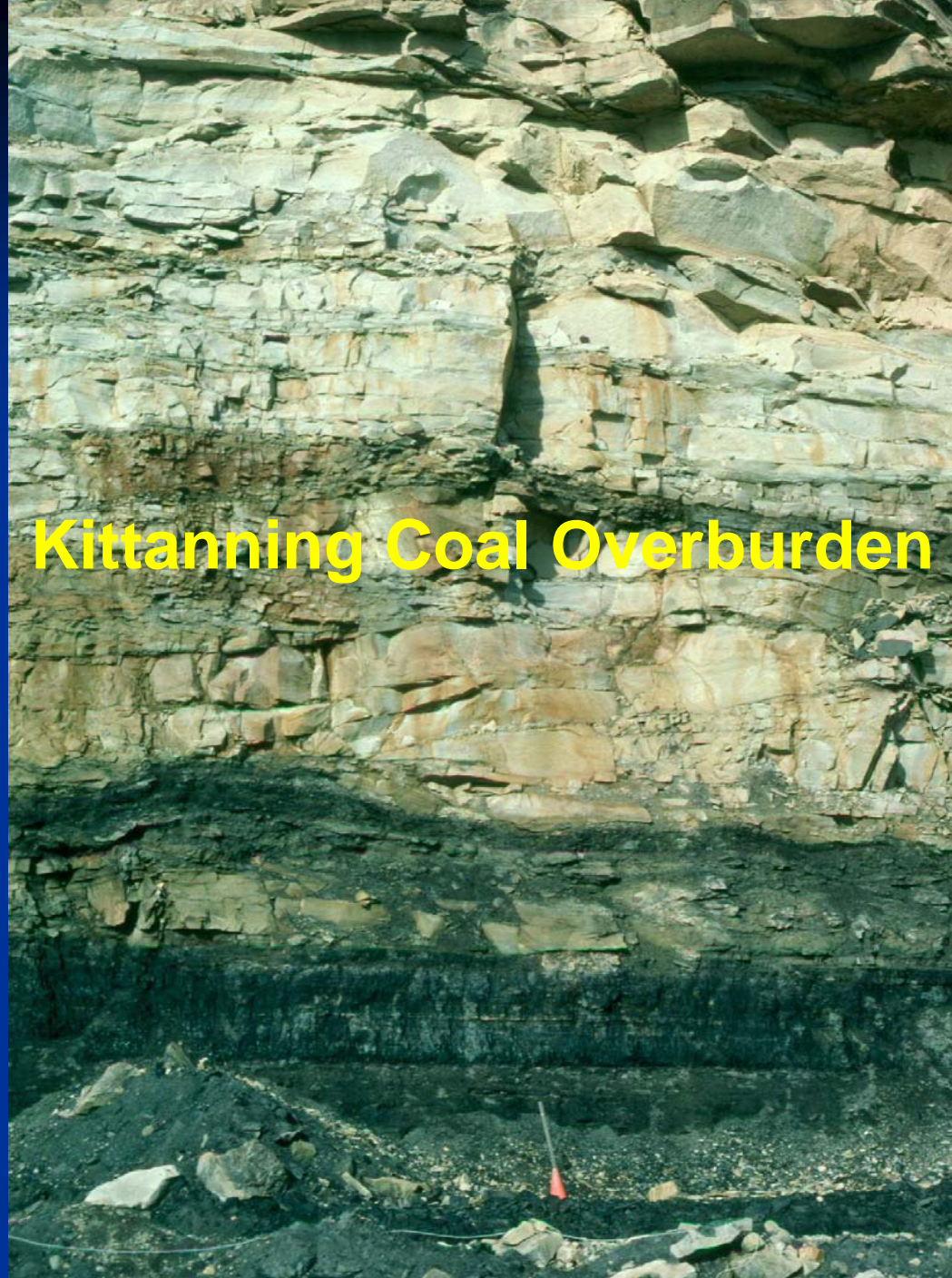


# West Virginia Surface Mine Drainage Task Force: 30<sup>th</sup> Anniversary of Formation





**Dave Callaghan**



**Kittanning Coal Overburden**



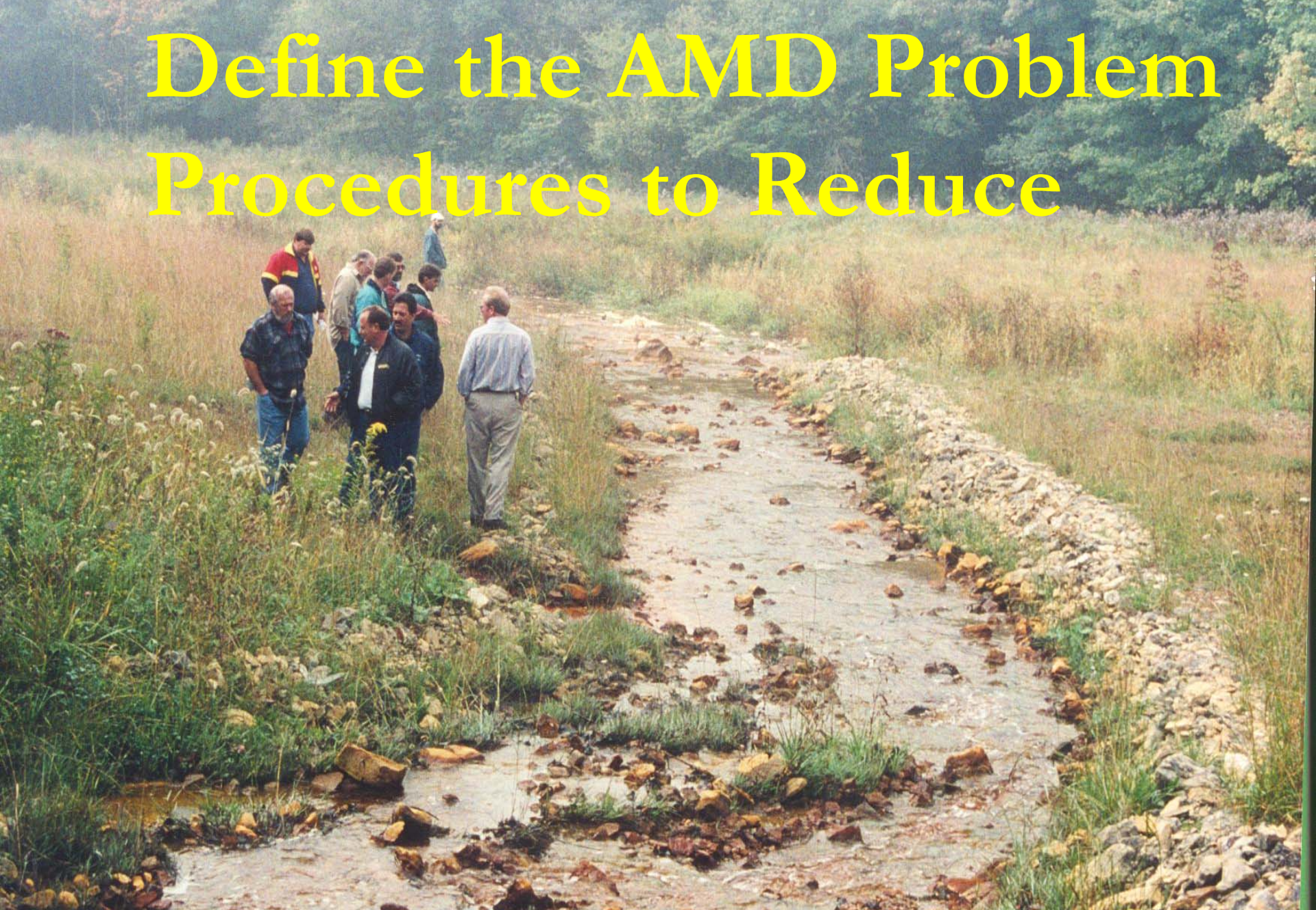
# Surface Mine Drainage Task Force

Organized in 1978





# Define the AMD Problem Procedures to Reduce





**Suggested Guidelines  
for Method of Operation  
in Surface Mining of Area  
with Potentially  
Acid-Producing Materials**

**West Virginia  
Surface Mine Drainage Task Force**

**1979**



# 1979 Bulletin

## outlined procedures for:

- ground and surface water,
- overburden analysis,
- topography and land use,
- geology,
- mining equipment,
- economic feasibility.



