

*Announcing*

# RISH EQUIPMENT COMPANY IS NOW YOUR DISTRIBUTOR FOR DRESSER AND HAULPAK IN WEST VIRGINIA



BEN B. FAULKNER  
RT 1 BOX 673  
PRINCETON WV 24740

Contractors throughout West Virginia will be pleased to learn that Rish Equipment Co. is now the distributor for the world-class line of HAULPAK trucks and the full line-up of Dresser earth moving equipment, in addition to Komatsu.

As your HAULPAK and Dresser dealer, Rish now offers contractors a greatly expanded line of equipment. From the Model 140M 35-39.5 ton hauler to the 830E 240 ton giant, HAULPAK off-highway trucks are designed exclusively to meet the demanding conditions of construction and mining.

Add the broad line of Dresser equipment from crawler tractors and loaders to Pay loaders and scrapers, and you have it all now at one dependable dealer—Rish Equipment Co.



**Rish**  
EQUIPMENT COMPANY

**KOMATSU**

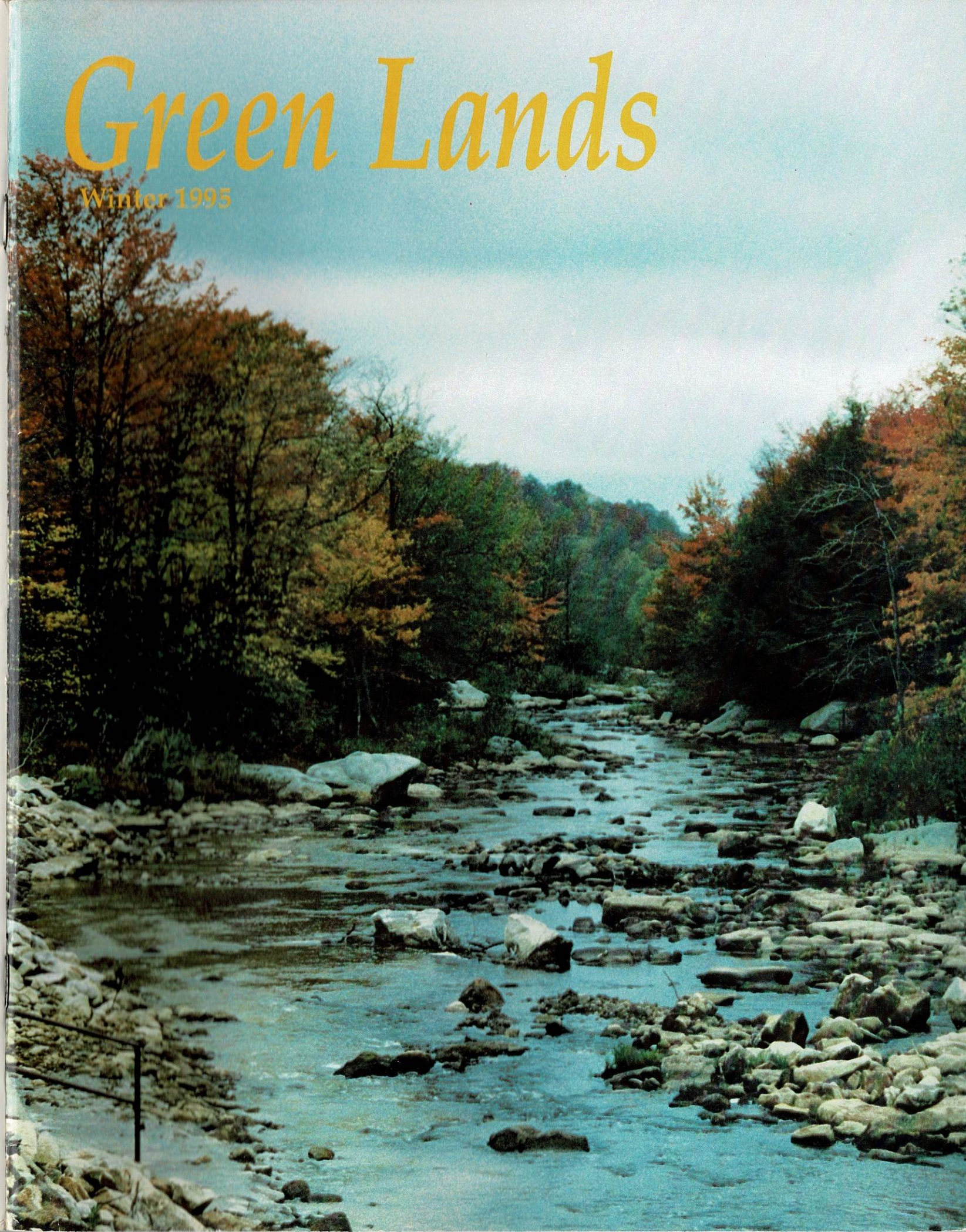
BECKLEY, WV • 304-255-4111  
BLUEFIELD, WV • 304-327-5124  
BRIDGEPORT, WV • 304-842-3511  
PARKERSBURG, WV • 304-422-8441

**DRESSER**

ST. ALBANS, WV • 304-755-3311  
COEBURN, VA • 703-395-6901  
FROSTBURG, MD • 301-689-2211

# Green Lands

Winter 1995





# The Commitment Behind The Equipment.



For more than four decades, the Rudd commitment has been the backbone of every relationship we've built. It gives our customers in the mining, construction, energy, logging, solid waste and aggregate industries confidence that their machines will be working day in and day out. Making them more productive. And more profitable.

**A commitment to support.** At Rudd Equipment Company, we not only provide a full line of trusted, recognized products to

match our customers' needs, we stand behind them with the kind of unsurpassed product support, on-site training, and parts and service back-up that you won't find anywhere else.

