DEQ Wind Energy Regulatory Advisory Panel (Wind RAP)
October 13, 2009 Meeting
Final Meeting Notes

Location: **DEQ Central Office, 2nd Floor Conference Room**
629 E. Main Street, Richmond, VA 23219

Start: 9:40 a.m.
End: 4:10 p.m.

RAP Lead/Facilitator: Carol Wampler, DEQ
Recorder: Debra Miller, DEQ

RAP Members Present:
Julie Langan, DHR
Bob Bisha, Dominion
Ray Fernald, DGIF
James Golden, DEQ
Nikki Rovner, Deputy SNR
Judy Dunscomb, TNC
Larry Land, Virginia Assoc. of Counties
Ronald Jenkins, DOF
Larry Jackson, Appalachian Power
Stephen Versen, VDACS
John Davy DCR (alternate)
Tony Watkinson, VMRC
Ken Jurman, DMME
Theo Wolff, Independent Developer
Mary Elfner, Audubon
Jonathan Miles, JMU
John Daniel, Troutman Sanders

RAP Members Absent:
Dan Holmes, Piedmont Environmental Council
Jayme Hill, Sierra Club-VA Chapter

Public Attendees:
Roger Kirchen, DHR (alternate)
Ronald Jefferson, Appalachian Power (alternate)
Elizabeth Murphy- VMRC (alternate)
David Phemister, TNC (alternate)
Richard Reynolds, DGIF (alternate)
Hank Seltzer, BP Wind Energy
Cody Walker, SCC
Bob Broom, McGill
Jerod Markley, Navy
Bill Bolin, Dominion
Don Giecek, Invenergy
Chris Hobson, DCR-DNH
John Anderson, BP Wind
Chris Ludwig, DCR
Emil Avram, Dominion
David Groberg, Invenergy
Larry Nichols, VDACS (alternate)
Scott Francis, Dominion Energy

Agenda Item: Introductions

Discussion Leader: Carol Wampler
Discussion: The RAP members and other attendees were welcomed. After the introductions, Carol presented an update to the group including background, purpose, goals, and path forward. Subcommittees are requested to provide authority and support for their recommendations. Following the presentation, there was further discussion of the regulation development.

The Wind RAP plenary group adjourned at 10:35am and subcommittee meetings began.
See Attachment A for the Living Resources Subcommittee Meeting Notes, Attachment B for the Landscape Subcommittee Meeting Notes, and Attachment C for the General Subcommittee Meeting Notes.
The Wind RAP meeting reconvened at 335 p.m.

Agenda Item: Public Forum

Discussion Leader: Carol Wampler, DEQ

Discussion: No one had signed up to speak, so no public forum was held.

Agenda Item: Brief Reports by subcommittees to Plenary Group

Discussion Leaders: Subcommittee Chairs
Discussion: Each of the subcommittees reported on the issues discussed and accomplishments from their meetings. See subcommittee meeting notes for details of the discussions.

Living Resources Subcommittee: The subcommittee presented an approach for dealing with pre-construction issues. This subcommittee will be meeting again next week on October 20th, as further discussion is still necessary for some mitigation topics.

General Subcommittee: The subcommittee has reviewed definitions, including project boundary, site plan specifics, criteria for other plans (design, operations), differing roles of localities regarding decommissioning and financial assurance, and also a de minimis and tiered approach.

Landscape Subcommittee: The subcommittee has identified the 10 areas that were discussed including criteria developed for those issues. The subcommittee is still revising and clarifying some of the issues.

Agenda Item: Announcements

Discussion Leader: Carol Wampler, DEQ
Discussion: The Living Resources Subcommittee will have another meeting on October 20th, 2009, at the DEQ's Central Office. This meeting has been noticed and the attendees were requested to let their constituency base know. When providing recommendations, the subcommittees were again reminded to provide substantiating reasons and justification for each recommendation. Recommendations are due to Carol by October 19th (except for Living Resources). The recommendations will be forwarded for legal and administrative feasibility review prior to the next Wind RAP meeting, which will be held at the DEQ Central Office on October 29, 2009. This date will be a plenary session to review recommendations from the subcommittees.

The meeting was adjourned at 4:10pm.

DEQ Wind Energy Regulatory Advisory Panel (Wind RAP)
Attachment A - Living Resources Subcommittee
October 13, 2009 Meeting
Draft Meeting Notes

Location: **DEQ Central Office, Training Room**
629 East Main Street, Richmond, VA 23218

Start: 10:35 a.m.
End: 3:30 p.m.

Subcommittee Chair: Judy Dunscomb, TNC
Recorder: Karen Sabasteanski, DEQ

Subcommittee Members Present:
Tom Smith, DCR
Bob Bisha, Dominion
Ray Fernald, VDGIF

Subcommittee Members Absent: none

Public Attendees (including some RAP members & alternates):
Chris Hobson, DCR
Rick Reynolds, DGIF
Larry Nichols, DACS
John Anderson, BP Wind
Hank Seltzer, BP Wind
John Daniel, Troutman Sanders
Bill Bolin, Dominion
David Young, West, Inc. (via phone)
Chris Ludwig, DCR
Mary Elfner, Audubon
Emil Avram, Dominion
David Groberg, Invenergy

Agenda Item: Draft Pre- and Post-construction Monitoring Plan
Discussion Leader: Judy Dunscomb
Discussion: Ms. Dunscomb began the meeting by introducing the draft pre- and post-construction plan prepared by Mr. Smith.

Agenda Item: Discussion of Habitat Mapping
Discussion Leader: Judy Dunscomb and Tom Smith
Discussion: The group discussed the habitat mapping portion of the draft pre- and post-construction plan. This language is based on DCR's habitat standard. It is used to identify habitats that are exemplary in nature (undisturbed and rare) as well as different vegetation types. It is most commonly used for applications for development projects if there are site-specific issues. It is typically used as a site-specific tool between DCR and the developer.
Key concerns: How does this process fit in with the statute? How does DCR fit into the process? Would this be conducted by a prudent developer regardless, and can all developers be assumed to be "prudent"? Will this affect the goals of certainty and expediting the process? Are the requirements duplicative? Will they provide needed clarity to the process? Should invasive species be addressed, and how?
Consensus: The group will work to revise the language of the draft based on today's discussion, including how to address invasives (including post-construction monitoring).

Agenda Item: Discussion of Unfragmented Natural Ecosystems
Discussion Leader: Judy Dunscomb and Tom Smith
Discussion: The group discussed the unfragmented natural ecosystems portion of the draft pre- and post-construction plan. The proposal is based on a standard currently used by DCR that defines ecological cores, which are identified and mapped by DCR, and are publicly available.

Key concerns: How can the applicant best demonstrate that it has taken appropriate steps to minimize impacts? Need to specify that "reasonable" actions will be taken.
Consensus: The group will work to revise the language of the draft based on today's discussion.

Agenda Item: Discussion of Natural Heritage Resources

Discussion Leader: Judy Dunscomb and Tom Smith
Discussion: The group discussed the natural heritage resources portion of the draft pre- and post-construction plan. The proposal is based on the normal consultation process conducted by DCR and DGIF on a site-by-site basis. It spells out what goes into the application process. The information on which it is based is publicly available. The "methodologies" portion of this section describes how the applicant coordinates the NHR survey with DCR in order to conduct the survey properly.
Key concerns: The structure of the proposal should be reorganized to consolidate mapping activities into one process. Required feedback from agencies should be clear and timely. Will specific guidance for preparing this information be developed, and how?
Consensus: The group will work to revise the language of the draft based on today's discussion.

Subcommittee took lunch break from 12:15 p.m. to 1:25 p.m.

Agenda Item: Discussion of State and Federally Protected Species

Discussion Leader: Judy Dunscomb and Tom Smith
Discussion: The group discussed the state and federally protected species portion of the draft pre- and post-construction plan. The proposal requires the applicant to determine potential impacts to any federally- or state-listed threatened or endangered species, or any state-listed plants and insects (which are managed by DACS). The group discussed how the federal and state lists interact, including adoption of lists and specific species, and how federal standards can be enforced at the state level.
Key concerns: Is some or all of this review redundant? As with other topics, need to specify that applicant will take "reasonable" steps. Is this level of detail excessive--how much is needed prior to or in the application itself? Isn't much of this process already being conducted? Significant concern was expressed over the handling of confidential information: what can legally be considered to be confidential, and how should such information be handled in the review process. What specific parts of this process are subject to FOIA? How much detailed information should be submitted and at what stage of the process? Exactly how do we define and demonstrate "consultation"? These issues apply to other subjects in the proposal as well.
Consensus: Remove unnecessary reference to federal lists. The group will also work to revise the language of the draft based on today's discussion, including reorganization of the proposal topics, condensing requirements where possible, and reconsideration of where invasive species should be addressed.

Agenda Item: Discussion of Mitigation Plans

Discussion Leader: Judy Dunscomb
Discussion: The group discussed how mitigation plans will be developed and what they will contain. All of the specific issues are siting decisions--one-time decisions that are part of the site plan, not ongoing mitigation projects. Is it OK to take this route for birds and bats? DGIF discussed its existing procedures for dealing with "takings." The group developed an outline of how the process could work:

1. Preapplication meeting, 2. agency input on potential, likely significant impacts, 3. preconstruction survey, 4. identify mitigation needs and options, 5. application with mitigation plans, and 6. DEQ consultation on completeness.

Key concerns: Is there a similar "reasonableness" standard that applies here as with the other issues? How will this be used to enable the DEQ Director to make an approval decision? Should birds/bats/threatened and endangered species be contained in the mitigation plan apart from the operation plan, which can consider reasonableness? How should the plan cover the pre- and post-construction phases? How do we establish criteria for DEQ to use in determining a specific impact? How will the consultation process work, practically speaking, in a permit by rule? What will the developer provide, at what stage, and in what form? Can this process be expeditious and consistent with the statute? What level of detail should the regulation contain as to general steps, timeframes, and specific requirements? How should consultation be documented? What happens after DEQ gets the application, and how will DEQ consult with the other affected agencies?
Consensus: The group will inquire of the RAP leader (i) whether the process outline drafted today would operate in a permit by rule, and (ii) whether DEQ can consult with the applicant after the application is submitted. The group will also work to revise the language of the draft based on today's discussion.

Agenda Item: Discussion of Economic Cap on Mitigation

Discussion Leader: Judy Dunscomb
Discussion: The group discussed economic issues associated with mitigation plans. A cap of $5K/turbine has been proposed
Key concerns: How does this translate to hours of actual curtailment, and what this will achieve in terms of wildlife protection? How can the accuracy of the economic figures provided be ascertained? How does the fluctuating cost of energy relate to the price of mitigation? Can monitoring be performed properly with the amounts provided? Pre- and post-construction costs will be different, because different indicators are being measured. The information provided by Mr. Madden should be kept in mind. How will the cost figures break down by curtailment and monitoring? Should costs be by number of turbines, or MW generated?
Consensus: Additional discussion of this topic is needed at the next subcommittee meeting.

Agenda Item: Next meeting

Discussion Leader: Judy Dunscomb
Discussion: The group will meet in order to discuss the issues identified above.
Next meeting: October 20, 2009
Action items: The group will (i) revise the draft pre- and post-construction monitoring plan; (ii) inquire of the RAP leader and discuss whether the process outline drafted today would operate in a permit by rule, and whether DEQ can consult with the applicant after the application is submitted; and (ii) further discuss economic issues.

DEQ Wind Energy Regulatory Advisory Panel (Wind RAP)
Attachment B - Landscape Subcommittee
October 13, 2009 Meeting
Meeting Minutes

Location: DEQ Central Office, 2nd Floor Conference Room B
629 E. Main Street, Richmond, VA 23219

Start: 10:35 a.m.
End: 3:30 p.m.

Subcommittee Chair: Dr. Jonathan Miles, JMU (Co-chair)
Recorder: Gary Graham, DEQ

Subcommittee Members Present:
Ronald Jenkins, DOF
Julie Langan, VDHR
Larry Land, VACO
Stephen Versen, VDACS
Tony Watkinson, VMRC
Larry Jackson, APCO

Subcommittee Members Absent: Dr. Maria Papadakis, JMU (Co-chair); Dan Holmes, PEC

Public Attendees:
John Davy, DCR (alternate)
Roger Kirchen, VDHR (alternate)
Elizabeth Murphy, VMRC (alternate)
LCDR Jared Markley, DoD
Scott Francis, Dominion Energy
Don Giecek, Invenergy

Agenda Item: Possible Future Telemeeting
Discussion Leader: Dr. Jonathan Miles, JMU
Discussion: Possible dates and times for an extra meeting of the subcommittee by teleconference.
Decision: No teleconference will be held during the week of October 20th.

