DIRECT TESTIMONY
OF
KRISTINA HILL
ON BEHALF OF
PIEDMONT ENVIRONMENTAL COUNCIL
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NOS. PUE-2007-00031 AND PUE-2007-00033

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Kristina Hill. My business address is Campbell Hall, University of Virginia, Charlottesville, Virginia, 22904.

Q. WHAT ARE YOUR PROFESSIONAL QUALIFICATIONS?

A. I have been teaching and conducting research in Landscape Architecture for 17 years. My work has included research on computer mapping techniques and visual simulation. I received a Doctor of Philosophy in Landscape Architecture from Harvard University, and a professional Master's degree in Landscape Architecture from the same institution. I have taught in regular faculty positions at MIT, Iowa State, the University of Washington, and the University of Virginia, where I now serve as head of the Landscape Architecture graduate program. I have served as a consultant to public agencies in the United States and abroad on a wide range of landscape planning issues. Exhibit KH-1.

Q. DR. HILL, HAVE YOU PREVIOUSLY PROVIDED TESTIMONY AS AN EXPERT WITNESS OR PROVIDED EXPERT CONSULTING SERVICES?

A. Yes, five or six years ago for a transmission line visual impact case in Hawaii. I do not have immediate access to the case name or number but will supplement my testimony when I locate it.

Q. ARE YOU FAMILIAR WITH THE PIEDMONT AREA OF VIRGINIA WHERE THE TRANSMISSION LINE PROJECT IS PROPOSED?

A. Yes. In my opinion this area is an excellent example of successful cultural preservation. There is a high level of citizen and government involvement in planning and efforts to keep the landscape character and sense of place intact.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. Counsel for the Piedmont Environmental Council asked me to assess the methods used in the visual analysis work submitted by Trans-Allegheny Instersate Line Company (TrAILCo) and Dominion Virginia Power (DVP) (jointly Applicants) in support of their application for authority to build the proposed 500-kV Meadow Brook-Loudoun transmission line (Loudoun line) alternatives.

Q. DR. HILL, HAVE YOU PERFORMED THIS ASSESSMENT?

A. Yes. From the DVP Application I have read the testimony of Cyril Welter and examined his Attachment CW-1, the Routing Study and Environmental Assessment for the Meadow Brook-Loudoun 500-kV Transmission Line Project, the Department of Environmental Quality (DEQ) Supplement and the Department of Historic Resources (DHR) Appendix to the DEQ Supplement. From the TrAILCo Application I have read the testimony of Jack Halpern and examined his Exhibit JH-1, the Route evaluation Report and Environmental Report TrAIL 500-kV Project and the testimony of Cyril Welter and examined his Attachment CW-1, the Routing Study and Environmental Assessment for the Meadow Brook - Loudoun 500-kV Transmission Line Project, and the Virginia DHR Final Report. I then compared the visual impact assessment methods used in those exhibits with standard methods that were cited in the visual assessments themselves.

Q. CAN YOU GIVE A SUMMARY OF YOUR OPINION BASED UPON YOUR REVIEW OF THE ROUTING STUDIES, ENVIRONMENTAL ASSESSMENTS AND THE SUPPLEMENTS INCLUDED IN BOTH DVP AND TRAILCO'S APPLICATIONS.

A. Yes. Before proposing a project like the Loudoun line, an Applicant should provide this Virginia State Corporation Commission a study that shows the change in visual resources, or scenic assets, that will result and a means to measure and evaluate the impact of that change. From my review of the Applications, neither DVP nor TrAILCo have done so.

Visual impact assessment in the DVP Application is limited to state identified historic properties. To the extent the Applicants considered the impact on those properties they have shown a small number of examples of what the new lines might look like. The Applications offer no indication of how they evaluated or measured the impact of that change in appearance. TrAILCo subjectively considered the impact on historic properties and selected residences within 500 feet of the proposed centerline of the transmission line.

Q. IS THERE AN OBJECTIVE STANDARD FOR MEASURING THE IMPACT OF PROJECTS SUCH AS THE PROPOSED LOUDOUN LINE ALTERNATIVES?

A. Yes. Routing studies routinely use handbooks developed by the Forest Service or the US Army Corps of Engineers. http://www.esf.edu/es/via/. Those, in addition to elementary landscape architecture principles should be the basis for judging the merits of an application. What should be avoided is a subjective approach that permits an applicant to tailor its review to suit its preferred outcome.

