts.
- Land disturbing activities must avoid encroachment into any wetland areas (outside the permitted impact area). Wetlands that are unavoidably impacted must be appropriately mitigated.
- Your project may require a Stormwater Permit from the SC Department of Health & Environmental Control, please visit <https://www.scdhec.gov/environment/water-quality/stormwater>

D. Project Best Management Practices (2 of 2)

SCDNR offers the following comments and best management practices (BMPs) regarding this project's potential impacts to natural resources within or surrounding the project area. Please contact our Office of Environmental Programs at environmental@dnr.sc.gov should you have further questions with regard to best management practices related to this project area.



Map Credits: Sources: Esri, USGS, CNES/Airbus DS, InterMap, Kartverket, LINZ, NASA/METI, NASA/NGS, NLS Finland, NLSI, Ordnance Survey, SKGeodesy, Esri, NASA, NGA, USGS, FEMA, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA



- If clearing must occur, riparian vegetation within wetlands and waters of the U.S. must be conducted manually and low growing, woody vegetation and shrubs must be left intact to maintain bank stability and reduce erosion.
- Construction activities must avoid and minimize, to the greatest extent practicable, disturbance of woody shoreline vegetation within the project area. Removal of vegetation should be limited to only what is necessary for construction of the proposed structures.
- Where necessary to remove vegetation, supplemental plantings should be installed following completion of the project. These plantings should consist of appropriate native species for this ecoregion and exclude plant species found on the exotic pest plant council list: https://www.se-eppc.org/southcarolina/SCEPPC_LIST2014finalOct.pdf.
- Review of available data, National Hydrography Dataset, indicates that streams or waters of the United States are present within your project area. These areas may require a permit from the U.S. Army Corps of Engineers (USACE), as well as a compensatory mitigation plan. SCDNR advises that you consult with the USACE Regulatory to determine if jurisdictional waters are present and if a permit and mitigation is required for any activities impacting these areas. For more information, please visit their website at www.sac.usace.army.mil/Missions/Regulatory. Additionally, a 401 Water Quality Certification or a State Navigable Waters permit may also be required from the SC Department of Health & Environmental Control. For more information, please visit the following websites:
 - <https://www.scdhec.gov/environment/water-quality/water-quality-certification-section-401-clean-water-act>
 - <https://www.scdhec.gov/environment/water-quality/navigable-waters>
- Excavation/Construction activities must not occur during fish spawning season from March through June due to its negative impacts on eggs and reproduction activities.
- If clearing must occur, riparian vegetation within wetlands and waters of the U.S. must be conducted manually and low growing, woody vegetation and shrubs must be left intact to maintain bank stability and reduce erosion.
- Construction activities must avoid and minimize, to the greatest extent practicable, disturbance of woody shoreline vegetation within the project area. Removal of vegetation should be limited to only what is necessary for construction of the proposed structures.
- Where necessary to remove vegetation, supplemental plantings should be installed following completion of the project. These plantings should consist of appropriate native species for this ecoregion.

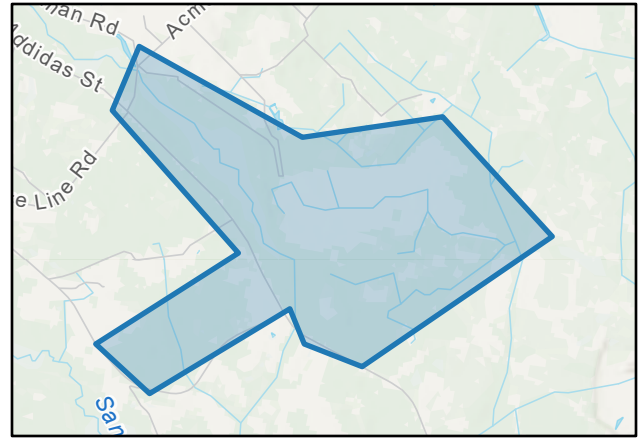
Your project area includes a FEMA special flood hazard area and may require a permit from the County National Floodplain Insurance Program Manager before impacts occur to aquatic resources and the associated floodplains on site. Please refer to <https://www.dnr.sc.gov/water/flood/documents/nfipadmindirectory.pdf> to find your appropriate contact information.

