

LESSONS-LEARNED APPLYING GEOMORPHICALLY STABLE LANDFORM DESIGN CONCEPTS TO RECLAMATION OF ABANDONED MINES¹

M.R. Donner² and B.A.D. Hill

Abstract: Historical open-pit mining operations have left numerous highwalls, spoil piles, overburden piles, and other miscellaneous earthen features scattered across the Wyoming landscape. The mines range in size from less than an acre to hundreds of acres. Traditional reclamation procedures include re-grading using straight slopes, contour ditches, and artificial erosion control. These methods typically require a fair amount of maintenance and typically do not blend into surrounding native topography. Recently, agencies and reclamation practitioners have recognized the benefits of applying “geomorphically stable landform” design concepts to reclaim surface disturbance. This approach mimics native topography using varying slopes aspects, concave and convex slopes, and varying channel types.

Trihydro uses professionally-accepted software as a design aid in developing geomorphically stable reclamation designs for abandoned surface mines. Unfortunately, software packages can and are often used as a “black box.” A certain degree of technical understanding and manipulation is required to develop a design that is constructible and provides a stable landform. Trihydro has applied landform grading techniques to the reclamation of 12 sites, 11 abandoned coal mines and 1 abandoned uranium mine, in Wyoming over the past 6 years. Through the design and implementation of these projects we have learned valuable lessons that are allowing us to enhance designs and on the ground reclamation, both in terms of time to develop the designs and quality of the completed reclamation. Trihydro will be discussing approaches that complement software packages and highlighting the dangers of using software “out of the box” based on our experience applying these approaches on abandoned surface mines.

¹ Paper was presented at the 2012 National Meeting of the American Society of Mining and Reclamation, Tupelo, MS *Sustainable Reclamation* June 8 - 15, 2012. R.I. Barnhisel (Ed.) Published by ASMR, 3134 Montavesta Rd., Lexington, KY 40502.

² Mark R. Donner, P.E., Civil Engineer, Natural Resources Team Leader, Trihydro Corporation, Laramie, WY, 82070, and Beau A.D. Hill, P.E., Civil Engineer, Trihydro Corporation, Laramie, WY, 82070,