Agenda Item: Checklist Topics for Discussion (attachment 1)
Discussion Leader: Dr. Jonathan Miles, JMU
Discussion:

1. Issues will be discussed from the September 4, 2009 checklist from the September 17, 2009 subcommittee meeting minutes.
2. Direction for the members: Give thought to what kind of product will be provided by the subcommittee: bullets vs. regulatory language.
3. Guidance from Carol Wampler: Go ahead and make decisions and recommendations on topics without considering what might end up in the Permit by Rule (PBR). Decisions and recommendation that are deemed beyond the scope of the final PBR may still useful for guidance and implementing procedures, even if for another level of government or another agency. All issues under consideration by subcommittee are important when a wind project is constructed and operated.

Agenda Item: Role of Local Land Use Jurisdictions
Discussion Leader: Dr. Jonathan Miles, JMU
Discussion: (see p. 2 of Draft Report from the Landscape Subcommittee dated October 9, 2009, attachment 2)

1. The PBR should not restrict local land use authority.

2. Local ordinances don't usually control erosion and sedimentation or address decommissioning of a facility, so E&S and decommissioning issues may be a place where the PBR may augment local land use authority.
3. Contrary to the description of the role of local land use authority in the draft summary paper (see the p.2 highlighted language), perhaps other issues affecting local land use may also be addressed in the PBR as long as they don't restrict the authority of the local governing authorities.

Agenda Item: Potential Adverse Impacts: Scenic and Recreational Resources
Discussion Leader: Dr. Jonathan Miles, JMU
Discussion: (See p. 9 of Draft Report from the Landscape Subcommittee dated October 9, 2009, attachment 2).

1. DCR recommends that the PBR set a baseline standard (option 2) for what must be considered when determining whether scenic and recreational resources are impacted by a project. No decision was made on this topic.
2. DCR should propose regulatory language sufficient to implement its recommendation.

Agenda Item: Potential Adverse Impacts: Landscapes of Cultural and Historic Importance
Discussion Leader: Dr. Jonathan Miles, JMU
Discussion: (See p. 5 of Draft Report from the Landscape Subcommittee dated October 9, 2009, attachment 2).

1. DHR recommends that the assessment for listed and unknown resource be conducted by DHR based upon pre-application meetings with the applicant. DHR would then make recommendations to DEQ concerning further investigation, mitigation or a recommendation to allow construction through the PBR. The recommendation would be implemented by one of two options: (1) DHR assists the applicant with the development of a mitigation plan which is then reviewed under the PBR for approval, or (2) DHR does the studies and the applicant develops the mitigation plan according to DHR guidelines, which is then reviewed under the PBR for approval.
2. Industry representatives have concerns that neither option provides the necessary prescriptive process that would provide either certainty or assurance of timely process.

Checklist of Issues and Potential Adverse Effects To Be Considered by the Landscape Committee

Issue/Potential Adverse Impact	Assigned To
❑ **Land Use Zoning and Ordinances**	
A. What is within local planning authority, and what needs to be addressed in the PBR.	Larry Land
B. Competing (zoned) land uses, and loss of agricultural lands	Steve Versen
❑ **Landscapes of Cultural Importance**	Julie Langan and Roger Kirchen
❑ **Landscapes of Scenic Importance**	DCR (Tom Smith/John Davy)
❑ **Water Resources**	
A. Wetlands	
B. Surface waters	
C. Ground water	
D. Stormwater	
❑ **Communications Interference**	Maria Papadakis
❑ **Solid And Hazardous Waste**	Maria Papadakis
❑ **Air Quality Impacts From Construction**	Jon Miles
❑ **Ground Transportation And Traffic During Construction**	Jon Miles
❑ **Landscapes Of Ecological Importance**	
A. Forest fragmentation	Ron Jenkins
B. Soil erosion	Maria Papadakis
C. Disturbances to specific ecosystems/ecologies (e.g., high elevation hemlock forests)	Dan Holmes
❑ **Impacts Associated with Power Line Interconnection**	Larry Jackson

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Report from the Landscape Subcommittee

Wind Regulatory Advisory Panel
Virginia Department of Environmental Quality

October 9, 2009

List Names of Subcommittee Members and Participating Alternates Here

DRAFT **** DRAFT **** DRAFT

Scope of Work

The Landscape Subcommittee of the Wind RAP was tasked with identifying issues and developing draft regulatory language with respect to **land-based** small renewable (wind) energy systems. Our scope of work related to the potential adverse impacts of wind energy systems at the landscape scale. Key topics included the role of local land use law, planning, and permitting and its relationship to the permit-by-rule; adverse visual impacts to historic resources and scenic landscapes; and a variety of specific adverse environmental impacts to both geophysical and living natural resources.

The Landscape Subcommittee used three categories of important landscapes—ecological, cultural, and scenic—in its consideration of significant adverse impacts. *Attachment 1* is a description of the three landscape categories. Of particular concern to the committee was the problem of *cumulative adverse effects* of wind energy systems to the landscape; these concerns are reflected especially in our recommendations regarding forested areas.

Role of Local Land Use Jurisdictions

The landscape subcommittee explicitly addressed the role of local land use law, planning, and permitting and its relationship to the permit-by-rule. One of the provisions in HB 2175 requires a permit applicant for a small renewable energy project to provide a "certification from the locality or localities wherein the small renewable energy will be located that the project complies with all applicable land use ordinances." The issue explored by the subcommittee was the role of local land use law in addressing areas of potential significant adverse impact, and whether the permit by rule needed to augment permitting criteria at the local level. The subcommittee concluded that, with the exception of erosion and sedimentation permitting and decommissioning on forested land, (1) local land use authority did not need to be augmented by the permit by rule, and (2) localities are the appropriate level of regulation for a large number of potential adverse impacts.

Underlying Authority.—When considering an application for the construction of land based wind turbines, localities act within the context of their general zoning powers set forth in Section 15.2-2283 of the *Code of Virginia*. Statutory authority applicable to the local permitting of wind energy systems includes:

> "Zoning ordinances shall be for the general purpose of promoting the health, safety and general welfare of the public and of further accomplishing the objectives of Section 15.1-2200. To these ends, such ordinances shall be designed to give reasonable consideration to each of following purposes, where applicable:
>
> i. To provide for adequate light, air, convenience of access, and safety from fire, flood, impounding structure failure, crime and other dangers;
> ii. To reduce or prevent congestion in the public streets;
> iii. To facilitate the creation of a convenient, attractive and harmonious community;
> iv. To facilitate the provision of adequate police and fire protection, disaster evaluation, civil defense, transportation, water, sewerage, flood protection, schools, parks, forests, playgrounds, recreational facilities, airports and other requirements;
> v. To protect against destruction and encroachment upon historic areas;

vi. To protect against one or more of the following: overcrowding of land, undue density of population in relation to community facilities existing or available, obstruction of light and air, danger and congestion in travel and transportation, or loss of life, health, or property from fire, flood, impounding structure failure, panic or other dangers;

vii. To encourage economic development activities that provide desirable employment and enlarge the tax base;

viii. To provide for the preservation of agricultural and forestal lands and other lands of significance for the protection of the natural environment.

Another section of the Code relating to local regulation of land based wind turbines is Section 15.2-2295.1. It allows local governments to protect mountain ridges through the designation by ordinance of an overlay zone that controls the location "tall buildings and structures." In short, zoning authority involves broad and – in some cases – competing factors, all of which need to be considered by local governing bodies to achieve the most reasonable balance possible in making land use decisions.

With respect to the potential adverse effects of wind energy systems, local land use law is the level at which regulation of the following would typically occur:

- Setbacks
- Minimum acreage
- Maximum height
- Noise
- Blade clearance
- Shadow flicker
- Ice fall
- Visual appearance (color, finish, signage, advertising)
- Decommissioning (including land restoration)
- Impacts on cultural and historic landmarks
- Impacts on viewshed and scenic vistas
- Liabilities and sureties
- Compliance with building and electrical codes
- Lighting
- Signal emissions/communications interference
- Notification of the Blue Ridge Parkway (Rockbridge County requires this)
- Mechanical operations of the turbine
- Protections against unauthorized access
- Utility connections
- Requirements for site plan or landscape plan
- Requirements for ongoing maintenance and (mechanical) monitoring
- Requirements for technical documentation

Gaps and Problems with the Local Regulatory Framework.—There are several issues with respect to local land use law and their regulatory frameworks for wind energy. First, not all localities have

wind ordinances.[1] Second, Virginia wind ordinances can and do differ widely. Third, not all localities have zoning. These three factors create some risk that citizens in the Commonwealth will not be uniformly protected from the potential adverse effects of wind turbines. The subcommittee concluded that the development of a state-wide, voluntary, model wind ordinance might be helpful, but it should not be a vehicle used to restrict governing bodies from considering matters unique to their respective localities and of concern to local citizens.

A fourth issue with respect to local land use law and their regulatory frameworks for wind energy is that local wind ordinances in Virginia have been silent with respect to many environmental factors already regulated at state and federal levels. A review of existing ordinances by the Virginia Association of Counties found that one area where county ordinances are not generally silent is in the requirements for small wind energy systems to comply with local erosion and sediment ordinances. "E&S" requirements apply to all construction projects beyond a certain size. Within the next several years, many counties will probably be placed in positions where (because of revamped state regulations) they will need to impose more rigorous stormwater requirements that will affect many projects in both the construction and post construction phases.

Recommendations for the Permit by Rule.--Through zoning powers local governments generally regulate land-based wind turbines on matters that relate to safety, lighting, aesthetics (by prohibiting advertising, protection of view-sheds), noise, height, setbacks, communications (that they not interfere with radio and other signals essential to public safety), and structural integrity. A permit-by-rule meant to protect natural resources should not impose limitations on the authority of local governments to regulate in the areas identified above. Because of concerns about the ability of rural counties to effectively regulate E&S for large wind energy systems, the subcommittee recommends that local E&S regulations be augmented by the permit by rule. In addition, although decommissioning requirements are within the purview of local authorities, the subcommittee recommends that this authority be augmented by the permit by rule specifically for forest land. Because ordinances appear to be largely silent on such environmental concerns as the effect of turbines on threatened and endangered species, air quality, waste management, wetland impacts, impacts on forest lands, and impacts upon historic and archeological resources, these concerns represent appropriate subjects for the permit-by-rule framework.

Note from Maria: do we want to drop communications from consideration (see my white paper) and leave it as a local concern, or explicitly address it? Our subcommittee should decide this. The point highlighted in green conflicts with the communications discussion below.

Potential Significant Adverse Impacts

The Landscape Subcommittee identified several potential areas of adverse impact for consideration based on the expertise of the subcommittee members as well as the American Wind Energy Association's *Wind Energy Siting Handbook*.[2] The impacts reviewed by the subcommittee include:

- Landscapes of Historic and Cultural Importance
- Landscapes of Scenic Importance

[1] A summary of wind ordinances by the Virginia Association of Counties is presented as Attachment 2.
[2] Available online at http://www.awea.org/sitinghandbook/.

- Water Resources
  - Wetlands
  - Surface waters [addressed as part of soil erosion, below]
  - Ground water
  - Stormwater
- Communications Interference
- Solid And Hazardous Waste
- Air Quality Impacts From Construction
- Ground Transportation And Traffic During Construction
- Landscapes of Ecological Importance
  - Forest fragmentation
  - Soil erosion
  - Disturbances to specific ecosystems/ecologies (e.g., high elevation hemlock forests)
- Impacts Associated with Power Line Interconnection
- Agricultural Land

The Landscape Subcommittee has made both minor and major recommendations with respect to these impacts, which are addressed individually below. [make a summary chart to insert here.]

Potential Adverse Impacts: Landscapes of Cultural and Historical Importance

Background

The construction and operation of wind turbines and wind farms, regardless of scale, have the potential to significantly impact cultural and historical resources. Critical resources include, but are not limited to, archaeological sites, historically significant buildings and structures, historic districts, rural historic districts, battlefields, and other cultural landscapes. Site preparations and construction can destroy archaeological and historic architectural resources if present within the project area. These impacts are considered *direct effects*. Impacts to historic architectural resources within ¼ mile of the project could also be considered direct given the nature and scale of the effects. Once constructed, turbines can adversely affect the historic setting of historic architectural resources and other critical cultural landscapes. These impacts are considered *indirect effects* and, in the context of wind projects, will generally take the form of visual impacts.