**A commitment to performance.** After 40 years, Rudd is still growing, increasing our investment in the industry, keeping pace with yours. So if you think you're ready for a real commitment, call Rudd Equipment today. We'll be right behind you every step of the way.



**Over 40 years serving the construction and mining industries**

Evansville, Indiana (812) 867-6661	Fort Wayne, Indiana (219) 482-3681	Indianapolis, Indiana (317) 247-9125	Louisville, Kentucky (502) 456-4050	Allen, Kentucky (606) 886-1276
Corbin, Kentucky (606) 528-9440	St. Louis, Missouri (314) 487-8925	Leetsdale, Pennsylvania (412) 322-1112	Clearfield, Pennsylvania (814) 765-8500	Nitro, West Virginia (304) 755-7788

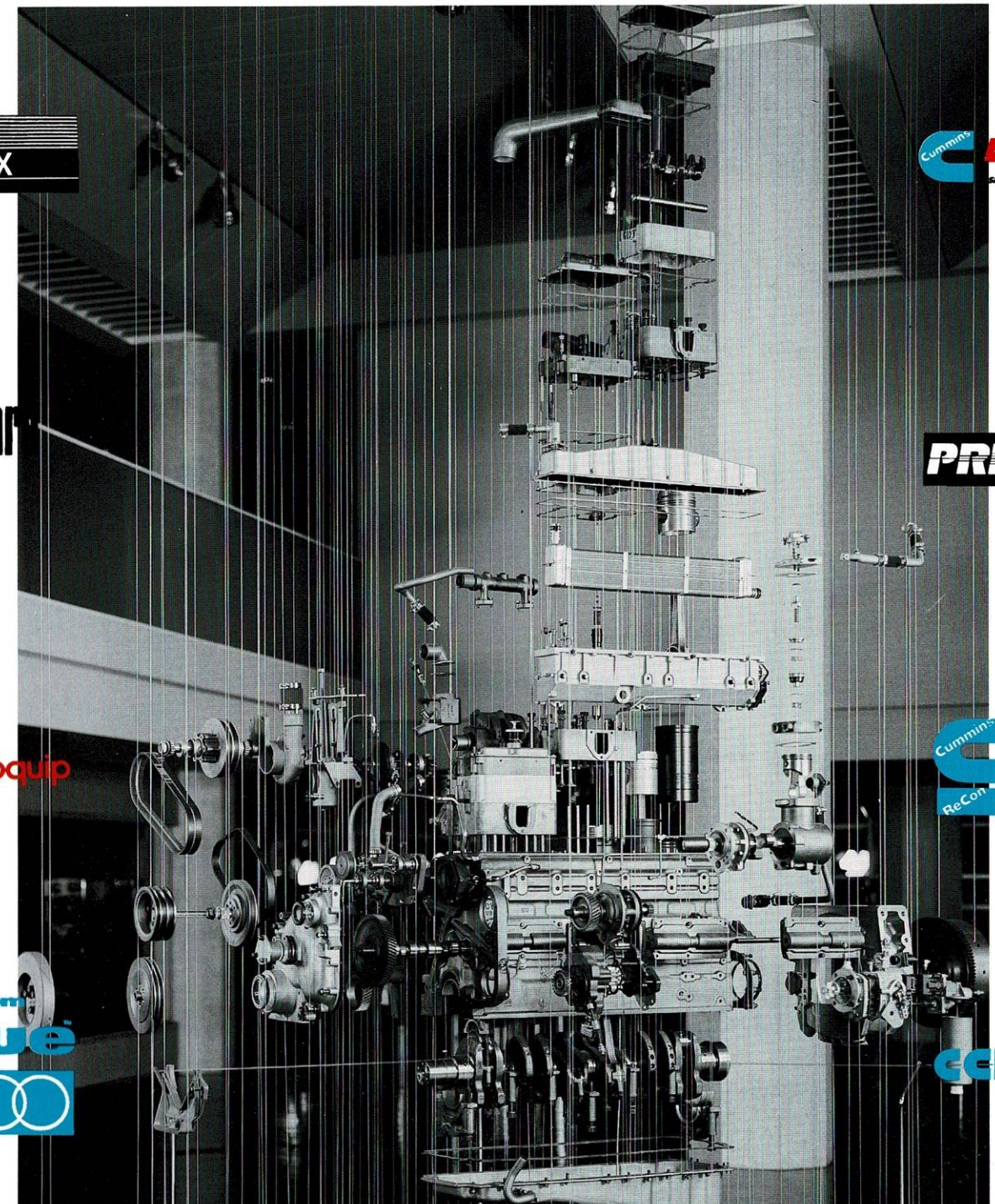
We're bringing it all together  
**Cummins Power, Parts & Service**  
along with a complete line of **AFTERMARKET PRODUCTS**

**Onan AUX**  
Auxiliary Power System

**Fleetguard**

**Aeroquip**

**Premium Blue 2000**



**EXTARDE**  
SMARTER WAY TO REPLACE

**PRELUB**

**RECON ELECTRICS**  
BUILT TOUGH AND BACKED WITH CONFIDENCE

**CEI HEAVY DUTY Batteries**

**Cummins Cumberland, Inc.**

South Charleston, WV  
(304) 744-6373

Bristol, VA  
(703) 669-4200

Hazard, KY  
(606) 436-5718

Nashville, TN  
(615) 366-4341

Fairmont, WV  
(304) 367-0196

Louisville, KY  
(502) 491-4263

Evansville, IN  
(812) 867-4400

Knoxville, TN  
(615) 523-0446



# Second Life...



# First Quality.



## With a Carter Total Machine Rebuild, the value lives on.

Carter Total Machine Rebuilds are designed to provide flexibility by offering an economic alternative to meet equipment management goals. With Caterpillar quality and the Carter commitment to customer satisfaction, a total machine rebuild demonstrates our dedication to provide products with the highest level of performance.