E. State & Federally Listed Species in Orangeburg County

The South Carolina Department of Natural Resources' Heritage Trust Program organizes a database that captures and tracks element of occurrence data for rare, threatened and endangered species, both federal and state. Please keep in mind that this information included within this report is derived from existing databases, and do not assume that it is complete. Areas not yet inventoried may contain significant species or communities. If your project requires the assessment of potential threatened or endangered species that could be within the project area, the SCDNR asks that you include a review of the state listed species within the county or watershed in addition to those that may be within the report as being within the project footprint or within 1-mile of the proposed project area. Consideration should be given to the occurrence of suitable habitat onsite, species movement and connectivity of habitat when assessing the likelihood of a state listed species on the project area.



Map Credits: Sources: Esri, USGS, CNES/Airbus DS, InterMap, Kartverket, LINZ, NASA/METI, NASA/NGS, NLS Finland, NLSI, Ordnance Survey, SKGeodesy, Esri, NASA, NGA, USGS, FEMA, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

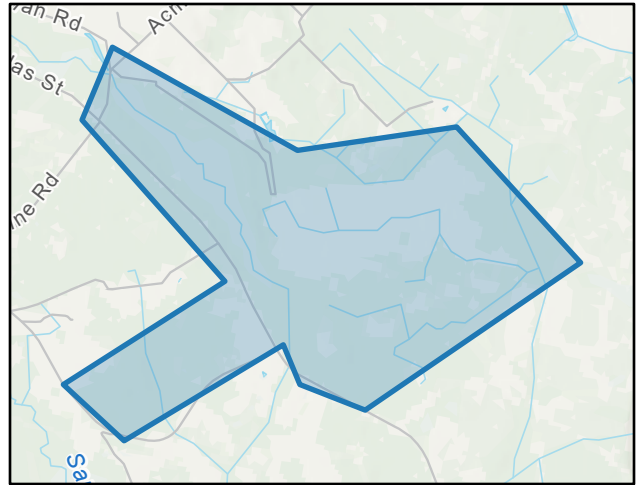


| County | Scientific Name | Common Name | G Rank | S Rank | Federal Protection Status | State Protection Status | Group Type |
|------------|---------------------------------|--------------------------------|--------|---------|--------------------------------------|-------------------------|------------|
| Orangeburg | <i>Acipenser brevirostrum</i> | Shortnose Sturgeon | G3 | S3 | LE: Federally Endangered | SE: State Endangered | Zoological |
| Orangeburg | <i>Acipenser oxyrinchus</i> | Atlantic Sturgeon | G3 | S3 | LE: Federally Endangered | Not Applicable | Zoological |
| Orangeburg | <i>Clemmys guttata</i> | Spotted Turtle | G5 | S3 | ARS: At-Risk Species | ST: State Threatened | Zoological |
| Orangeburg | <i>Corynorhinus rafinesquii</i> | Rafinesque's Big-eared Bat | G3G4 | S2 | Not Applicable | SE: State Endangered | Zoological |
| Orangeburg | <i>Danaus plexippus</i> | Monarch Butterfly | G4 | S4 | C: Candidate | Not Applicable | Zoological |
| Orangeburg | <i>Dryobates borealis</i> | Red-cockaded Woodpecker | G3 | S2 | LE: Federally Endangered | SE: State Endangered | Zoological |
| Orangeburg | <i>Eurycea chamberlaini</i> | Chamberlain's Dwarf Salamander | G4 | S3 | ARS: At-Risk Species | Not Applicable | Zoological |
| Orangeburg | <i>Haliaeetus leucocephalus</i> | Bald Eagle | G5 | S3B,S3N | Bald & Golden Eagle Protection Act | ST: State Threatened | Zoological |
| Orangeburg | <i>Lithobates capito</i> | Carolina Gopher Frog | G2G3 | S1 | ARS: At-Risk Species | SE: State Endangered | Zoological |
| Orangeburg | <i>Noturus sp. 2</i> | Broadtail Madtom | G2 | S1 | Not Applicable | ST: State Threatened | Zoological |
| Orangeburg | <i>Perimyotis subflavus</i> | Tricolored Bat | G3G4 | S1S2 | LEP: Federally Endangered (Proposed) | Not Applicable | Zoological |
| Orangeburg | <i>Pseudobranchius striatus</i> | Northern Dwarf Siren | G5 | S2 | Not Applicable | ST: State Threatened | Zoological |
| Orangeburg | <i>Lobelia boykinii</i> | Boykin's Lobelia | G2G3 | S2? | ARS: At-Risk Species | Not Applicable | Botanical |
| Orangeburg | <i>Tiedemannia canbyi</i> | Canby's Cowbane | G2 | S2 | LE: Federally Endangered | Not Applicable | Botanical |