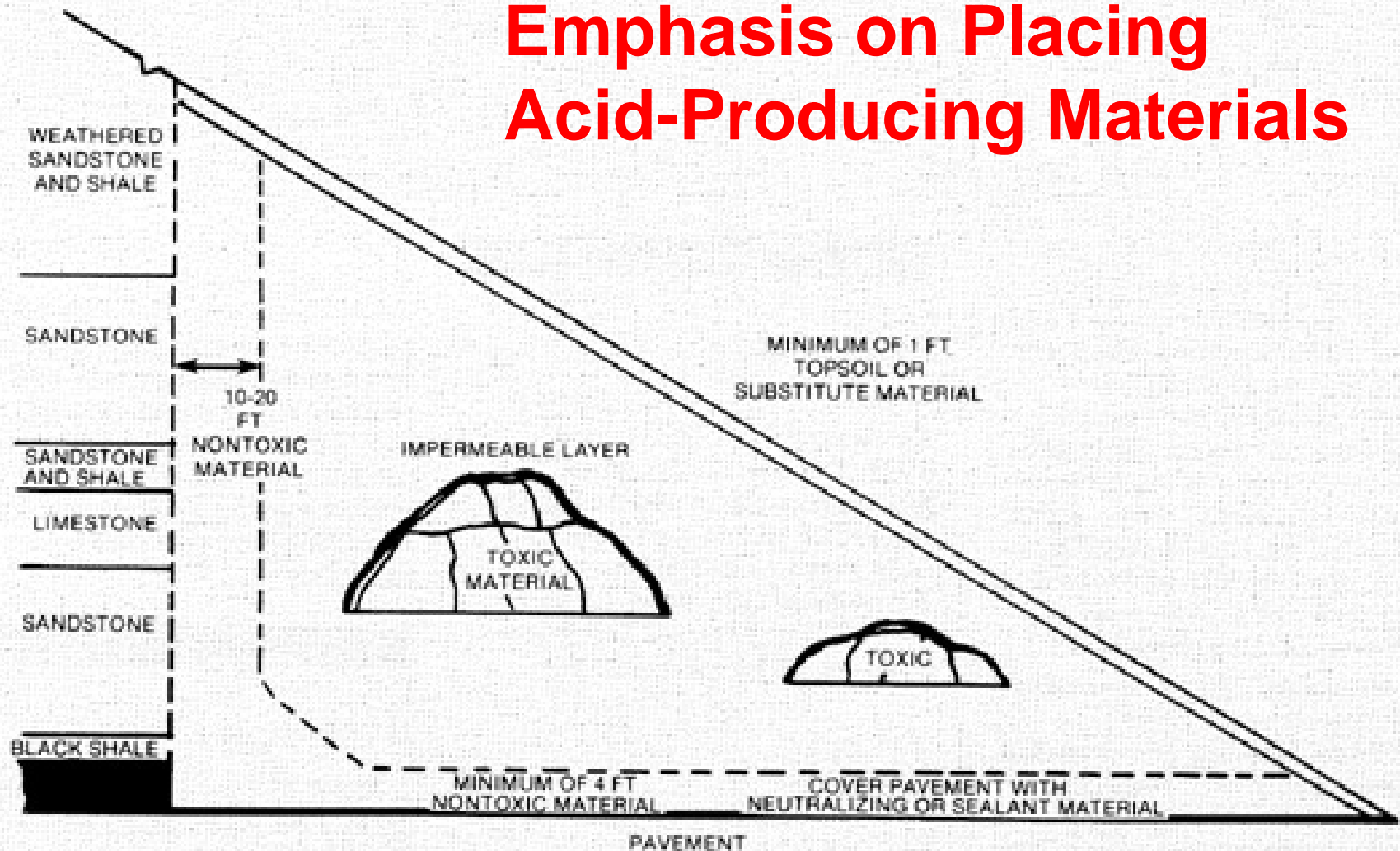
# SUGGESTED GUIDELINES

(SMD Task Force, 1979)

1. Acid-Base Account
2. Proper Placement of Materials
3. Control Water on the Site



# Emphasis on Placing Acid-Producing Materials



**Figure 11:** During construction of the backfill, toxic material should be placed off the pit floor, compacted, treated with neutralizing material, and capped with an impermeable layer to reduce air and water contact.



# **New Ideas and Technologies**

## **Broaden Task Force Objectives**

- Current AMD Research**
- AMD Control Practices**
- AMD Treatment**
- Annual Symposia**



Interest remains high!



2007 4 10



Mike Isabell



Except when some people speak!



2006 4 19





# Registration Table Lunch





Sometimes more  
happens in the halls  
and during the breaks



# PROCEEDINGS

250<sup>+</sup> papers

2008 3 29



## 28<sup>th</sup> West Virginia Mine Drainage Task Force Symposium

*April 10-11, 2007  
Morgantown, WV*

CO-SPONSORED BY  
WEST VIRGINIA MINE DRAINAGE TASK FORCE  
AND  
WEST VIRGINIA COAL ASSOCIATION

	8.5
<b>West Virginia</b>	8.0
<b>Surface Mine Drainage</b>	7.0
<b>Task Force</b>	6.5
<b>Symposium Papers</b>	6.0
<b>1980 - 1999</b>	5.5
	5.0
	4.5
	4.0





# West Virginia Mine Drainage Task Force

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Morgantown, WV  
26506-6108  
304-293-6256

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**2008 Symposium****Past Symposium  
Papers****Members****Links**