• Firm Price Quote • Quick Turnaround • New Machine Warranty

Call your Product Support Representative for a quote.



(800) 768-8380

# Green Lands

Volume 25 Number 1

- 8 AML program emphasizes water quality
- 18 WVMRA Day at Pete Dye
- 29 Douglas Abandoned Mine Land Project
- 42 Coal In the real classroom
- 47 Coal Calendar
- 48 Association Notebook

*Green Lands*  
is a quarterly publication of the  
West Virginia Mining & Reclamation Association,  
with offices at 1624 Kanawha Boulevard East  
Charleston, West Virginia 25311  
(304) 346-5318, FAX 346-5310.



*Our Cover*  
The scenic Blackwater River in  
northeastern West Virginia is again "environmentally  
friendly," thanks to a limestone treatment  
facility constructed with AML funds.  
Our cover story begins on page 8.

## WVMRA Staff & Board of Directors

**President**  
Benjamin C. Greene

**Vice President**  
K.O. Damron

**Assistant to the President**  
Patty Bruce

**Business Manager**  
Mary Ann Steele

**Editor**  
Daniel Miller

**OFFICERS**  
**Chairman**  
Sidney R. Young, III - Gilbert  
**First Vice Chairman**  
K. Donald Nicewonder - Bristol, VA

**Second Vice Chairman**  
Markus J. Ladd - Wharndcliffe

**Secretary**  
James C. Justice, II - Beckley

**Treasurer**  
Wayne H. Stanley - Bridgeport  
**Associate Division Chairman**  
J. Christopher Supcoe - Charleston

**Directors**  
J. W. Anderson - Princeton  
F. L. Barkofske - Fairview Hts., IL  
D. L. Blankenship - Richmond, VA  
K. J. Bealko - Clarksburg  
R. B. Bolen - Beaver  
W. E. Broshears - Charleston  
J. R. Bryan - Lebanon, VA  
R. D. Cussins - Bayard  
B. E. Dearth, Jr. - Shinnston  
D. R. Donell - Weirton  
J. H. Harless - Gilbert  
D. E. Huffman - Bridgeport  
P. F. Hutchins - Columbus, OH  
T. W. Hylton - Beckley  
P. A. Laskody, Jr. - Morgantown

D. E. Long - Yolyn  
J. B. Rader - South Charleston  
R. L. Raines - Bluefield  
G. W. Ramsburg - Clarksburg  
J. C. Smith - Charleston  
L. A. Streets - Mt. Storm  
E. F. Surgeon - Louisville, KY  
J. C. Williamson - Charleston  
K. G. Woodring - Huntington

**Honorary Members**  
C. E. Compton - Clarksburg  
L. W. Hamilton, Jr. - Hansford  
J. C. Justice, Sr. 1924-1993  
F. B. Nutter, Sr. - Pompano Beach, FL



MT. STATE BIT SERVICE, INC.

- Air Trac drilling supplies
- Security bits
- Raven pumps

- Contract Blasting
- Equipment hauling
- Blasting Accessories
- Water treatment chemicals

**Your Full Line Explosives Distributor Since 1962**

1-304-296-1783 or 1-800-352-8322

PO Box 4300, Morgantown, West Virginia 26504

## Index to Advertisers

Acordia of West Virginia.....	38	Kimberly Industries.....	7
Anderson of West Virginia .....	15	McGrew Tire .....	41
Akers Supply.....	44	Massie Reclamation.....	21
Beckwith Machinery.....	inside back cover	Miller & Miller.....	50
Bell Farms Reclamation Service.....	14	Morton Specialty Insurance Partners.....	47
Bridgeport Trucking.....	41	Mt. State Bit Service.....	4
Ca. ter Machinery.....	2	National Ammonia.....	22
Chapman Printing.....	28	Nell Jean Enterprises.....	45
Cecil I. Walker Machinery.....	23	New Directions Media.....	45
Crown Hill Equipment .....	6	Ohio Seed.....	14
Cummins Cumberland.....	1	Penn Line Service.....	40
Eagle Carbon.....	46	Pentree.....	22
Flat Top Insurance.....	5	Petroleum Products.....	22
Guyan Machinery.....	20	Rish Equipment.....	back cover
Heavy Machines.....	16	Rudd Equipment.....	inside front cover
Hotsy Equipment.....	44	Stowers & Sons.....	21
ICI Explosives .....	39	Terra Engineers.....	45
Ingersoll Rand.....	15	TerraSod.....	46
J & G Seeding .....	44	Triangle Surety Agency .....	44

SERVING AMERICA'S COAL INDUSTRY

**NINETY-SIX YEARS OF  
DEPENDABLE SERVICE**

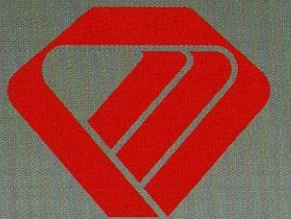
The 21st Century is rapidly approaching and with it unprecedented change. The traditional ways of doing business are undergoing close scrutiny. More efficient ways of going about the business of harvesting the nation's most abundant energy source are moving from drawing boards to coalfields.

The methods employed to return the land to an environmentally approved state are also being constantly evaluated and upgraded.

Through it all, there's been one insurance agency that has worked alongside the coal industry, from 1897 to today. That agency is Flat Top Insurance. For more than 96 years, Flat Top Insurance has been at the cutting edge of industry change, always available and ready to assist the coal industry as it meets each new challenge.

The specialists at Flat Top Insurance lend valuable assistance in the important reclamation bond requirements and in many other areas of insurance for the coal industry. We invite you to check us out and see for yourself why, for more than 96 years, Flat Top Insurance has been a leader in the insurance field in serving the nation's most abundant and valuable energy source.