F. Instructions for Submitting Species Observations

The SC Natural Heritage Dataset relies on continuous monitoring and surveying for species of concern throughout the state. Any records of species of concern found within this project area would greatly benefit the quality and comprehensiveness of the statewide dataset for rare, threatened and endangered species. Below are instructions for how to download the SC Natural Heritage Occurrence Reporting Form through the Survey123 App.

Map Credits: Sources: Esri, USGS, CNES/Airbus DS, InterMap, Kartverket, LINZ, NASA/METI, NASA/NGS, NLS Finland, NLSI, Ordnance Survey, SKGeodesy, Esri, NASA, NGA, USGS, FEMA, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA



Conservation Ranks & SWAP Priority Status

The SC Natural Heritage Program assigns S Ranks for species tracked within the state of South Carolina based on ranking methodology developed by NatureServe and its state program network. For information conservation rank definitions, please visit <https://explorer.natureserve.org/AboutTheData/Statuses>

The SCDNR maintains and updates its State Wildlife Action Plan (SWAP) every 10 years. This plan categorizes species of concern by Moderate, High, and Highest Priority. Please visit <https://www.dnr.sc.gov/swap/index.html> for more information about the SC SWAP.

Important Information Regarding Element Occurrence Data:

The South Carolina Department of Natural Resources' Heritage Trust Program organizes a database that captures and tracks element of occurrence data for rare, threatened and endangered species, both federal and state. Please keep in mind that this information included within this report is derived from existing databases, and do not assume that it is complete. Areas not yet inventoried may contain significant species or communities. If your project requires the assessment of potential threatened or endangered species that could be within the project area, the SCDNR asks that you include a review of the state listed species within the county or watershed in addition to those that may be within the report as being within the project footprint or within 1-mile of the proposed project area. Consideration should be given to the occurrence of suitable habitat onsite, species movement and connectivity of habitat when assessing the likelihood of a state listed species on the project area. To view these lists please visit our county and watershed dashboards at our website: <https://schtportal.dnr.sc.gov/portal/apps/sites/#track>

Instructions for accessing the SC Natural Heritage Occurrence Reporting Form

For use in a browser (on your desktop/PC):

- 1) Follow <https://bit.ly/scht-reporting-form>
- 2) Select 'Open in browser'
- 3) The form will open and you can begin entering data!

This method of access will also work on a browser on a mobile device, but only when connected to the internet. To use the form in the field without relying on data/internet access, follow the steps below.

