APPENDIX 8.11B

Design Visualization and Simulation Process

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Photo/3D Model Composite Image Generation

The steps taken in the visualization process are described below, within the corresponding software platforms employed. Computer Aided Design (CAD) equipment allows for life-size modeling within the computer. This translates to using *real world scale and dimension* to locate facilities, other site data, and the actual camera locations corresponding with 3D observation viewpoints. Generally, a reasonable degree of visual accuracy is achieved, and in turn, provides a strong sense of overall visual impact.

Digital photographs were taken from each Key Observation Point (KOP). A 50-mm camera lens was used to photograph the KOPs. This lens represents an undistorted, non-wide angle field of vision of 39.5 degrees. At the time the photographs were taken, the exact location of the photo point was marked through Global Positioning System (GPS) equipment for accuracy. The GPS points were then digitally placed on a scaled aerial photograph.

Auto-Cad & 3D Studio Max Electronic Model Data Integration

Scaled aerial site maps were initially imported as a background reference. They included conceptual arrangement of structures and observation points from which the photos were taken. 3D models of the proposed facilities are placed upon the to-scale aerial site map to register and orient the correct locations. The 3D Studio massing models of the proposed structures are generated in real world scale and orientation, with respect to each other, and to the aerial site map on which they are placed. Note: no 3D terrain model or GPS data were utilized in the visualization process.

3D Studio Max / Adobe Photo Shop

An electronic camera lens matches the lens that was actually used in the field. A 35-mm camera was used with a 50-mm lens, consistently throughout the process. This lens selection allows for viewing of the model generated above in the same way the project would be viewed in the field.

Next, the photography is integrated into the 3D database and loaded as an environment map, within which, the view of the 3D model is generated. To generate the correct view relative to the actual photographs, the electronic camera is placed at a location, (within the computer), corresponding to the location that the photograph was taken in the field. Note: the degree of accuracy of the visualization is dependant upon the level of accuracy of the support data provided.

From here, the 3D wire frame models of the proposed structures are displayed, along with any significant existing structures, so that proper alignment, scale, angle, and distance can be verified. To complete this phase, the sun angle is set, materials and textures are applied,

and the composite image is rendered through computer image processing known as *RayTracing*. Any additional filters required for appropriate atmospheric conditions, such as blur/focus/haze etc., are applied at this time.