FLAT TOP  
INSURANCE

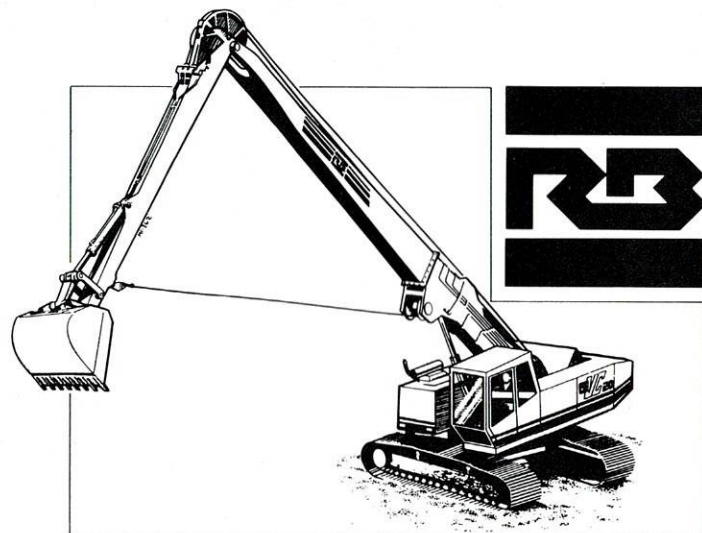


320 Federal Street • Bluefield, WV 24701 • 304/327-3421  
1520 Kanawha Blvd. East • Charleston, WV 25311 • 304/346-0414  
Rt. 52 • Guyandotte Avenue • Gilbert, WV 25621 • 304/664-2056  
1000 Hampton Center - Suite E • Morgantown, WV 26505 • 304/598-3660  
858 Mercer Street • Princeton, WV 24740 • 304/425-2176  
Main Street • P.O. Box 1960 • Grundy, VA 24614 • 703/935-2486  
1701 Euclid Avenue • Weberling Building - Suite F • Bristol, VA 24203 • 703/466-9121  
620 Park Avenue • Norton, VA 24273 • 703/679-2222

*Division Offices:*

Bluefield, WV • 304/327-3421 ♦ Charleston, WV • 304/346-0414  
Knoxville, TN • 615/637-0311 ♦ Pikeville, KY • 606/437-7361





— THE VC —  
**RANGE**  
 HIGH CAPACITY  
 AND LONG REACH



**Crown Hill Equipment, Inc.**

Box 210, Hansford, WV 25103-0210

304/595-4111

inside WV 1-800-950-4445

**HEAVY/HIGHWAY CONSTRUCTION**

# You Want It Done Right.

When the job has to be done right, you want Kimberly Industries, a company that understands your needs. You can expect high-quality work using the latest technology, performed in a safe and timely manner.

Call Kimberly for:

- ▶ mine construction
- ▶ mine development
- ▶ mine reclamation
- ▶ refuse dam construction

For more information, call John H. Wellford, III or J. Steven Cvechko at 346-3775.

**Kimberly Industries®**

The *Get it done right* Company





This million dollar Limestone Station has effectively restored several miles of the Blackwater River. Other outstanding examples of AML work in the past year appear on the following pages.

## AML program emphasizes water quality

West Virginia's Abandoned Mine Lands program has developed a certain consistency, collecting regular appropriations from the federal government, and putting West Virginians to work improving the environment, all at no cost to the taxpayer.

Specific projects are planned, bid and carried out according to a priority list of criteria established by the original Surface Mining Control Act. From a practical standpoint, this has meant that the lion's share of the funds have gone to reclaim the hundreds of coal refuse piles that dot West Virginia's landscape.

Recently, however, AML has diverted more attention and funding to water quality situations. An outstanding example is the Blackwater River Limestone Station which was dedicated in late September. Constructed with more than \$1 million in AML funds on the banks of the Blackwater River in scenic Tucker County, the station was designed to raise the pH of six miles of the river, which had suffered from acid drainage from old upstream abandoned mines.

"This facility has succeeded beyond our most optimistic expectations," said West Virginia AML Chief Pete Pitsenbarger. "We were able to measure the effects within a week after the facility went into operation, and the pH now stands between 6 and 7, squarely in the middle of the neutral range. The treatment also extended much further downstream than we anticipated."