Q. DR. HILL, WERE ANY OF THESE WORKS CITED BY THE APPLICANTS?

A. Yes. Both the Louis Berger Group report prepared on behalf of TrAILCo and the Burns & McDonnell reports prepared for both TrAILCo and DVP cite *Landscape Aesthetics A*

Handbook for Scenery Management (Landscape Aesthetics Handbook) originally prepared by the United States Department of Agriculture Forest Service in 1995, available at http://www.esf.edu/es/via/. This book creates an approach called a "Scenery Management System."

Q. WHAT IS THE PURPOSE OF A "SCENERY MANAGEMENT SYSTEM" PROCESS?

A. Allow me to quote from the manual. "The Scenery Management System provides for improved integration of aesthetics with other biological, physical and social/cultural resources in the planning process." http://www.esf.edu/es/via/ at pp. 6, 20, 30-34.

Q. SHOULD A SCENERY MANAGEMENT SYSTEM CREATED FOR MANAGING FOREST SERVICE PROPERTY BE APPLIED TO A HIGH-VOLTAGE TRANSMISSION LINE RUNNING THROUGH PRIVATE LAND?

A. Yes. This System represents a reliable, peer-reviewed method of comparing the visual impacts of alternative plans. Whether it is used by a public or private entity, it establishes a rational baseline and point of comparison for alternative plans. This rational approach is especially important for projects that affect large areas of land and potentially impact the visual experience of large numbers of people.

Q. IS THERE MORE TO THIS THAN SIMPLY TRYING TO KEEP THE COUNTRYSIDE PRETTY?

A. Yes. By following a system that uses common terminology that is applied consistently and seeks data from a wide variety of sources, a visual impact study can produce results that are replicable and reliable. The goal should be to create a plan for incorporating the scenic values and their related social values into the evaluation process. Scenery and social values help to

create the "sense of place" that is integral to our environment. In fact, studies have shown that open spaces with interesting visual elements have a positive effect on people's health, and that landscapes without these elements can promote negative associations and behavior. Landscapes with positive visual impacts can be of benefit to society in general. http://www.esf.edu/es/via/ at pp. 8, 17, 30-34.

Q. PLEASE DESCRIBE THE SCENERY MANAGEMENT PROCESS, DR. HILL?

A. There are approximately five steps in Scenery Management. It begins with a consideration of the landscape as it is, establishes the Landscape Character, Scenic Classes, Alternative Development and Alternative Selection. Constituent Information is included at each step. I am attaching a flow chart from the Forest Service Handbook as Exhibit KH-2.

Q. WHAT SHOULD BE THE FIRST TASK IN EVALUATING A PROJECT?

A. There should be an evaluation of the existing landscape.

Q. FROM YOUR REVIEW, DID THE APPLICATIONS DEVELOP A LANDSCAPE CHARACTER DESCRIPTION?

A. Yes. To a degree each of the three Assessments attempted to develop a Landscape Character Description. However they didn't distinguish between the different landscapes along the routes.

Q. FROM YOUR REVIEW, HOW MANY LANDSCAPE CHARACTER AREAS STAND TO BE AFFECTED BY THE PROPOSED LOUDOUN LINE ALTERNATIVES?

A. From my review there are multiple landscape character areas. Some texts call these landscape similarity zones. http://www.esf.edu/es/via/. In the first place, there is a Preferred Route and an Alternate Route. It is possible that the Alternate Route, which follows Interstate 66, has as few as three landscape similarity zones as it begins in a very rural, forested area and

ends in a highly developed suburban area, while including views of a transportation corridor throughout. This route traverses approximately 53 miles, of which about 37 parallel Interstate 66.

The Preferred Route, on the other hand, goes through many different kinds of landscape similarity zones. It begins in forested mountains, descends through rolling hills and open meadows, follows a scenic river way, and crosses nearly flat plains with historically significant agricultural lands and memorial battlefields before passing through densely developed suburban housing areas. Some of it overlaps the Alternate Route, but it is over 80 miles long. Without attempting to duplicate the Applicants' work, I would say that the Preferred Route affects at least five distinct Landscape Character Areas.

Q. DID THE APPLICANTS CREATE LANDSCAPE SIMILARITY ZONES?

A. No.

Q. WHAT IS THE SIGNIFICANCE OF THIS FAILURE, DR. HILL?

A. There are landscapes with very different characteristics along the routes. For example, both routes cross the Appalachian Trail, an area that is intended to be in a natural state. The southern route passes through densely populated areas around Linton Hall where single-family homes are clustered around cul-de-sacs. A change to a landscape, like the introduction of a new or larger transmission line corridor, has different perceptual impacts in different landscape similarity zones. Failing to ascertain different landscape similarity zones will prevent the analyst from identifying and understanding those different impacts.