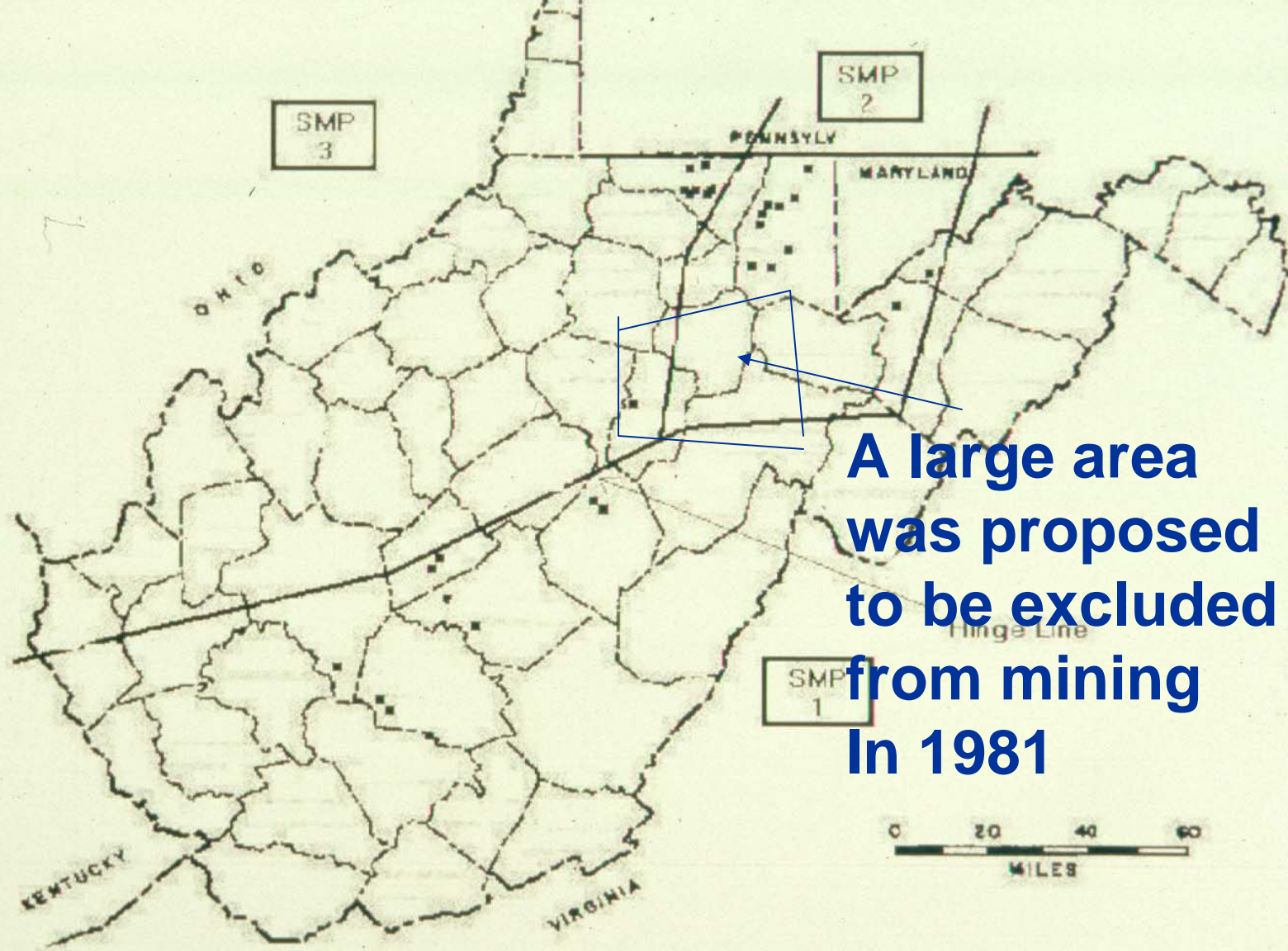


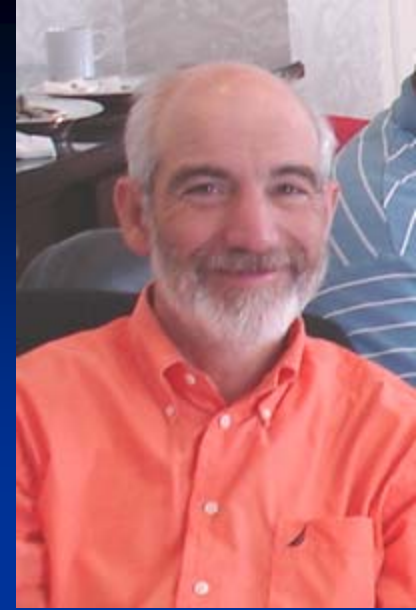
Figure 1. Map of West Virginia showing locations of 28 sites used for the Acid-Base Accounting study. Surface mining provinces 1, 2, and 3 are shown, along with the hinge line separating the northern and southern coalfields. Nine sites were found in southern WV, and 19 sites were found in northern WV.



# Acid Mine Drainage Technical Advisory Committee (AMDTAC)

<u>Member</u>	<u>Organization</u>	<u>Background</u>
David C. Callaghan	West Virginia Department of Natural Resources, Charleston, W.V.	Director
Frank T. Caruccio, Ph.D.	CARGEID and Department of Geology, University of South Carolina, Columbia, S.C.	Geochemistry of acid mine drainage, environmental hydrogeology
Gwendelyn Geidel, Ph.D.	CARGEID and Department of Geology, University of South Carolina, Columbia, S.C.	Applied Geochemistry, rock-water interactions, overburden analysis
Roger Hall, M.S.	West Virginia Department of Natural Resources, Charleston, S.V.	Reclamation, mine permitting, environmental protection
Bob Kleinmann, Ph.D.	Supervisor, Acid Mine Drainage Research Section, U.S. Bureau of Mines, Pittsburgh, P.A.	Geochemistry of acid mine drainage, microbiology of iron bacteria
Charles Miller, M.S., P.E.	Grafton Coal Company, Weston, W.V.	Industry representative; Chairman, W.V. Surface Mine Drainage Task Force
Hans Naumann, P.E.	Island Creek Coal Company, Craigsville, W.V.	Industry representative, engineering services manager
Pete Pitsenbarger	West Virginia Department of Natural Resources, Charleston, W.V.	Chief, Division of Reclamation
Jack Renton, Ph.D.	Geology Department, West Virginia University, Morgantown, W.V.; W.V. Geol. Survey	Mineral matter in coal, geochemistry of acid mine drainage
John Sencindiver, Ph.D.	Division of Plant and Soil Science, West Virginia University, Morgantown, W.V.	Overburden analysis, mine soils reclamation
Alfred Stiller, Ph.D.	Department of Chemical Engineering, West Virginia University, Morgantown, W.V.	Iron sulfide geochemistry, oxidation kinetics, reactor processes









# USING SURFACTANTS TO CONTROL ACID MINE DRAINAGE



Soap Foam in the Creeks!



