



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

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L. Preston Bryant, Jr.
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June 30, 2006

Mr. Joel H. Peck
Clerk
State Corporation Commission
1300 East Main Street
Richmond, Virginia 23219

RE: Highland New Wind Development, L.L.C., State Corporation Commission, Case No. PUE-2005-00101, Application for Approval to Construct, Own and Operate an Electric Generation Facility in Highland County, Virginia pursuant to §§56-46.1 and 56-580D of the Code of Virginia (DEQ# 06-011S).

Dear Mr. Peck:

As requested by the State Corporation Commission (SCC), the Department of Environmental Quality (DEQ) has coordinated the review of the above referenced project with appropriate state agencies and the locality, for the purpose of developing information for SCC staff about potential impacts to natural resources.

Based on comments submitted by reviewers, we are providing a summary of potential impacts to natural resources associated with the proposed Wind Powered Electric Generation Facility project. The report includes copies of the comments submitted by reviewers.

Thank you for the opportunity to review this application and related materials. We trust that you will find our report helpful in your certification process. If you have questions, please feel free to call Ms. Ellie Irons, Program Manager, Office of Environmental Impact Review (telephone (804) 698-4325).

Sincerely,

Michael P. Murphy, Director
Division of Environmental Enhancement

Enclosures

cc: Andrew K. Zadnik, DGIF
Robert S. Munson, DCR
Scott Bedwell, DCR
Rene Hypes, DCR
Susan E. Douglas, VDH
Allen R. Brockman, DEQ-Waste
Catherine M. Harold, DEQ-DWQ
Ronald D. Phillips, DEQ-VRO
Mary T. Stanley, VDOT
Traycie West, VMRC
Roger Kirchen, DHR
J. Michael Foreman, DOF
Matt Heller, DMME
Susan H. Simmers, DOAv
Roberta A. Lambert, Highland County
G. Mark Gibb, Northern Virginia Regional Commission
Wayne N. Smith, SCC
John Flora, Esquire, Keeler Obenshain, PC
Henry T. McBride, Jr., Highland New Wind L.L.C.



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COMMENTS OF THE DEPARTMENT OF ENVIRONMENTAL QUALITY

Review of an Application for Approval to Construct, Own and Operate

an Electric Generation Facility in Highland County, Virginia

pursuant to §§56-46.1 and 56-580D of the Code of Virginia

State Corporation Commission Case No PUE-2005-00101

Highland New Wind Development, L.L.C.,

Reviewed under: DEQ# 06-011S

The comments which follow are intended to provide technical assistance to the State Corporation Commission in evaluating this project. The following state agencies, planning district commission, and locality joined in this review:

Department of Environmental Quality
Department of Game and Inland Fisheries
Department of Conservation and Recreation
Department of Agriculture and Consumer Services
Department of Health
Department of Aviation
Department of Forestry
Department of Transportation
Marine Resources Commission
Department of Historic Resources
Department of Mines, Minerals and Energy
Central Shenandoah Planning District Commission
Highland County.

The following information, provided by Highland New Wind Development, L.L.C. (hereinafter "the Applicant"), was considered during this review:

- Application to the State Corporation Commission, Case No. PUE-2005-00101
- Radar study
- Avian Risk Assessment
- Bat Study
- Exhibits C, D, and E (attachments to Dr. Paul Kerlinger's testimony).

PROJECT DESCRIPTION

The Applicant proposes to construct and operate a wind energy power generating facility in Highland County, Virginia near the West Virginia border, just northeast of State Route 250 on Allegheny Mountain, specifically on Red Oak Knob and Tamarack Ridge. The project will use utility-scale wind turbines to produce approximately 39 megawatts (MW) of electricity. The proposed wind power facility will consist of up to twenty (20) turbines of 2.0 MW nominal capacity each, mounted on free-standing tubular towers. Final selection of the equipment to be used is underway, but the Applicant anticipates the towers will be approximately 262 feet (80 meters) in height (Application, page 7). The proposed site is currently pasture, surrounded by forestland, and is bisected by State Route 250 and an existing Allegheny Power Company 69 kilovolt (kV) transmission line (Application, page 6). A new substation with transformers and other electrical equipment will interconnect the facility to this existing Allegheny Power Company transmission line.

LIST OF PERMITS OR APPROVALS REQUIRED

The following list presents the summary of permits and approvals that may be applicable to the proposed project. Based on the level of information provided by the Applicant, reviewers were unable to determine the applicability of permits with certainty. More details on these requirements appear in the “Regulatory and Coordination Needs” section of these Comments (pages 39 through 41).

- 1. Water Quality and Wetlands.** The project may require a Virginia Water Protection (VWP) permit from DEQ’s Valley Regional Office (DEQ-VRO). See “Regulatory and Coordination Needs,” Item 1 on page 39.
- 2. Air Quality Permits.** If open burning of construction or other wastes is contemplated, an open burning permit from DEQ’s Valley Regional Office may be required. In addition, fuel-burning equipment used in the project may require permitting. See “Regulatory and Coordination Needs,” Item 4 on page 40.
- 3. Erosion and Sediment Control Plan; Stormwater Management.** Land disturbance must be carried out in accordance with the Erosion and Sediment Control Law and Regulations and the Virginia Stormwater Management Act and Regulations. See “Regulatory and Coordination Needs,” Items 2(a) and 2(b), on page 39.
- 4. Solid and Hazardous Waste Management.** Any soil that is suspected of contamination or wastes that are generated must be tested and disposed of in accordance with applicable Federal, State, and local laws and regulations. See “Regulatory and Coordination Needs,” Item 3 on page 40.

5. Protected Species Legislation. The Federal Endangered Species Act and Virginia protected species legislation may apply if there is any taking of protected species. See “Environmental Impacts and Mitigation,” Item 5(a) (i)-(ii) on pages 13-15; 5(b) on page 15-17, and Item 6(a-d) on pages 17 -22); and “Regulatory and Coordination Needs,” Item 8 on page 41.

6. Local Permits and Requirements. A Conditional Use Permit (with twenty conditions, including submission of a detailed site plan) has been issued pursuant to the Highland County Zoning Ordinance for Electric Generation and Substations. See “Environmental Impacts and Mitigation,” Item 14 on page 35, and “Regulatory and Coordination Needs,” Item 9 on page 41.

SUMMARY OF RECOMMENDATIONS

Based on the information and analysis submitted by reviewing agencies, we have several recommendations for consideration by the SCC as conditions of the Certificate of Public Convenience and Necessity under consideration by the Commission for this project. The justification and rationale for these recommendations appear in the Environmental Impacts and Mitigation section of these comments. It should be noted that several reviewing agencies reported that the information is not sufficient to complete their review. It should also be noted that these recommendations are in addition to regulatory requirements. The summary of recommendations follows:

1. Submit Final Site Plan to Review Agencies: Provide a detailed site plan with project location maps showing the location of towers and all other components of the project including but not limited to the location of the three stream crossings, location of wetlands along the three stream channels, and location where the drilling beneath the stream channels will occur. See “Environmental Impacts and Mitigation,” Item 8(a) on page 29, and Item 14 on page 35.

2. Conduct Viewshed Analyses: Develop, conduct, and report the results of a viewshed analysis, based on coordination with Department of Historic Resources and Department of Conservation and Recreation. See “Environmental Impacts and Mitigation,” Item 6(f) on page 23, Item 8(a) on page 29, and Item 10(d) on pages 31-32.

3. Assess Cumulative Impacts: The environmental impact analysis should consider the cumulative impacts of constructing the Highland Wind project within the Allegheny Mountain physiographic region. The cumulative impacts analysis should consider that there are already 88 wind turbines operating, 457 permitted, and 480 industrial wind turbines proposed or planned at 34 facilities within the Allegheny Highlands of Virginia, West Virginia, Maryland, and Pennsylvania. See “Environmental Impacts and Mitigation,” Item 6(g) on page 24.

4. Develop Appropriate Sampling Methodology: Prior to starting studies, coordinate with the appropriate review agencies, including but not limited to DEQ, DHR, DCR, VDGIF, and the United States Fish and Wildlife Service (USFWS) to develop the appropriate sampling methodology, reporting procedures, and mitigation required to comply with applicable regulations. See "Environmental Impacts and Mitigation," Item 5(b) on pages 15-17 and Item 6(a) (DGIF Recommendations A and B) on page 18.

5. Conduct Pre-construction Surveys/Studies to include a radar survey during the spring, mist net surveys for bats (May-September), and a fall-winter-spring survey of raptors at the project site. See "Environmental Impacts and Mitigation," Item 5(b) on pages 15-17, and Item 6(a) (DGIF Recommendation C) on pages 18-19, and Item 6(b) on pages 19-20.

6. Perform Pre-construction Habitat Assessment for Protected Species: Conduct an inventory of suitable habitat, natural heritage resources, and protected species in the study area (by a qualified biologist), as recommended by DGIF and by DCR – DNH. See "Environmental Impacts and Mitigation," Item 5(b) on pages 15-17, and Item 6(a) (DGIF Recommendation C) on pages 18-19, 6(b) on pages 19-20, and 6(d) on pages 21- 22.

7. Develop Mitigation Plan: Develop a mitigation plan, utilizing the results of the studies, (e.g., wildlife, viewshed, and socioeconomic studies) to determine turbine placement and mitigation of impacts, based on consultation with natural resources agencies. See "Environmental Impacts and Mitigation," Item 5(b) on pages 15-17, Item 6(h) on page 25-26.

8. Conduct Archaeological and Architectural Surveys if necessary: Coordinate with DHR for guidance regarding the potential need for archaeological and architectural surveys, recommended studies and field surveys to evaluate the project's impacts to historic resources. See "Environmental Impacts and Mitigation," Item 8(a) on page 29, 8(d) on page 30, and "Regulatory and Coordination Needs," Item 6 on page 40.

9. Avoid Direct and Indirect Impacts to Wetlands. Wetland and stream impacts should be avoided and minimized to the maximum extent practicable. See "Environmental Impacts and Mitigation," Item 1(b) on pages 6-7.

10. Protect Natural Resources During Construction: Protect water quality, habitat, and aquatic resources from construction impacts by adopting recommendations from the DEQ, DGIF, and DCR. See "Environmental Impacts and Mitigation," recommendations in Item 1(b) on pages 6-7, Item 5 on pages 13-17, and Item 6(e) on pages 22-23.

11. Protected Species: Work closely with DGIF and US FWS to ensure that threatened and endangered species are adequately protected. See "Environmental Impacts and Mitigation," Item 6(d) on pages 21-22.

12. Consider Impacts of Highland Wind Project on Ecotourism: Ecotourism impacts should be considered as part of an overall socioeconomic analysis of this project. This analysis should be conducted through consultations with the Highland County Chamber of Commerce, Virginia Tourism Corporation, and operators of ecotourism companies/facilities, such as Bear Mountain Farm and Wilderness Retreat, at (540) 468-2700. See "Environmental Impacts and Mitigation," Item 6(f) on pages 23-24, and Item 10, pages 31-32.

