BEFORE THE STATE OF WASHINGTON

ENERGY FACILITY SITE EVALUATION COUNCIL

In the Matter of Application No. 2009-01: WHISTLING RIDGE ENERGY LLC; WHISTLING RIDGE ENERGY PROJECT	EXHIBIT NO. 8.00

APPLICANT'S PREFILED DIRECT TESTIMONY

WITNESSES #8 & #9: CHRIS & TOM WATSON

Q Please state your name and business address.

A My name is Chris Watson, and my business address is 4660 NE Belknap Court, Suite 123, Hillsboro, Oregon 97214.

Q Chris, what is your present occupation and profession, and what are your duties and responsibilities?

A I am the owner and Senior Project Manager at GeoDataScape, Inc., which provides GIS and visual simulation experience for a variety of projects. My duties on this

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Project involved the spatial, data, and visual simulation products. I assisted in the preparation of the Application for Site Certification for this Project.

Q Chris, please identify what has been marked for identification as Exhibit No. 8.01.

A Exhibit No. 8.01 is a résumé of my education background and employment experience.

Q Tom, what is your present occupation and profession, and what are your duties and responsibilities?

A I am 3D Simulations Manager and Web Designer at GeoDataScape, Inc., which provides GIS and visual simulation experience for a variety of projects. I was the lead visual simulation analyst on this Project. I assisted in the preparation of the Application for Site Certification for this Project.

Q Tom, please identify what has been marked for identification as Exhibit No. 8.02.

A Exhibit No. 8.02 is a résumé of my education background and employment experience.

Q Are you sponsoring any portions of the Application for Site Certification for the Whistling Ridge Energy Project?

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A Yes. We are sponsoring the visual simulations that were done for the following section:

Section 4.2.3 Visual

Q Are you sponsoring any appendices or other documents that are part of the Application for Site Certification?

A No.

Q Are you familiar with the visual simulations in the Application for Site Certification?

A Yes.

Q Did you prepare these visual simulations, or, if not, did you direct and/or supervise their preparation?

A Yes.

Q Is the information in these visual simulations within your area of authority and/or expertise?

A Yes.

Q Did you take the photographs and prepare the visual simulations included in the Application for Site Certification using information that reasonably prudent persons in your field are accustomed to rely on in the conduct of their affairs?

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A Yes.

Q To the best of your knowledge, are the contents of these visual simulations in the Application for Site Certification accurate?

A Yes.

Q Do you incorporate these visual simulations as part of your testimony?

A Yes.

Q Are you able to answer questions under cross examination regarding these visual simulations?

A Yes.

Q Do you sponsor the admission into evidence of these visual simulations in the Application for Site Certification?

A Yes.

Q Are there any modifications or clarifications to be made to those portions of the Application for Site Certification that you are sponsoring?

A No.

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Q Tom, would you please summarize your experience in preparing visual simulations for similar projects?

A I have been involved in the production of visual simulations on eight energy facilities or projects, including a biofuel refinery, a liquefied natural gas terminal and pipeline, a waste management facility (producing electricity from methane), a major regional electricity demand growth simulation, and four wind farms. In addition, I have directed or participated in the production of well over 100 simulations both static and animated on projects both in the energy arena and out.

Q What equipment did you use to take the photographs upon which the visual simulations are based?

A Photographs from each of the 21 viewpoints were taken with a 35 mm digital SLR camera. With the exception of Viewpoint 23 in the Application, which used a focal length of 34 mm, various digital focal lengths from 40 to 70 mm were used with the intent to capture the maximum pixels and resolution for the simulation.

Q Parties to these proceedings have contended that a lens with a 50 mm focal length most closely captures human visual perception. Why did you use a 35 mm digital SLR camera with digital focal lengths from 40 to 70 mm?