Controlled Release  
BF Goodrich - ProMac

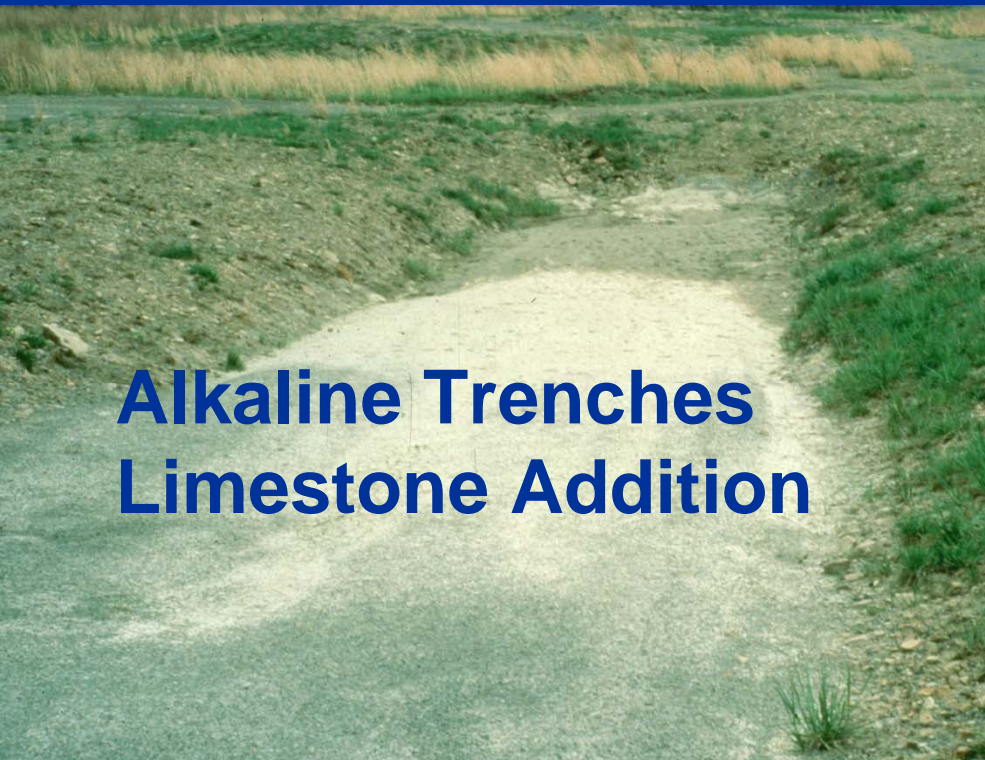


MERCER SITE

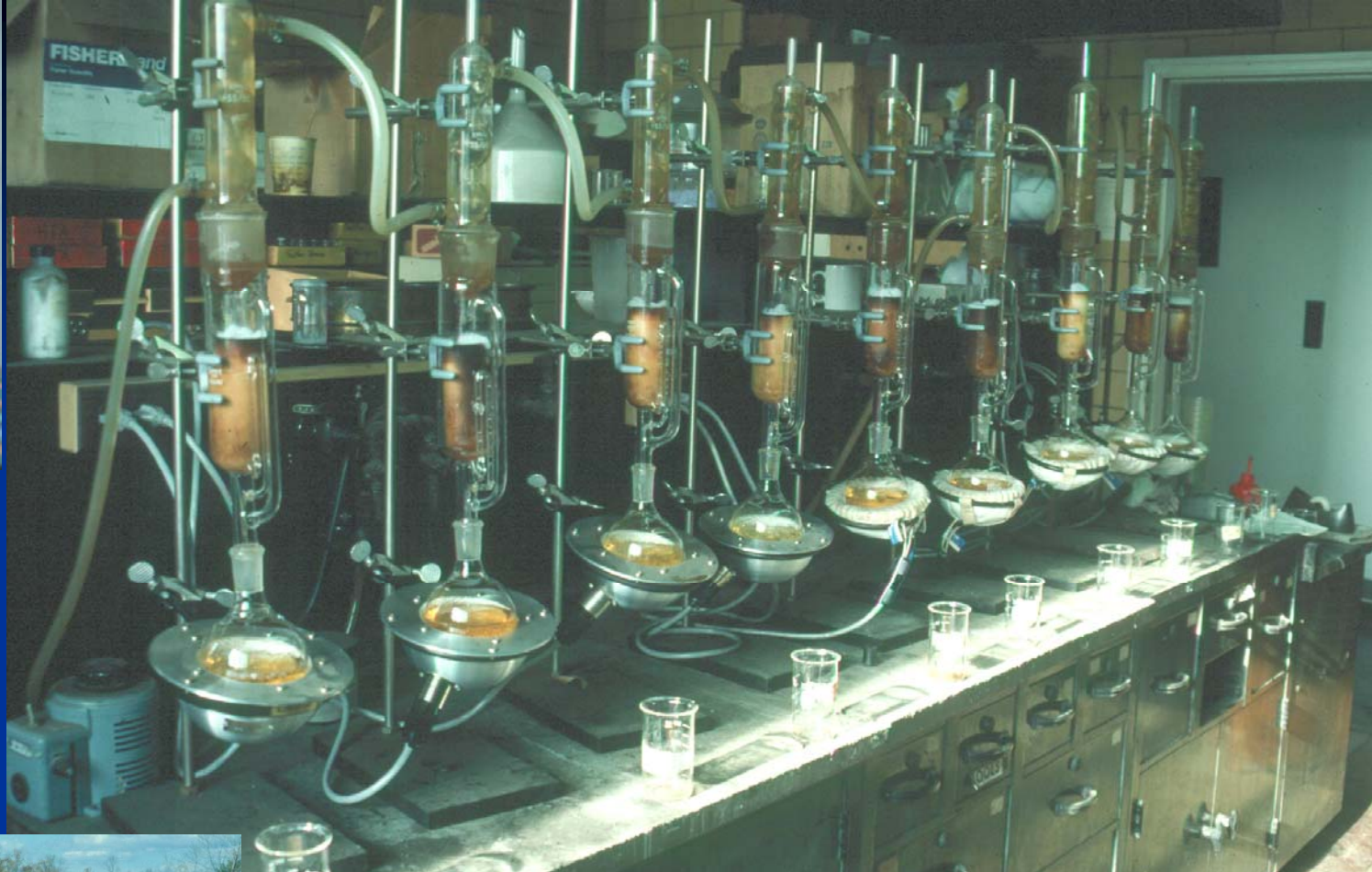
# Pseudo-karst Hydrology



Alkaline Trenches  
Limestone Addition





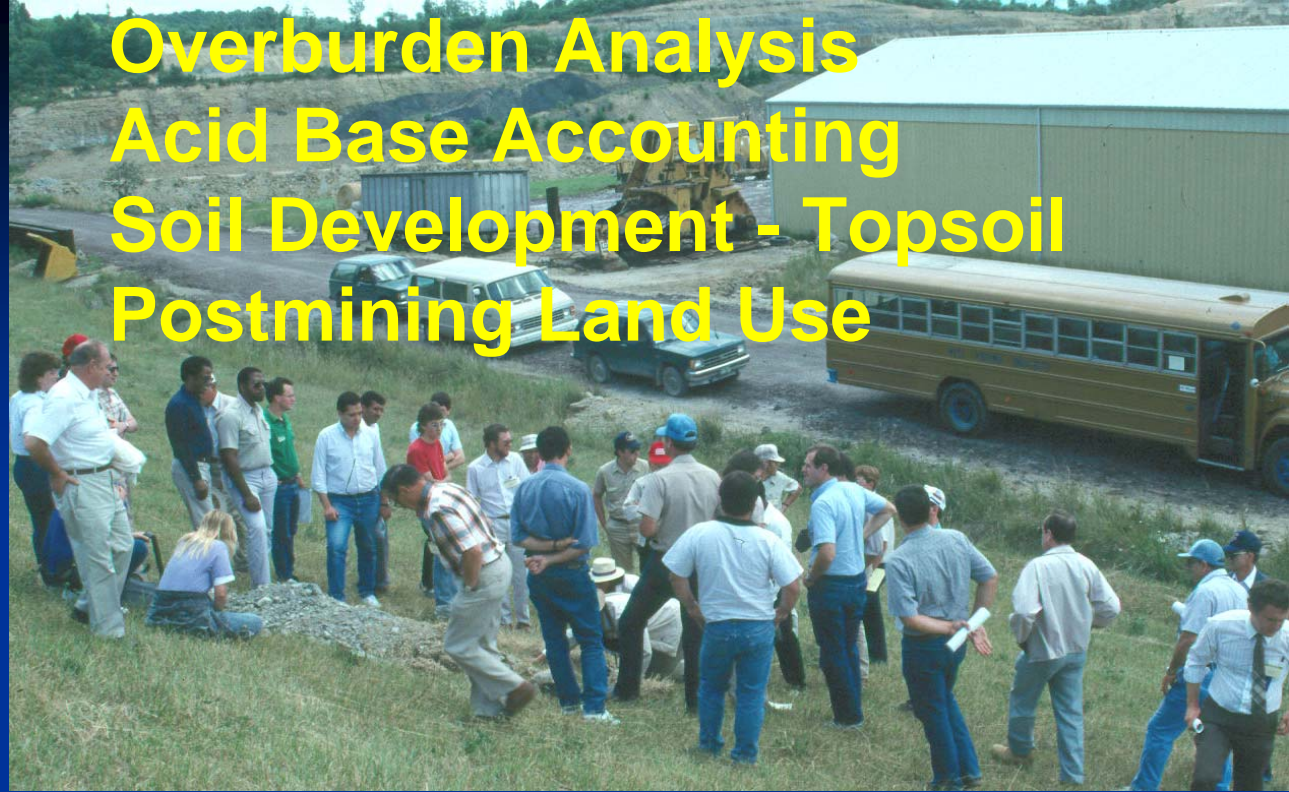


**Leaching Tests**  
**Soxhlet**  
**Pyrite Reaction and Release**  
**Phosphate Application**





# Overburden Analysis Acid Base Accounting Soil Development - Topsoil Postmining Land Use



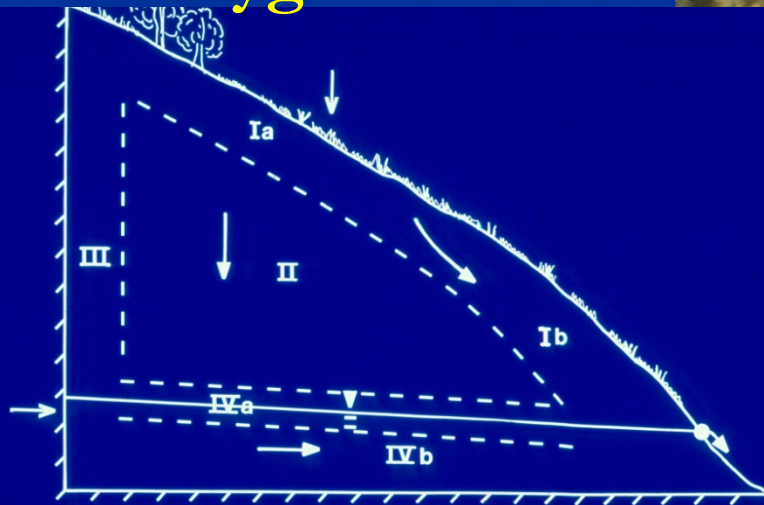


# DLM Site

Liner over refuse



## Oxygen Content





# Prong Site



## Topsoiling Clay Caps Tracers



# 1983 Symposium

All of the presentations  
at the 1983 Symposium  
were by AMDTAC members



**"The Acid Mine Drainage Technical Advisory Committee"**

**"Bactericide Control of Acid Mine Drainage"**

**"Phosphate Prevention of Acid Mine Drainage"**

**"Soxhlet Studies of Acid Generation From Coal Associated Rocks"**

**"Effect of Selected Reclamation Methods on Minesoil Properties"**

**"The Effect of Plastic Liner on Acid Loads: DLM Site"**

# Subsequent Symposia

included presentations  
by AMDTAC members



	8.5
	8.0
A Review of Procedures for Surface Mining and Reclamation in Areas with Acid-Producing Materials	7.0
	6.5
	6.0
	5.5
	5.0
	4.5
	4.0