13. Conduct Post-construction Sampling/Monitoring: Conduct (a minimum of) 3-years of post-construction sampling/monitoring using same methods as those used during pre-construction monitoring, but include carcass searches for birds and bats. The post-construction monitoring should include adjustments for scavenger removal and searcher efficiency to more accurately reflect mortality rates. See "Environmental Impacts and Mitigation," Item 5(b) on pages 15-17, and Item 6(i) on pages 26- 27.

14. Coordinate Transportation Safety Issues: Coordinate closely with the Virginia Department of Transportation to evaluate and ensure that transportation issues are adequately addressed. See "Environmental Impacts and Mitigation," Item 9 on pages 30-31, and "Regulatory and Coordination Needs," Item 5 on page 40.

ENVIRONMENTAL IMPACTS AND MITIGATION

1. Water Quality and Wetlands. The information provided in the application states that there are no wetlands within the site boundary and the site development will have no change on local run-off patterns (11(d), page 11). There are no water requirements for a wind farm. Water required during construction and operation will be transported by truck to the Project site. There will be no impact to groundwater availability since no groundwater will be used for the construction or operation of the proposed Project (11(b), page 10). There is no discharge of cooling water related to a wind farm (Item 11(c), page 10). Several headwater tributaries appear to originate on the property and the Project site is bisected by Laurel Fork, a branch of the Potomac River (Item 11(m), page 15).

1(a) Wetland Impact Consultation: The Department of Environmental Quality and the State Corporation Commission have a *Memorandum of Agreement regarding Wetland Impact Consultation*. The appendix of this MOA lists certain information that DEQ requires to document that wetland issues have been considered by the Applicant, and to advise the SCC on wetland issues during siting reviews.

Summary of DEQ – DWQ Findings: The DEQ – DWQ stated that, based upon its review of a letter from the U.S. Army Corps of Engineers-Norfolk District (dated August 13, 2003) and the information provided by the Applicant (November 16, 2005, email and November 30, 2005 letter), it appears that potential impacts to state waters will be limited to several underground electrical crossings of Laurel Fork.

1(b) Potential Permits: According to the DEQ – VRO, a Virginia Water Protection permit application (JPA) for utility crossings under Laurel Fork is currently under review. VRO is waiting for some additional information to complete its file. Upon receipt of this information, VRO expects to send a “No Permit Required” (NPR) letter to the owner. For additional information on the status of the VWP permit application and related questions, contact Mr. Keith Fowler, DEQ-VRO, at (540) 574-7812.

Recommendations

In general, DEQ recommends that stream and wetland impacts be avoided to the maximum extent practicable. To minimize unavoidable impacts to wetlands and waterways, DEQ recommends the following practices:

- Use directional drilling from upland locations for stream crossings, to the extent practicable. If directional drilling is not feasible, stockpile the material excavated from the trench for replacement.
- Operate machinery and construction vehicles outside of stream-beds and wetlands; use synthetic mats when in-stream work is unavoidable;
- Construct the trench for the utility line in a manner that does not drain

the wetlands (for example, backfilling with extensive gravel layers thereby creating a French drain effect).

- Preserve the top 12 inches of trench material removed from wetlands for use as wetland seed and root-stock in the excavated area.
- Erosion and sedimentation controls should be designed in accordance with the most current edition of the Virginia Erosion and Sediment Control Handbook. These controls should be in place prior to clearing and grading, and maintained in good working order to minimize impacts to State waters. The controls should remain in place until the area is stabilized.
- Place heavy equipment, located in temporarily impacted wetland areas, on mats, geotextile fabric, or use other suitable measures to minimize soil disturbance, to the maximum extent practicable.
- Restore all temporarily disturbed wetland areas to pre-construction conditions and plant or seed with appropriate wetlands vegetation in accordance with the cover type (emergent, scrub-shrub, or forested). The applicant should take all appropriate measures to promote re-vegetation of these areas. Stabilization and restoration efforts should occur immediately after the temporary disturbance of each wetland area instead of waiting until the entire project has been completed.
- Place all materials which are temporarily stockpiled in wetlands, designated for use for the immediate stabilization of wetlands, on mats, geotextile fabric in order to prevent entry in State waters. These materials should be managed in a manner that prevents leachates from entering state waters and must be entirely removed within thirty days following completion of that construction activity. The disturbed areas should be returned to their original contours, stabilized within thirty days following removal of the stockpile, and restored to the original vegetated state.
- All non-impacted surface waters within the project or right-of-way limits that are within 50 feet of any clearing, grading, or filling activities should be clearly flagged or marked for the life of the construction activity within that area. The project proponent should notify all contractors that these marked areas are surface waters where no activities are to occur.
- Measures should be employed to prevent spills of fuels or lubricants into state waters.

1(c) Public Water Supply: According to the Virginia Department of Health – Office of Drinking Water (VDH-ODW), there are no public drinking water systems groundwater wells within 1 mile of the proposed facility and no surface water intakes within 5 miles. Therefore, VDH-ODW has no objections. For more information regarding public water supplies, contact Ms. Susan Douglas, VDH-ODW Field Services Engineer, at (804) 864-7490).

1(d) Jurisdiction under Section 404 of the Clean Water Act (33 C.F.R. 1344) and U.S. Army Corps of Engineers Permit Requirements. According to the U.S. Army Corps of Engineers January 23, 2006, letter to Ms. Susan T. Murdock (Malcolm Pirnie), if the proposed utility line crossing of Laurel Fork and its two tributaries requires the discharge of dredged or filled material below the ordinary high water line of Laurel Fork Creek or its tributaries, and/or adjacent wetlands, a Department of the Army permit will be necessary. If this permit is required, the Corps of Engineers is obligated to comply with the requirements of the National Environmental Policy Act (NEPA), and the National Historic Preservation Act (NHPA). The Corps cannot issue a permit until the requirements of these laws have been satisfied. The Corps identified potential impact to the following resources that requires evaluation:

- Northern Flying Squirrel
- Historic Resources
- Laurel Fork, a State Trout Water

The Corps also notes it would be relevant to clarify the perennial or intermittent classification of the two tributaries which may be impacted by this project.

According to the Corps, based on their April 2006 field review, it appears that the access roads do not cross jurisdictional waters. However, the Corps requested additional information for the three stream crossings documenting:

- Where the wetlands are located along the three stream channels, and the details of where exactly the drilling beneath the stream channels will occur.
- This information should be surveyed and transferred to a document showing the wetland boundary line at each crossing and the exact position of the proposed directional drill corridor beneath the channel (e.g., where it will enter the ground and where it will exit the ground).
- The document should include a scale so that the information can be verified on the ground if required.

The Corps further reports that, if the access road into the drill site will require an upgrade and changes of the stream crossings (fill for existing fords, or installation of culverts at existing fords) in order to stage the drilling equipment, this will require a permit.

According to the Corps (June 20, 2006, letter (to the Applicant), the project will require the upgrade of existing access roads to Red Oak Knob and Tamarack Ridge, and the crossing of Laurel Fork Creek, two feeder streams, and adjacent wetlands for the construction of the utility line to the proposed wind energy construction site. Based on the information submitted with the permit application the Corps concluded the following:

- The upgrade of the two access roads into the two wind farm sites will not impact any jurisdictional areas (no crossing of ephemeral, intermittent or

perennial stream channels, nor any wetlands, isolated or otherwise) requiring a Department of the Army permit.

- The wetlands, the two tributary channels and main channel of Laurel Fork were delineated and surveyed, and the proposed directional drilling sites were superimposed on the survey at the three stream crossing locations. As proposed, the drilling sites are to be entered and exited outside any jurisdictional wetland and/or stream channel, thereby circumventing any potential impact to jurisdictional waters.
- Stream channels (either perennial or intermittent) which exist as ford crossings of the access road to the drilling site will not have to be upgraded to culvert crossings which would require a Department of the Army permit.
- Based on the submitted information supporting the proposed wind energy project, it has been determined that the project will not impact jurisdictional waters and/or wetlands subject to regulatory jurisdiction pursuant to Section 404 of the Clean Water Act; therefore, it has been determined that the project will not require a Department of the Army Section 404 permit.

Please note that if, in the course of the construction of this project, it becomes necessary to discharge dredged or fill material into waters of the U. S., including ephemeral, intermittent or perennial stream channels, and/or adjacent wetlands, you should immediately contact the Corps and submit the proper application to coordinate the issuance of any required Department of the Army permit.

For additional information pertaining to the applicability of permit requirements under the federal Clean Water Act, contact Mr. James Brogdon, Western Virginia Field Office U. S. Army Corps of Engineers, at (540) 886-4221.

2. Subaqueous Lands. In its February 2, 2006 response to DEQ's request for comment, the Marine Resources Commission (VMRC) reported that, pursuant to Chapter 12 of Title 28.2 of the Code of Virginia, the Commission has jurisdiction over any encroachments in, on, or over any State-owned rivers, streams, or creeks in the Commonwealth. Accordingly, if any portion of the subject project involves any encroachments channelward of ordinary highwater along natural rivers and streams, a Subaqueous Lands permit may be required.

VMRC further indicated that it appears that there is one creek crossing proposed that may involve lands subject to its jurisdiction. However, VMRC stated that additional information is necessary to determine if the crossing will be subject to its jurisdiction. On February 14, 2006, VMRC completed its review of the Joint Permit Application (JPA # 06-0138) which was submitted for its review and action. According to the information provided for review, all three stream crossings will be done by directional drilling. Accordingly, on February 14, 2006, VMRC advised the Applicant that the proposed project does not fall within the

jurisdiction of the VMRC and its authorization is not required. For additional information regarding this review, please contact Ms. Traycie West, VMRC, at (757) 247-2200.

3. Air Quality. The DEQ Air Division indicates that the project is located within an ozone attainment area.

3(a) Fugitive Dust Control: During construction, fugitive dust must be kept to a minimum by using control methods outlined in 9 VAC 5-50-60 et seq. of the Regulations for the Control and Abatement of Air Pollution. These precautions include, but are not limited to, the following:

- Use, where possible, of water or chemicals for dust control;
- Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials;
- Covering of open equipment for conveying materials; and
- Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.

3(b) Open Burning: If project activities include the burning of construction or demolition material, this activity must meet the requirements of the Regulations for open burning (9 VAC 5-40-5600 et seq.), and it may require a permit. See Regulatory and Coordination Needs, Item 5, below. The Regulations provide for, but do not require, the local adoption of a model ordinance concerning open burning. The Applicant should contact Highland County officials to determine what local requirements, if any, exist. The model ordinance includes, but is not limited to, the following provisions:

- All reasonable effort shall be made to minimize the amount of material burned, with the number and size of the debris piles;
- The material to be burned shall consist of brush, stumps and similar debris waste and clean burning demolition material;
- The burning shall be at least 500-feet from any occupied building unless the occupants have given prior permission, other than a building located on the property on which the burning is conducted;
- The burning shall be conducted at the greatest distance practicable from highways and air fields;
- The burning shall be attended at all times and conducted to ensure the best possible combustion with a minimum of smoke being produced;
- The burning shall not be allowed to smolder beyond the minimum period of time necessary for the destruction of the materials; and
- The burning shall be conducted only when the prevailing winds are away from any city, town or built-up area.

For more information on air quality impacts, contact Mr. Ronald Phillips, DEQ-VRO Air Compliance Manager. at (540) 574-7846. For more information on

local requirements, contact Ms. Roberta Lambert, Highland County Administrator, at (540) 468-2347.