A Our goal was to provide the best qualitative visual representation of the Project site from each viewpoint so that the viewer could draw a clear comparison between the existing state of the site and the simulated post-construction state of the site. It is true that the field of view captured by a 50 mm lens closely approximates the normal sight

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lines of a human's stationary range of focused vision. However, a 50 mm lens fails to account for the full visual perception of humans, which is actually a panorama encompassing somewhere between 170 and 180 degrees rather than just the 31 degrees that is captured by a 50 mm lens. Simply put, a 50 mm lens does not provide the best qualitative representation of the view a human would see.

Because the field of view from each of the 21 viewpoints differs, some viewpoints required wider panoramas to more closely approximate the visual perception of humans at a given viewpoint. To provide such wider panoramas without the innate distortion of trying to achieve the same perspective with a single image, which requires uses of a wide angle lens of 10-30 mm, "photo stitching" of multiple, overlapping, high focal length images was used. This resulted in visual simulations that convey a more realistic perspective of the Project site from that viewpoint. Another benefit of this methodology is that it provides far higher resolution and detail for printing larger sizes for easier viewing.

Finally, use of 40 to 70 mm digital focal lengths also helps minimize barrel distortion, which decreases as focal length increases. The effective focal length of digital SLR cameras is dependent on the sensor size, with most digital SLR cameras having a focal length multiplier around 1.4 to 1.7. The camera used for these simulations has a multiplier, based on sensor size, of 1.6. Thus, applying the multiplier to the digital focal lengths used in the Project's visual simulations—40 to 70 mm—results in film camera conversion focal length equivalents of 64 to 112 mm. Consequently, these visual simulations all have far less barrel distortion than the distortion of a standard 50 mm film lens.

Viewpoint 23 is a special case. Because of its close proximity to the Project, a much wider field of view was required to more closely approximate the visual perception of humans at that location. Even so, the geometry of a 34 mm digital focal

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length is equal to a 54.4 mm film camera focal length which is still greater, and has less "distortion" than any 50 mm film lens.

Q Chris, would you please summarize how you prepared the simulations?

A Visual Nature Studio, a widely-used three-dimensional Geographic Information System (GIS) software, manufactured by 3D Nature, LLC, was used to model the turbine locations on terrain built from USGS digital elevation model data. The photo locations were camera-matched in the software to render the turbines from the same viewpoint as the photographs taken on the ground. The resulting rendered turbine images were then photo-composited into the photographs to create the simulations. Existing topographic and site data provided the basis for developing the initial digital model.

Q What wind turbine model was used for the simulations?

A In preparing the visual simulations, the turbine model used was the 2.5-MW Clipper Liberty model C93, because this model provides the maximum height that would be put on the Project site and would be a "worst case" scenario for the visual simulations. This model has an overall height to nacelle of 80 m (262 feet) and blade diameter of 93 m (305 feet), and a blade length of 45.2 m (153 feet). The overall height to the tip of a stationary, vertical blade is 126.5 m (415 feet). The actual turbine size has not been determined, but potential turbines are estimated to have a height to nacelle of 262 feet and blade length between 129 and 164 feet.

Q How many turbines did you include in your simulations?

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A Simulations were prepared assuming a conservative scenario of 50 turbines. This approach to creating simulations most likely overstates the visual impacts. This is because the Applicant has applied for EFSEC certification for a maximum of 75 MW. If 2.5 MW turbines were to be used, only 30 turbines could be built, and overall visual impact would be less. If lower-power turbines were used, the turbines would be smaller and thus less visible. Further, in evaluating impacts, the turbine is considered visible if any part of a vertical turbine blade is visible. In practice, turbines with only a part of the blade visible will not be seen when the blade is moving or is stationary but not vertical.

Q The photos appear to be taken on mostly clear or partly cloudy days. In your opinion, would this tend to overstate or understate the potential visual impacts?

A The turbines would be most visible when the contrast against the background sky is the greatest. Because the turbines will likely be painted a non-reflective gray finish, they would be more visible against a clear blue sky than against clouds. The sky depicted in some of the visual simulations includes clouds, simulating the cloudy conditions that are common at the site.

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