For the purposes of this document, and as defined in Federal regulations, *historic properties* are those which are listed in or eligible for listing in the National Register of Historic Places. *Adverse effects* to historic properties are defined as those that may alter, directly or indirectly, any of the characteristics of a property that qualify the property for inclusion in the National Register of Historic Places in a manner that would diminish the integrity of the property's location, design, materials, workmanship, feeling, or association. The goal of any renewable energy project should be to identify significant cultural and historical resources, evaluate and quantify all impacts of the proposed project on those resources, and, to all extents practicable, minimize or mitigate the project's effects to those resources.

Existing Regulatory and Administrative Authority

1. The duties of the Department of Historic Resources (DHR) are to encourage, stimulate, and support the identification, evaluation, protection, preservation, and rehabilitation of the Commonwealth's significant historic, architectural, archaeological, and cultural resources; to establish and maintain a permanent record of those resources; and to foster a greater appreciation of these resources among the citizens of the Commonwealth [*Code of Virginia* § 10.1-2202].
2. DHR has developed *Guidelines for Conducting Cultural Resource Survey in Virginia* (1999; rev. 2003) which establish minimum standards for all archaeological and architectural survey in Virginia. This document is based on and consistent with the federal guidelines entitled *Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines* (48 FR 44742, September 29, 1983). All work conducted in support of state and federal projects is expected to meet these standards and be conducted by or under the direct supervision of a qualified professional in the appropriate discipline meeting the *Secretary of the Interiors Professional Qualification Standards* (36 CFR 61).
3. The enabling legislation for the Permit by Rule [HB 2175] specifically includes as a condition for issuance an analysis of the beneficial and adverse impacts of the proposed project on natural resources and, if adverse impacts to historic resources are likely, the preparation of a mitigation plan detailing reasonable actions to avoid, minimize, or otherwise mitigate such impacts.
4. In certain situations, Section 106 of the National Historic Preservation Act of 1966 (as amended) may apply to the project or portion thereof. Section 106 requires Federal agencies to take into account the effects of their undertakings on historic properties. Undertakings are defined as a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval. It is the responsibility of the Federal agency to determine whether or not a particular project is an undertaking subject to Section 106 and to comply with its implementing regulations at 36 CFR 800. DHR, which serves as Virginia's State Historic Preservation Office (SHPO), advises and assists Federal agencies in carrying out their Section 106 responsibilities.

Gaps and Problems with Existing Regulatory Frameworks

DHR has no regulatory authority regardless of whether Section 106 applies to the project and must rely on the responsibilities and authorities of others to enable and enforce its recommendations.

Options for the Permit by Rule

1. Establish a process that mirrors the procedures laid out for compliance with Section 106 of the National Historic Preservation Act of 1966 as codified in its implementing regulations at 36 CFR 800 whereby an applicant would, in consultation with DHR and other consulting parties:

    a. establish an Area of Potential Effects (APE), which is defined as the geographic area or areas within which a project may directly or indirectly cause alternations in the character of use of historic properties, if any such properties exist. Wind projects will have both an APE for direct effects (i.e. those areas where ground disturbance will occur) and indirect effects;
    b. gather information on known historic resources from DHR and other affected governmental entities;

c. seek public input at various stages in the process;
d. complete a comprehensive architectural identification study within the APE and evaluate resources for listing in the Virginia Landmarks Register and/or National Register of Historic Places;
e. complete a comprehensive archaeological study within areas of proposed project-related ground disturbance and evaluate identified resources for listing in the Virginia Landmarks Register and/or National Register of Historic Places;
f. assess the project's potential direct and indirect impacts to all identified historic properties within the APE; and
g. develop a plan to avoid, minimize, or mitigate adverse effects to historic properties.

In New York and West Virginia, the APE is established as an arbitrary 5-mile radius around the project and studies are limited to this area; otherwise, the process is the same. It is recommended that the study area for Scenic and Recreational Resources be consistent with that established for Cultural and Historical Resources. DHR has developed a draft guidance document entitled *Assessing Visual Effects on Historic Properties* to assist in the evaluation of impacts.

2. Establish a tiered process similar to that developed and employed by DHR for electric transmission line projects currently regulated by the State Corporation Commission. This tiered approach would give greatest consideration to the most significant resources while concentrating survey efforts on a more refined area where impacts could be greatest. Studies under this option would be confined as such:

    a. Within 5 miles – consider impacts to National Historic Landmarks, National Register-listed properties, battlefields, and rural historic districts;
    b. Within 1.5 miles – conduct a comprehensive architectural identification study and evaluate resources for listing in the Virginia Landmarks Register and/or National Register of Historic Places; and
    c. Within project area - complete a comprehensive archaeological study at areas of proposed project-related ground disturbance and evaluate identified resources for listing in the Virginia Landmarks Register and/or National Register of Historic Places;

    The use of a 5-mile study area is supported by established processes in other states. The 1.5-mile survey area is consistent with that established by the Federal Communications Commission for studies in support of communications towers greater that 400' in height. As noted above, it is recommended that the study area for Scenic and Recreational Resources be consistent with that established for Cultural and Historical Resources.

    Once the tiered studies have been completed, the applicant should assess the project's potential direct and indirect impacts to all identified historic properties and develop a plan to avoid, minimize, or mitigate adverse effects to historic properties. DHR has developed a draft guidance document entitled *Assessing Visual Effects on Historic Properties* to assist in the evaluation of impacts.

Recommendations and Suggested Language

The landscape subcommittee recommends that an assessment of significant adverse impacts on historic and cultural resources and associated mitigatory responses be conducted by DHR before an applicant submits an application to DEQ under the permit by rule. DHR would then provide a letter of certification to DEQ as part of the applicant's package. The letter of certification would contain a finding of effect and statements regarding the acceptability of the mitigation plan. We recommend that DEQ and DHR consult directly on the language used in the letter of certification so that it can meet the permit by rule need for standardized language. Note from Maria: do we need to address a time limit on this process, do we need to deal with the problem of when DHR and the applicant can't agree?

Suggested Language **Do we have a preference for one of these options?**

Option #1

The applicant shall establish, based on the design, location, and setting of the project, a reasonable Area of Potential Effects (APE) for the project; obtain from the Department of Historic Resources, other affected local and state governments, and local historical societies information on known historic resources within the APE; seek the comment of Native Americans that may attach traditional religious and cultural importance to properties within the APE; seek public comment on the project's potential impact to historic resources within the APE; conduct archaeological survey and evaluation within all areas of land disturbing activity in consultation with DHR and in accordance with established state guidelines; conduct architectural survey and evaluation within the APE in consultation with DHR and in accordance with established state guidelines; evaluate the project's potential direct and indirect effects to all identified historic properties within the APE; and prepare and submit as part of a complete application a mitigation plan detailing the actions to be taken to avoid, minimize, or otherwise mitigate adverse impacts.

Option #2

The applicant shall establish a 5-mile radial study area around the project; obtain from the Department of Historic Resources, other affected local and state governments, and local historical societies information on known historic resources within the study area; seek the comment of Native Americans that may attach traditional religious and cultural importance to properties within the study area; seek public comment on the project's potential impact to historic resources within the study area; conduct archaeological survey and evaluation within all areas of land disturbing activity in consultation with DHR and in accordance with established state guidelines; conduct architectural survey and evaluation within 1.5 miles of the project in consultation with DHR and in accordance with established state guidelines; evaluate the project's potential direct and indirect effects to all National Historic Landmarks, National Register-listed properties, battlefields, and rural historic districts within the study area; evaluate the project's potential direct and indirect effects to all identified historic properties within the 1.5-mile survey area; and prepare and submit as part of a complete application a mitigation plan detailing the actions to be taken to avoid, minimize, or otherwise mitigate adverse impacts.

Potential Adverse Impacts:
Scenic and Recreational Resources

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Background

Wind turbines have the potential to impact the views from important recreational and scenic resource areas in the Commonwealth. Wind turbines become the focal point of visual and aesthetic concerns based on size and the visual patterns created by spacing, appearance, physical markings and lighting. The number of turbines and the size of the wind turbines is the predominant source of visual contrast created by a wind energy facility. Often the maximum turbine and propeller height is over 300 feet. At this scale, and in settings that are typically free of other structures, trees and intervening terrain, wind turbines will be a visible and predominant feature in the landscape (AWEA, February 2008, pp 5-28 & p 3-3).

Possible scoring and visual analysis systems have been identified for assessing the impact of wind turbines on significant recreational resources and scenic views. The visual analysis should include:

1. Extent to which the proposed wind farm will introduce visual contrast in the landscape.
2. Resulting adverse visual impacts.
3. Consistency with applicable laws, regulations plans and policies related to Virginia's scenic resources.

Current Regulatory and Administrative Authority

It has been established through Virginia's court system that states and localities can protect scenic resources by upholding local landmark protection laws. Scenic resources are recognized by the mention of the word 'scenic' in over 160 sections of the Code of Virginia. The Code of Virginia §10.1-108 defines environment as "the natural, scenic, scientific and historic attributes of the Commonwealth." The effect of planning, transportation, mining, signage, advertising and management of the environment, including its scenic values are also referenced in the Code of Virginia. Mapping these resources within the area of the project site is critical to the assessment process (2007 *Virginia Outdoors Plan).*In addition, there are a number of programs in the state which specifically recognize and officially designate resources for their scenic values. These include:

1. Scenic Highways and Virginia Byways . Driving for pleasure has been ranked as one of the top five outdoor recreation activities for the past 40 years. The appeal of scenic roads is the intrinsic quality of Virginia's diverse landscapes and the ease of connecting with nature from the automobile. There are both national and state sponsored scenic roads programs. The Virginia Byways program in Virginia recognizes natural, cultural, historical, recreational and archeological amenities of the Commonwealth's scenic roads. In addition, the unique and varied culture and character of the geographic regions of the Commonwealth are represented by designated Virginia Byways throughout the state (2007 *Virginia Outdoors Plan*). htttp://www.dcr.virginia.gov/recreational_planning/documents/vopchapt07e.pdf .

2. Scenic Rivers. The Virginia Scenic Rivers Act of 1970 created a statewide program to protect and preserve rivers or sections of rivers having natural or scenic beauty and cultural and historic interest. Since the first scenic river designation in 1975, 22 rivers totaling more than 505 river miles have been recognized, including one state historic river. Thirteen additional rivers have been evaluated and found to qualify for

scenic river designation (2007 *Virginia Outdoors Plan).*
http://www.dcr.virginia.gov/recreational_planning/documents/vopchapt07d.pdf .

3. Other Scenic Resources. (A) Promontories – overlooks – are established high points of land that extend into a body of water or are a headland or cliff. Promontories provide excellent viewing positions of the surrounding scenic landscape making the preservation of these sites and their viewsheds critical. (B) Linear sites – trails and byways/scenic pull-offs – including pull-off areas that highlight the natural landscapes of Virginia sought by tourists and citizens are often found along roadways and trails. All federal, state and regional trails recognized in the 2007 *Virginia Outdoors Plan* (VOP) should be included in the assessment. (C) Recreation areas – both private and public. These areas are dedicated to outdoor recreation opportunities for the public. Among them are areas for picnicking, hiking, camping, golfing, outdoor interpretation, boating, and other similar areas. (D) Federally and state designated or owned areas. For example, these types of areas may include state and federal parks, designated national recreation or scenic trails, US Forest Service lands, state and federal wildlife management areas, Journey Through Hallowed Ground and Northern Neck Heritage Areas. (E) Regional resources recognized in the VOP – Regional and local planning agencies identify areas of regional outdoor and conservation significance. These recommendations are presented in the VOP and periodically updated to reflect changes in priorities throughout the Commonwealth. (F) Outdoor tourist destination – these include public and private destination points like gardens, interpretive sites, and other outdoor venues.

Gaps and Problems with Current Regulatory Frameworks

While there are generally not specific regulatory programs that protect the scenic views from important resources, the designation language usually directs all agencies which permit projects that could impact these resources to consider the impact of the project on the resource before permits are issued. In addition, as noted earlier, local landmark protection laws and other local land use controls can certainly be applied.

Another problem, because of the subjectivity of human values and perception, is the ability to clearly define the viewshed impact of the proposed facility and reaching consensus on when the impact is truly of significance and to whose standard. It will be important to define and then adopt a template for determining viewshed impacts that is reasonably objective and can be accepted by those involved in the sighting process which include both the project sponsor and the community stakeholders.

