# **Attachment 8: Mitigation Plan**

# 9 VAC 15-40-60: Mitigation Plan

A mitigation plan is required to address significant adverse impacts to wildlife and/or historic resources as determined in 9 VAC 15-40-50 for the following reasons:

- Bats have been detected within the disturbance zone [9 VAC 15-40-50(A)(1)] and statelisted threatened and endangered (T&E) wildlife were found to occur within the disturbance zone [9 VAC 15-40-50(A)(2)].
- The Project was found to have a potential visual impact to the Tredegar House (011-0215) a property considered eligible for inclusion in the NRHP [9 VAC 15-40-50.B].

The mitigation plan is outlined below, and includes a description of the affected wildlife and historic resources, the impact to be mitigated, a description of actions that will be taken to avoid or minimize the stated impact, and a plan for implementation.

# A. Description of Wildlife Impacts

Pre-construction surveys were conducted to analyze potential impacts to wildlife in accordance with PBR (9 VAC 15-40-40) and USFWS requirements. Study plans were developed in coordination with DGIF and USFWS. Over the course of these surveys, one state-listed bird species (peregrine falcon, threatened) was recorded and potential use of the project area was established for four state-listed bat species (Indiana bat [endangered], tri-colored bat [endangered as of April 1, 2016], little brown bat [endangered as of April 1, 2016], and northern long-eared bat [threatened as of April 1, 2016]).

#### **Peregrine Falcon**

Peregrine falcons breed in open landscapes with high cliffs and/or rock outcrops, and often migrate along ridgelines and coastlines. No suitable peregrine falcon nesting habitat was identified in or near the Project (WEST 2016a), and only two individuals have been recorded onsite(October 15, 2010 and September 6, 2015). Due to the fact that only two individuals were recorded, both during fall migration, use of the project by the species is low and impacts are not likely to occur as a result of the construction or operations of this Project. No mitigation measures are warranted to avoid significant adverse impacts to the species.

#### Indiana Bat, Northern Long-eared Bat, Tri-colored Bat, and Little Brown Bat

Indiana bat, northern long-eared bat, tri-colored bat, and little brown bats occur over most of the eastern half of the U.S., hibernating in caves during the winter, roosting in trees (as well as buildings, caves, rocks, and wood piles in the case of little brown bats) during the summer, and migrating between the two areas during spring and fall. A hibernacula with records of Indiana, tri-colored and little brown bats is known to occur approximately 3.7 miles south of the Project area (i.e., Perry's Saltpetre cave), and although none of these species were captured onsite, acoustic surveys indicate all three species may occur during summer (Copperhead 2015). Northern long-eared bats were confirmed present during summer (Copperhead 2015), and all four bat species may migrate through the Project area and may be at risk of collision with operating turbines during the migration period. Potential impacts to bats may also include

indirect impacts such as habitat loss due to tree clearing and displacement from construction activities.

In order to avoid take of state-listed bats or significant adverse impacts on their habitats, the following measures will be implemented. These measures were developed in coordination with USFWS and DGIF, primarily to avoid take of federally listed bats (Indiana and northern long-eared bats); however, they are also effective measures for minimizing risk to little brown and tri-colored bats:

- Avoid tree clearing within 150 feet of identified northern long-eared bat roost trees from April 1-September 15, and within 5 miles of Perry's Saltpetre cave from April 1-November 15.
- Minimize overall impacts to forested areas to the extent practicable.
- Begin blasting prior to May 1 so that roosting bats have time to habituate or select maternal roost sites away from Project activity.
- Curtail all turbines (i.e., feather blades) from sunset to sunrise from May 15 through November 15 at winds below 6.9 m/s when temperatures are greater than 38°F. This measure ensures no risk of operational take during migration and summer roosting periods.

# B. Mitigation Measures for Wildlife

# State-listed T&E Wildlife

No significant adverse impacts are anticipated to state-listed T/E wildlife with implementation of the above measures; therefore, no additional mitigation is proposed. Apex may pursue a federal Incidental Take Permit (ITP) to authorize potential take of listed bats, which would require additional mitigation measures. Should an ITP be pursued, DGIF will be consulted for compliance with the state's endangered species statutes.

# Bats

# Curtailment

Turbines will be curtailed as outlined above.

# Post Construction Monitoring

To evaluate potential avian and bat impacts associated with the Project, the following monitoring plan is proposed for implementation during year 1 of operations. Data will be used to estimate facility-wide fatality rates for birds and bats and evaluate the relationship of bat fatalities to operational protocols and weather related variables. The overall effectiveness of operational protocols to reduce impacts will be assessed.

#### Standardized Carcass Searches

To estimate the number of avian and bat fatalities associated with the Project, personnel trained in proper search techniques will conduct carcass searches during year 1 as outlined below.

• 20% of turbines will be searched with cleared- plot surveys (up to 50-m radius depending on terrain), 80% turbines road and pad surveys, with roads evaluated out to 90 meters from April 1 through November 15.

- During the fall bat migration period (August 1- November 15), surveys will be conducted twice per week from August 1 31 and weekly from September 1-November 15.
- During spring and summer (April 1- July 31), surveys will be conducted weekly.
- During winter (November 15 April 1), operations staff will conduct monthly road and pad surveys at 100% of turbines, primarily to assess impacts to wintering birds.