3(c) Environmental Costs and Benefits, based on air emissions: In the Applicant's April 27, 2006 letter (responding to DEQ's March 1, 2006 request for additional information), the Applicant requested that DEQ's report to the SCC include a discussion of the positive air emissions benefits of the Highland Wind project. It should be noted that there is insufficient information about this project and other local and regional conditions to allow the substantive impact analyses that are necessary to make conclusive statements about the project's positive impacts on the environment. However, DEQ's Office of Pollution Prevention and DEQ's Office of Small Business Assistance were invited to participate in the review. Staff provided comments (attached) regarding the environmental costs and benefits associated with the use of wind turbines to generate electricity.

Estimated Electricity Generated: Twenty 2.0 megawatt (MW) turbines with maximum generating capacity of 39 MW.

If the twenty turbines were able to achieve an annual average 30 percent capacity factor, they would produce 102,492 megawatt-hours (MWh) per year ($39 \text{ MW} \times 0.30 \times 8760 \text{ hrs. per yr.}$).

General Discussion on Wind Energy: Electricity is produced only when wind speeds are within a certain range and the amount produced varies within that range. Because of this intermittency, electricity from wind turbines is less reliable than traditional energy sources (coal, natural gas, oil, nuclear energy and hydropower). On the other hand, wind conditions are reasonably predictable, wind project developers seek consistently windy locations out of financial self-interest, and wind generated power has very low marginal cost (no fuel costs). Thus, wind power is not "dispatchable" on demand but when it is produced, it is a low cost source that can displace other methods of generation.

Electric utilities must match power supply with power demand. They use weather forecasts and understanding of daily, weekly, and seasonal electricity use patterns to estimate power demand to be met by their own generators or power purchased from other utilities and independent power producers. Typically utilities maintain a "spinning reserve" of generating units that often operate at less than peak efficiency but can be employed (within minutes) to meet rapid increases in power demand. Likewise, a reserve or cushion would be required to respond to intermittent changes in wind power output. However, the spinning reserve would not equal the anticipated output of a wind generating facility. Wind output is variable (as is customer demand), but windy days do not suddenly become calm without warning (which would cause rapid loss of wind power output) any more than cool days suddenly become hot without warning (which would rapidly increase air conditioning demand). At low wind power penetration levels, variations in wind power output may be small compared to existing variations in customers' load. Department of Energy experts and others suggest

that wind power penetration of up to 10 percent should be readily accommodated by existing utility grid systems.

Environmental Costs and Benefits, based on air emissions: Wind turbines do not consume fuel so they do not emit air pollution or greenhouse gases. They do not use cooling water, release effluents, and they do not generate wastes.

To the extent that wind power displaces fossil fuel-based power generation, it can result in avoidance of sulfur dioxide (SO₂), nitrogen oxides (NO_x), particulate matter, mercury, and carbon dioxide (CO₂) emissions as well as avoided water and waste impacts. However, quantifying such impacts requires a detailed “backdown” study that would identify power plants whose operations would be reduced or “backed down” as a result of wind power entering the grid.

Avoided air pollution and other impacts from backing down power plants depends on the number and types of plants in the region, how they are dispatched by utilities, characteristics of fuels used by the plants, pollution controls employed, and transmission constraints.

For instance, a study performed in 2003 for a prospective western Maryland wind project posited NO_x emissions avoidance of 3.06 to 5.72 pounds per MWh of wind power depending on wind farm location and which fossil-fueled plants are backed down. The study is out-of-date since improved NO_x and other pollution controls have been implemented at some of the pertinent power plants. A similar study performed for the New England grid estimated 0.78 pounds per MWh NO_x avoidance while noting an estimate of 1.65 pounds per MWh for New Jersey.

Recommendations: To assess potential air quality impacts of the proposed Highland County project, a “backdown study,” providing objective analysis of the Highland County contact would need to be performed. A “backdown study” is a study that examines and estimates which power plants or electricity sources would reduce generation or contributions of electricity to the area being examined by what amount due to power generated by another facility. In this case, the studies cited estimate reductions in fossil fuel-based generation because of power generation from prospective wind power facilities. Based on a backdown study one could also estimate potential emission avoidance. The information above should not be used to assess potential air quality impacts of the proposed Highland County project.

For additional information, please contact Mr. Keith Boisvert, DEQ-Office of Pollution Prevention, at (804) 698-4225 or Mr. Rodney Sobin, DEQ-Office of Small Business Assistance, at (804) 698-4382.

4. Solid and Hazardous Waste Management.

4(a) General. DEQ’s Waste Division stated that both solid waste and hazardous waste issues and sites were addressed to some extent in the report. However, the report did not include a search of waste-related

databases. DEQ's Waste Division staff conducted a cursory review of its data files and determined that the site is in the general vicinity of the Highland County Sanitary Landfill (DEQ Waste Permit Number 208). Additional information for this solid waste facility can be found at the following website:

<http://www.deq.virginia.gov/waste/waste.html>.

4(b) Soil that is suspected of contamination or wastes that are generated must be tested and disposed of in accordance with applicable Federal, State, and local laws and regulations. Some of the applicable state laws and regulations are: Virginia Waste Management Act, Code of Virginia Section 10.1-1400 *et seq.*; Virginia Hazardous Waste Management Regulations (VHWMR) (9VAC 20-60); Virginia Solid Waste Management Regulations (VSWMR) (9VAC 20-80); Virginia Regulations for the Transportation of Hazardous Materials (9VAC 20-110). Some of the applicable Federal laws and regulations are: the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 *et seq.*, and the applicable regulations contained in Title 40 of the Code of Federal Regulations; and the U.S. Department of Transportation Rules for Transportation of Hazardous materials, 49 CFR Part 107.

4(c) Pollution Prevention. Please note that DEQ encourages all construction projects and facilities to implement pollution prevention principles, including the reduction, reuse, and recycling of all solid wastes generated. All generation of hazardous wastes should be minimized and handled appropriately. See also Environmental Impacts and Mitigation, Item 11, below.

5. Natural Heritage Resources. The Department of Conservation and Recreation (DCR) strives to preserve and protect the environment of the Commonwealth of Virginia and advocate the wise use of its scenic, cultural, recreational, and natural heritage resources. The DCR's Division of Natural Heritage (DCR – DNH) maintains a Biotics Data System documenting occurrences of natural heritage resources under its jurisdiction. "Natural heritage resources" are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, significant geologic formations, and similar features of scientific interest.

DCR submitted comments on February 15, 2006, in response to DEQ's first request for comments and again on May 31, 2006 following the Applicant's response to DEQ's March 1, 2006 request for additional comments. The discussion which follows summarizes both sets of comments.

5(a) Biotics Data System Results: DCR – DNH has searched its Biotics Data System for occurrences of natural heritage resources in the area outlined on the submitted map. *Any absence of data may indicate that the project area has not been surveyed*, rather than confirm that the area lacks natural heritage resources. New and updated information is continually added to Biotics.

Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

(i) Natural Heritage Resources: According to DCR's February 15, 2006, letter, the following natural heritage resources may occur within Laurel Fork if suitable habitat is present:

Fontigens morrisoni Virginia Springsnail G1/S1/NL/NL
Cambarus monogalensis Monongahela crayfish G5/S1?/NL/NL

DCR also reiterates its previous (November 28, 2005) comments for this project. According to the information currently in its files, the natural heritage resources of concern documented within a two-mile radius of the project area are listed in Table 1 (below):

Table 1. Natural heritage resources within a two-mile radius of the project area.

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Sitename
<i>Empidonax alorum</i>	Alder Flycatcher	G5	S1B		SC	
<i>Carpodacus purpureus</i>	Purple Finch	G5	S1B,S5N		SC	HABITAT ZONE, BEAR MOUNTAIN, TAMARACK
<i>Seiurus noveboracensis</i>	Northern Waterthrush	G5	S1B			
<i>Glaucomys sabrinus fuscus</i>	Virginia Northern Flying Squirrel	G5T2	S1	LE	LE	TAMARACK RIDGE
<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker	G5	S1B,S4N			HABITAT ZONE, BEAR MOUNTAIN, TAMARACK
<i>Regulus satrapa</i>	Golden-crowned Kinglet	G5	S2B,S5N		SC	HABITAT ZONE, BEAR MOUNTAIN, TAMARACK
<i>Loxia curvirostra</i>	Red Crossbill	G5	S1B		SC	
<i>Sorex palustris punctulatus</i>	Southern Water Shrew	G5T3	S1S2		LE	LAUREL FORK TRIBUTARY HABITAT ZONE
<i>Geranium robertianum</i>	Herb-robert	G5	S2			LANTZ MOUNTAIN HABITAT ZONE

In addition, the following natural heritage resources may occur on site if suitable habitat is present.

Aegolius acadicus Northern Saw-whet Owl G5/S1B/S1N/NL/SC
Sitta canadensis Red-breasted Nuthatch G5/S2B/S4N/NL/SC
Dendroica fusca Blackburnian Warbler G5/S2B/SZN/NL/NL
Speyeria atlantis Atlantis Fritillary G5/S2/NL/NL
Colias interior Pink-edge Sulphur G5/S1S2/NL/NL
Phyciodes cocyta Northern Crescent G5/S1S3/NL/NL
Phyciodes batesii batesii Tawny Crescent G4T1/SH/NL/NL
Corynorhinus townsendii Virginia big-eared bat G4T2/S1/LE/LE
-virginianus
Myotis sodalis Indiana bat G2/S1/LE/LE
Myotis leibii Eastern small-footed bat G3/S1/NL/N

(ii) Threatened and Endangered Plant and Insect Species: Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant

and insect species. The proposed project will not affect any documented state-listed plants or insects. VDACS confirmed this finding.

(iii) State Natural Area Preserves: DCR-DNH files do not indicate the presence of any State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

5(b) Recommendations of the DCR-DNH: Due to the potential for this site to support populations of these natural heritage resources, DCR-DNH requests additional information and recommends:

- An inventory for these resources in the study area. With the survey results DCR can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources.
- A pre-construction monitoring period of at least two years.
- Mist net surveys for bats be conducted May-Sept of each pre-construction monitoring year. DCR supports the February 2006 comments of the Virginia Department of Game and Inland Fisheries.
- The implementation of and strict adherence to applicable state and local erosion and sediment control/storm water management laws and regulations, to minimize adverse impacts to the aquatic ecosystem as a result of the proposed activities.

DCR supports the following Virginia Department of Game and Inland Fisheries' recommendations for:

- Additional pre-construction monitoring for bats.
- Formal habitat assessment: having a qualified biologist conduct a formal habitat assessment for the southern rock vole (*Microtus chrotorrhinus carolinensis*, G4T3/S1/NL/LE) and southern water shrew (*Sorex palustris punctulatus*, G5T3/S1S2/NL/LE) at the crossings of Laurel Fork to determine potential impacts.
- Pre-construction and Post-construction Sampling: DCR recommends 2 years of pre-construction sampling and 3 years of post-construction sampling. DCR concurs with VDGIF that post-construction monitoring should assess mortality and examine its possible correlation with site conditions, turbine operation and passage rates. The methods used should be the same as pre-construction monitoring, but include carcass searches for birds and bats. The post-construction monitoring should include adjustments for scavenger removal and searcher efficiency to more accurately reflect mortality rates.
- Minimizing adverse impacts to the aquatic ecosystem: DCR recommends the implementation of and strict adherence to applicable state and local erosion and sediment control/storm water management laws and regulations, to minimize adverse impacts to the aquatic

ecosystem as a result of the proposed activities. In addition, DCR supports VDGIF's recommendation of increasing the setback of all workspaces to at least 50 feet from each side of the streams.