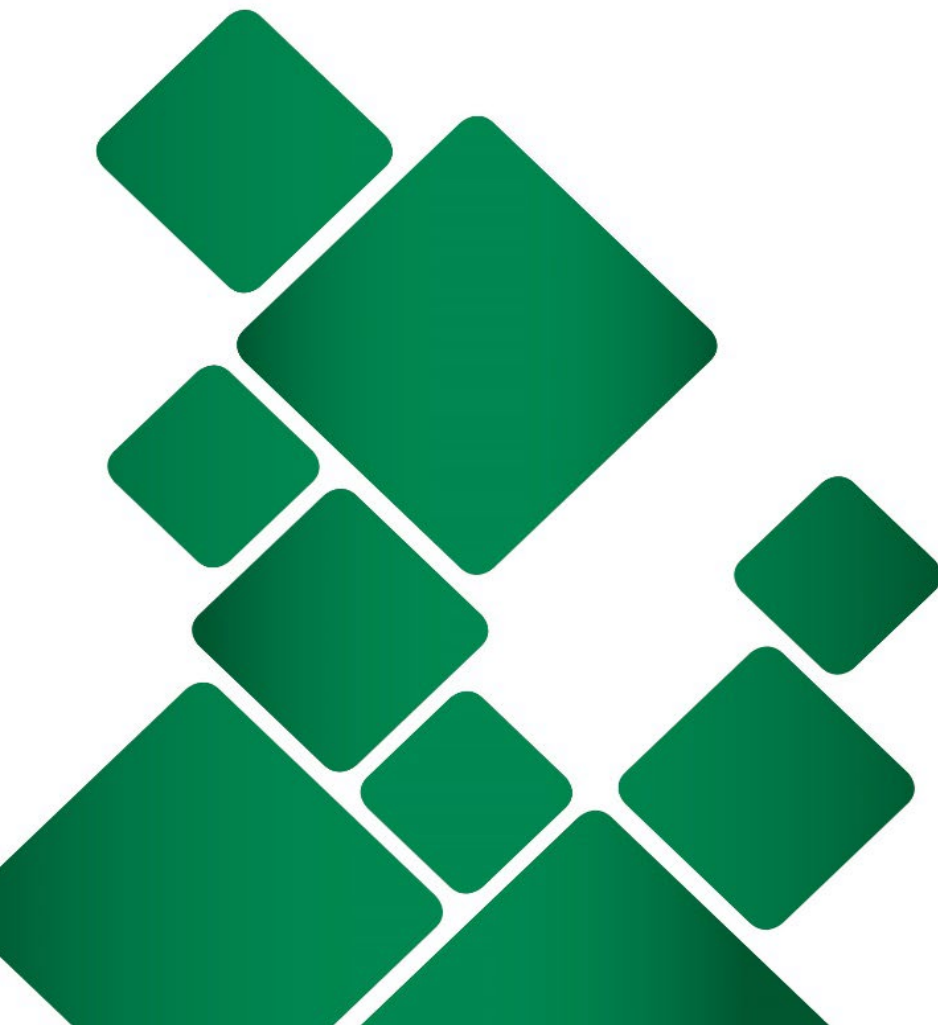
For use on a smartphone or tablet using the field app:

- 1) Download the Survey123 App from the Google Play store or the Apple Store. This app is free to download. Allow the app to use your location.
- 2) Use the camera app (or other QR Reader app) to scan the QR code on this page from your smartphone or tablet. Click on the 'Open in the Survey123 field app'. This will prompt a window to allow Survey123 to download the SC Natural Heritage Occurrence Reporting Form. Select 'Open.'
- 3) The form will automatically open in Survey123, and you can begin entering data! This form will stay loaded in the app on your device until you manually delete it, and you can submit as many records as you like.



NORTHERN LONG-EARED BAT EFFECT DETERMINATION LETTER

AUGUST 10, 2023



Science & Engineering Consultants



United States Department of the Interior



FISH AND WILDLIFE SERVICE
South Carolina Ecological Services
176 Croghan Spur Road, Suite 200
Charleston, SC 29407-7558
Phone: (843) 727-4707 Fax: (843) 727-4218

In Reply Refer To:
Project code: 2023-0070148
Project Name: Vulcan Orangeburg Quarry

August 09, 2023

Federal Nexus: yes
Federal Action Agency (if applicable): Army Corps of Engineers

Subject: Technical assistance for 'Vulcan Orangeburg Quarry'

Dear Gerald Pottern:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on August 09, 2023, for 'Vulcan Orangeburg Quarry' (here forward, Project). This project has been assigned Project Code 2023-0070148 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements are not complete.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project.

Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat Rangewide Determination Key (Dkey), invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid.***

Determination for the Northern Long-Eared Bat

Based upon your IPaC submission and a standing analysis, your project is not reasonably certain to cause incidental take of the northern long-eared bat. Unless the Service advises you within 15 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the Action is not likely to result in unauthorized take of the northern long-eared bat.

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination for the northern long-eared bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Canby's Dropwort *Oxypolis canbyi* Endangered
- Monarch Butterfly *Danaus plexippus* Candidate
- Red-cockaded Woodpecker *Picoides borealis* Endangered
- Tricolored Bat *Perimyotis subflavus* Proposed Endangered

You may coordinate with our Office to determine whether the Action may cause prohibited take of the animal species listed above. Note that if a new species is listed that may be affected by the identified action before it is complete, additional review is recommended to ensure compliance with the Endangered Species Act.

Next Step

Consultation with the Service is necessary. The project has a federal nexus (e.g., Federal funds, permit, etc.), but you are not the federal action agency or its designated (in writing) non-federal representative. Therefore, the ESA consultation status is incomplete and no project activities should occur until consultation between the Service and the Federal action agency (or designated non-federal representative), is completed.

As the federal agency or designated non-federal representative deems appropriate, they should submit their determination of effects to the Service by doing the following.

1. Log into IPaC using an agency email account and click on My Projects, click "Search by record locator" to find this Project using **479-130123003**. (Alternatively, the originator of the project in IPaC can add the agency representative to the project by using the Add Member button on the project home page.)
2. Review the answers to the Northern Long-eared Bat Range-wide Determination Key to ensure that they are accurate.
3. Click on Review/Finalize to convert the 'not likely to adversely affect' consistency letter to a concurrence letter. Download the concurrence letter for your files if needed.

If no changes occur with the Project or there are no updates on listed species, no further consultation/coordination for this project is required for the northern long-eared bat. However, the Service recommends that project proponents re-evaluate the Project in IPaC if: 1) the scope, timing, duration, or location of the Project changes (includes any project changes or amendments); 2) new information reveals the Project may impact (positively or negatively) federally listed species or designated critical habitat; or 3) a new species is listed, or critical habitat designated. If any of the above conditions occurs, additional coordination with the Service should take place before project implements any changes which are final or commits additional resources.

If you have any questions regarding this letter or need further assistance, please contact the South Carolina Ecological Services and reference Project Code 2023-0070148 associated with this Project.

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

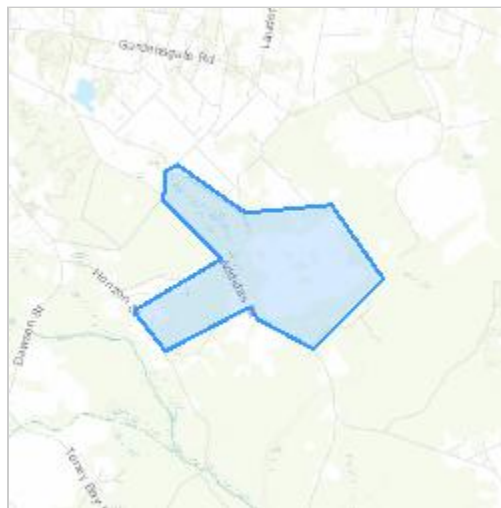
Vulcan Orangeburg Quarry

2. Description

The following description was provided for the project 'Vulcan Orangeburg Quarry':

Proposed rock quarry

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@33.36071335,-80.28782094105665,14z>



DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of “may affect, but not likely to adversely affect” for the Endangered northern long-eared bat (*Myotis septentrionalis*).