Q. FROM YOUR REVIEW OF THE APPLICATION AND ITS SUPPORTING DOCUMENTS, CAN YOU DETERMINE HOW MANY ZONES THERE MIGHT BE ALONG THESE TWO ROUTES?

A. No. I can say that there are at least three very different zones in the Interstate 66 Alternative Route, and at least five in the southern Preferred Route.

Q. WHAT WOULD YOU DO NEXT AS PART OF A STANDARD VISUAL ASSESSMENT?

A. I would apply a Scenic Attractiveness Classification. As described in the Landscape Aesthetics Handbook a scenic attractiveness classification seeks to classify the area within one of three classifications: Distinctive, Typical and Indistinctive.

Distinctive Scenes are those that display unusual, unique or outstanding scenic qualities. Typical Scenes are positive, and contain common attributes of variety, unity and vividness. Indistinctive Scenes have weak or missing elements. http://www.esf.edu/es/via/ at pp 1-16.

Q. DID THE APPLICANTS ESTABLISH ANY SCENIC ATTRACTIVENESS CLASSES?

A. Not that I was able to identify. National forests are treated the same as existing electric substations.

Q. DR. HILL, WHAT OTHER STEPS ARE USED IN THE HANDBOOKS CITED BY BOTH LOUIS BERGER AND BURNS & MCDONNELL?

A. The handbooks call for establishing a Scenic Integrity Value and determining Landscape Visibility. A Scenic Integrity Value measures the level of scenic integrity as it exists before considering the addition. It ranges from Unacceptably Low to High. Another method of measuring the existing scenery is through a Resource Management Classification, which measures the level of visual qualities from Preservation Class at the top end to Rehabilitation Class at the low end. Preservation Class assets are unique and are often protected by federal or

state policies and may include scenic rivers, historic sites and districts. Rehabilitation Class areas may be considered blighted areas.

Q. DID THE APPLICANTS ESTABLISH A SCENIC INTEGRITY VALUE?

A. No.

Q. DID THE APPLICANTS ESTABLISH ANY LANDSCAPE VISIBILITY ZONES?

A. No, but Louis Berger on behalf of TrAILCo creates a 250 foot and 500 foot visibility zone. I would have expected to see zones more comparable to “foreground”, “middle ground” and “background”.

At page 75 of the Route Evaluation Report and Environmental Report of Louis Berger states that it conducted a brief review of "the visual accessibility of the line” from known residences within 250 and 500 feet, presumably of the existing lines. Louis Berger’s assertion that the 500-foot distance is more inclusive than the Forest Service’s use of a 300-foot buffer is curious. The visual impact of a tower over 125 feet tall is not particularly different at those distances. It may be that some screening might be different, but that would be a matter of the vegetation, not the distance from the tower.

I have attached as Exhibit KH-3 a page from Landscape Aesthetics Handbook to illustrate the relative visibility zones. As can be seen from this example, visibility zones can extend all of the way to the horizon.

Q. DO YOU HAVE OTHER COMMENTS ON THE VISUAL EVALUATIONS CONTAINED IN THE APPLICATIONS?

A. In written evaluations, map-based visual impact modeling, or photographs, the Applicants do not distinguish between leaf-on and leaf-off conditions. The difference between the visual impacts during the winter when there are no leaves on the trees versus the summer

conditions, is not addressed in the Application. Most of the photographs appear to be taken when the trees have leaves, suggesting a conscious effort to minimize the estimated visual impacts.

Q. DID THE APPLICANTS PERFORM ANY CONSTITUENT ANALYSIS, DR. HILL?

A. Both the Louis Berger report and the Burns & McDonnell report mention that there were public meetings. There is some mention of a change in alignment based upon these meetings, but there is nothing that would allow an outside observer to understand what was presented to constituents or what constituent input was offered to the Applicants.