- Collection of site-specific pre-construction data: The radar study (Plissner, et al. 2006) conducted for the Highland Project in the fall of 2005 documented the highest passage rates of nocturnal migrants compared with other Appalachian ridgetop sites (and several other sites in the eastern U.S.). DCR concurs with the suggestion by Plissner et al. (2006) that the collection of site-specific pre-construction data across various temporal scales is needed in order to identify the species currently using the Highland site and to determine potential impacts both on a temporal and additive scale.
- A breeding bird study: The Applicant has proposed to conduct a breeding bird survey. DCR supports this, because the breeding bird study proposed by the Applicant may provide useful data on bird use of the site, which could play an important role in the siting of the turbines.
- Increasing sampling effort for the proposed bat acoustic monitoring project. The Applicant has also proposed to conduct a bat acoustic monitoring project. However, DCR does not believe the bat sampling effort is adequate. DCR supports an increase in sampling effort similar to that currently being used at the wind facility in Pennsylvania (Arnett and Hayes 2006).
- A Fall-Winter-Spring Raptor Survey: DCR also supports VDGIF's recommendation for a fall-winter-spring survey of raptors at the project site and coordination with all agencies in sampling design for pre- and post-construction monitoring.
- *Threatened and Endangered Plant and Insect Species*: DCR does not believe the butterfly species listed in its November 28, 2005, letter will be impacted due to the project area consisting mainly of pasture rather than natural meadow habitat (as stated in the Applicant's response letter dated April 27, 2006).
- Interagency coordination: DCR continues to recommend coordination with VDGIF and the United States Fish and Wildlife Service (USFWS) to ensure compliance with protected species legislation, due to the legal status of the Virginia northern flying squirrel.
- Mitigation: As stated in the VDGIF's February 24, 2006, letter, DCR supports setting a threshold for implementation of mitigation measures (1.8 bats per turbine per year and 2.3 birds per turbine per year). Research is currently being conducted on new technologies for deterrents or mechanisms that reduce mortality of bats and birds. As these mitigation measures become available, DCR recommends their

pre and post-construction implementation in consultation with natural resources agencies.

For additional information and coordination pertaining to DCR-DNH comments, please contact Ms. René Hypes, DCR-DNH at (804) 371-2708.

6. Wildlife Resources and Protected Species. The Department of Game and Inland Fisheries, as the Commonwealth's wildlife and freshwater fish management agency, exercises enforcement and regulatory jurisdiction over wildlife and freshwater fish, including state or federally listed endangered or threatened species, but excluding listed insects. The Department (hereinafter "DGIF") is a consulting agency under the U.S. Fish and Wildlife Coordination Act (16 U.S.C. sections 661 et seq.), and provides environmental analysis of projects or permit applications coordinated through the Department of Environmental Quality and several other state and federal agencies. DGIF determines likely impacts upon fish and wildlife resources and habitat, and recommends appropriate measures to avoid, reduce, or compensate for those impacts.

DGIF submitted comments on February 24, 2006, in response to DEQ's first request for comments and again on May 24, 2006, following the applicant's response to DEQ's March 1, 2006, request for additional comments. The discussion which follows summarizes both sets of comments.

6(a). Analysis and Summary of Comments from the DGIF: DGIF stated in its May 24, 2006, comments that, based on the review of the information submitted by the applicant on April 28, 2006, DGIF continues to have concerns for potential significant impacts upon wildlife. The information provided by the applicant has been insufficient to address these concerns.

(i) Wind Industry Commitment to the Environment: The Applicant (Flora 2006, Page 6 and an April 28, 2006 email) refers to two documents from the American Wind Energy Association (AWEA). One of these documents highlights the "Three C's" of the wind industry: Clean, Compatible, and Committed. DGIF assumes the applicant provided this document to show its adherence to the "Three C's." The other document summarizes how impacts upon wildlife have been addressed at other projects.

DGIF is encouraged to read of the commitment the wind industry has to conduct extensive wildlife surveys at project sites and implement innovative measures to mitigate impacts. DGIF hopes the Highland Project will serve as an example of this commitment during the risk assessment (pre-construction) period and, if the project is constructed, the operational (post-construction) period.

(ii) Coordination with DGIF and its partner agencies: DGIF appreciated the opportunity to meet with the applicant's representatives and consultants on March 24 and April 6, 2006, to discuss issues and additional proposed studies

related to bats and birds, respectively. However, DGIF is disappointed in the overall purpose and results of these meetings.

DGIF Recommendations:

A. Coordinate Study Planning and Design: DGIF recommends that any studies to be conducted for the Highland Project be coordinated with DGIF and its partner agencies. This would provide an opportunity to clearly identify the issues of concern, review the proposed study objectives and methods, discuss any necessary revisions to the study design, discuss how the results will be used, prioritize funding expenditures to ensure wise use of limited funds, develop an implementation schedule, and generally reach consensus between the agencies and the applicant. Until this consensus is reached, any studies conducted cannot be guaranteed to adequately address DGIF's concerns. This type of coordination meeting is common with other projects and is vital to ensuring that a project will be implemented in the most environmentally responsible way. It also appears to be consistent with statements made by the AWEA (Flora 2006, Attachment 8). Unfortunately, the two meetings that were held for this project did not accomplish these objectives. While the meetings provided an opportunity for some issues to be discussed and proposed study methods explained, consensus was not reached.

In fact, the proposed bat acoustic study had already begun prior to the meeting, and the proposed breeding bird study was not among DGIF's earlier recommendations (Fernald 2006). This general lack of coordination continues to make it difficult to complete an environmental assessment of this project. It seems that DGIF and its partner agencies are consulted only after conclusions have been made by the applicant.

B. Include State and Federal Agencies in Studies to Reduce Costs: The applicant discussed the monetary expense incurred to date to conduct wildlife surveys. However, the applicant neglected to contact state and federal agencies for assistance in obtaining the required data, prior to implementing the studies. DGIF believes that, had the applicant worked with the agencies from the beginning, the overall cost for wildlife surveys would be very similar to the cost figures presented, with the final product meeting the needs of the agencies.

C. Conduct an additional spring radar study: This study is necessary in order to assess the wildlife species using the project area during the spring. Contrary to recommendations of DGIF and its partner agencies, the applicant has decided to conduct a breeding bird survey and a bat acoustic monitoring project. The breeding bird study was not among DGIF's February 24, 2006, recommendations. DGIF believes that such a study may provide helpful information regarding use of the project site by early- to mid-successional breeding birds, such as the State Threatened loggerhead shrike. However, DGIF is not sure of the overall value of a breeding bird survey because it is

unclear how the data will be used. The study proposal states that the data could be used as a tool for determining turbine deployment location, to avoid sensitive nesting habitat. DGIF supports such a goal. However, the same information regarding habitat quality could be obtained through a habitat assessment.

To date, the applicant has not provided DGIF with a mitigation plan stating that the results of all the wildlife studies will be used to determine turbine placement. While DGIF's responsibility is to conserve all wildlife, for this project, DGIF is more concerned about potential adverse impacts upon migrating wildlife and wintering raptors than breeding birds.

6(b). Comments and Recommendations on Avian Studies: DGIF made the following comments on the avian studies submitted by the Applicant:

- Additional information within the physiographic region of the project is necessary. The Phase 1 Avian Risk Assessment (Kerlinger and Guarnaccia, 2005; hereafter "Avian Assessment") did not review significant and pertinent data collected at other sites in the Allegheny Mountains.
- The Avian Assessment must include data in the Virginia Breeding Bird Atlas, published in 2001.
- The use of the project site as a stopover point for songbird migrants warrants additional review of the potential impacts of the proposed wind turbines on nocturnal migrants.
- A Radar and Visual Study of Nocturnal Bird and Bat Migration at the Proposed Highland New Wind Development Project, Virginia, Fall 2005 (Plissner et al., 2006; hereafter, Radar Study or Study), does not include data for July and early August. Other studies have recommended that radar studies should start no later than the middle of July in order to capture the migration period. This should be addressed.
- Fall-winter-spring survey of raptors at the project site: In his response to DEQ's letter of March 1, 2006, the applicant's primary bird consultant, Paul Kerlinger, states that eagles may fly over the site on rare occasions, but their "use of the site will be minimal" (Flora 2006, Attachment 4).

Without site-specific data, this statement is inadequate to address DGIF's concerns. Recent birding forays conducted from January 13, 2006, to April 15, 2006, documented over 100 bald and golden eagle sightings in Highland County, including the first confirmed bald eagle nests (Bratton et al. 2006). This information supports the common belief that Highland County may provide important habitat for a population of golden eagles during the winter, and possibly year-round; and it reemphasizes DGIF's concerns for potential

impacts upon eagles and other raptors. Therefore, DGIF reiterates the recommendation for a fall-winter-spring survey of raptors at the project site. Such a survey would document raptor use of the project area, assess potential risk to raptors, and help identify opportunities to mitigate that risk.

- The Avian Assessment should review pertinent data on hawk migration in the Allegheny Mountain range.
- Field Surveys and assessments during bald eagle breeding season.
- Winter use of the area by raptors including but not limited to bald and golden eagles, and potential take by wind turbines.

6(c). Comments and Recommendations on Bats and Related Studies:

DGIF requests additional information and recommends the following additional assessments, monitoring, and mitigation, including but not limited to:

- **The Overview of the Current State of Knowledge of Bats** with Specific Reference to the Potential Impacts of Wind Power, Highland New Wind Project (North East Ecological Services, 2006; hereafter, Overview) did not address use by bats of “watering holes” located on the ridges. This deficiency should be remedied since areas of water, even as small as road ruts, are very important to bats and are used extensively throughout the spring, summer, and fall.
- **Bat Acoustic Study, Sample Area:** DGIF believes the bat acoustic study is insufficient to address the question of bat use of the Highland Project area. One reason is because of the limited area that is proposed to be sampled.

The use of acoustical monitoring to predict bat fatalities at wind facilities is a new approach that is currently being tested by the scientific community. Ed Arnett (Bat Conservation International) and John Hayes (Oregon State University) are currently studying this technique at a proposed wind facility in Pennsylvania (Arnett and Hayes 2006). That facility will have 23 wind turbines in two strings. Arnett and Hayes are deploying acoustic detectors at 5 meteorological towers and 7 mobile towers for a total of 12 sample sites. The preliminary findings indicate that the number of bat calls varies considerably both within and among sampling locations and sample nights.

This finding was corroborated at the March 24, 2006, meeting by the applicant’s primary bat consultant, Mr. Scott Reynolds, for a study at a different site. The high variance in the number of calls between sites suggests that multiple towers will be needed to capture the complete picture of bat activity at a wind project. Unlike the Pennsylvania study, the acoustic project at the Highland Project site is currently deploying acoustic detectors at only two meteorological towers.