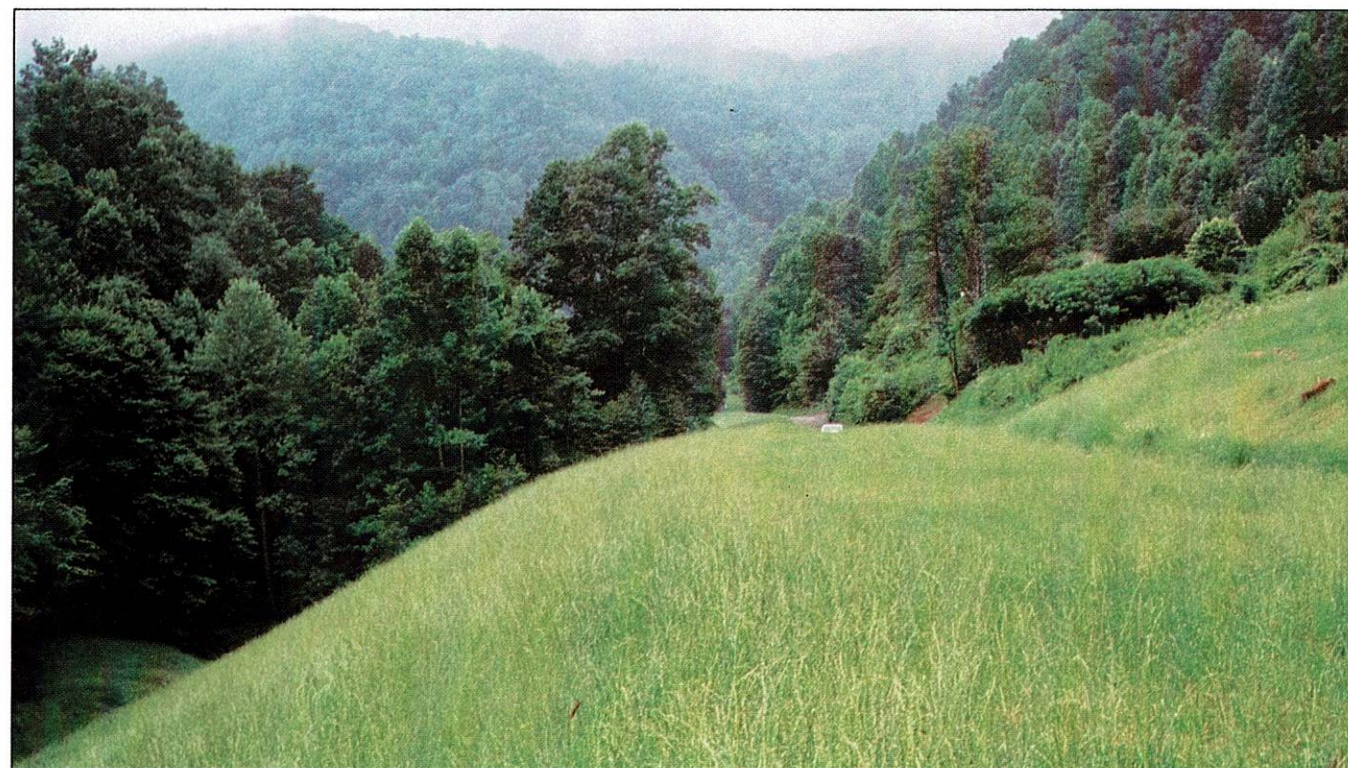
The station, which is powered by stream flow, contains six drums which feed limestone directly into the river at a rate dictated by the force of the water flowing through it. According to Pitsenbarger, the station is monitored daily, but could operate unmanned for a week.

The federal Office of Surface Mining has been collecting 35¢ a ton on surface mined coal and 15¢ a ton on underground production since 1977. The State AML program is funded by federal "grants" amounting to about half of the taxes collected from state mining operations. Each year the AML Section of the West Virginia Division of Environmental Protection formally applies for its share of the funds for construction (reclamation), administration and emergencies, as well as specific funds for acid mine drainage treatment and for water quality in general. In fiscal year 1994, the grant was for \$25.9 million. This year, State officials are confident of receiving the full application of \$31.5 million.



Rocklick - Fayette County

Contractor - Green Mountain Co.