## AMD CONTROL

- Overburden Analysis
- Handling and Placement
- Postmining Hydrology

**Update, published in 1987**

**New Ideas:**

**Alkaline Injection**

**Ammonia Treatment**

**In-Line Aeration**

**Wetlands**



# TECHNIQUES TO REDUCE AMD

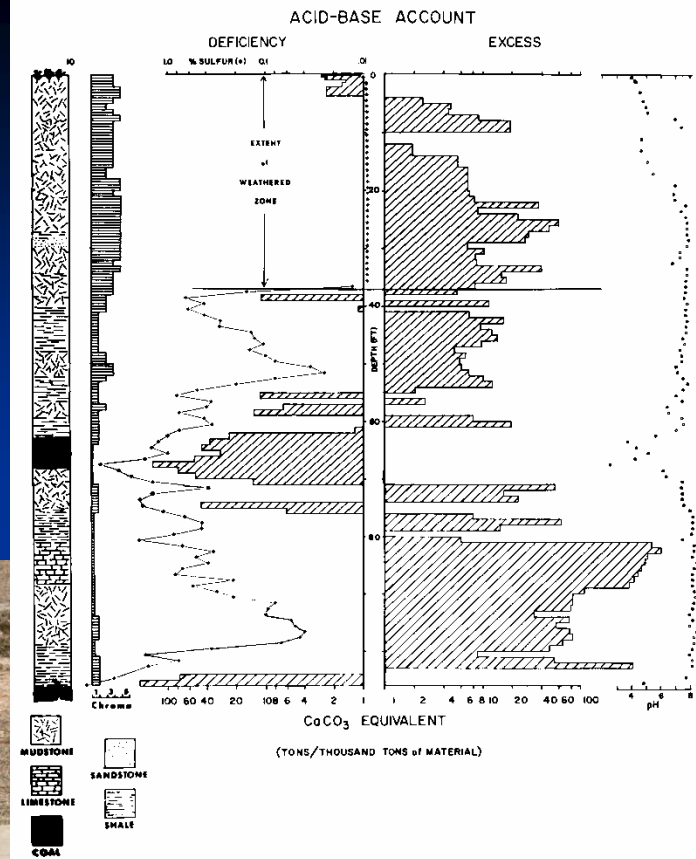
## Identify Acid and Alkaline Strata

## Mix/Blend Acid and Alkaline Materials

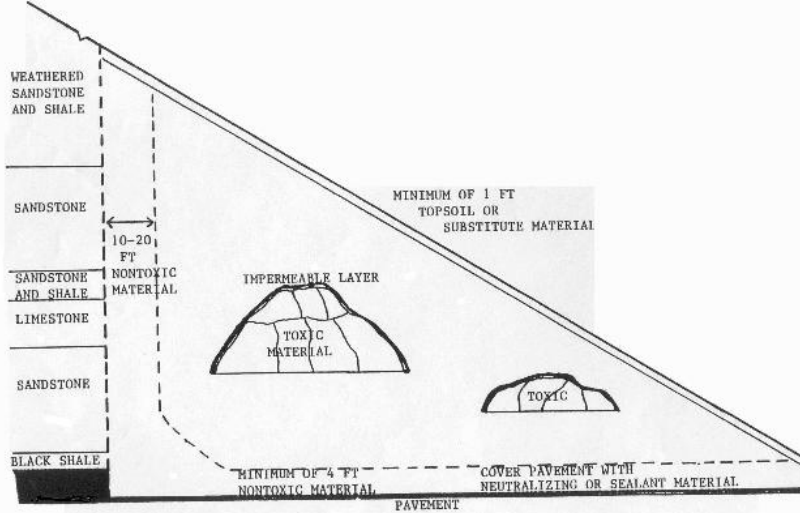
## Isolate Acid-Producing Materials

## Acid Base Accounting

## Leaching Tests







**Lime the Pit floor**



**High & Dry Placement**





**Hurry Up!  
Mine Fast!**

**Don't leave pit  
open long**



**Alkaline Addition**



# Importance of Regrading Topsoiling Revegetation





# Importance of Regrading Seeding Tree Planting





# Innovations Since 1987

## Examples of Papers



**EVOLVED GAS ANALYSIS FOR IDENTIFYING  
TOXIC OVERBURDEN MATERIALS – Hammack**

**"QUANTIFYING ALKALINITY IN COAL SPOILS AND  
LIMESTONE" - Evangelou**

**"THE MAGIC OF WATER TREATMENT" Tiff Hilton**

**"IMPPS TECHNOLOGY ON AMD ABATEMENT" -  
Jim Crawford and Jo Davison**

**"Stabilization of Combined Refuse Using Lime Kiln Dust"  
- D. Rich and K. Hutchison**

"ANOXIC LIMESTONE DRAINS IN THE PASSIVE  
TREATMENT OF AMD" - Nairn, Hedin & Watzlaf

"DIVERSION WELLS: A LOW-COST APPROACH "  
Dean Arnold

"LONG-TERM EVALUATION OF MINE SEALS IN  
RANDOLPH CO., WV 1967" Borek, Ackman, Watzlaf

"ACID PREVENTATIVE TECHNIQUES EMPLOYED  
AT ISLAND CREEK MINING COMPANY " Al Meek

"AMD TREATMENT WITH THE AQUAFIX SYSTEM"  
- Mike Jenkins



# Stowing of Limestone in Underground Mines – Burnett and Skousen



# "SUCCESSIVE ALKALINITY-PRODUCING SYSTEMS (SAPS)"

- Doug Kepler

# "EFFECT OF DIGESTION METHOD, SIDERITE CONTENT, AND FIZZ RATING ON NEUTRALIZATION POTENTIAL "

- Skousen, Leavitt, & Brady

# "THE NORTH BRANCH OF THE POTOMAC RIVER: RESULTS OF TWO YEARS OF LIME DOSING" - Joseph Mills

# "EARLY RESULTS FROM LIMESTONE SAND ADDITION"

- Peter Zurbuch

# "AMD TREATMENT WITH OPEN LIMESTONE CHANNELS"

- Paul Ziemkiewicz and Jeff Skousen

# "MANGANESE CONTAMINATED DISCHARGES" - Maggard



# "STEEL SLAG IN AMD CONTROL AND TREATMENT"

- Ziemkiewicz and Skousen

Injecting Alkaline Lime Sludge and FGD Material into Underground Mines for Acid Abatement - Jim Ashby

Special Handling and Unique Mining Practices at Fola  
– Mike Isabell