When questioned about the small sample size during the March 24, 2006, meeting, Mr. Reynolds stated that their study might only sample about 1% of

the project area. Another aspect of Highland Project study is to attach four microphones to each acoustic detector. This will allow the recording of overlapping calls from the same bat or several bats simultaneously.

In a review of the study proposal, Gannon (2006) stated that data collected by this system may be of limited value. Gannon also questions the proposed method of evaluating the sonograms produced by the acoustic detectors. The proposed method is to evaluate the sonograms qualitatively in order to identify species, i.e. through an observer looking at the figure. According to Gannon (2006) and DGIF's own experience (Rick Reynolds, DGIF, personal communication), this technique has many shortcomings. A more desirable technique to evaluate sonograms involves the use of quantitative analyses (Gannon 2006, Britzke et al. 1999, Robbins and Britzke 1999).

- Use by bats of high ridges for raising young and for migration (Pre-construction).
- Carcass searches should be conducted at least daily from April through October (Post-construction).

6(d). Comments on Federal Endangered and State Endangered species: DGIF made the following comments:

- **No "Incidental Take" Provision Under Virginia Law:** DGIF reminds the applicant that it remains unlawful at any time to "take" a species listed under Virginia's endangered species law. It is important to note that, unlike the Federal Endangered Species Act, there is no incidental take provision under Virginia's law (*Virginia Code § 29-1-564 et seq.*)
- **The Northern Flying Squirrel:** Survey at Site of Proposed Highland New Wind Development, Highland County, Virginia (Michael 2005) did not document northern flying squirrels on Red Oak Knob or along Tamarack Ridge, previously documented in Highland County and on the Project property (Pagels et al., 1990, Fies and Pagels, 1991, and Reynolds et al., 1999).

Northern Flying Squirrels, Recommended Studies and Guidance: As referenced by the Applicant (Flora 2006, Page 9), the Federal Endangered and State Endangered northern flying squirrel has been documented in proximity of the project site. The Applicant states that the survey conducted in 2005 did not encounter the species, nor did it find appropriate habitat on the 217-acre project site. However, in reviewing the survey report (Michael 2005), it is not clear whether the survey adequately sampled all 217 acres.

- **Cooperation of State Agencies:** As required under *Virginia Code § 29.1-570*, all departments, commissions, boards, authorities, agencies, offices and institutions within any branch of the state government shall cooperate

with the Board of Game and Inland Fisheries in carrying out the purposes of Article 6 pertaining to endangered species.

Recommendations: Coordinate with DGIF and USFWS: DGIF continues to recommend that, if any areas considered suitable for northern flying squirrels are to be disturbed for any aspect of this project, including road improvement and utility line installation, the applicant should coordinate with DGIF and the USFWS (Fernald 2006). DGIF also continues to recommend that this coordination occur prior to any other land disturbance, including timbering operations, within or adjacent to appropriate habitat. Areas of appropriate habitat should be determined by a qualified biologist.

- **Rock Voles and Water Shrews Recommended Studies and Guidance:** The State Endangered rock vole and State Endangered water shrew have been documented less than 1 mile from the Highland Project. Rock voles are typically associated with areas of cool, moist talus, mossy boulders, and logs close to a stream, spring, or seep. Water shrews are typically associated with small rocky streams surrounded by forest.

Recommendations: To address potential adverse impacts upon these species, DGIF continues to recommend that a qualified biologist conduct formal habitat assessments for these species on all 217-acres of the project site. Based upon DGIF's review of these assessments, if there is appropriate habitat for rock voles and/or water shrews, DGIF will offer additional comments and recommendations to mitigate impacts.

Pursuant to earlier discussions, DGIF has agreed to conduct a site visit to address these species. Based on this visit, DGIF may decide that formal habitat assessments are not necessary.

The results of the formal habitat assessments and scheduling of a site visit should be coordinated with DGIF Wildlife Diversity Biologist, Mr. Rick Reynolds, at (540) 248-9360.

6(e). Laurel Fork, Recommended Studies and Guidance for Protecting Natural Resources during Construction: Laurel Fork is a Class II wild trout stream containing brook and brown trout. DGIF understands the utility lines associated with the Highland Project are proposed to be drilled under Laurel Fork and two unnamed tributaries to Laurel Fork. DGIF supports directional drilling of these crossings as opposed to open-cutting the streams. However, DGIF is concerned for potential adverse impacts upon trout and other aquatic resources due to the close proximity of the proposed equipment/access ditches to the stream.

DGIF noted that, the permit application for these crossings states that the equipment pits will be dug approximately 6 feet from both banks of the streams. These pits will be approximately 9 feet wide x 15 feet long and to a

depth of at least 4 feet below the streambed. This amount of land disturbance in such close proximity to the streams may result in a significant amount of excess sedimentation, thereby adversely impacting trout and other aquatic resources. For example, trout spawning success is known to be reduced as the amount of fine sediment increases.

Recommendations: To mitigate these impacts, DGIF recommends:

- Increasing the setback of all work spaces to at least 50 feet from each side of the streams. A 50-foot setback for a staging area associated with a waterbody crossing is consistent with mitigation procedures outlined by the Federal Energy Regulatory Commission (FERC; 2003). These mitigation procedures represent the minimum level of resource protection that the FERC deems acceptable.
- All equipment refueling should be at least 100 feet from the streams. Erosion control devices, including silt fence and hay bales should completely surround the construction sites.
- Timber mats or wooden board pads should be installed along the travel lanes and work areas to minimize soil disturbance.
- Top soil and subsoil should be segregated when excavated from the bore pit area. This will facilitate site restoration. The spoil storage areas should be surrounded with hay bales and silt fence, and all spoil should be covered with visqueen to prevent run-off in the event of rainfall.
- A frac-tank should be staged near the work areas. In the event a bore pit fills with groundwater, water should be pumped into the frac-tank for settling. The pumped water should be inspected for any sign of contaminants (e.g., oil, grease, etc.). After settling, the water should be discharged from top to bottom through a filter bag in a well vegetated area, beyond the work areas.

6(f). Ecotourism, Viewshed and Socioeconomic Impacts to Regional Economy: The Applicant (Flora 2006, Page 2) states that, due to the remoteness of the project site, which is “marred by only” two highways and one transmission line, the project site is “as good as it gets” in regard to potential impacts upon the viewshed. Furthermore, it is stated that, because the viewshed was “thoroughly” addressed by the Highland County Board of Supervisors, it should not be addressed again.

DGIF believes that this response is insufficient to address its concerns for potential impacts upon the Virginia Birding and Wildlife Trail and other wildlife-related recreation opportunities. As DGIF stated in its earlier comments (Fernald 2006), a primary reason people travel to Highland County for wildlife-related recreation is the very remoteness of the area. Another reason is the

high diversity of species relatively uncommon to Virginia, such as a known winter population of golden eagles.

Importance of Viewshed to Regional Economy: The Highland County Chamber of Commerce (Chamber) has made a conscious effort to target ecotourism as an important contributor to the region's economy (Carolyn Pohowsky, Highland County Chamber of Commerce, personal communication, May 2006). See Item 10(c), page 30. Over the past several years, the Chamber has seen a steady increase in the number of birders traveling to the County, even in January and February.

Neither the applicant nor County Board of Supervisors has consulted with the Chamber of Commerce regarding the impacts this project may have upon ecotourism (Carolyn Pohowsky, Highland County Chamber of Commerce, personal communication, May 2006). The Chamber has some concerns about this project and generally believes that more answers are needed regarding the potential for impacts. DGIF concurs.

Ecotourism and Socioeconomic Impacts: The Bear Mountain Farm and Wilderness Retreat is one of the most popular destinations for birders and other ecotourists visiting Highland County. The owners of this facility believe that the impact to their business due to the Highland Project will be significant (Thomas Brody, Bear Mountain Farm and Wilderness Retreat, personal communication, May 2006). They have received numerous comments from their guests expressing concern over this project. Many of their guests have even stated that they will not return to the County if this project is constructed.

Recommendation: Part of DGIF's mission as an agency is to provide opportunity for all to enjoy wildlife-related outdoor recreation. The Highland Project may affect DGIF's ability to accomplish this mission. Therefore, DGIF reiterates its recommendation that ecotourism impacts be considered as part of an overall socioeconomic analysis of this project. This analysis should be conducted through consultations with the Chamber of Commerce at (540) 468-2550, the Virginia Tourism Corporation at (804) 545-5500, and operators of ecotourism companies/facilities, such as Bear Mountain Farm and Wilderness Retreat at (540)-468-2700.

6(g). Cumulative Impacts: There are already 88 wind turbines operating, 457 permitted, and 480 industrial wind turbines proposed or planned at 34 facilities within the Allegheny Highlands of Virginia, West Virginia, Maryland, and Pennsylvania.

Recommendation: The impact analysis must consider the cumulative impacts of constructing the Highland Wind project within the Allegheny Mountain physiographic region. The cumulative impacts analysis should consider wind turbines proposed or planned at 34 facilities within the Allegheny Highlands of Virginia, West Virginia, Maryland, and Pennsylvania.

6(h). Site-Specific Data and Required Mitigation Plan: To date, the applicant has not provided DGIF with a mitigation plan stating that the results of all the wildlife studies will be used to determine turbine placement. In fact, the applicant (Flora 2006, Page 2), states that the project location is “as good as it gets.”

One project discussed in the AWEA documents, Foote Creek Rim, WY, was redesigned based on site-specific data on golden eagle behavior. DGIF believes this example adds justification to its recommendation for a fall-winter-spring survey of raptors at the Highland Project site (Fernald 2006).

The radar study that was conducted for the Highland Project in the fall of 2005 documented the highest passage rates of nocturnal migrants compared with other sites in the eastern U. S. that have been studied using similar methods (Plissner et al. 2006). The percent of targets observed flying below the rotor height (125 m) was among the highest recorded in the east. While this study provided only a “snapshot” view of relative bird and bat use during that period, it was sufficient to identify the concern for potential significant impacts to bats and possibly birds. Documented bird mortality at industrial wind facilities in the east has, so far, been tolerable to the scientific community.

Conversely, bat mortality has been significant. Moreover, DGIF is aware of no projects that have conducted multiple years of pre- and post-construction monitoring in order to adequately assess risk, document mortality, and implement appropriate mitigation.

The authors of the radar study state, “Understanding the timing of migration at multiple temporal scales (e.g., within nights, within seasons, and seasons within years) allows the determination of patterns...that can be used with other information, especially weather... (This) may be useful...for the consideration of operational strategies to reduce fatalities...” (Plissner et al. 2006). DGIF concurs with this statement.

Collection of site-specific pre-construction data across various temporal scales is the only way to document with any level of confidence how species are currently using a site. DGIF needs to know what resources are currently present in order to determine what may be lost and how to mitigate for those losses.

Recommendation: In response to comments by Kerlinger (2006), DGIF acknowledges the question of whether birds migrate along ridges or along a broad front. DGIF stated that, regardless as to which hypothesis is correct, the following questions have yet to be answered to DGIF’s satisfaction:

- How do birds and bats currently use the Highland Project site?
- What correlations are there between bird and bat use and site characteristics?