Jim's Branch - Wyoming County

Contractor - Garcie Marker & Sons





**Kimball - McDowell County**

Contractor - **Pioneer Construction Co.**



**Red Hollow - Mercer County**

Contractor - **Pioneer Construction Co.**



**Albert Highwall - Tucker County**

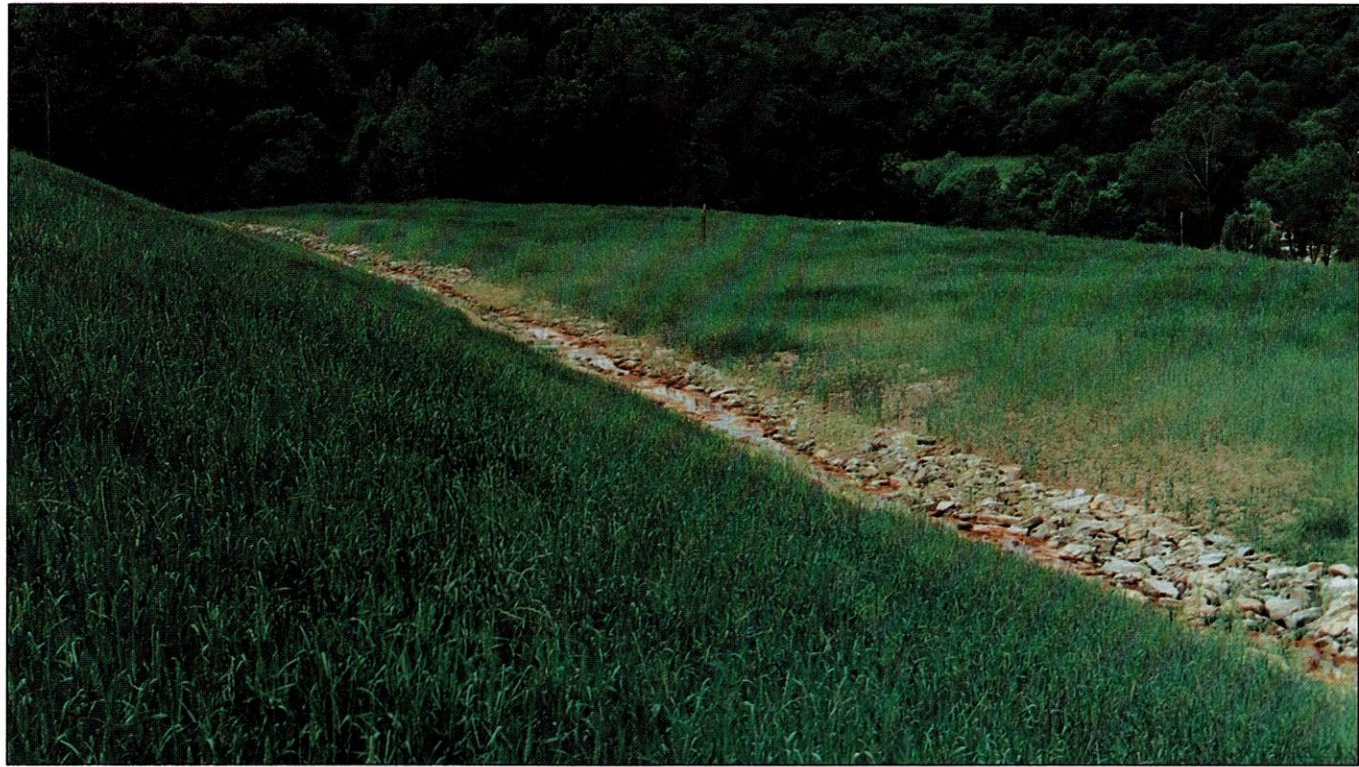
Contractor - **Fairfax Trucking Co.**



**Mingo Run - Brooke County**

Contractor - **Landscaping & Reclamation Co.**





**Florence Hollow - Harrison County**

Contractor - **Garcie Marker & Sons**



**Mount Clare Refuse - Harrison County**

Contractor - **Wayne Concrete**



**Weaver Highwall - Randolph County**

Contractor - **Grafton Coal Co.**



**Beatty Church Portals - Preston County**

Contractor - **General Paving**



# Tradition Proud. Technology Wise. Leading The Way Into The Future. Today's LeTourneau.

In surface mines and heavy construction sites around the world, the complete line of LeTourneau loaders has established a tradition of engineering and manufacturing excellence unparalleled in the industry. From the exacting blend of special alloy steel used in frames, lift arms and buckets to micro-machined gearing and hand-assembled solid-state circuit boards, quality and durability are priority one.

Utilizing proven diesel-electric power with the lowest center of gravity, LeTourneau loaders operate at a constant engine speed for superior fuel savings and longer engine life. Computerized, no-spin torque is individually controlled to each traction motor, so if traction is lost at one wheel, power is instantly redistributed to the other drive wheels.

LeTourneau loaders offer the most complete range of efficient and productive buckets precisely sized for any material, with solid-state controls providing faster cycle times and greater productivity than any comparably-sized loader.

Superior safety features include an acoustically advanced operator's cabin design with non-obstructive integral ROPs and sloped rear cowling for unequalled visibility. The primary regenerative dynamic-retarding brake system brings the loader to a complete stop, with secondary air-operated disc brakes mounted on each motor.

And when it comes to state-of-the-art technology, LeTourneau continues to lead the pack. The generators, traction motors and solid-state electronic controls are the most advanced in the industry, with interchangeable modular components for easy service and maintenance access.

So when only the best-built, finest quality, most productive loader will do, look to today's LeTourneau. Tradition proud and technology wise.



**HEAVY  
MACHINES  
INC.**

100 SMILEY DR.  
P.O. BOX 430  
ST. ALBANS, WV 25177  
(304) 755-7000  
FAX: (304) 755-1045 PARTS  
FAX: (304) 755-1047 OFFICE  
(800) 362-3761

## Loaders From Today's LeTourneau

	L-1000	L-1100	L-1400
Operating Payload			
Standard .....	51,000 lbs. (23,133 kgs.)	66,000 lbs. (29,937 kgs.)	84,000 lbs. (38,102 kgs.)
High Lift .....	48,000 lbs. (21,773 kgs.)	60,000 lbs. (27,216 kgs.)	78,000 lbs. (35,381 kgs.)
SAE-Rated Bucket Capacity			
Standard .....	17 yd <sup>3</sup> (13.00 m <sup>3</sup> )	22 yd <sup>3</sup> (16.82 m <sup>3</sup> )	28 yd <sup>3</sup> (21.4 m <sup>3</sup> )
High Lift .....	16 yd <sup>3</sup> (12.00 m <sup>3</sup> )	20 yd <sup>3</sup> (15.29 m <sup>3</sup> )	26 yd <sup>3</sup> (19.9 m <sup>3</sup> )
Dump Heights			
Standard .....	18'-5" (5.61 m)	18'-10" (5.74 m)	21'-6" (6.55 m)
High Lift .....	19'-10" (6.04 m)	20'-0" (6.10 m)	23'-6" (7.16 m)





A spectacular fall West Virginia day combined with the natural beauty of the Club to provide a memorable outing.

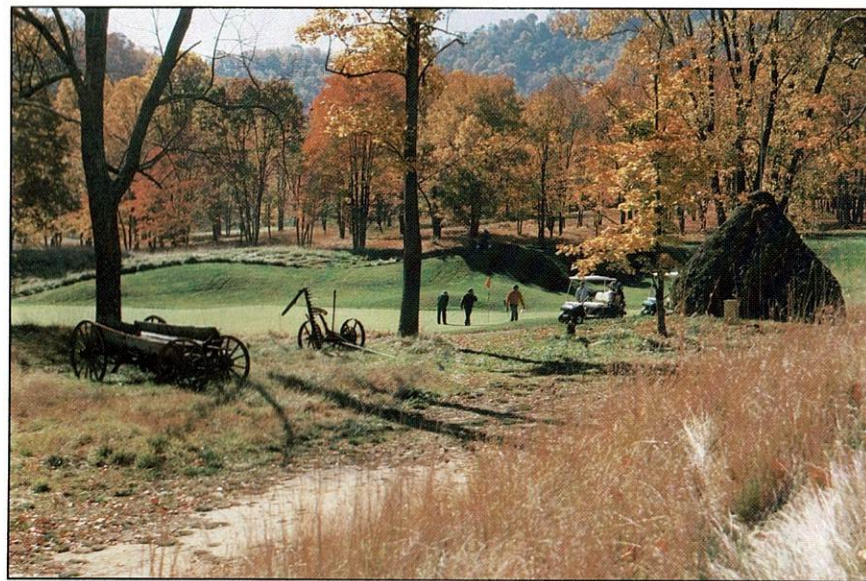
## WVMRA Day at Pete Dye

Some 140 WVMRA members and guests were treated to a round on West Virginia's newest championship golf course in mid-October, as Jim Larosa ordered up a perfect fall day to show off his newly completed Pete Dye Golf Club, near Bridgeport.