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Options for Permit by Rule

1. Do nothing other than acknowledge that scenic and recreational resources must be taken into account by the applicant. The applicant would define what they were and how they were addressed in the permit application.
2. Develop a more formal process which sets a minimal/base standard for scenic and recreational resource evaluation. This should lead to more consistency in project development and permitting with respect to such resources and should provide a higher level of public comfort with the PBR process.

Recommendation: Set a baseline standard and process which an applicant must follow in addressing recreational and scenic resources in the permit by rule process.

The Landscape Subcommittee recommends that the PBR include obligatory language to address the evaluation of recreational and scenic resources which could be impacted by the project.

Note: Need draft obligatory language here.

A suggested approach follows to evaluation, scoring, and mitigation is provided in Attachment 3.

Potential Adverse Impacts:
Forest Impact (Forest Loss and Fragmentation)

Background

A significant threat to our forests is the conversion of forest lands to other uses. Virginia loses more than 27,000 acres (net loss) of forest land each year, mainly through conversion to home sites, shopping centers, roads and other developments. When forests are managed responsibly, harvesting of trees improves forest health or makes way for a new, young forest. In contrast, when land is developed, it will probably never be forested again. Land-use changes cause fragmentation of large parcels of land, as they are broken into smaller blocks for houses, roads and other non-forest uses. Fragmentation limits the options for forest management because the land units are smaller. It also threatens those wildlife species that need sizable habitat free of constant disturbance and human competition. Forest land loss and fragmentation also threaten the scenic beauty of Virginia's natural landscape, which delights residents and attracts millions of tourists each year. If the long-term trend continues, Virginia could lose one million acres of forest within the next 25 years.

House Bill 2175 amended §§ 56-46.1 and 56-580 of the Code of Virginia to amend the Code of Virginia by adding in Chapter 11.1 of title 10.1 and article numbered 5, consisting of sections numbered 10.1-1197.5 through 10.1-1197.11, relating to permits for certain renewable energy projects. The amendments provided authority for the Director of Environmental Quality to establish the conditions for the issuance of the permit by rule for small renewable energy projects, with guidance to initially develop the permit by rule for wind energy projects with a rated capacity not exceeding 100 megawatts. Based on

guidance from the Virginia Renewables Siting Scoring System, table 3 (wind energy installation characteristics by type and scale), one could estimate forest loss due to the construction of a 100 megawatt wind farm to range from two hundred acres to 2500 acres (dependent upon whether the installation is linear or an array of turbines), plus the acreage lost due to roads and transmission lines.

Wind energy construction projects in forests will create forest fragmentation, a form of habitat fragmentation, occurring when forests are harvested in a manner that leaves relatively small, isolated patches of forest known as *forest fragments* or *forest remnants,* or in the case of mountain ridge – top wind energy projects long linear clearings. The intervening matrix that separates the remaining woodland patches can be natural open areas, farmland, or developed areas.

Fragmentation occurs when a large region of habitat has been broken down, or fragmented, into a collection of smaller patches of habitat. Fragmentation typically occurs when land is converted from one type of habitat to another. For example, a forest habitat may become fragmented when a highway is built across the forest. The highway would split a single, large, continuous patch of forest into two smaller patches. The same would be true for wind energy projects as construction is completed for wind turbines, the associated connectivity, and the transmission lines associated with the wind farm.

Fragmentation Impacts.—Forest fragmentation is one of the greatest threats to biodiversity in forests, especially in the tropics, but true elsewhere too. The problem of habitat destruction that caused the fragmentation in the first place is compounded by:

- the inability of individual forest fragments to support viable populations, especially of large vertebrates
- the local extinction of species that do not have at least one fragment capable of supporting a viable population
- edge effects that alter the conditions of the outer areas of the fragment, greatly reducing the amount of true forest interior habitat.

The effect of fragmentation on the flora and fauna of a forest patch depends on a) the size of the patch, and b) its degree of isolation. Isolation depends on the distance to the nearest similar patch, and the contrast with the surrounding areas. For example, if a cleared area is reforested or allowed to regenerate, the increasing structural diversity of the vegetation will lessen the isolation of the forest fragments. However, when formerly forested lands are converted permanently to pastures, agricultural fields, or human-inhabited developed areas, the remaining forest fragments, and the biota within them, are often highly isolated.

Forest patches that are smaller or more isolated will lose species faster than those that are larger or less isolated. A large number of small forest "islands" typically cannot support the same biodiversity that a single contiguous forest would hold, even if their combined area is much greater than the single forest.

Construction for wind energy projects of 100 megawatts power generation will contribute to the additional losses of forest land through fragmentation and direct loss of the forests. The anticipated losses due to 100 megawatt wind energy projects could range between 200 to 2500 acres for the wind turbines, plus additional acreage for roads and transmission lines. The additional losses would add to the current estimated net loss in Virginia of 27,000 acres per year to development and other conversions. The additional losses by wind energy and other development require consideration and possible mitigation actions by Commonwealth in the future.

Underlying Regulatory and Administrative Authority

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The Code of Virginia provides authority to the State Forester to provide protection, enhancement and improvement of Virginia's forest resources. Statutory authority exists to protect forests from wild fires, assist with the establishment and care of new forests, improve existing forests, and to ensure clean water from forests activities. The following list of Code of Virginia citations describes much of the State Forester's authority potentially applicable to wind energy projects.

Ron, can you provided a shorter summary? I moved your long summary to an attachment.

A detailed summary of the State Forester's authority is provided in Attachment 4.

Gaps and Problems with Regulatory Frameworks

The Department of Forestry does not have authority to regulate the management of forests zoned for more intensive use than agriculture or forestry. Under the authority of § 10.1-1181.2, the State Forester's employees may enter upon the silvicultural operation for inspection to determine whether the activity is causing or likely to cause pollution and notify the owner or operator regarding the activity that is causing or likely to cause pollution and recommend (i) corrective measures and (ii) a reasonable time period to prevent, mitigate, or eliminate the pollution. No Commonwealth of Virginia agency is currently mandated to preview and assess sites for potential forest impacts. Therefore, we must consider whether this lack of statutory authority warrants, under the permit by rule, an additional permit requirement. Options are provided below which may considered to include in the permit by rule for wind energy projects.

Options for the Permit by Rule

1. Provide funding for conservation of other existing forests, or for the establishment of new forests. This could include the losses due to transmission lines associated with the Wind Energy project.

2. Require approved Erosion & Sedimentation E&S permits to prevent sedimentation movement from the site and erosion as currently required by any other land disturbance / construction project in Virginia. DCR would be the principal regulatory enforcement agency. DOF could provide advice and on the ground assistance for best management practices.

3. Require that all vegetation used following construction consist of native species. Require that all known invasive species found confined with the boundaries of the wind energy project be appropriately eradicated

4. Require pre – construction site review for all wind energy projects to determine the forest species, forest area loss; invasive species; and impact on local/regional forest economy.

5. Require, upon the decommission of wind turbines, owners to return prior forested sites to forested conditions, or to indigenous wildlife habitat, or to agricultural usage, as determined to suit the owner's objectives, through the planting of forest tree species, or other plants, common to the area.

Recommendation: Obligate Applicants to Mitigate Potential Interference

The Landscape Subcommittee recommends that the PBR include obligatory language on this issue. The most likely state agency to review these sites for forest impacts would be the Department of Forestry. Alternatively, the DOF could draft a checklist based on generally acceptable forest reviews used for other construction environmental site reviews, which the wind energy contractor could complete the checklist through a consultant forester, or in – house staff. As part of the review approval, the Director of Environmental Quality could ask for the State Forester's review of the forest assessment and recommendations.

The next issue for the subcommittee and plenary committee is to determine whether the review findings and recommendations necessitate additional requirements beyond information gathering, such as, voluntary best management practices implementation, mandatory practices, and/or mitigation of forest impacts and losses.

The following are potential remediation and / or mitigation considerations for wind energy developers under the Permit by Rule.

1. Ensure that sedimentation does not leave the construction site. Consider a two step process where DOF inspect slogging operations, and DCR regulates the E & S regulations. Or, combine these regulatory actions into one step for the logging and clearing under the E & S regulations for all wind farm construction.

2. Forest species known to only exist in limited sites, or this could apply to all forests, would be established elsewhere and / or other sites with similar species conserved in 1:1 ratio. For example, the mitigation could require that for each acre of forest lost to wind energy construction, one acre of afforestation would be implemented, or one acre of existing forest land would be conserved elsewhere.

3. Remove identified invasive plant species within the wind energy boundary as part of the clearing process (reference §§3.1-296.11-21, of the Code of Virginia (1950), as amended.)

4. Establish native species appropriate to the site conditions following the construction. Ensure all appropriate measures are in place to prevent sedimentation movement from the site.

5. Upon decommissioning of wind turbines energy farms, require forest sites to be returned to forests using native forest species, or other native plants, or an appropriate agricultural use meeting the owner's needs. Other considerations upon decommissioning could include road restoration, returning the land to natural contours of the land, removal of tower foundations and other buildings and equipment, and acceptable alternative uses.

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Potential Adverse Impacts: Grid interconnection (transmission lines)

Background

Small renewable energy projects such as commercial wind generation projects; are generally designed to provide electricity to the utility grid. Interconnection to the grid can be accomplished in a variety of ways depending on the size of the project and proximity to the grid, with either the wind developer or utility owning and operating the connecting facilities. Whether constructed and operated at transmission or distribution voltages, these interconnections involve electric lines that may extend in a linear nature well beyond the wind project site.

Construction and operation of interconnection facilities are not unique to the wind industry, however, and construction of power lines in connection with wind projects should be subject to the same local, state, and federal laws and regulations that govern construction of these facilities by others. Procedures are currently in place across the Commonwealth to regulate the siting, construction, and operation of interconnection facilities; just as there are separate regulatory procedures covering generating facilities. And separate approvals – whether local, state, or federal – are required for generation and transmission facilities regardless of ownership. Practically speaking, the nature of generating facilities and transmission facilities are so different as to warrant separate consideration and review.

Underlying Regulatory and Administrative Authority: Interconnection Facilities

Transmission Interconnection Approval .—All generators – whether private wind farms or public utilities – must follow the same process in obtaining permission to connect to the existing electric grid. PJM (www.pjm.org) is responsible for managing the grid for the mid-Atlantic region, including Virginia. Interconnection requests are governed by PJM's Open Access Transmission Tariff (OATT), which sets out the procedure for the filing of an interconnection request, evaluation of the effects of the interconnection on the transmission system and the need for system improvements to accommodate the interconnection and any associated costs and responsibility to make necessary improvements. The OATT does provide an expedited application process and reduced costs for interconnection requests from generators under 20 MW.

Transmission siting and construction – 138kV and above.—Sections 56-46.1 and 56-265.2 of the Virginia Code require that all proposed transmission lines at or above 138kV must be reviewed and approved by the Virginia State Corporation Commission (SCC).

Applications for approval by the SCC of transmission lines typically include comprehensive information on the need for and environmental impact of the proposed project as specified in the SCC Staff's *Guidelines of Minimum Requirements for Transmission Line Applications* (May 10, 1991). Under these statutes and pursuant to memoranda of agreement between the SCC and the Department of Environmental Quality, the SCC is required to submit transmission line applications to DEQ for a review by the state agencies concerned with environmental protection, and to give consideration to the reports of those agencies on the proposed projects. These statutes and the SCC's Rules of Practice and Procedure also establish a process for all interested parties, including local governments and affected landowners, to comment on and introduce evidence relevant to the need for and impact of the proposed transmission line, including public hearings and formal evidentiary proceedings. Section 56-46.1 provides that SCC approval

of a transmission line project is deemed to satisfy local zoning requirements and comprehensive plan conformance requirements.

Distribution and transmission projects less than 138kV.—*Transmission* – For transmission lines below 138 kV, the state's public utilities have adopted a procedure comparable to the procedure used in the SCC approval process for projects 138kV and above. This procedure ensures state and local agencies (DHR, DCR, etc.) are consulted in these projects. As with the larger projects, this process includes significant interaction with localities and property owners, as well as, stakeholder input. Transmission lines under 138 kV will be subject to local zoning ordinances, which are present in most, but not all, localities. Depending on the locality and the particular location of the transmission line, the local zoning ordinance may require a special use permit, which typically requires public notice and a public hearing before the local planning commission and a second public hearing before the local board of supervisors or city/town council. Certain zoning districts may prohibit transmission lines altogether, thus requiring a rezoning proceeding before the line can be built in that district. ***Distribution*** – Public utilities work with local agencies and property owners in distribution extensions of any length, both in the planning and construction phases of the project. Typically, distribution facilities do not require any special zoning approvals, but there may be exceptions and special requirements (e.g., undergrounding requirements).