Although take of state-listed bats and significant impacts to birds or bats are not anticipated, results will be reviewed with DGIF after year 1 to determine if another year of surveys (or a reduced or more focused approach) is necessary; otherwise roads and pads will be searched monthly by operations staff for the life of the project to assess general trends. The following information will be collected during each survey: date, start and end time, observers, and weather data. If a dead bird or bat is found, the observer will additionally record: date and time detected, species, sex and age (when possible), turbine number, measured distance from turbine, habitat surrounding carcass, condition of carcass (e.g., intact, scavenged, feather spot), and estimated time of death. Photographs of each subject will be recorded. The Applicant will request that its subcontractors obtain state permits to handle bats so that specimens can be collected and provided to DGIF for research purposes. This measure will be implemented assuming health and safety concerns with handling and storing/transporting bats can be addressed in a cost-effective manner.

#### Searcher Efficiency

To assess detection probability, carcasses of small and large birds and bats or bat surrogates (e.g., mice) will be randomly placed within survey plots. A total of 40 birds (20 large and 20 small) and 20 bats (or surrogates) will be placed at the start of each season (spring, summer, and fall). Trials will be divided between plots and road and pad survey areas.

Test carcasses will be placed on the morning of turbine searches, dropped from waist high or higher and allowed to land in a random posture. Each trial carcass will be discreetly marked (with tape or thread) prior to placement so that it can be identified as a study carcass if it is found by observers or wind facility personnel, or moved by a scavenger.

Searcher efficiency trials will be completed in a manner that allows unbiased testing of detection probability. Searchers will be unaware of the placement of the test subjects by the biologist overseeing the fatality monitoring program. Test subjects will be checked after searcher efficiency trials to confirm presence at the time of the trial. Detection rates will be determined by carcass type (i.e., small bird, large bird, and bat) and location (i.e., road and pad, survey plot) and used to adjust estimates of facility-wide fatality.

#### Carcass Removal Trials

Carcass persistence trials will be completed using the same test subjects used for searcher efficiency trials. The test carcasses will be monitored over a 30-day period according to the following schedule as closely as possible. Carcasses will be checked every day for the first 4 days, and then on days 7, 10, 14, 20, and 30. This schedule may vary slightly depending on weather and coordination with the other survey work. At each visit, the observer will note the condition of the carcass (e.g., intact, scavenged, feather spot [for birds; i.e., more than 10 feathers], or absent [less than 10 feathers for birds]). Trial carcasses will be left at the location until the end of the 30-day trial or until the carcass is removed entirely by scavengers. After 30 days, any remaining evidence of the carcasses will be removed.

#### Post Construction Wildlife Mitigation and Management.

Monitoring results will be reviewed with DGIF after the initial year of post-construction monitoring, and a report outlining study results, mitigation measure effectiveness, and expenditures/lost revenues attributable to curtailment, other mitigation actions, and monitoring will be provided. The monitoring and mitigation actions will continue for the life of the Project as outlined above, unless an ITP is attained or data supports a reduced or more focused monitoring approach. If so, then the Applicant will work with DGIF to revise the mitigation and monitoring plan accordingly.

# C. Description of Potential Impacts to the Tredegar House, Archaeological Site 44B00617, and Mitigation Measures

The Applicant completed a pre-construction historic resources analysis, the results of which are reported in the document titled, Phase I Cultural resources Survey of the Rocky Forge Wind Turbine Project, Botetourt County Virginia, April 2016 (Attachment 7B to the PBR Application). The historic resources analysis identified that the Tredegar House (011-0215), a property considered eligible for inclusion in the NRHP, could have a potentially adversely affected viewshed as a result of the location of a limited number of the turbines.

To take into account potential impacts to the Tredegar House, the Applicant first reviewed options to avoid or minimize the project impacts through consideration of project design and location changes. Given the interconnected nature of the various project components and their relationship to the project area topography, it was determined that project design and location changes were not viable and that meaningful and effective opportunities to avoid or minimize visual impacts to the Tredegar House are not available. Therefore, the Applicant proposes the following actions as mitigation for potential visual impacts to the Tredegar House:

- Completion and submission of a Virginia Department of Historic Resources' (VDHR) Preliminary Information Form (PIF) for both the Tredegar House (011-2015) and Rebecca Furnace (011-0216) as a historically and functionally related resource. While visual impacts to the Rebecca Furnace property are not anticipated, completion of a PIF will document both properties, their relationship to each other from an historical and functional perspective, and their role in the county's broader mining history. The completed form will be submitted to the VDHR for review and approval.
- Financial contribution to the Botetourt Historical Society to support education and program development relative to the historic mining and furnace operations in the county. While much is known about the county's mining history, the financial contribution will enable the Historical Society to further develop opportunities for public access to this history, as well as increase the public's understanding of surviving resources and their relationship to the larger landscape and local economy. The amount of the contribution will be determined in consultation with the Botetourt Historical Society.

The Applicant will complete the mitigation proposals described above within 60 days of authorization of the project by the DEQ.

In addition, the historic resources analysis identified archaeological site 44B00617 as potentially eligible for inclusion in the NRHP. Given the age of the artifacts identified by shovel tests, their association with the Tredegar House (011-0215), the existing topography, and the proximity of the finds to the overall right-of-way expansion for road construction, controlled site burial of the deposits prior to road construction is proposed. In the event archaeological deposits associated

with site 44B00617 cannot be avoided or buried in accordance with industry accepted standards, the site will be evaluated for NRHP listing. If determined eligible, data recovery will be undertaken on the impacted portion of the site in consultation with the VDHR prior to commencement of construction in the area of site 44B00617.