- What might the cumulative effects of this project be upon those resources, both temporal and additive?

Therefore, DGIF reiterates its recommendation for an additional pre-construction radar survey during the spring, multiple years of post-construction monitoring, and implementation of appropriate mitigation (Fernald 2006, also see below).

6(i). DGIF's Conclusion: In its earlier comments (Fernald 2006), DGIF expressed concern that this project may result in significant adverse impacts upon wildlife. DGIF remains concerned and believes that the information submitted by the applicant is insufficient to determine what the level of impact may be or to develop a plan to mitigate those impacts.

- While the cumulative impacts to birds were briefly discussed by Kerlinger (Flora 2006, Attachment 4), the cumulative impacts to bats have not been addressed. Likewise, the impacts upon ecotourism is still unknown. The only quantitative site-specific study, the fall 2005 radar study (Plissner et al. 2006), leads DGIF to believe that the impacts to birds and/or bats may be greater than other projects in the east. This level of impact would be unacceptable.
- To adequately address what the impacts upon wildlife and wildlife-related recreation may be, DGIF recommends the additional analyses discussed above, including an assessment of cumulative impacts upon bats, and the series of studies and mitigation described in DGIF's earlier letter under the section titled, "Additional studies, monitoring, and mitigation," numbers 1 - 3 (Fernald 2006).
- DGIF requests that the SCC note the agency's concern and incorporate the foregoing recommendations as conditions of its CPCN. The studies recommended above would provide information critical to assess baseline habitat conditions for certain species, the relative abundance of birds and bats at the project site, and potential correlations between site conditions (e.g., topography, season, wind speed, and weather) and bird and bat activity. In general, the study methods birds and bats, should include using a combination of radar (horizontal and vertical) and acoustic monitoring techniques. Acoustic monitoring can help differentiate the relative proportion of birds to bats using the project area.
- DGIF recommends that raw radar data be recorded and submitted with annual reports to enable further review of the information provided. Also, agency representatives should be allowed to accompany consultants as they conduct their studies.
- The information from the pre-construction studies should be used to help determine the final project design, including placement of turbines,

and develop a preliminary mitigation plan. The mitigation plan should incorporate a modified operation schedule, modification of equipment, possible use of deterrents, and/or other measures anticipated to avoid or minimize mortality.

- If the project is constructed, DGIF continues to recommend a minimum of 3 years of post-construction monitoring to examine correlations between actual mortality of wildlife, continued wildlife use of the site (e.g., passage rates), and site conditions. This post-construction monitoring will test the preliminary mitigation plan to determine if it is adequately avoiding or minimizing impacts.
- All wildlife fatalities associated with the project should be properly preserved and provided to DGIF on a bi-weekly basis. If DGIF considers the impacts to be unacceptable, the mitigation plan should be modified. Again, DGIF reiterates that these studies, assessments, and mitigation measures should be coordinated with DGIF and its partner natural resource agencies.

6(j). Additional Wildlife Information. The Department of Game and Inland Fisheries maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters. This database is on the Department's website:

http://www.dgif.virginia.gov/wildlife/info_map/index.html.

Subscriptions to the VAFWIS are available. Questions about this database may be addressed to Ms. Shirl Dressler, Department of Game and Inland Fisheries at (804) 367-6913.

Questions about these recommendations may be addressed to Mr. Andrew Zadnik, DGIF Environmental Services Section Biologist at (804) 367-2733. See also "Regulatory and Coordination Needs," Item 8 on page 41.

7. Erosion and Sediment Control; Stormwater Management. Electric companies that undertake land-disturbing activities of 10,000 square feet or more for construction, installation, and maintenance of transmission lines (including essential supporting activities within and outside the easement) must file general Erosion and Sediment Control specifications annually with the Department of Conservation and Recreation's Division of Soil and Water Conservation for review and approval in accordance with the Virginia Erosion and Sediment Control Law (*Virginia Code* section 10.1-563.D.).

7(a) Scope of Land-Disturbing Activities. The supporting activities contributing to the land disturbance threshold above include, but are not limited to, substations, staging areas, access roads, and borrow or spoil areas.

7(b) Regulated Activities; Locations. Regulated activities include the supporting activities (above) that take place on company property or an easement (including Department of Transportation rights-of-way) owned by another party.

7(c) Specifications. Erosion and Sediment Control specifications must include, at a minimum, a description of all measures and policies that will be implemented on the site to ensure compliance with the state program. Standard practices (general narrative and plan sheets with appropriate details, symbols, etc.) must be provided and must meet the requirements of the 19 Minimum Standards (MS) found in the Virginia Erosion and Sediment Control Regulations (4 VAC 50-30-40) that apply to company activities. Practices found in the *Virginia Erosion and Sediment Control Handbook* must serve as minimum design criteria. Any variance requests (especially those for MS-16, trench length) must be submitted for approval on a project-specific basis to ensure that site-specific characteristics (soils, topography, adjacent areas) are fully considered.

Company-specific specifications covering all planned regulated activities for the calendar year in which the activity will be undertaken must be approved by the Department of Conservation and Recreation's Division of Soil and Water Conservation prior to initiation. See "Regulatory and Coordination Needs," Item 2(a) on page 39.

7(d) Stormwater Management. Projects involving the disturbance of one acre or more of land area are subject to general permit coverage under the Virginia Pollutant Discharge Elimination System (VPDES) Stormwater General Permit for Construction Activities. Administration of this permit program has been transferred from the Department of Environmental Quality to the Department of Conservation and Recreation. See "Regulatory and Coordination Needs," Item 2(b) on page 39.

7(e) Analysis: A comprehensive site plan, including detailed grading and construction plans, is required to determine the location and extent of all ground-disturbing activities. This information was not provided with the initial application or subsequent materials.

8. Historic Structures and Archaeological Resources. Section 106 of the National Historic and Preservation Act of 1966, as amended, requires that federal agencies must consider effects of licensed/permitted activities on properties that are listed or eligible for listing on the National Register of Historic Places. The Department of Historic Resources (DHR) conducts reviews of projects to determine their effect on historic structures or cultural resources listed in or eligible for the National Register of Historic Places or the Virginia Landmarks Register.

8(a) Analysis and Summary of February 23, 2006, Comments from the DHR: The DHR finds that the information provided in Section 11(h) of the application is insufficient for the DHR to provide full and final comment on the potential impacts of this project on historic properties. At the scoping meeting on September 12, 2005, DHR expressed concern over the potential direct impacts to archaeological resources and indirect impacts to Camp Allegheny and other potentially historic structures and districts. At that time, DHR recommended to the Applicant that the following items be provided for DHR's review:

- Viewshed analysis to determine from where the turbines would be seen;
- The results of an architectural survey within the viewshed to determine if individual historic structures or potential rural historic districts are present; and
- A comprehensive site plan, including detailed grading and construction plans, to determine the location and extent of all ground-disturbing activities so recommendations on the need for an archaeological survey within the project area can be offered.
- In addition, the claim that the turbines would not be visible from the parking lot at the Camp Allegheny is unsubstantiated with photo-simulation. The potential impacts to the extensive earthworks and other well-preserved components of this camp are not addressed.

8(b) February 23, 2006, Recommendations from the DHR: None of the items listed above have been provided with the application packet submitted for DHR's review. The DHR requests that these and earlier DHR comments be addressed, and the necessary, additional information be provided for DHR consideration. Once DHR has this information, it will be able to provide guidance on the need for additional studies and evaluations. Questions about these comments should be addressed to Mr. Roger Kirchen, DHR, at (804) 367-2323 extension #153 or email: roger.kirchen@dhr.virginia.gov. See also Regulatory and Coordination Needs Item 6 on page 40.

8(c) Analysis and Summary of May 23, 2006, Comments from the DHR: DHR has reviewed the Applicant's response to its request for additional information on the project referenced above. DHR understands and supports the need to pursue alternative energy sources. DHR's role as Virginia's State Historic Preservation Office (SHPO) is to strike a balance between the valued history of the Commonwealth and its productive future. The success of DHR's mission relies heavily on positive collaboration between all parties to assess the effects of proposed projects on historic resources. The meaningful participation of all interested parties, such as the U.S. Forest Service, Civil War Preservation Trust, American Battlefield Protection Program (NPS), West Virginia SHPO, Virginia Council on Indians, and the concerned public, is vital to a thoughtful and successful project.

8(d) May 23, 2006, Recommendations from the DHR: DHR reiterates its February 23, 2006, comments. DHR recommended to the Applicant that the following items be provided for DHR's review:

- Viewshed analysis: DHR's request for a viewshed analysis is based on DHR's need to determine the Area of Potential Effect (APE) for the project. Only after the APE is determined can DHR begin to assess the effects of this project on historic resources. A well-executed viewshed analysis to establish the APE would avoid unnecessary survey of areas unaffected by this project and would, in DHR's opinion, represent a good use of project resources.
- Detailed site plan: Similarly, it is DHR's opinion that the site plan submitted for consideration was not complete enough to determine the project's direct impacts and potential effect on archaeological resources. DHR did not reply to the Applicant's March 9, 2006, submission, because DHR is waiting for additional information from the COE in order to coordinate reviews and streamline comments.
- Preliminary engineering, plan review, potential archaeological survey: DHR remains available to review project plans as they are finalized to provide additional guidance on the need for archaeological survey. These recommended studies and field surveys would ensure a fair consideration of the project's impacts to historic resources.

8(e) Section 106 of the National Historic Preservation Act:

Beyond DHR's participation in the review of applications to the State Corporation Commission, it has a mandated role in Federally licensed or permitted projects. Section 106 of the National Historic Preservation Act of 1966 (as amended) requires all Federal agencies to consider the impacts of their undertakings on historic properties and to consult with the State Historic Preservation Office. Any required permitting by the US Army Corps of Engineers (including Nationwide general permits) or the Environmental Protection Agency (through their National Pollutant Discharge Elimination System [NPDES] Permitting Program as administered by the Department of Conservation and Recreation through the Virginia Stormwater Management Program) may necessitate continued consultation with DHR, pursuant to Section 106 of the National Historic Preservation Act. Questions about these comments should be addressed to Mr. Roger Kirchen, DHR at (804) 367-2323 extension #153 or email: roger.kirchen@dhr.virginia.gov. See also Regulatory and Coordination Needs, Item 6 on page 40.

9. Transportation. VDOT stated that, there are no conflicts with the current or future construction projects, and the improvement should not adversely impact the existing or future transportation system. VDOT requests:

- Any land use requirements, lane closures, traffic control or work zone safety issues should be closely coordinated with the counties affected and VDOT.
- All work with the potential to affect roadways or other transportation facilities should be coordinated with the VDOT's Verona Residency at (540) 332-8989.

Questions about these comments should be addressed to Ms. Mary Stanley, VDOT, at (804) 786-0868.

10. State Scenic Resources, Socioeconomic Role, and Recreational Facilities. The Department of Conservation and Recreation (DCR) reviews all projects from a recreational and scenic perspective.

10(a) Analysis and Summary of February 27, 2006, Comments from the DCR: The Department of Conservation and Recreation's Division of Planning and Recreation Resources (DCR – DPRR) stated that the application does not address the scenic and recreational impacts of the project.

