EVALUATION OF THE TERRESIM© MODEL FOR COVER DESIGN ANALYSIS[1]

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Abstract: In the spring of 2001, Shepherd Miller, Inc. (now MFG, Inc.) completed a closure design for a Waste Rock Storage Facility in northeastern Nevada. An ecological simulation model application, TerreSIM©, was utilized to evaluate various cover designs as part of the cover design process for the 180-acre facility. TerreSIM© is a spatially-explicit, mechanistic computer model that estimates development of the above- and below-ground plant community over time, imitates responses of ecological systems to environmental stressors, and estimates the hydrological dynamics related to ecosystem changes. TerreSIM© modeled the effect of various substrate depths and textures on the establishment of vegetation and water use by vegetation at the site. The final closure was implemented from May 2002 to Nov 2003. Lysimeters were installed in the reclaimed facility to provide a means to measure cover performance relative to the design evaluations. These lysimeters have been monitored periodically after the installation. This paper evaluates the effectiveness of using the Terrestrial Ecosystem Simulation Model (TerreSIM©) for cover design analysis, and validates the model's projections based upon the lysimeter data.

Additional Key Words: simulation modeling, hydrology

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