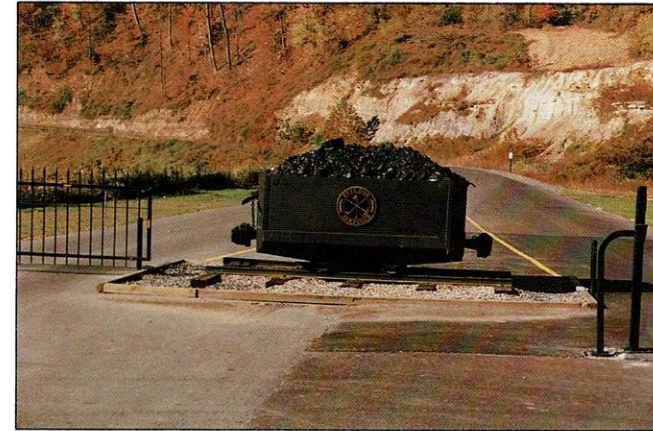
The Club, featured in the Summer, 1993 edition of **Green Lands**, is maturing nicely, with the opening of the back nine this fall securing its place among the finest golf courses in the region.

Designed by, and named for, famed golf architect Pete Dye, the course skillfully combines rustic West Virginia beauty with the natural heritage of the surrounding countryside.

Billed as a "national private club," Pete Dye has drawn visitors from Nevada, Florida, New York and many points between.



The Pete Dye Club has retained the character of its former incarnations as an Indian hunting ground, coal mine and farm land.



An impressive gateway reflecting the area's coal heritage now guards the entrance to the Pete Dye Golf Club.



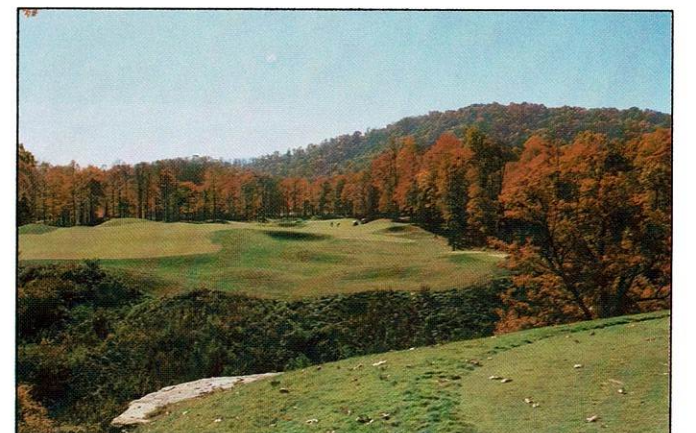
Newcomers to the Pete Dye Golf Club were uniformly impressed with West Virginia's latest golf oasis.



Members enjoyed the crisp outdoor setting as well as LaRosa hospitality on the Club's lunch deck.



Repeat visitors agreed that the Club grows more mature and beautiful with each visit.





# A Leader in the Coalfields Introduces An Innovator in Rotary Drills.

## Guyan and REICHdrill for Power, Price and Performance

Guyan Machinery Company has been satisfying its customers since 1913. And with that kind of reputation, it's easy to understand why our Heavy Equipment Division knows the needs of your business so well. We provide flexibility, service, reliability and quality...all at prices you'll appreciate.

That's why Guyan is now a distributor for REICHdrill Crawler Mounted Rotary Drills in sales, parts and service. They're engineered like no other drill in the world, with easy-to-operate design, safety features, unsurpassed performance and an exclusive new Cushion-Air-Centralizer™ bushing assembly.



**A Division of Guyan International**  
P.O. Box 150  
Chapmanville, West Virginia 25508  
(304) 855-4501 or 1-800-999-3888

Stand back and

# Watch Us Grow!

## Massie Reclamation, Inc.

We specialize in

- hydroseeding
- tree planting
- straw blowing

P. O. Box 396  
Shady Spring, West Virginia 25918

Charles Massie, Owner  
(304) 787-3933



## Stowers & Sons

### TRUCKING

- Heavy Hauling
- Boom Trucks
- Winch Trucks
- Dump Trucks
- Water Trucks

### EXCAVATING

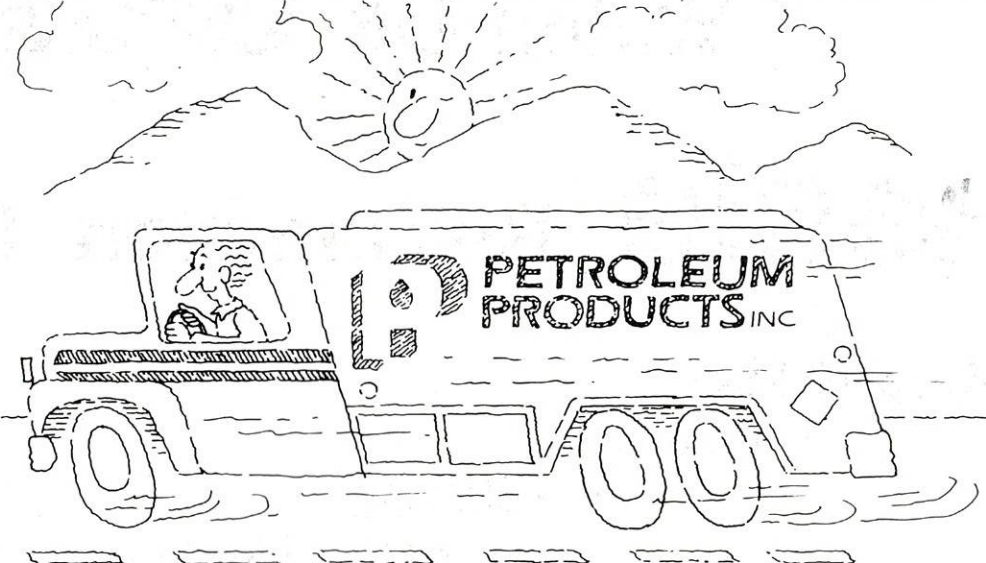
- Construction
- Reclamation
- Hydroseeding
- Pipeline Construction
- Equipment Rental