10(b) February 27, 2006, Recommendations from the DCR: An analysis of the viewshed from Laurel Fork, a potential Virginia Scenic River, is not provided and is necessary for complete review. Also, an analysis of the viewshed from Route 250, a potential Virginia Scenic Byway, is not provided and is necessary for complete review.

10(c) Analysis and Summary of May 31, 2006, Comments from the DCR: The DCR reiterated its February 27, 2006, comments. DCR administers the Virginia Scenic Rivers and the Virginia Byways programs. Additionally, DCR is responsible for developing the Virginia Outdoors Plan (VOP), the state's comprehensive outdoor recreation and open space plan. The VOP recognizes the importance of scenery to Virginians who drive for pleasure and visit natural areas, parks, and scenic areas. Tourists who visit Virginia come in search of advertised scenic beauty, and tourist expenditures while in Virginia contribute significantly to Virginia's economy. See "Environmental Impacts and Mitigation," Item 6(f) pages 23-24.

10(d) May 31, 2006 Recommendations from DCR: To ensure that wind turbines are sited in locations where the least potential impact to the scenery of Highland County results, DCR is requesting that the project sponsor utilize a recognized scenery impact assessment tool:

- **Visual/scenic Impact Analysis:** DCR recommends that a study of the visual/scenic impacts of the project be done using the U. S. Forest Service's Landscape Aesthetics Scenery Management Process as laid out in Agriculture Handbook Number 701, or an accepted industry equivalent, to determine the relative sensitivity and importance of the visual impacts on the identified scenic resources. This tool can also be used to identify the best locations for the towers.
- **Study Locations:** Scenic resources (locations) from which the analysis should be conducted are from the potential scenic byways of Route 250 and Route 220; the Laurel Fork, a potential scenic river; and other managed public overlooks such as Sounding Knob Look Out located in the Highland Wildlife Management Area.
- **Reporting Results:** The findings of such a scenery impact analysis and any recommendations for identified changes to the locations

should be presented to DCR and other interested agencies or organizations for review.

For additional information, the Applicant should contact DCR – DPRR, either Mr. Bob Munson at (804) 786-6140), or Ms. Lynn Crump at (804) 786-5054.

11. Pollution Prevention. DEQ advocates that principles of pollution prevention be used in all construction projects as well as in facility operations. Effective siting, planning, and on-site Best Management Practices (BMPs) will help to ensure that environmental impacts are minimized. However, pollution prevention techniques also include decisions related to construction materials, design, and operational procedures that will facilitate the reduction of wastes at the source. We have several pollution prevention recommendations that may be helpful in constructing or operating this project:

- Consider development of an Environmental Management System (EMS). An effective EMS will ensure that the proposed facility is committed to minimizing its environmental impacts, setting environmental goals, and achieving improvements in its environmental performance. DEQ offers EMS development assistance and recognizes facilities with effective Environmental Management Systems through its Virginia Environmental Excellence Program.
- Consider environmental attributes when purchasing materials. For example, the extent of recycled material content, toxicity level, and amount of packaging should be considered and can be specified in purchasing contracts.
- Consider contractors' commitments to the environment (such as an EMS) when choosing contractors. Specifications regarding raw materials and construction practices can be included in contract documents and requests for proposals.
- Choose sustainable materials and practices for infrastructure construction and design. These could include asphalt and concrete containing recycled materials, and integrated pest management in landscaping, among other things.
- Integrate pollution prevention techniques into facility maintenance and operation, to include the following: inventory control (record-keeping and centralized storage for hazardous materials), Maintenance facilities should be designed with sufficient and suitable space to allow for effective inventory control and preventive maintenance.

DEQ's Office of Pollution Prevention provides information and technical assistance relating to pollution prevention techniques and EMS. If interested, the Applicant may contact Mr. Thomas Griffin, DEQ-OPP at (804) 698-4545.

12. Geologic Resources and New Renewable Energy Policy.

12(a) General: The Department of Mines, Minerals, and Energy (DMME) stated in its February 7, 2006, comments (attached) that the geology section

of the application (page 14) is a physiographic discussion. There is no description of the geology of the site. The DMME suggests the proponent contact the Virginia Division of Mineral Resources (Charlottesville) for published geologic information. Questions pertaining to the geology or mineral resources of the Commonwealth may be addressed to Mr. Matt Heller, DMME, at (434) 951-6351).

The Applicant's April 28, 2006, response includes Public Geological Information.

12(b) Commonwealth's Policies Regarding Renewable Energy Facilities:

In response to the Applicant's request (April 27, 2006 letter), DEQ sought guidance from DMME regarding the Commonwealth's policies on renewable energy. DMME provided the following information on the Commonwealth's policies regarding renewable energy facilities in its May 31, 2006, letter (attached). It should be noted that the Commonwealth's renewable energy policies do not negate the need to perform site-specific environmental impact analyses.

12(c) Senate Bill (SB), New Title 67 of the Code of Virginia: Recently enacted SB 262 (2006) establishes a new Title 67 of the Code of Virginia setting out the Energy Policy of the Commonwealth. Several key findings include the need to:

- Ensure the availability of reliable energy at costs that are reasonable and in quantities that will support the Commonwealth's economy.
- Establish sufficient supply and delivery infrastructure to maintain reliable energy availability in the event of a disruption affecting a portion of the Commonwealth's energy matrix.
- Increase Virginia's reliance on sources of energy that, compared to traditional energy resources, are less polluting of the Commonwealth's air and waters.
- Remove impediments to the use of abundant low-cost energy resources located within and outside the Commonwealth and ensuring the economic viability of the producers, especially those in the Commonwealth, of such resources.
- Recognize the need to foster those economically developable alternative sources of energy that can be provided at market prices as vital components of a diversified portfolio of energy resources.

12(d) New Energy Policy of the Commonwealth: Based on these and related findings, SB 262 (2006) created a new Commonwealth Energy Policy. Among the items of the Energy Policy, the Commonwealth is to:

- Support research and development of, and promote the use of, renewable energy sources.
- Ensure that the combination of energy supplies and energy-saving systems are sufficient to support the demands of economic growth.

- Promote the generation of electricity through technologies that do not contribute to greenhouse gases and global warming.
- Ensure that energy generation and delivery systems are located to minimize impacts to pristine natural areas and other significant onshore natural resources, and as near to compatible development as possible.

12(e) Need for Planning: With proper planning, the Highland New Wind project should be consistent with these findings and the Commonwealth Energy Policy. Specifically, the proposed project should:

- Provide a reliable source of energy at reasonable costs to support Virginia's economy.
- Add to and diversify Virginia's electric supply infrastructure that can help maintain electric supplies in the event of disruption to other parts of Virginia's electric infrastructure.
- Increase reliance on sources of energy that are less polluting than traditional sources.
- Support development of this site's renewable energy resource.
- Provide for wind resource development on an already cleared, non-forested site, which avoid disruption of pristine natural areas and, given proper controls, avoid disruption of significant onshore natural resources.
- Provide for new electric generation near existing electric distribution and transmission lines.

Questions pertaining to these comments may be addressed to Mr. Stephen Walz, DMME, at (804) 692-3200.

13. Forest Resources. The Department of Forestry stated there would be no significant impact to the forests of the Commonwealth. However, in order to protect trees not slated for removal from the effects of construction activities associated with this project, the Applicant and its contractors should mark and fence them at least to the dripline or the end of the root system, whichever extends farther from the tree stem. Marking should be done with highly visible ribbon so that equipment operators see the protected areas easily.

Parking and stacking of heavy equipment and construction materials near trees can damage root systems by compacting the soil. Soil compaction, from weight or vibration, affects root growth, water and nutrient uptake, and gas exchange. The protection measures suggested above should be used for parking and stacking as well as for moving of equipment and materials. If parking and stacking are unavoidable, the Applicant and its contractors should use temporary crossing bridges or mats to minimize soil compaction and mechanical injury to plants.

Any stockpiling of soil should take place away from trees. Piling soil at a tree stem can kill the root system of the tree. Soil stockpiles should be covered, as well, to prevent soil erosion and fugitive dust. Questions pertaining to forest

resources of the Commonwealth can be addressed to Mr. Michael Foreman, DOF, at (434) 977-6555.

14. Local and Regional Concerns. According to the Highland County Administrator, on July 14, 2005 the Highland County Board of Supervisors approved a Conditional Use Permit for Highland New Wind Development, LLC for the use of certain real property zoned agricultural general district (A-2) for electric generation (wind turbines) and substations. The Highland County, Virginia, Board of Supervisors' July 14, 2005 Resolution (attached) grants a Conditional Use Permit to the Applicant (Permittee). The Conditional Use Permit is subject to twenty (20) conditions (Resolution, paragraph three; pages 4 through 11) including but not limited to:

- **Site Plan:** The Permittee shall submit a detailed site plan addressing turbine structure, substation and accessory building locations, height of structures, set-backs, screening and color of all structures, fencing and other security measures, erosion and sediment control measures, signage and location and construction standards for access roads. The site plan shall be designed to mitigate the impact of the permitted use on nearby property owners and the natural environment and shall include computer simulations or other visual representations of each wind turbine at its proposed location. The location of the turbine structures shall be shown on the site plan based on minimizing the overall visual impact on nearby property owners and the area to the extent reasonably practicable.

See also "Regulatory and Coordination Needs," Item 9 on page 41. The Staff report on the conditional use application, and the Resolution granting the Conditional Use Permit for Highland New Wind Development, LLC are attached. Questions pertaining to Highland County involvement should be directed to Ms. Roberta Lambert, Highland County Administrator, at (540) 468-2347.

The Central Shenandoah Planning District Commission stated that it has no comments.

15. Aviation. The Virginia Department of Aviation (DOAv) has reviewed the project information and stated that, the Department cannot make a determination on the impact regarding the public-use airports closest to the proposed development, Ingalls Field and Bridgewater Air Park. DOAv asks that the Applicant coordinate further with the Federal Aviation Administration and the VDOAv to make certain the development would not create negative impacts to the safety, utility, and expandability of the state's air transportation system, including our public-use airports and airspace. The Department reserves the right to make additional comments at a later time. For additional information pertaining to these comments, please contact Ms. Susan Simmers, DOAv, at (804) 236-3624).

Background on Coordinated Review Process

On January 18, 2006, DEQ commenced the Commonwealth's coordinated review process.

DEQ's March 1, 2006, letter (attached) notified the State Corporation Commission that agencies reviewing the Application need additional information in order to complete their evaluation of the environmental impacts of the proposed project. Pursuant to Section 5.A.(ii) of the Department of Environmental Quality-State Corporation Commission (DEQ-SCC) Memorandum of Agreement (dated August 14, 2002), DEQ suspended the review of the environmental report for this application in order to seek additional information. The following agencies are parties to this request for additional information from the Applicant:

- Department of Environmental Quality (hereinafter "DEQ")
- Department of Game and Inland Fisheries ("DGIF")
- Department of Conservation and Recreation ("DCR")
- Department of Historic Resources ("DHR")
- Department of Mines, Minerals, and Energy ("DMME").

The detailed comments of DGIF, DCR, and DHR (attached), based on information received prior to March 1, 2006, and described above, were sent electronically to the Applicant's representative (Mr. John Flora) at his request on March 1, 2006.

