CASE STUDIES FOR EVALUATING PHOTOSIMULATIONS FOR VISUAL IMPACT ASSESSMENT

Principle
Scale of project elements

Statement
All elements in the simulation must be accurately scaled.

Explanation
Photosimulations are created from a composite of a photograph showing an existing view and project elements that are modeled on a computer. If the two parts are not at the same scale, then the representation of the project elements will be incorrect.

Case Study. Spruce Mountain Wind
Spruce Mountain Wind is proposed for a 2,879 acre site in Woodstock, Maine. It includes eleven 1.5 MW GE wind turbines that are 80 m (262 ft) to the hub center plus 38.5 m (126 ft) for the rotor blades for a height of 118.5 m (388 ft) to an upright blade tip. The photosimulations were created with WindPRO which includes digital models for most commercial wind turbines. These models are located in a digital terrain which is then registered to the photograph.

The photosimulation is from the shore of Shagg Pond, a designated scenic resource of statewide significance. The photosimulation originally prepared for the VIA is shown in Figure 1. Maine conducts an independent review of wind project VIAs. Figure 2 shows a visualization prepared with ArcScene GIS software as part of that review. Both the original photosimulation and the visualization were set to use the same approximate viewpoint and camera lens (50 mm equivalent lens with approximately a 40° horizontal angle of view). The order of the turbines along the ridge line appears to be correct, but the turbines appear a bit small and do not occupy the full horizontal angle of view, as represented in the visualization. The applicant was asked to check the photosimulation's accuracy. The photosimulation was corrected and the revised version is shown in Figure 3.

Discussion
In this version of WindPRO, the registration of the rendered turbines to the photograph primarily relies on matching the silhouette of the digital terrain ridgeline to the photograph. The error was caused by improper registration. One clue was that while all the visible turbines were shown, they did not occupy the full horizontal field of view as well as the visual scale shown in the visualization. ArcScene visualizations may be basic visual images, but they are geometrically accurate representations of the project's visual scope and scale relative to the terrain and forest cover. The error was easy to miss because photosimulations look so real and therefore seemed to be a reasonable ridgeline match.

Maine normally has an independent aesthetics expert review wind and other large development proposals if there is a possibility that they will affect scenic resources. This case study is an example of the importance of this type of peer-review.

FIGURE 1. The original photosimulation of the Spruce Mountain wind turbines from Shagg Pond.



FIGURE 2. A visualization of the view from Shagg Pond created in ArcScene GIS software.

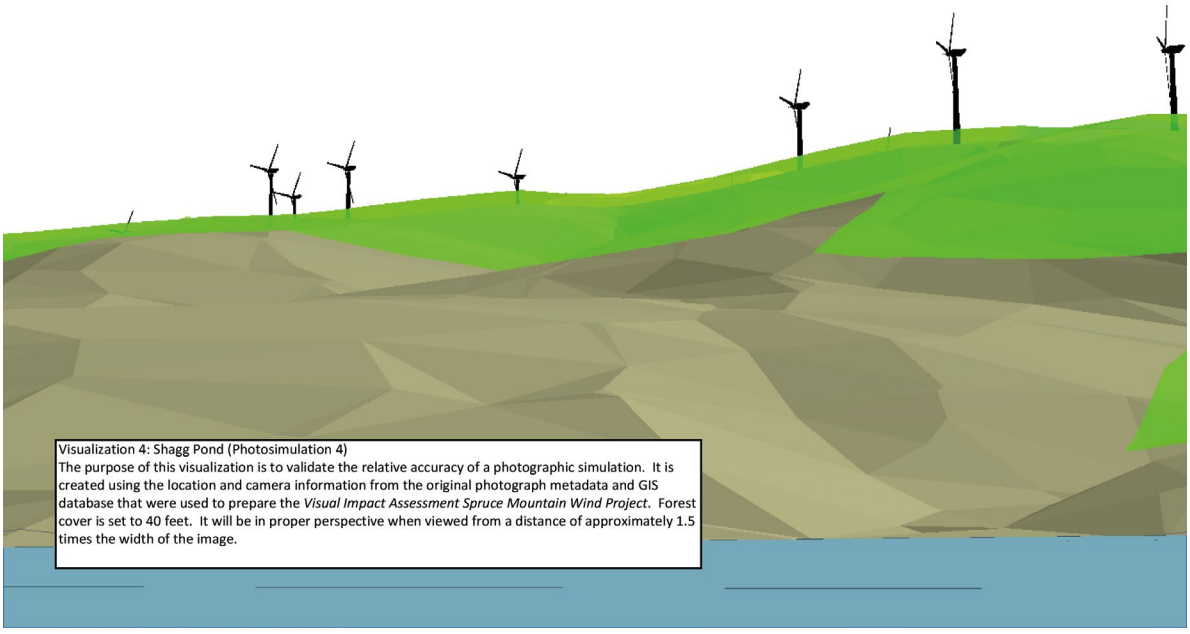

FIGURE 3. The revised photosimulation of the Spruce Mountain wind turbines from Shagg Pond.



Statement of Limitations: The simulations presented here were entered into the public record as part of a permitting process. They were prepared to be printed on 11-by-17-inch paper. However, in the process of distribution as PDFs they may have been substantially compressed. The figures presented here were clipped from these PDFs, converted to high quality JPGs and their resolution reduced. The original photosimulation has been substantially changed and as presented here should be used only as learning material.

Source: The figures used in this case study are taken from materials submitted to the Maine Department of Environmental Protection.