Note: All transmission and distribution extensions are subject to the National Electrical Safety Code in effect at the time the project is built.

Gaps and Problems with Regulatory Frameworks

There is currently not a direct regulatory tie between a generation project and interconnecting transmission or distribution lines. Public utilities have an established and accepted process for the regulatory approval by the SCC (for lines of 138 kV and higher) and the localities (for lines under 138 kV) for the siting and construction of transmission and distribution facilities, which serves to engage all interested parties in the project. A private transmission developer proposing a project would generally be required to follow these same procedures.

Facilitating the permitting of small renewable generation projects should not require a change in the existing transmission or distribution interconnection approval process.

Options for the Permit by Rule

1. a. Exclude interconnecting facilities beyond the wind farm's on-site electrical collection station from permit-by-rule considerations. Specify that interconnection facilities associated with a wind project must follow established industry, SCC and local siting and construction processes as applicable to the voltage level being considered.
   b. Include a check off within the permit by rule process indicating that appropriate interconnection studies and agreements have occurred.
2. Consider electrical interconnection facilities in the scope of the wind project. Adopt accepted industry and SCC siting and construction processes.

Recommendation:

The Landscape Subcommittee recommends Option 1 above. Practically speaking, siting and construction of the interconnection facilities will be a separate and unique project in and of itself for regulatory purposes than the generating project. Ensuring the two projects are considered separately will help to ensure the unique differences between the two are considered in the proper light. Additionally, existing regulatory procedures are already in place across the Commonwealth to ensure proper siting and construction of transmission lines. Provision of check offs within the PBR process indicating the interconnection and transmission agreements or studies have occurred ensures the generation facilities can be interconnected to the grid.

Potential Adverse Impacts: Communications Interference

Note: conflicts with earlier statements about local land use authority.

Background

The operation of wind turbines has the potential to interfere with broadcast and other communications signals. Although the airwaves and broadcast spectrum are not traditionally thought of as a "natural resource," their physical properties do make them an inherent part of our physical (natural) environment. According to AWEA's *Wind Energy Siting Handbook*:[3]

> Wind projects may impact communications signals in two ways. Wind turbines and their associated transmission lines can generate electromagnetic noise, which can interfere with telecommunications services, or, more commonly, wind turbines create physical obstructions that distort communications signals. The types of communications systems that may be affected include microwave systems, off-air TV broadcast signals, land mobile radio (LMR) operations, and mobile telephone services (p. 5-51).

Several straightforward engineering solutions are available to mitigate potential communications interference.

Current Regulatory and Administrative Authority

Federal regulation is involved in identifying the impacts of wind installations on federal microwave towers, and the FAA also reviews installations for their impact on radar. Otherwise, there is no regulation in Virginia governing communication signals. [Confirm.]The local land use authority could, in principle, address this issue in its zoning and ordinance regulations. Several model wind ordinances in other states include model language for protecting communications signals from interference from wind turbine operations.

[3] American Wind Energy Association, *Wind Energy Siting Handbook* (2008). Available online at http://www.awea.org/sitinghandbook/download_center.html.

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Gaps and Problems with Current Regulatory Frameworks

The principle difficulty with the existing regulatory framework is that it is somewhat an "optional" issue for local land use jurisdictions. If local authorities do not address this potential problem through zoning law, then the public could be left unprotected and without recourse for remedy except for general civil damages.

Options for the Permit by Rule

1. Do nothing other than acknowledge existing federal regulations and the authority of local land use jurisdictions to regulate communications interference.
2. Include language that obligates the applicant to assess for and mitigate potential interference.

Recommendation: Obligate Applicants to Mitigate Potential Interference

The Landscape Subcommittee recommends that the PBR include obligatory language on this issue. Model language from other state ordinances is provided below. We recommend the model language from Pennsylvania.

From New York State[4]

- The applicant shall minimize or mitigate any interference with electromagnetic communications, such as radio, telephone or television signals caused by any wind energy facility.

  or

- No individual tower facility shall be installed in any location along the major axis of an existing microwave communications link where its operation is likely to produce electromagnetic interference in the link's operation.

  and

- No individual tower facility shall be installed in any location where its proximity with fixed broadcast, retransmission or reception antenna for radio, television or wireless phone or other personal communications systems would produce electromagnetic interference with signal transmission or reception.

From Pennsylvania[5]

> SIGNAL INTERFERENCE
>
> The Applicant shall make reasonable efforts to avoid any disruption or loss of radio, telephone, television or similar signals, and shall mitigate any harm caused by the Wind Energy Facility.

[4]New York State Energy Research and Development Authority, *Wind Energy Model Ordinance Options* (2005). Available online at http://www.powernaturally.org/programs/wind/toolkit/2_windenergymodel.pdf.
[5]Office of the Governor, "Model Ordinance For Wind Energy Facilities In Pennsylvania" (April 2006). Available online at http://www.depweb.state.pa.us/energy/cwp/view.asp?a=1370&Q=485761.

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Potential Adverse Impacts: Landscapes of Ecological Importance—Erosion and Sedimentation

Background

Site disturbance for the construction of wind turbines and wind farms has the potential to create significant erosion and surface water sedimentation through the displacement of soil, rock and rubble. In addition to potentially degrading soil and surface water resources, sedimentation of cold water streams is of concern. A large number of Virginia's threatened and endangered species are residents of cold water ecosystems [get exact percentage here]; erosion and sedimentation (E&S) therefore also represents a generalized threat to the habitat of a large number of sensitive species. Because Virginia's land-based wind resources are greatest along mountain ridgelines and upland slopes, E&S constitutes a major potential adverse impact.

Current Regulatory and Administrative Authority

Three different agencies directly or indirectly affect E&S. These are:

1. **Department of Conservation and Recreation, Division of Soil and Water Conservation (DCR-DSWC).** The construction phase of wind projects fall under the regulatory requirements of two programs administered by DCR-DSWC: 1) The Virginia Erosion and Sediment Control Program, and 2) The Virginia Stormwater Management Program. These programs apply to development projects during the construction phase of the project only. Regulatory authority for both programs end when the construction activity is complete, all infrastructure has been installed (including permanent Stormwater BMPs) and all disturbed areas are completely stabilized. DSWC does not have any programs or permits that apply to development activities after construction is complete. Construction projects must comply with Virginia's Erosion and Sediment Control Law (Virginia Code 10.1-563) and regulations (4 VAC 50-30-30 and 4 VAC 50-30-40). An ***E&S Plan*** is required The Virginia Erosion and Sediment Control (E&S) Program Regulations apply to non exempt land disturbing activity in excess of 10,000 square feet, which includes land disturbing activity related to wind projects (including on shore infrastructure related to off shore projects) . However, because wind projects are private development the E&S program requirements are not administered directly by DSWC. The E&S regulations for private development activities are administered primarily by local governments (Counties, Cities and Towns) with a few exceptions. The exceptions are when localities opt to allow their local soil and water conservation district to administer the E&S program. In the case of private development projects and local E&S programs, DSWC's role is one of oversight and Technical Assistance: Each local E&S program must be approved by the Soil and Water Conservation Board and is reviewed for consistency with the E&S law every 5-years; and, the DSWC provides technical assistance with any portion of program administration (administration, plan review, inspection, enforcement) at the request of the local program. ***E & S Annual Specifications*** for *Power line* construction must comply with the company's annual specifications for erosion and sediment control in accordance with Section 10.1-563D of the Virginia Erosion and Sediment Control Law (VESCL) for land-disturbing activities greater than 10,000 square feet (2,500 square feet in Chesapeake Bay Preservation Areas). Construction of company buildings, facilities, and other structures are not regulated at Section 10.1-563D, and therefore, must comply with the requirements of the appropriate local ESC Program.

2. **Department of Game and Inland Fisheries, Environmental Services Section (DGIF)**. DGIF administers the Virginia Fish and Wildlife Information Service (VWIS) and has regulatory authority for Virginia's Threatened and Endangered fish and wildlife. In addition, DGIF is vested with the authority to conserve and manage all fish and wildlife in the Commonwealth. Upon request, DGIF will provide location-specific analysis of a wind installation on fish and wildlife and their habitats, including cold water streams. Using the resources of VWIS, the Environmental Services Section will provide summary reports of the potential wildlife and coldwater stream impacts, and recommend mitigatory measures if necessary. These mitigatory measures are not mandatory, however, and DGIF has no enforcement authority. [Confirm. Not sure if this is exactly correct.]

3. VDOT. Road construction. [Elaborate] Defer to Jon Miles' section.

Gaps and Problems with Current Regulatory Frameworks

There are two key issues associated with current regulatory frameworks. These are:

1. Local E&S officials in rural areas, where Virginia's wind resources are greatest, often do not have the expertise to effectively review E&S plans for steeply sloped or sensitive environments. In addition, they may lack the requisite manpower for rigorous site inspections and enforcement. Local E&S capacity represents a notably weak link in the regulatory system with respect to E&S control for the construction of wind farms.

2. Site developers are not obligated to seek DGIF reports on the proximity of cold water streams to their construction sites [check], and DGIF mitigatory measures for cold water streams are recommended but not mandatory. In addition, DCR's evaluation of E&S plans focuses specifically on the risk of migration of soil/rubble offsite, and not on the presence or needs of cold water streams per se.

Options for the Permit by Rule

1. Do nothing other than acknowledge the existing DCR permitting process for E&S and role of DGIF.
2. Attempt to strengthen the DCR local E&S system with respect to wind installations.
3. Attempt to hold applicants accountable for obtaining DGIF cold water stream analysis reports and any recommended mitigatory measures.

Recommendation #1: Strength E&S Programs

The permit-by-rule should strengthen the DCR local E&S system with respect to wind installations by (a) requiring early notification of DCR of a pending wind project, (b) require a performance bond (this is currently optional for local programs), and (c) requiring third party inspectors, which significantly increases the quality of onsite inspection and maintains a constant channel of communication between DCR, local E&S programs, and site developers.

Specifically, we suggest that:

1. The PBR require that the Department of Conservation and Recreation be informed of the pending project in the early stages of planning. The responsible party/applicant should have a pre-construction conference on-site with the Erosion & Sediment Control Program local program authority and representatives of DCR's Stormwater Program prior to development of the erosion & sediment control plan and the stormwater management plan. This will help ensure that any obvious site considerations are addressed in the initial plans.

2. The PRB implement DCR's recommendation that Wind Energy Projects be required to secure a performance bond that is of an amount adequate to construct the entire suite of practices necessary to fully implement the final approved erosion & sediment control plan. (The local program authority currently has the option to require a performance bond for land disturbing activities to ensure that adequate funding exists if the local program authority finds it necessary to step in and have appropriate erosion & sediment controls put in place.)

3. The PRB implement DCR's recommendation that third party inspectors be used for Wind Energy Projects. DCR has experience with requiring large, linear utility projects (gas pipelines, etc.) to hire a 3rd party project inspector to carry out a higher frequency inspection rate and monitor corrective actions to ensure required erosion & sediment controls in installed properly in a timely manner and maintained until final stabilization is completed.

Suggested Language:

Note: need more draft suggested language to correspond to items #1 and #2 above.

{Company Name/ "The Applicant"} will provide at least one full-time, DCR approved inspector for the project prior to the initiation of any land disturbing activity. The inspector will provide inspection oversight of the project for compliance with the Virginia Erosion and Sediment Control Law and Regulations. The inspector must hold a current certificate of competence from the Virginia Soil and Water Conservation Board in the area of project inspection or combined administrator. The DCR approved inspector will conduct erosion and sediment control inspection following the initial installation of erosion and sediment control measures, at least once every 7-day period, within 24 hours following a rainfall event and at the completion of the project to insure proper final stabilization of the site. Inspection reports will be provided, within 24 hours following an inspection, to the local Erosion and Sediment Control Program Authority and the DCR Regional Office serving that area.

Recommendation #2: Hold Applicants Responsible for Cold Water Stream Impacts

We suggest that the PBR hold applicants accountable for obtaining DGIF cold water stream analysis reports by requiring that developers request such reports and explicitly address how they will address any mitigatory measures recommended by DGIF.

