1984 NATIONAL MEETING

AMERICAN SOCIETY FOR SURFACE MINING AND RECLAMATION

Symposium on the Reclamation of Lands Disturbed by Surface Mining:

A Cornerstone for Communication and Understanding



Owensboro, Kentucky July 10-13, 1984 <u>Co-sponsor</u>

U. S. Forest Service

British Library Cataloguing in Publication Data

American Society for Surface Mining and Reclamation, Meeting. (1st) Surface mining and reclamation: proceedings of the First National Meeting of the American Society for Surface Mining and Reclamation.

1. Strip mining - United States

I. Plass, William T.

622'.3'0973 TN 291

ISBN 0-905927-02-8

c Science Reviews Limited, 1985

40 The Fairway, Northwood, Middlesex, England.

Printed and bound in England

INTRODUCTION

This proceedings contains 22 manuscripts which were prepared for and presented at the first national meeting of the American Society for Surface Mining and Reclamation. The meeting was held in Owensboro, Kentucky from July 10-13, 1984.

The primary objective in the design and implementation of this first program was to provide a broad collection of reference papers covering many environmental disciplines over a wide geographical region of the United States. A second objective was to select highly recommended authors who were considered to be the forerunning authorities within their respective fields.

The long term goal of this committee and the society overall is that this proceedings be the solid cornerstone upon which many more eventful national meetings will be founded. Furthermore, it is intended that this proceedings will promote communication and understanding among representatives of the mining industry, research groups, academia, regulatory agencies, land owners, and others, all of whom have a vested interest in successful surface mine reclamation.

The fundamental policy of the American Society for Surface Mining and Reclamation is ". . . to encourage any agency, institution, organization, or individual in efforts to protect, reestablish, or enhance the surface resources of land disturbances associated with mineral extraction". Basic to this policy is development of improved communication between those concerned with surface mining and reclamation. It is anticipated that this proceedings and national meetings in general will encourage broader communication between individuals and an appreciation of national involvement in matters relating to surface mining and reclamation.

The National Meeting Committee November 1984

ACKNOWLEDGEMENTS

The National Meeting Committee would like to express their sincere thanks to the many devoted individuals who made this publication and national meeting possible. Bill Plass, Executive Secretary - American Society for Surface Mining and Reclamation, deserves special recognition for his continued devotion to the Society. Don Eagleston, Chairman -National Meeting Committee, provided the inspiration, motivation, and oversight that was needed to complete this project from start to finish. Walt Davidson, Chairman - Local Arrangements Committee, did an excellent job selecting accomodations, planning for banquet festivities, and scheduling exhibitors. He also did a fantastic job advertising his sky blue hat with the white Society logo.

Frank Munshower, Vice Chairman - Program Committee, offered assistance and comments based upon his past experiences with planning and organizing national meetings. The eight session chairmen of the Program Committee deserve particular acknowledgement for their assistance in nominating and selecting manuscript authors, reviewing manuscripts, and chairing the technical sessions. These commendable individuals include Richard Barnhisel, Richard Barth, Edward DePuit, Robert Knight, Alten Grandt, Jarvis Harper, Ronald Ries, and John Sencindiver. The manuscript authors were instrumental in meeting last minute deadlines and incorporating final review comments.

Bill Evangelou planned and directed an eventful field reclamation tour of local coal mines. Thanks to Gibraltar, River Queen, and Sinclair Mines - Peabody Coal Company, for providing the tour sites. Lastly, the National Meeting Committee would like to thank the meeting attendees, expecially those who completed the post meeting questionaire which will be beneficially utilized to plan the second national meeting of the Society.

> Gary W. Wendt Chairman - Program Committee

CONTENTS

Enhancing shrub establishment by utilizing direct haul topsoil on mine spoils in Western Colorado V.R. Pfannenstiel and G.W. Wendt	1
Water quality of runoff from revegetated mine spoil Joel E. Trouart and Robert W. Knight	15
Generating productive topsoil substitutes from hard rock overburden in the Southern Appalachians W. Lee Daniels and Dan F. Amos	37
Acid mine drainage from inactive eastern coal operations Patricia M. Erickson, K.J. Ladwig and R.L.P. Kleinmann	58
Reclamation techniques in Southwestern Wyoming Fred E. Parady III	87
Microbial relationships in surface-mine revegetation Frederick M. Rothwell and Don Eagleston	94
Forage production and quality as influenced by amended quartz sand-tailings following phosphate mining P. Mislevy and W.G. Blue	114
Reclamation of bentonite mined lands in the Northern Great Plains G.E. Schuman, E.J. DePuit, J.A. Smith and L.A. King	131
Grazing research and water-use-efficiency on reclaimed pastures in North Dakota R.E. Reis and L. Hofmann	151
History of reclamation research Alten F. Grandt	164
Modern mining and reclamation procedures for reduced costs and improved land resources Timothy A. Keeney and Richard M. Smith	188
Reactions and mechanisms controlling water quality in surface mined spoils V.P. Evangelou and A.D. Karathanasis	213
Impoundments on mined mountaintops in Eastern Kentucky Willie R. Curtis	249
Spoil aquifer resaturation following coal strip mining Robert W. Ringler	275
Acid minesoil problems in the Horthern plains states D.J. Dollhopf	292

Overburden analysis using acid-base accounting techniques on the divide section, Tennessee-Tombigbee waterway John T. Ammons and Paul A. Shelton	302
Estimating agricultural limestone needs and observed responses for surface mined coal spoils R.I. Barnhisel, J.L. Powell, J.S. Osborne and S. Lakhakul	318
Superabsorbents, a new "tool" for mine reclamation James F. Pritchard	345
A comparison of basic and acidic products using acid- base accounting and simulated weathering studies Charles S. Sturey	369
Ecological forces affecting reclamation with trees W. Clark Ashby and Clay A. Kolar	395
Rowcrop yield response to soil horizon replacement I.J. Jansen, R.E. Dunker, C.W. Boast and C.L. Hooks	411
Chemical and physical properties of lignite overburden as related to environmentsof deposition J.S. Ahlrichs, L.R. Hossner, J.B. Dixon and A.L. Senkayi	431