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of the northern long-eared bat or any other listed species?

Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

No

2. Your project overlaps with an area where northern long-eared bats may be present year-round. Time-of-year restrictions may not be appropriate for your project due to bats being active all year.

Do you understand that your project may impact bats at any time during the year and time-of-year restrictions may not apply to your project?

Yes

3. Do you have post-white nose syndrome occurrence data that indicates that northern long-eared bats (NLEB) are likely to be present in the action area?

Bat occurrence data may include identification of NLEBs in hibernacula, capture of NLEBs, tracking of NLEBs to roost trees, or confirmed acoustic detections. With this question, we are looking for data that, for some reason, may have not yet been made available to U.S. Fish and Wildlife Service.

No

4. Does any component of the action involve construction or operation of wind turbines?

Note: For federal actions, answer ‘yes’ if the construction or operation of wind power facilities is either (1) part of the federal action or (2) would not occur but for a federal agency action (federal permit, funding, etc.).

No

5. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

Yes

6. Is the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), or Federal Transit Administration (FTA) funding or authorizing the proposed action, in whole or in part?

No

7. Are you an employee of the federal action agency or have you been officially designated in writing by the agency as its designated non-federal representative for the purposes of Endangered Species Act Section 7 informal consultation per 50 CFR § 402.08?

Note: This key may be used for federal actions and for non-federal actions to facilitate section 7 consultation and to help determine whether an incidental take permit may be needed, respectively. This question is for information purposes only.

No

8. Is the lead federal action agency the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC)? Is the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC) funding or authorizing the proposed action, in whole or in part?

No

9. Is the lead federal action agency the Federal Energy Regulatory Commission (FERC)?

No

10. Have you determined that your proposed action will have no effect on the northern long-eared bat? Remember to consider the [effects of any activities](#) that would not occur but for the proposed action.

If you think that the northern long-eared bat may be affected by your project or if you would like assistance in deciding, answer “No” below and continue through the key. If you have determined that the northern long-eared bat does not occur in your project’s action area and/or that your project will have no effects whatsoever on the species despite the potential for it to occur in the action area, you may make a “no effect” determination for the northern long-eared bat.

Note: Federal agencies (or their designated non-federal representatives) must consult with USFWS on federal agency actions that may affect listed species [50 CFR 402.14(a)]. Consultation is not required for actions that will not affect listed species or critical habitat. Therefore, this determination key will not provide a consistency or verification letter for actions that will not affect listed species. If you believe that the northern long-eared bat may be affected by your project or if you would like assistance in deciding, please answer “No” and continue through the key. Remember that this key addresses only effects to the northern long-eared bat. Consultation with USFWS would be required if your action may affect another listed species or critical habitat. The definition of [Effects of the Action](#) can be found here: <https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions>

No

11. Your project overlaps with an area where northern long-eared bats may be present year-round.

Is suitable northern long-eared bat habitat present within 1000 feet of project activities?

Yes

12. Will the action cause effects to a bridge?

No

13. Will the action result in effects to a culvert or tunnel?

No

14. Does the action include the intentional exclusion of northern long-eared bats from a building or structure?

Note: Exclusion is conducted to deny bats' entry or reentry into a building. To be effective and to avoid harming bats, it should be done according to established standards. If your action includes bat exclusion and you are unsure whether northern long-eared bats are present, answer "Yes." Answer "No" if there are no signs of bat use in the building/structure. If unsure, contact your local U.S. Fish and Wildlife Services Ecological Services Field Office to help assess whether northern long-eared bats may be present. Contact a Nuisance Wildlife Control Operator (NWCO) for help in how to exclude bats from a structure safely without causing harm to the bats (to find a NWCO certified in bat standards, search the Internet using the search term "National Wildlife Control Operators Association bats"). Also see the White-Nose Syndrome Response Team's guide for bat control in structures

No

15. Does the action involve removal, modification, or maintenance of a human-made structure (barn, house, or other building) **known or suspected to contain roosting bats**?