Suggested Language:

> The applicant shall obtain a report from the Department of Game and Inland Fisheries on the presence or proximity of cold water streams to the proposed project. A copy of this report shall be included in the applicant's analysis of the beneficial and adverse impacts of the proposed project on natural resources. If the Department of Game and Inland Fisheries recommends mitigatory measures for the proposed project, the applicant shall submit a mitigation plan detailing the reasonable actions to be taken by the owner or operator to avoid, minimize, or otherwise mitigate cold water stream impacts and to measure the efficacy of those actions.

Potential Adverse Impacts: Farmland

Background

Text here.

Current Regulatory and Administrative Authority

Text here.

Gaps and Problems with Current Regulatory Frameworks

Text here.

Options for the Permit by Rule

1. Do nothing ….
2. Include language that obligates the applicant to assess for and mitigate significant adverse effects on farmland.

Recommendation:

Applicants must submit to DEQ an assessment on approximately how many acres of existing farmland the proposed project will directly convert into other uses. The assessment must also describe likely significant negative impacts on agricultural activity in neighboring parcels and proposed mitigation measures to reduce these negative impacts.

Need draft language here.

Important Landscape Categories

A variety of state and federal programs, along with programs managed by private organizations, identify or recognize major types of landscapes that deserve priority status for conservation. Often landscapes are sorted into groups based on discrete values such as wildlife habitat, historic/cultural significance, agricultural value, or significant scenic attributes.

It is, however, recognized that landscapes and their values are not so easily sorted. For example, landscapes important to wildlife protection or working landscapes related to the culture of an area may also be scenic landscapes important to the protection of a view shed or recreational corridor. Separating one type of landscape from another can be difficult. The history of human use and development also plays a role in landscape conservation/definition.

The long and intimate relationship between people and the land guarantees that virtually any large landscape within Virginia will potentially represent multiple values. Thus, the following categories for recognizing landscapes, are at best, a first attempt, to described in general those that could be considered in developing a landscape measure for permitting wind energy facilities.

Landscapes of Ecological Importance

Landscapes recognized for high-value habitat have sufficient size and ecological functions to support sustainable populations of Virginia's native species. They include:

- Forested areas of contiguous natural habitat with significant interior size, transition areas, and buffers; these are either significant, continuous areas of forest or a collection of interrelated forests that are largely not impacted by other forms of land use.
- Corridors with natural land cover that link protected, high-ranking habitats; corridors may follow prominent features such as streams, ridges, valleys or waterfronts.
- Large areas of aquatic bottoms, mud flats, grass beds, oyster reefs, dunes and beaches, tidal wetlands (especially those connected to undeveloped uplands), and sanctuaries for sustainable reproduction of aquatic life.
- Terrestrial or aquatic areas that have scientific importance because they host biological and geological features that are unique, rare, or threatened; they contain rare species, rare habitat types, or unique natural communities.
- Landscapes recognized for watershed values that provide regionally meaningful services such as flood control, stormwater management, base flow, carbon sinks, and water quality treatment.

Landscapes of ecological importance are sometimes referred to as "green infrastructure" by virtue of the crucial ecosystem services they provide for human communities and native wildlife.

Landscapes of Cultural Importance

Many landscapes are recognized for their cultural value—the ways in which they reinforce human relationships to place over time, creating a true sense of place and identity unique to an area or region in Virginia. Cultural landscapes reflect historic significance and day-to-day working relationships with land and water; they also include

places specifically recognized for their ability to provide important and direct personal experiences with the Commonwealth's resources and stories. Cultural landscapes include:

- Places associated with historically significant events, people, and ideals.
- Archaeological sites with the potential to yield information through investigation.
- Specific sites of unique cultural importance to indigenous peoples.
- Places that characterize a significant way of life; they have been important in the culture and traditions of the region's peoples through time.
- Working landscapes that reflect traditional uses of the region's lands and waters, producing marketable goods and services such as forest products, agricultural goods, and fish. These include:
    - Relatively unfragmented patches of productive, dense forest land supporting economically viable timber management; forest management practices avoid detrimental effects on environmentally sensitive lands, including wetlands, riparian areas, steep slopes, and unique natural heritage resources.
    - Historically productive farm lands with prime agricultural soils that not only contribute to the economy and support our way of life, but create and reflect the rural character for which the region is known.
    - Traditional fishing areas and communities, including docks and facilities that support the industry and habitat areas that support commercial and sport species at all life-stages (such as coastal wetlands, streams, estuaries, and spawning areas).

Landscapes of Scenic Importance

These are landscapes that are recognized for their visual importance as seen from areas of scenic or recreational value. This would include both the near and far views as seen from recognized resources such as Virginia's scenic byways, scenic rivers, the Appalachian Trail, National and State Parks, and designated historic/cultural sites. They may be described as:

- Places and routes that allow people to experience the state's natural/cultural resources, stories, and the broader landscape through direct, personal interaction in the outdoors; across the board, a significant contributor to these places is the visual experience of the surrounding ecological and cultural values. These places include:
    - A variety of routes, trails and corridors—on both land and water—that have been recognized as providing significant pathways through the State's cultural and natural history.
    - Specific places designated for providing direct recreational access to the significant resources for recreational activity.
    - Designated historic structures/sites, the view from which is important to their integrity.

A number of programs exist for recognizing important landscapes whether these be at the local, state or federal level. It would seem important that these landscapes and the resource they are associated with conserving be identified as a part of any permitting process. A view shed analysis could then be done using one of the available techniques

to determine how the new project would impact the critical areas of the landscape and what could/should be done to reduce those impacts.

Examples of Local Wind Ordinances in the Commonwealth

Several months ago the Virginia Association of Counties conducted an informal survey to determine progress counties are making in the development of ordinances that regulate land based wind turbines. Generally, this appears to be a new issue for counties. Currently, few counties have adopted ordinances, but the number of counties considering ordinances appears to be growing as public interest in the viability of wind turbines as a renewable, non-carbon emitting energy source grows. Among counties with ordinances, "Small Wind Energy Systems" are generally allowed through either conditional use permit or special exception as an accessory use in (for example, in Halifax County's case) an A-1 Agricultural zone; M-1, Limited industrial and M-2, General Industrial zoning classifications. Rockingham County defines a "Small Wind Energy System" as:

> "A wind energy conversion system consisting of a wind turbine, a tower, and associated control or conversion electronics that has a maximum power at more 50kW, which will be used primarily to reduce on-site consumption of utility power."

Among county ordinances reviewed for small wind energy systems, these are the typical siting requirements for wind towers (From the Halifax County ordinance):

- "a certification of approval under the Emerging Technologies Program of the California Energy Commission or any small wind certification program recognized by the American Wind Energy Association.
- "(they) shall maintain a galvanized steel finish, unless Federal Aviation Administration (FAA) standards require otherwise, or if the owner is attempting to conform the tower to the surrounding environment and architecture, in which case it may be painted to reduce visual obtrusiveness. The zoning authority may require a photograph of a small wind energy system of the same model that is the subject of the landowner's application adjacent to a building or some other object illustrating scale.
- "small wind energy systems shall not be artificially lighted unless required by the FAA or appropriate authority.
- "no tower shall have any sign, writing, or picture that may be construed as advertising.
- "Small wind energy systems shall comply with (noise) provisions of the County Code. (Rockingham County's ordinance states "small wind energy systems shall not exceed 60 decibels, as measured at the closest property line. The level may be exceeded during short-term events such as utility outages and/or windstorms.")
- "The applicant shall provide evidence that the proposed height of the small wind energy system tower does not exceed the height recommended by the manufacturer or distributor of the system.
- "The applicant will provide information demonstrating that the small wind energy system will be used primarily to reduce on-site consumption of electricity.

Whether or not the applicant is participating in the net energy metering program, the applicant will be required to meet (applicable) liability insurance coverage requirements.

- "The minimum distance between the ground and any protruding blades utilized on a small wind energy system shall be 15 feet, as measured at the lowest point of the arc of height of any structure within 150 feet of the base. The supporting tower shall also be enclosed with a six-foot tall fence, and the base of the tower shall not be climbable for a distance of 12 feet.
- "The small wind energy system generators and alternators should be constructed so as to prevent the emission of radio and television signals. The applicant should correct any signal disturbance that is identified within 90 days."

The Halifax County ordinance also requires (this is typical of other ordinances) compliance with the Uniform Statewide Building Code and the National Electric Code. Setback requirements also are an important part of county codes being reviewed. On setbacks the Halifax County Code states:

> "The small wind energy system shall be set back a distance at least 110 percent of the height of the tower plus the blade length from all adjacent property lines and a distance equal at least to 150 percent of the tower height plus blade length from any dwelling inhabited by humans on neighboring property and from overhead power lines ."

The siting requirements in the Halifax County and other ordinances essentially reflect interest (and responsibilities) counties have in protecting residents from any hazards wind turbines might generate. This is done by requiring proper construction consistent with industry standards and proper setbacks. Noise and lighting limitations limit the potential of them becoming a nuisance, and other provisions are meant to protect community aesthetics, which is consistent with "iii" under Section 15.2-2283 of the Code as cited above.

Albemarle County has undergone a process of reviewing an ordinance for wind turbines. As part of that process Albemarle's staff submitted a report identifying the following considerations for its Planning Commission to consider:

- "The visibility of monopoles and towers is one of the most common and usually the most controversial land use issue, and small wind turbines may be visible. While most of the concern is with large commercial wind turbines, concerns have also been noted with small wind turbines, especially when they are proposed in areas of high aesthetic value, such as mountain tops and land in or near a conservation easement. Another visual factor with small wind turbines has been shadow flicker, resulting from the sun behind the rotating blades. This primarily is a concern with small wind turbines in close proximity to other uses.
- "Small wind turbines create noise. It appears that the technology has significantly reduced the noise levels with newer wind turbines, but noise concerns are still an issue when the turbines are in close proximity to other uses. A whirring noise is

often identified as an annoyance in places where wind turbines are placed near residences.

- "Albemarle County has very limited areas where wind power will be cost effective, as most of the County is considered poor for wind energy production. With this in mind, staff believes that if wind turbines are to be encouraged in the County, it will be necessary to keep County regulation of the use to a minimum and provide as much flexibility as possible. Due to the marginal economic benefit that might be realized in low wind areas and the fact that turbine technology and design are evolving, staff believes a rigid ordinance could exclude some promising new technologies.
- "Turbine efficiency increases with height, and this is especially true when height is necessary to provide wind clearance from nearby obstructions. Given the challenging economics of wind turbines in this area, flexibility on the height of structures will be a critical consideration. The literature indicates that turbine blades should be a minimum of thirty feet above any obstruction within three hundred feet of the turbine. For example, if nearby trees are seventy feet tall and the wind turbine blades are twenty six feet in diameter, the turbine shaft should be at least one hundred thirteen feet above the ground to be considered effective. This height can be reduced based on the local conditions.
- "The consequences of a tower collapse, ice throws, and noise should be taken into account when considering the required clear zone and setback distances. The literature suggests that most localities require a clear zone somewhere between one to three times the structure height. For stand-alone turbines, this would effectively limit wind turbines to sparsely developed areas.
- "The telecommunications industry may seek to co-locate personal wireless service facilities (cell phone antennas) on wind turbines. Because most wireless facilities in the County are either attached to an existing structure (Tier I) or are limited to a height not exceeding 10 feet above the nearest tree (Tier II), the additional height required for a wind turbine could provide a tremendous incentive to co-locate these antennas on wind turbines. There are still some technical issues with antenna co-location, such as vibration created by the turbine's rotor blades, but those issues may be resolved in the future. Because a wind turbine would likely be considered an existing facility under the County's wireless regulations, the current Zoning Ordinance could allow an antenna to be co-located as a "Tier 1 Facility", which would be considered through an administrative process."

An Approach to Assessing, Scoring, and Mitigating Adverse Scenic Impacts

The components needed to determine and evaluate the potential for visual impacts are taken from the May 2009 *Scenic Management Study for Claytor Lake* and include:

a. Characterization of the baseline or existing conditions using photography at near range, moderate range and far range of the project site from any identified important view shed areas.
b. Photographic simulations with superimposed before and after views.
c. An assessment of changes based on the baseline conditions.