Q. DID THE APPLICANTS ESTABLISH ANY DIFFERENT CLASSES OF CONSTITUENTS?

A. No, and this is particularly troubling.

Q. WHY WOULD IT BE IMPORTANT TO ESTABLISH DIFFERENT CLASSES OF CONSTITUENTS, OR USER GROUPS?

A. Because different constituent classes and user groups are affected differently. The Applicants focus on a very small subset of the public: visitors standing at a Virginia Department of Historic Resources locations and homeowners within 500 feet of transmission lines. In fact, in standard visual impact assessments, one should consider residents at farther distances, commuters, business employees and recreational users, just to name a few. There will be a major impact on the commuting public along Interstate 66 west of Marshall. The Burns & McDonnell Viewshed Analysis (Alternate Route, Sheet 1 of 2) shows a high frequency of visibility in this area that the Virginia Department of Transportation Traffic Engineering

Division estimates has an annual average daily traffic count of 46,000 vehicles. Exhibit KH-4. The visual impact on this many people should be, but has not been, addressed.

Q. DID YOU REVIEW THE VIRGINIA DHR HISTORIC RESOURCE VIEWSHED ANALYSIS TRAIL 500 KV PROJECT AND THE DHR APPENDIX TO THE DEQ SUPPLEMENT?

A. Yes. I examined the photo simulations and read the accompanying text. The chosen locations were limited to identified historic properties. I could not determine how DHR chose the specific locations from which it took the photographs or how it selected a direction to point the camera. The narrative does not provide any clues about whom or how many people would view the proposed line, how they would be using the area or what their expectations of a viewshed would be. The selection of observation points should have some rational basis. Again, these locations should be selected based upon how the visual resources are actually used. But there appears to be neither rhyme nor reason underlying the locations and perspectives selected in the Viewshed Analysis.

Q. HOW SHOULD OBSERVATION POINTS BE DETERMINED?

A. A good rule would be to consider the viewshed in the context of how it might be viewed by the public. The only way to do that is to ask the users.

Q. HAVE YOU PERFORMED AN INDEPENDENT VISUAL ANALYSIS OF THE TRANSMISSION LINE ROUTE?

A. No. I have only reviewed the Applications.

Q. DO YOU BELIEVE THAT YOU CAN FORM AN OPINION ON THE APPLICATIONS BASED UPON REVIEWING THE MATERIALS FILED IN THIS MATTER?

A. Yes. Equipped with the right training, it is a relatively simple matter to compare the methods used in the Applications to the standard methods used in this area of professional work. My purpose is not to do the Applicants or the Commonwealth's work for them. Rather, I was asked to review their work and assess whether it was done competently and professionally.

Q. HAVE YOU LOOKED AT VISIBILITY STUDIES FROM OTHER TRANSMISSION LINE CASES?

A. Yes. The Southern Rhode Island Transmission Line Project is an example of a study that more closely follows the standard approach. Although the Rhode Island project was a relatively small project, with the Visibility Study limited to 12.3 miles of new transmission line and the construction of a new substation, the planners of that project were far more detailed in their review than were the Applicants here.

Q. HOW DID THAT STUDY DIFFER FROM THE ONES IN THIS CASE, DR. HILL?

A. The proposal was to add 147 new poles ranging in height between 55 feet and 90 feet. Considering that the Rhode Island project impacted a much smaller area, with significantly smaller structures, they nonetheless did a more thorough job. The inventory of visually sensitive resources was more comprehensive, taking in recreation areas, natural areas, schools and outdoor use areas. It also took into account areas that reflect the natural resource heritage of the affected areas. The Rhode Island study also inventoried areas of intensive use, including towns, schools and highways.

Q. WHAT ELSE DID THEY DO?

A. The Rhode Island study established five separate landscape similarity zones, establishing the location and distinctive features of each. Exhibit KH-5. The Rhode Island study also

established four different user groups. Exhibit KH-5. Differentiation of users groups is critical to evaluating viewer sensitivity and appropriate viewpoints during visual impact evaluation. Establishing viewer groups gives the analysis a context. Each of these steps is recommended by the procedural literature cited by the Applicants.

Q. DOES THE RHODE ISLAND STUDY PROVIDE A BETTER BASIS FOR REVIEW?

A. Yes. The inclusion of multiple landscape zones and user groups offers a superior perspective. Without consideration of how people will see the proposed transmission line there really cannot be a determination of how it will affect the scenic assets, historic districts or the environment. The Rhode Island study went on to perform a Visual Impact Assessment Rating, which involved a panel of three in-house landscape architects to compare before and after photo simulations using a numeric scale to measure aesthetic impact. Exhibit KH-5.

Q. WOULD YOU RECOMMEND THAT SUCH AN ANALYSIS BE PERFORMED IN THIS CASE?

A. Yes.

Q. THANK YOU, DR. HILL, NO FURTHER QUESTIONS.