No

16. Will the action cause construction of one or more new roads open to the public?

For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

No

17. Will the action include or cause any construction or other activity that is reasonably certain to increase average daily traffic on one or more existing roads?

Note: For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.). .

Yes

18. Will the increased vehicle traffic occur on any road that lies between any two areas of contiguous forest that are each greater than or equal to 10 acres in extent and are separated by less than 1,000 feet? Northern long-eared bats may cross a road by flying between forest patches that are up to 1,000 feet apart.

Note: "Contiguous forest" of 10 acres or more may include areas where multiple forest patches are separated by less than 1,000 feet of non-forested area if the forested patches, added together, comprise at least 10 acres.

Yes

19. For every 1,000 feet of new road that crosses between contiguous forest patches, will there be at least one place where bats could cross the road corridor by flying less than 33 feet (10 meters) between trees whose tops are at least 66 feet (20 meters) higher than the road surface?

Yes

20. Will the proposed action involve the creation of a new water-borne contaminant source (e.g., leachate pond pits containing chemicals that are not NSF/ANSI 60 compliant)?

No

21. Will the proposed action involve the creation of a new point source discharge from a facility other than a water treatment plant or storm water system?

Yes

22. Will the proposed action result in the cutting or other means of knocking down, bringing down, or trimming of any trees suitable for northern long-eared bat roosting?

Note: Suitable northern long-eared bat roost trees are live trees and/or snags ≥ 3 inches dbh that have exfoliating bark, cracks, crevices, and/or cavities.

Yes

PROJECT QUESTIONNAIRE

Enter the extent of the action area (in acres) from which trees will be removed - round up to the nearest tenth of an acre. For this question, include the entire area where tree removal will take place, even if some live or dead trees will be left standing.

90

In what extent of the area (in acres) will trees be cut, knocked down, or trimmed during the inactive (hibernation) season for northern long-eared bat? **Note:** Inactive Season dates for spring staging/fall swarming areas can be found here: <https://www.fws.gov/media/inactive-season-dates-swarming-and-staging-areas>

0

In what extent of the area (in acres) will trees be cut, knocked down, or trimmed during the active (non-hibernation) season for northern long-eared bat? **Note:** Inactive Season dates for spring staging/fall swarming areas can be found here: <https://www.fws.gov/media/inactive-season-dates-swarming-and-staging-areas>

90

Will all potential northern long-eared bat (NLEB) roost trees (trees ≥ 3 inches diameter at breast height, dbh) be cut, knocked, or brought down from any portion of the action area greater than or equal to 0.1 acre? If all NLEB roost trees will be removed from multiple areas, select 'Yes' if the cumulative extent of those areas meets or exceeds 0.1 acre.

Yes

Enter the extent of the action area (in acres) from which all potential NLEB roost trees will be removed. If all NLEB roost trees will be removed from multiple areas, entire the total extent of those areas. Round up to the nearest tenth of an acre.

90

For the area from which all potential northern long-eared bat (NLEB) roost trees will be removed, on how many acres (round to the nearest tenth of an acre) will trees be allowed to regrow? Enter '0' if the entire area from which all potential NLEB roost trees are removed will be developed or otherwise converted to non-forest for the foreseeable future.

0

Will any snags (standing dead trees) ≥ 3 inches dbh be left standing in the area(s) in which all northern long-eared bat roost trees will be cut, knocked down, or otherwise brought down?

No

Will all project activities be completed by April 1, 2024?

Yes

IPAC USER CONTACT INFORMATION

Agency: Mogensen Mitigation Inc.
Name: Gerald Pottern
Address: 104 East Chestnut Ave
City: Wake Forest
State: NC
Zip: 27587
Email: gpottern@rjgacarolina.com
Phone: 9195568845

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Army Corps of Engineers