Factors to consider in the analysis include:

a) **Visual sensitivity**. Visual sensitivity includes the factors which influence concern for the landscape and those factors that influence the ability of alterations to blend into the existing landscape.

b) **Frequency** – Frequency is the number of times a turbine or other structure is seen during the course of travel. If a significant view is interrupted multiple times by a visual intrusion along a road or other linear path, the impact will be greater.

c) **Viewing distance** – Viewing distance considers how far the viewer is from the landscape. A landscape is considered to be more sensitive when viewed from a closer distance. Concern for the landscape is influenced by the distance from which it is being viewed and is typically divided into three distance zones and for the purpose of this study are defined as: foreground (0 to 1/4 mile), middle ground (1/4 to 1 mile), and background (beyond 1 mile). In the foreground the viewer is most influenced by landscape detail (i.e. individual structures, individual trees and plantings). Contrasts in the color and texture of building materials with the color and texture of the natural landscape are most evident in the foreground. In the middle ground, the details are less important and the overall patterns are apparent. Colors and textures of building materials are somewhat muted by the graying affect of atmosphere. Patterns created by topography and vegetation are apparent in the middle ground. The level of concern for visual quality in the middle ground relates to the extent to which development blends with the natural patterns in the landscape. The background distance and the graying affect of the atmosphere soften the contrast between built and natural forms and there will be less concern for visual quality.

d) **Length of time seen -** When traveling a road or trail, the view is impacted to a greater extent if the natural view is interrupted for a longer period of time during travel. For example if the view of a turbine is completely unobstructed for ¼ mile the impact is greater than glimpses of the turbine between ridges or trees for ¼ mile.

e) **Viewer volume -** Landscapes that are viewed by many people will be a greater public concern than landscape viewed by fewer people.

f) **Viewer activity -** This criterion takes into consideration "what viewers are likely to be doing" when they view the landscape being evaluated. People's concern for the environment around them is influenced by the activity in which they are participating, while experiencing that environment. People who are recreating or living in a landscape are more likely to be concerned about its quality than people who are simply commuting through a landscape. (Virginia Polytechnic Institute and State University May 2009)

Scoring of the assessment could then be done as follows:

The assessment of the impacts of proposed wind turbines on the visual quality of the area is required to determine if mitigation is required. The first aspect of the scoring assesses the scenic quality which is a measure of how visually pleasing people find a landscape. The second part of the scoring assesses the visual characteristics to determine the visual complexity and variety of visual elements that comprise the landscape.

1. Scenic Quality Classification

- Low Scenic Quality. Units ranked as having low visual quality have no prominent physical landscape feature. Their visual attributes are not remarkable and lack viewing opportunity due to vegetation or topography. Man-made intrusions are dominant and are not consistent with the natural environment. (Score 1)

- Moderately Low Scenic Quality. Units rated moderately low have little prominent physical landscape features. Viewing opportunities are limited by vegetation or topography so that visual attributes are not remarkable. Man-made intrusion is dominant in units ranked moderately low. (Score 2)

- Moderate Scenic Quality. Units given high visual quality have physical landscape features of interest. Viewing opportunities have little limitation and there are certain positive visual attributes. Man-made intrusion may exist in a unit rated as moderate. (Score 3)

- Moderately High Scenic Quality. Units given high visual quality have prominent physical features. There are good viewing opportunities in these units and visual attributes are not notable. There may be man-made intrusion in the unit rated moderately high but these intrusions do not demolish the landscape integrity. (Score 4)

- High Scenic Quality. Units rated as having high visual quality have prominent physical landscape features. These visual attributes are distinct and allow great

viewing opportunities. These are few to no man-made intrusion in these units. If man-made intrusions are present, they can barely be seen directly. (Score 5)

2. Visual Sensitivity Classification

- Low Visual Sensitivity. Units with low visual sensitivity are areas of minimal concern by only a small number of people. The viewing activity is rare and simple. The visual absorption capacity in the unit is comparatively high. (Score 1)

- Moderately Low Visual Sensitivity. Units with moderately low visual sensitivity are areas where viewing activity by people is limited. The visual absorption capacity in such units is comparatively high. (Score 2)

- Moderate Visual Sensitivity. Units with moderate visual sensitivity concern a certain number of people, who participate in activities while experiencing the environment. Visibility is restricted and visual absorption capacity is either comparatively low or comparatively high. (Score 3)

- Moderately High Visual Sensitivity. Units with high visual quality concern a number of people who frequently experience the environment. The visual absorption capacity in these units is comparatively low. (Score 4)

- High Visual Sensitivity. Units with high visual quality are of interest to a large number of people who frequently participate in activities while experiencing the environment. Recreation, tourism and residential uses may be present in or near the viewing area. The visual absorption capacity of these areas is comparatively low. (Score 5) (Virginia Polytechnic Institute and State University, May 2009)

3. Scoring Process

1. Rate the visual impact of each site from a scenic quality classification and visual sensitivity classification.

2. Weight combined scores based on area of impact.

3. Determine action from established weighted combined scores.

   a. A <u>low</u> score (0-2) allows the project to go forward without any mitigation.

   b. A <u>moderate</u> score (3-5) requires mitigation &/or reduction in number of turbines.

   c. A <u>moderate-high</u> score (6-8) requires siting changes, mitigation, reducing the number of towers &/or remediation

d. A high score (9-10) prevents the project from being built

4. Potential Mitigations and Remediation Options

Numbers of turbines. The visual impact may relate to the numbers of wind turbines planned in the landscape. Reducing the numbers of wind turbines in area with high visual sensitivity may be appropriate mitigation.

Siting. Visual contrast with the existing landscape is often unavoidable because of the size and typical location of wind farms. The incorporation of design alterations into project facilities to limit the degree of visual contrast and reduce the prospect of that contrast may be considered a part of project mitigation. Micro-siting to minimize visual impacts may be possible.

Aesthetic offsets. An aesthetic offset is a correction or remediation of an existing condition located in the same view shed of the proposed development that has been determined to have a negative visual or aesthetic impact. Aesthetic offsets should be considered as a mitigation option in situations where visual impacts are unavoidable or where alternative mitigation options are only partially effective or uneconomical. Aesthetic offsets could include reclamation of unnecessary roads in the area, removal of abandoned buildings, cleanup of illegal dumps or trash, or the rehabilitation of existing erosion or disturbed areas (BLM 2005a).

Lighting. Lighting should be kept to the minimum required for safety reasons. In all cases lighting should be designed to prevent "light pollution" from leaving the immediate area.

Alternative Construction Processes. To avoid the construction of large maintenance roads and clearing areas for access of equipment, aerial construction techniques could be considered. In cases of high visibility and long term concern of the visual impact from the access roads, this construction alternative could eliminate or minimize impacts. (American Wind Energy Association, February 2008)

5. Siting and Design Guidelines for Minimizing Visual Impacts

1. Wind Turbines shall be a non-obtrusive color which blends with the surrounding environment.

2. Wind energy facilities shall not be artificially lighted, except to the extent required by the Federal Aviation Administration or other applicable authority that regulates air safety.

3. Wind turbines shall not display advertising, except for reasonable identification of the turbine manufacturer, facility owner and operator.

4. On-site transmission and power lines between wind turbines shall, to the maximum extent practicable, be placed underground.

5. Identify and locate all significant scenic resources within the viewshed from the top of the tallest turbine rotor at its highest point.

6. A decommissioning plan shall include the removal of all turbines and ancillary structures and restoration/reclamation of the site.

(Pennsylvania Model Ordinance for Wind Energy Facilities, March 21, 2006)

Underlying Authority of the State Forester

§ 10.1-1105. Additional powers and duties of State Forester.

The State Forester shall supervise and direct all forest interests and all matters pertaining to forestry within the Commonwealth. He shall have charge of all forest wardens and shall appoint, direct and supervise persons he employs to perform labor in the forest reservations or the nurseries provided for herein, and he is authorized to employ temporary forest wardens to extinguish forest fires in the Commonwealth. He shall take such action as is authorized by law to prevent and extinguish forest fires; develop a program to promote the use of prescribed burning for community protection and ecological, silvicultural, and wildlife management; enforce all laws pertaining to forest and woodlands; prosecute any violation of such laws; develop silvicultural best management practices, including reforestation, prevention of erosion and sedimentation, and maintenance of buffers for water quality, pursuant to Article 12 (§ 10.1-1181.1 et seq.) of this chapter; collect information relative to forest destruction and conditions; direct the protection and improvement of all forest reservations; and, as far as his duties as State Forester will permit, conduct an educational course on forestry at the University of Virginia for credit toward a degree, at farmers' institutes and at similar meetings within the Commonwealth. He shall provide for the protection of state waters from pollution by sediment deposition resulting from silvicultural activities as provided in Article 12 (§ 10.1-1181.1 et seq.) of this chapter. In addition, the State Forester shall cooperate with counties, municipalities, corporations and individuals in preparing plans and providing technical assistance, based on generally accepted scientific forestry principles, for the protection, management and replacement of trees, wood lots and timber tracts and the establishment and preservation of urban forests, under an agreement that the parties obtaining such assistance shall pay the field and traveling expenses of the person employed in preparing such plans.

§ 10.1-1106. State Forester to control forest reserves and funds; reforesting; preservation of timber, etc.

The care, management and preservation of the forest reserves of the Commonwealth and the forests thereon, and all moneys appropriated in that behalf, or collected therefrom in any way, and all personal and real property acquired to carry out the objects of this chapter, shall be subject to the control of the State Forester.

The State Forester shall observe, ascertain, follow and put into effect the best methods of reforesting cutover and denuded lands, foresting wastelands, preventing the destruction of forests by fire, the administering of forests on forestry principles, the instruction and encouragement of private owners in preserving and growing timber for commercial and manufacturing purposes, and the general conservation of forest tracts around the headwaters and on the watersheds of the watercourses of the Commonwealth.

§ 10.1-1119. Preservation of evidence as to conserving forest supply; reports to General Assembly; publications.

The State Forester shall preserve all evidence taken by him with reference to conserving the forests of the Commonwealth and the methods best adapted to accomplish such object. He shall report his actions, conclusions and recommendations to each session of the General Assembly and from time to time publish for public distribution, in bulletin or other form, such conclusions and recommendations as may be of immediate public interest.

§ 10.1-1126.1. Silvicultural practices; local government authority limited.

A. Forestry, when practiced in accordance with accepted silvicultural best management practices as determined by the State Forester pursuant to § 10.1-1105, constitutes a beneficial and desirable use of the Commonwealth's forest resources.

B. Notwithstanding any other provision of law, silvicultural activity, as defined in § 10.1-1181.1, that (i) is conducted in accordance with the silvicultural best management practices developed and enforced by the State Forester pursuant to § 10.1-1105 and (ii) is located on property defined as real estate devoted to forest use under § 58.1-3230 or in a district established pursuant to Chapter 43 (§ 15.2-4300 et seq.) or Chapter 44 (§ 15.2-4400 et seq.) of Title 15.2, shall not be prohibited or unreasonably limited by a local government's use of its police, planning and zoning powers. Local ordinances and regulations shall not require a permit or impose a fee for such silvicultural activity. Local ordinances and regulations pertaining to such silvicultural activity shall be reasonable and necessary to protect the health, safety and welfare of citizens residing in the locality, and shall not be in conflict with the purposes of promoting the growth, continuation and beneficial use of the Commonwealth's privately owned forest resources. Prior to the adoption of any ordinance or regulation pertaining to silvicultural activity, a locality may consult with, and request a determination from, the State Forester as to whether the ordinance or regulation conflicts with the purposes of this section. Nothing in this section shall preclude a locality from requiring a review by the zoning administrator, which shall not exceed ten working days, to determine whether a proposed silvicultural activity complies with applicable local zoning requirements.

C. The provisions of this section shall apply to the harvesting of timber, provided that the area on which such harvesting occurs is reforested artificially or naturally in accordance with the provisions of Chapter 11 (§ 10.1-1100 et seq.) of Title 10.1 or is converted to bona fide agricultural or improved pasture use as described in subsection B of § 10.1-1163.

The provisions of this section shall not apply to land that has been rezoned or converted at the request of the owner or previous owner from an agricultural or rural to a residential, commercial or industrial zone or use.

Nothing in this section shall affect any requirement imposed pursuant to the Chesapeake Bay Preservation Act (§ 10.1-2100 et seq.) or imposed by a locality pursuant to the designation of a scenic highway or Virginia byway in accordance with Article 5 (§ 33.1-62 et seq.) of Chapter 1 of Title 33.1.

§ 10.1-1163. Exemptions from article.

A. This article shall not apply to any acre of land on which there are present at the time of final cutting of the timber 400 or more loblolly or white pine seedlings, singly or together, four feet or more in height.

