

Introduction to the Papers in Session 5: EVALUATION OF MINESOILS

This session contains five papers that cover several aspects of reclaimed minesoils. The papers were prepared by an interdisciplinary Soil Working Group, whose members work in Texas. The Soil Working Group was established as a result of the Industry-Agency Symposium on the Elements of a Surface Mining Soil Program that was held at the Balcones Research Center in Austin, Texas, on November 16-17, 1993. The Soil Working Group's charge was to prepare technical papers, based on scientific principles, in an attempt to clarify a number of soil and minesoil-related issues of concern to the lignite industry in Texas. The Soil Working Group was composed of the following organizations and their representatives:

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| • Academia (Texas A&M University): | L.R. Hossner (Chair) |
| • Office of Surface Mining (The Dept. of the Interior): | S.E. Fisher / W.L. Joseph |
| • Railroad Commission of Texas (state regulatory authority): | P.E. Askenasy / J.E. Brandt |
| • Natural Resources Conservation Service (U.S.D.A.): | M.L. Golden / C.L. Neitsch |
| • Texas Mining and Reclamation Association: | J.K. Horbaczewski |

There are several issues that have been studied and the reports are complete; however there is still an ongoing effort related to trace elements and their acceptable threshold levels in reclaimed minesoils. The results covering the completed topics have been summarized and will be presented in this technical session. The topics of the papers and the rationales for their selection are presented below:

Paper #1: *Concepts and criteria for evaluating topsoil substitutes: The Texas experience.* This paper presents the results of the investigation that was undertaken to define what is meant by "best available material," both in terms of technical properties such as pH, acid/base account, texture, and other physicochemical properties. The rationale for the investigation was that many of the terms used in the coal-mining regulations are not quantitatively defined. Additionally, the issue concerning material suitability was of particular interest to mine operators, because of the expense associated with overburden handling.

Paper #2: *A review of minesoil sampling and spatial variability in Texas.* This paper briefly summarizes several of the issues related to the variability of regraded spoil material and how it affects the resultant spatial variability of minesoils. The level of variability at the site will dictate the type of soil/minesoil sampling program that is implemented, thereby influencing the sampling of materials by depth intervals and determination of grid sizes used in minesoil monitoring. The rationale for this topic was that a sound standardized procedure should be developed for determining appropriate minesoil sampling depth increments and establishment of grid sizes for minesoil monitoring.

Paper #3: *Acid/base account and minesoils: A review.* This paper presents an abbreviated version of the results of a review of the acid/base account (ABA). The ABA methodology was reviewed to examine its possible limitations when used for characterization of overburden and minesoil materials. It appeared either that the predictive ability of the ABA was poor or that the concept of acid-forming materials was not well defined. The rationale for this review was that large expenses were being incurred by mining operations either in selective handling of overburden material or in alkaline remediation of regraded minesoils on the basis of an apparently inadequate measure. Another concern related to the ABA was the appropriateness of using the method when evaluating regraded minesoils.

Paper #4: *Land capability classification.* This paper presents a proposed land capability classification for the evaluation of the quality of post-reclamation mine land. The classification system is based on the one used by the U.S. Department of Agriculture, Soil Conservation Service (now the Natural Resources

Conservation Service) for evaluation of cropland and other agricultural land for about 50 years. This classification system would integrate qualities of the land such as slopes, drainage, and physicochemical properties, thereby allowing a better assessment of the suitability of the land for its intended post-mining land use. The rationale for the classification system was that the use of just a few soil parameters for minesoil quality evaluation did not adequately represent the plant-growth environment and that a more integrated approach was warranted.

Paper #5: *Variability of physicochemical analytical results from minesoils and QA/QC considerations*. This paper presents the preliminary evaluation of results from an analytical round robin program that is currently under way in Texas. The program was implemented in 1990 by the Texas Mining and Reclamation Association (TMRA) to investigate the variability of standardized soil/minesoil analyses. The data obtained by this program have undergone statistical analysis to determine the degree of inter-laboratory and intra-laboratory variability in analytical results. The rationale for the statistical analysis of the round robin data was that tacit acceptance of laboratory data, without an understanding of their context or limitations, could lead to erroneous interpretations.