The DEQ received a response (attached) to our January 28, 2006, request for Additional information from the Applicant on April 28, 2006. The letter indicated that the Applicant did not intend to provide any more information during this review.

On May 4, 2006, DEQ provided this information to reviewers. DEQ requested reviewers report:

- Whether the information provided is sufficient to complete their review.
- If there is information that remains outstanding, to explain what information is required and provide recommendations, as appropriate.
- Whether reviewers wish to reiterate previous comments, modify, or withdraw them.

The Virginia Department of Game and Inland Fisheries (DGIF) notified DEQ that three reports referenced in the Applicant's response were not among the materials submitted. On May 11, 2006, DEQ requested that (email attached) the Applicant provide a copy of these three reports, prepared by Curry and Kerlinger LLC:

Curry and Kerlinger LLC. Analysis of the ABR radar study, titled:

Plissner, Jonathan H., T.J. Mabee, and B.A. Cooper. A Radar and Visual Study of Nocturnal Bird and Bat Migration at the Proposed Highland New Wind Development Project, Virginia Fall 2005. Final Report. ABR, Inc. 33 pp.

Curry and Kerlinger LLC. Analysis of the effect of FAA lights on birds.

Curry and Kerlinger LLC. Analysis of the effect of FAA lights on bats.

According to the Applicant, the requested reports were filed as part of the pre-filed testimony delivered to the SCC on February 7, 2006, and subsequently posted on the SCC website. The three reports were attachments to Dr. Kerlingers's testimony and marked as exhibits C, D, and E. The Applicant notified DGIF of that filing February 8, 2006. DEQ received a copy of the following reports (attached) from the Applicant on May 12, 2006:

Kerlinger, Paul. February 2, 2006. Federal Aviation Administration Obstruction Lighting and Avian Fatalities at Wind Turbines in the United States: A Test of the Hypothesis that Red Flashing Lights Attract Night Migrants. Curry & Kerlinger, LLC. 17 pp.

Kerlinger, Paul. February 2, 2006. Review of Research on FAA Obstruction Lighting on Wind Turbines With Respect to Bat Fatalities. Curry & Kerlinger, LLC. 7 pp.

Kerlinger, Paul. February 3, 2006. Assessment of Risk for Night Migrating Birds at the Highland New Wind Development, Highland County, Virginia. Curry & Kerlinger, LLC. 23 pp.

Subsequently, the State Corporation Commission (SCC) notified DEQ that a data report and photos for Highland County, Virginia's Eagle Watch would be posted on the SCC website on May 30, 2006. The DEQ forwarded this information (attached) to the reviewers (DGIF and DCR) on May 30, 2006.

In addition to the customary coordination steps, DEQ also coordinated reviews at the request of the Applicant or other parties. A description follows:

1. Meetings with Applicant. At the Applicant's request, DGIF, DCR, DEQ-OEIR and the USFWS participated in two meetings, one on March 24, 2006, and the second on April 6, 2006, to discuss issues and additional studies proposed related to bats and birds, respectively.

DGIF expressed its disappointment with the overall purpose and results of these meetings. DGIF has recommended that any studies proposed to be conducted for the project be coordinated with DGIF and its partner agencies. DGIF noted that the Applicant had already begun one study (proposed bat acoustic study)

prior to the meeting with DGIF, while another study (proposed breeding bird study) was not among DGIF's earlier recommendations (Fernald 2006). DGIF expressed its concern that it seems that the Applicant consults DGIF and its partner agencies after conclusions have been made (by the Applicant), and this general lack of coordination continues to make it difficult to complete an environmental assessment of this project. See "Environmental Impacts and Mitigation," Item 6 on pages 16-27.

2. Nature Conservancy Teleconference. At the request of Wiley Mitchell, Counsel for The Nature Conservancy (TNC), DGIF, DCR, and DEQ-OEIR participated in two teleconferences with TNC experts on May 25, 2006. One of these was with TNC bat expert, Dr. Merlin Tuttle of Bat Conservation International; the second was with TNC bird expert, Dr. Sarah Mabey of North Carolina State University. Both experts reported during these teleconferences that they have reviewed DEQ's March 1, 2006, letter to the SCC including the attached comments from DGIF and DCR and concur with all recommendations.

3. Public concerns regarding impacts on Department of Defense/United States Navy Training Flight Path . In November 2005, DEQ received a letter from two citizens, Patrick Lowry and Valerie Hilliard, pertaining to the potential impacts of Highland Wind project on the flight path used by the Navy for the Military Training Routes in Highland County. DEQ sent the letter (by facsimile) to the SCC and Virginia Department of Aviation (DOAv). DEQ also responded to the letter indicating that SCC was responsible for the review of public comments and provided information on SCC's public comment process and upcoming public meetings.

4. Federal Aviation Administration (FAA). To DEQ's knowledge, the FAA has not conducted/completed its review of the Highland Wind proposal. It is not customary for DEQ to coordinate an SCC application with federal agencies. Hence, the Navy and the FAA were not invited to comment during our review of the project. As described above, DEQ sent this information to the SCC and the Department of Aviation.

REGULATORY AND COORDINATION NEEDS

1. Water Quality and Wetlands. DEQ's Valley Regional Office (DEQ-VRO) indicates that in accordance with 9 VAC 25-210-50 of the Virginia Water Protection (VWP) Permit regulations, a VWP permit from the Virginia Department of Environmental Quality (DEQ) may be required for the proposed impacts to wetlands and streams. A Joint Permit Application (JPA # 06-0138) has been submitted for the proposed wetland and stream impacts. According to the DEQ-VRO, a Virginia Water Protection permit application (JPA) for utility crossings under Laurel Fork is currently under review. DEQ-VRO is waiting for some additional information to complete its file. Upon receipt of this information, DEQ-VRO expects to send a "No Permit Required" (NPR) letter to the owner. Questions on water resources permitting may be addressed to DEQ's Water Quality Division (Ms. Catherine Harold, telephone (804) 698-4375 or Mr. David Davis, telephone (804) 698-4105). For additional information on the status of the VWP permit application, contact Mr. Keith Fowler at DEQ-VRO, at (540) 574-7812.

2. Erosion and Sediment Control; Stormwater Management.

2(a) Erosion and Sediment Control and Stormwater Management. The Applicant must comply with Virginia's Erosion and Sediment Control Law and Regulations and the Virginia Stormwater Management Act and Regulations. Questions regarding the Erosion and Sediment Control annual standards and specifications mentioned above ("Environmental Impacts and Mitigation, Item 7(c)) may be addressed to the Department of Conservation and Recreation's Division of Soil and Water Conservation, Mr. Larry Gavan, Stormwater Compliance Specialist, at (804) 786-34508.

2(b) Stormwater Management: VPDES Stormwater Permits for Construction Activities. As mentioned above ("Environmental Impacts and Mitigation," Item 7(d)), proponents of projects involving land disturbance of one acre or more must apply for coverage under the Virginia Stormwater Management Program (VSMP) General Permit for Discharges of Stormwater from Construction Activities. This program covers municipal separate storm sewer systems (MS4s) and other construction activities. Information and registration forms are available on the Department of Conservation and Recreation's web site: <http://www.dcr.virginia.gov/sw/vsmp.htm>

Specific questions on program requirements may be addressed to the Department of Conservation and Recreation's Division of Soil and Water Conservation, Mr. Lee Hill, Assistant Director, Stormwater Management Programs at (804) 786-3998 or e-mail lee.hill@dcr.virginia.gov.

3. Solid and Hazardous Waste Management, and DEQ – Federal Facilities Restoration Program. The Applicant must comply with all applicable Federal, State, and local laws and regulations, such as Virginia Code section 10.1-1400 et seq.; Virginia Hazardous Waste Management Regulations (VHWMR) (9VAC 20-60); Virginia Solid Waste Management Regulations (VSWMR) (9VAC 20-80); Virginia Regulations for the Transportation of Hazardous Materials (9VAC 20-110); and the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 et seq. See “Environmental Impacts and Mitigation,” Item 4 on pages 12-13. For additional information and coordination concerning the location and availability of suitable waste management facilities in the project area or if free product, discolored soils, or other evidence of contaminated soils are encountered, please contact Mr. Graham Simmerman, DEQ-Waste Compliance Manager at (540) 574-7865).

4. Air Quality Regulation. This project may be subject to air regulations administered by the Department of Environmental Quality. During construction, fugitive dust must be kept to a minimum by using control methods outlined in 9 VAC 5-50-60 et seq. of the Regulations for the Control and Abatement of Air Pollution. If project activities include the burning of material, this activity must meet the requirements under 9 VAC 5-40-5600 et seq. of the Regulations for open burning, and it may require a permit. For additional information and coordination pertaining to Regulations for the Control and Abatement of Air Pollution, please contact Mr. Ronald Philips, DEQ-Valley Regional Office Air Compliance Manager at (540) 574-7846.

5. Transportation. Any project work with the potential to affect roads or other transportation facilities should be coordinated with the Department of Transportation. The Applicant must coordinate closely with VDOT to ensure that transportation is adequately addressed. See “Environmental Impacts and Mitigation,” Item 9 on pages 30-31. The Applicant should contact Ms. Mary Stanley of VDOT at (804) 786-0868 for additional information.

6. Historic Structures and Archaeological Resources. If there will be federal involvement in this project (such as the possible requirement for an EPA delegated Virginia Pollutant Discharge Elimination System (VPDES) General Permit for Discharges of Stormwater from Construction Activities), it will then be the responsibility of the federal agency, under Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations at 36 CFR 800, to define the Area of Potential Effect and to provide to the Department of Historic Resources, Virginia’s State Historic Preservation Office, a recommendation concerning the project’s effect on historic properties. See “Environmental Impacts and Mitigation,” Item 8 on pages 28 through 30. For more information, contact Mr. Roger Kirchen at (804) 367-2323, extension #153, or email: roger.kirchen@dhr.virginia.gov).

7. Natural Heritage Resources. For additional information and coordination pertaining to DCR-DNH comments, please contact Ms. René Hypes, DCR-DNH, at (804) 371-2708.

8. Wildlife Resources and Protected Species. The Applicant must comply with the Federal Endangered Species Act (16 U.S.C. sections 1531 et seq.), and Virginia protected species legislation (Virginia Code §29.1-563 et seq.). See “Environmental Impacts and Mitigation,” Items 5 and 6 (pages 13 through 27). The Applicant should direct questions regarding protected species to Mr. Andrew Zadnik, DGIF Environmental Services Section Biologist, at (804) 367-2733.

9. Regional and Local Concerns: The Applicant must coordinate closely with Highland County to ensure that local requirements are adequately addressed. See “Environmental Impacts and Mitigation,” Item 14 on page 35, above. Questions should be directed to Ms. Roberta Lambert, Highland County Administrator at (540) 468-2347.

10. Aviation. The Department of Aviation (DOAv) asks that the Applicant coordinate further with the Federal Aviation Administration and the DOAv to make certain the development would not create negative impacts to the safety, utility, and expandability of the state’s air transportation system, including public-use airports and airspace. See “Environmental Impacts and Mitigation,” Item 15 on page 35. For additional information pertaining to these comments, please contact Ms. Susan Simmers, DOAv, at (804) 236-3624.