B. This article shall not apply to any person who clears or who procures another to clear his land for bona fide agricultural or improved pasture purposes or for the purpose of subdividing such land for sale for building sites. For the purpose of this article, evidence of intent of bona fide agricultural or improved pasture use shall require, as a minimum and within twelve months from the date of completion of commercial cutting, that the land intended for such use be cleared of all trees, snags, brush, tree tops, and debris by piling and burning or otherwise disposing of same, or by enclosing the area with a well-constructed fence and planting grass seed thereon so as to make a bona fide improved pasture. In the case of clearing for building sites evidence of intent shall be the construction of dwellings or other bona fide structure in progress or completed within two years from the date of completion of commercial cutting.

C. This article shall not apply to land which has been zoned for a more intensive land use than agricultural or forestal use.

D. The provisions of this article shall not apply to any acre or acres of forest land for which a planting, cutting or management plan has been prepared, designed to provide conservation of natural resources, and which plan has been submitted to and approved by the State Forester previous to the cutting of any trees on the acre or acres concerned. If such plan has been submitted to the State Forester by registered or certified mail and he has not approved the plan, or disapproved it with a statement in writing of his reasons therefor, within a period of sixty days from the date of submission, the plan shall be deemed approved and shall be effective for the purposes of this section.

E. The State Forester may grant exemptions from this article to individual landowners who wish to grow hardwoods on their property. The State Forester may place conditions on the exemption as he deems advisable for the conservation of natural resources.

§ 10.1-1164. Pine trees to be left uncut for reseeding purposes.

Every landowner who cuts, or any person who cuts or procures another to cut, or any person who owns the timber at the time of cutting and knowingly and willfully allows to be cut, for commercial purposes, timber from ten acres or more of land on which loblolly or white pine, singly or together, occur and constitute twenty-five percent or more of the live trees on each acre or acres, shall reserve and leave uncut and uninjured not less than eight cone-bearing loblolly or white pine trees fourteen inches or larger in diameter on each acre thus cut and upon each acre on which such pine trees occur singly or together, unless there is in effect for such land a planting, cutting or management plan as provided in subsection D of § 10.1-1163. Where eight cone-bearing loblolly or white pine trees fourteen inches or larger in diameter are not present on any particular acre, there shall be

left uncut and uninjured for each such pine two cone-bearing pine trees of the largest diameter present less than fourteen inches in diameter. Such pine trees shall be left uncut for the purpose of reseeding the land and shall be healthy, windfirm, and of well-developed crowns, evidencing seed-bearing ability by the presence of cones in the crowns.

§ 10.1-1181.2. Conduct of silvicultural activities; issuance of special orders.

A. If the State Forester believes that an owner or operator has conducted or is conducting or has allowed or is allowing the conduct of any silvicultural activity in a manner that is causing or is likely to cause pollution, he may enter upon the silvicultural operation for inspection to determine whether the activity is causing or likely to cause pollution and notify the owner or operator regarding the activity that is causing or likely to cause pollution and recommend (i) corrective measures and (ii) a reasonable time period to prevent, mitigate, or eliminate the pollution. If the owner or operator fails to take action to prevent, mitigate, or eliminate the pollution, the State Forester shall issue a special order pursuant to subsection B or C. Failure of the State Forester to notify an owner or operator of such corrective measures shall not impair the State Forester's authority to issue special orders pursuant to subsection B or C.

B. The State Forester shall have the authority to issue special orders to any owner or operator who has conducted or is conducting, or has allowed or is allowing to be conducted, any silvicultural activity in a manner that is causing or is likely to cause pollution, to cease immediately all or part of the silvicultural activities on the site, and to implement specified corrective measures within a stated period of time. Such special orders are to be issued only after the owner or operator has been given the opportunity for a hearing with reasonable notice to the owner or operator, or both, of the time, place and purpose thereof, and they shall become effective not less than five days after service as provided in subsection D.

C. If the State Forester finds that any owner or operator is conducting any silvicultural activity in a manner that is causing or is likely to cause an alteration of the physical, chemical or biological properties of any state waters resulting from sediment deposition presenting an imminent and substantial danger to (i) the public health, safety or welfare, or the health of animals, fish or aquatic life; (ii) a public water supply; or (iii) recreational, commercial, industrial, agricultural or other reasonable uses, the State Forester may issue, without advance notice or hearing, an emergency order directing the owner or operator, or both, to cease immediately all or part of the silvicultural activities on the site, and to implement specified corrective measures within a stated period of time. The commencement of proceedings by the State Forester for the issuance of a special order pursuant to subsection B shall not impair the State Forester's authority to issue an emergency special order pursuant to this subsection. The State Forester shall provide an opportunity for a hearing, after reasonable notice as to the time and place thereof to the owner or operator, to affirm, modify, amend or cancel such emergency special order.

D. The owner or operator to whom such special order is directed shall be notified by certified mail, return receipt requested, sent to the last known address of the owner, or operator, or by personal delivery by an agent of the State Forester, and the time limits specified shall be counted from the date of receipt.

E. The State Forester shall not issue a special order to any owner or operator who has incorporated generally acceptable water quality protection techniques in the operation of silvicultural activities, which techniques have failed to prevent pollution, if the State Forester determines that the pollution is the direct result of unusual weather events that could not have been reasonably anticipated.

F. Any hearing required under this section shall be conducted in accordance with § 2.2-4020 unless the parties consent to informal proceedings.

G. The State Forester shall not issue a notice under subsection A or a special order or emergency special order under subsection B or C more than one year after the silvicultural activity has occurred on the property. Any such notice, special order, or emergency special order shall remain in effect until the State Forester determines that corrective measures specified therein have been implemented.

H. Prior to completion but not later than three working days after the commencement of an operation, the operator shall notify the State Forester of the commercial harvesting of timber. For the purpose of this section, commercial harvesting of timber means the harvesting of trees for the primary purpose of transporting to another site for additional manufacturing. The notification may be verbal or written and shall (i) specify the location and the actual or anticipated date of the activity, (ii) include an owner's name or the owner's representative or agent and contact information, and (iii) be provided in a manner or form as prescribed by the State Forester. If an operator fails to comply with the provisions of this subsection, the State Forester may assess a civil penalty of $250 for the initial violation and not more than $1,000 for any subsequent violation within a 24-month period by the operator. Such civil penalties shall be paid into the state treasury and credited to the Virginia Forest Water Quality Fund pursuant to § 10.1-1181.7.

DEQ Wind Energy Regulatory Advisory Panel (Wind RAP)
Attachment C –General Subcommittee
October 13, 2009

Location: **DEQ Central Office**
629 E. Main Street
Richmond, VA 23219

Start: 10:40 am
End: 3:30 pm

Subcommittee Chair: Nikki Rovner, Deputy Secretary of Natural Resources
Recorder: Debra Miller, DEQ

Subcommittee Members Present:
Ken Jurman, DMME
Theo de Wolff, Independent Developer
James Golden, DEQ
Mary Elfner, Audubon

Subcommittee Members Absent:
Jayme Hill, Sierra Club
John Daniel, Independent Developer Rep

Guests/Speakers: none

Public Attendees:
Ronald Jefferson, APCo (RAP Alternate)
David Phemister, TNC (RAP Alternate)
Cody Walker, SCC

Agenda Item: Welcome and Introductions

Discussion Leader: Nikki Rovner
Discussion: Subcommittee Chair, Nikki Rovner, welcomed members of the subcommittee to the meeting and introductions were made. Draft regulatory language had been sent to the subcommittee members. This draft language will be reviewed during the course of this meeting.

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Agenda Item: Section 1.A – Applicability

Discussion Leader: Nikki Rovner
Discussion: The language presented identifies what wind energy projects would be subject to this regulation. The language was reviewed and further clarification was provided to indicate that the regulations would be applicable to those wind energy facilities with aggregate capacity equal to or greater than 500kW and less than 100 MW. This would exempt from regulation those under 500kW aggregate capacity. There was further discussion on this issue in light of SCC's 5 MW notification only requirement and this included ideas regarding a tier approach for regulation. The issue was noted to be important as community-based wind projects are likely to be a faster growing segment of the industry. A few options were discussed, one option suggested was <500 kW would be exempted and those <5MW would have lesser requirements (for instance, Phase I studies). This will be presented to the plenary group for discussion.

Agenda Item: Section 1.B – Definitions

Discussion Leader: Nikki Rovner
Discussion: The group then reviewed the suggested language for definitions. Owner will be revised to include "portional" ownership. PBR will be revised to remove "associated". There was further discussion on project boundary and wind energy facility definitions. These definitions led to discussion of rated capacity.

Rated capacity in comparison to nameplate capacity was an issue discussed as was the generation capability as it is linked to the interconnection agreement. A proposed definition of rated capacity was presented as the maximum generation capacity of a wind energy facility under a single interconnection agreement. Additional definitions will likely need to be added based on the other subcommittee's recommendations. These will be discussed in the plenary sessions.

The subcommittee broke at 12:08pm for lunch and reconvened the subcommittee meeting at 1:20pm.

Agenda Item: Section 2 – PBR for Wind Energy Facilities

Discussion Leader: Nikki Rovner

Discussion: The language of section 2 was discussed. Comments to revise the language to make various plans enforceable parts of the PBR were suggested. This will include plans for design, mitigation, and decommissioning. Section 2.A.7 discusses a "participant." Waste regulatory language regarding the public participation submittal criteria will be used for this subdivision (refer to VRP regulations – use a copy of a list of comments). It was noted that the public meeting attendance does not confer "participation"; those that submit comments will be "participants." In Section 2.B, a suggestion that the DEQ review timeframe be increased to 60 days was proposed as there may be coordination time needed with the other agencies. The issue of 30 or 60 days will be presented and discussed in the plenary session..

Agenda Item: Section 3 – Site Plan and Area Map Requirements

Discussion Leader: Nikki Rovner

Discussion: The language of Section 3 was reviewed. It was noted that the site plan did not include wind turbine locations. The section will be revised to include wind turbine and other structure locations on the site plan. For clarity, the language will be revised to provide a standard for the scale of the map (the suggestion for this scale will be discussed further). The language of subsection A will be revised to include within the area of the project boundaries. The project boundary definition was again discussed and it was further clarified that the boundary will be dependent on the interconnection point. This will be added to the definition of Section 1.

Agenda Item: Section 4 – Operating Plan Requirements

Discussion Leader: Nikki Rovner

Discussion: The language of Section 4 was reviewed. Based on these discussions, the section will be revised to clarify requirements. The revised requirements will be to comply with mitigation plan (main point). Compliance with applicable regulatory requirements will be added. Additionally the language regarding invasive species will be revised.

Agenda Item: Section 5 – Design Standards

Discussion Leader: Nikki Rovner

Discussion: Based on information for industry, this section will reflect only that the design meet the current industry standards (ANSI). Section B will be removed. If additional requirements are necessary based on recommendations from the other subcommittees, this section may need revision after plenary discussion of the recommendations.

Agenda Item: Section 6 – Decommissioning, site restoration and financial assurance requirements

Discussion Leader: Nikki Rovner

Discussion: Some of the group prefers that these types of issues be handled under the locality. Additional concern regarding land owner post-decommissioning use and preferences may also impact decommissioning objectives. It was also discussed that this section could be used by localities that do not have requirements. No consensus was achieved on locality requirements for decommissioning and funding and whether that should have primacy over these requirements. For financial assurance language, DEQ

will provide financial assurance regulatory language used for other programs. These requirements provide criteria for use and exact wording for the specific mechanism used to provide assurance (in this case it would be assurance of decommissioning costs). These issues will be presented to the plenary for further discussion.

Agenda Item: Section 7 – Public Participation

Discussion Leader: Nikki Rovner
Discussion: It was clarified that the statute requires the PBR to have a public participation period. It was discussed regarding whether the local process can be used for the PBR process. Based on the statute's language, there will need to be a public comment and meeting for the PBR. It was noted that this requirement cannot be met through public participation required for local government approvals.

Agenda Item: Section 8 – Change of ownership, facility modifications, loss of permit by rule status..

Discussion Leader: Nikki Rovner
Discussion: The group discussed the language (based on the VSWMR). Concerns were noted regarding the material standards and cure period. If there is not material standard and cure period, then it will be difficult to access. This may need to be clearer in the language. The section needs to consider operations and shut downs based on materiality concerns. Subsection B will be revised to clarify that modifications do not increase rated capacity.

Agenda Item: Section 9 – Permit Fee Requirements

Discussion Leader: Nikki Rovner
Discussion: This section will require further revision once the other recommendations are presented.