Acid-Base Accounting to Predict Post-mining Drainage Quality on WV Surface Mines - Skousen & Ziemkiewicz

Alkaline Addition Techniques in the Prevention of Acid Mine Drainage - Ron Hamric, V. Miller, J. Skousen

Geochemical Evolution of Deep Mine Discharges, Irwin Syncline, Pennsylvania - Capo

Modeling the Flooding of Below-Drainage Underground Coal Mines, Pittsburgh Coal Basin, WV-PA - Donovan & Leavitt

Longevity of Mine Drainage from Above-Drainage Underground Mines – Skousen, McDonald, Demchak, and Mack

A Computer-based Model for Estimating Mine Drainage Treatment Costs -- Brent Means

Martinka's State-of-the Art AMD Treatment Plant – Timms

Completed and Future Projects on the Cheat River and Use of TMDL Trading -- Ziemkiewicz



Hazards of Selenium for Aquatic Life - Joe Skorupa

A Preliminary Study of the Selenium Levels Found in Fishes - Ed Kirk, Randy Maggard, & Christy Mower

The Success of Remining in Pennsylvania  
- Thomas Kovalchuk

Antidegradation and TMDL Issues  
- Ellison, Campbell



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### Past Symposium Papers

Here you will find the papers presented at Task Force Symposia over the last 27 years 1980 - 2006.

Proceeding year					
1st	<a href="#">1980</a>	14th	<a href="#">1993</a>	27th	<a href="#">2006</a>
2nd	<a href="#">1981</a>	15th	<a href="#">1994</a>	28th	<a href="#">2007</a>
3rd	<a href="#">1982</a>	16th	<a href="#">1995</a>		
4th	<a href="#">1983</a>	17th	<a href="#">1996</a>		
5th	<a href="#">1984</a>	18th	<a href="#">1997</a>		
6th	<a href="#">1985</a>	19th	<a href="#">1998</a>		
7th	<a href="#">1986</a>	20th	<a href="#">1999</a>		
8th	<a href="#">1987</a>	21st	<a href="#">2000</a>		
9th	<a href="#">1988</a>	22nd	<a href="#">2001</a>		
10th	<a href="#">1989</a>	23rd	<a href="#">2002</a>		
11th	<a href="#">1990</a>	24th	<a href="#">2003</a>		
12th	<a href="#">1991</a>	25th	<a href="#">2004</a>		

**I'll have  
2008 papers  
and presentations  
up this week.**

# 1988 Task Force Tour





# 1997 Task Force Tour



# 2001 Tour





# 2004 Fall Tour to Pennsylvania for Passive Systems



OCT 21 2004



# 2005 - Jeddo Tunnel in Anthracite Region







# 2001 Task Force Symposium





# 2005 Task Force Symposium



# Older But Wiser





# Exotic Places with Wild Women!





# West Virginia Surface Mine Drainage Task Force: 30<sup>th</sup> Anniversary of Formation