P.O. Box 368  
Hamlin, WV 25503

Hamlin 304-824-5136  
Charleston 304-727-4721

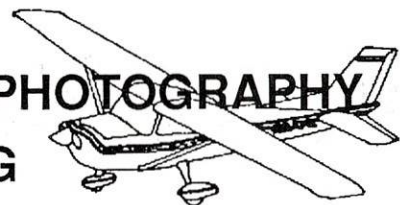


"Oil is Our Product... Service is Our Business."



Charleston (304) 926-3000 Logan (304) 752-3900 Beckley (304) 256-3000

## AERIAL PHOTOGRAPHY MAPPING PHOTOGRAMMETRISTS



Specializing in coal stockpile volumes & stripmine and construction excavation quantities.

Centrally located to southern West Virginia, Eastern Kentucky and Western Virginia with 25 years continuous experience in photogrammetry.



P.O. BOX 1309 • PRINCETON, WV 24740 • 304-425-9581

SIGN OF DEPENDABILITY SINCE 1890



## NATIONAL AMMONIA

A Division of Tanner Industries, Inc.

(215) 535-7530 - FAX (215) 743-7013

Ed Weiss 5811 Tacony St.  
Sales Manager Philadelphia, PA 19135



Walker

CAT



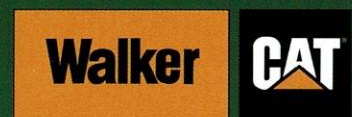


# It's Our Home, Too.

West Virginia is home to many folks and creatures. The fine work of Kimberly Industries, through the Abandoned Mine and Reclamation program, is reflected in restoring habitat for our furred and feathered friends at Bear Run, Gilmer County.

Walker Machinery is proud to support and provide Caterpillar equipment for such worthwhile projects.

After all —  
It's Our Home Too.





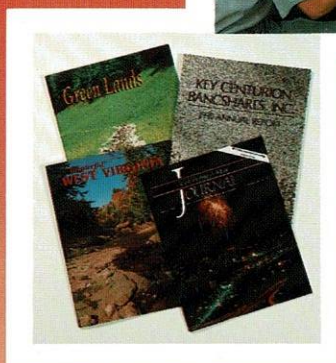
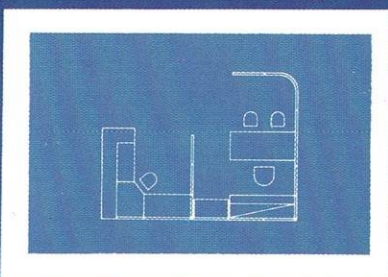
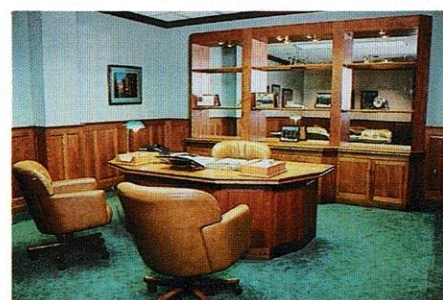


It's Our Home, Too.





# What Happens When Stars Collide . . .



OFFICE SUPPLIES  
INTERIOR DESIGN  
OFFICE FURNITURE  
DATA SUPPLIES  
BUDGET OFFICE FURNITURE  
PREOWNED FURNITURE

ELECTRONIC COLOR RETOUCHING  
SEPARATIONS  
PHOTOGRAPHY  
TOTAL CONCEPT PRINTING

## THE CHAPMAN PRINTING COMPANY, INC.

*A Division of Champion Industries, Inc.*

*Stationer's*  
INCORPORATED  
*Your Office Supplier*

2450-90 1ST AVENUE  
P.O. BOX 2968  
HUNTINGTON, WV 25728  
(304) 528-2791

1565 HANSFORD STREET  
P.O. BOX 2029  
CHARLESTON, WV 25327  
(304) 341-0676

405 ANN STREET  
P.O. BOX 2001  
PARKERSBURG, WV 26102  
(304) 485-8596

890 RUSSELL CAVE ROAD  
P.O. BOX 12370  
LEXINGTON, KY 40583  
(606) 293-2661

STATIONERS SHOWROOM  
1945 5TH AVENUE  
HUNTINGTON, WV 25703  
(304) 528-2780

## Douglas Abandoned Mine Land Project Description of an Innovative Acid Mine Drainage Treatment System

by Jeff Skousen, West Virginia University

### Introduction and History

"Coketon" is the term for the central mining facility of the Davis Coal & Coke Company between Thomas and Douglas, West Virginia. Located along the North Fork of the Blackwater River in Tucker County, Coketon was an integral part of the vast and productive industrial complex of Henry G. Davis. In 1884, the railroad reached Thomas where the Davis Coal & Coke had already begun active mining operations. Around the turn of the century, approximately 400 houses centered around the roundhouse and machine shops, and the valley was home to about 1,500 people. The community of Thomas boasted an opera house, hotels, banks, schools, and fraternal orders uniting 18 nationalities into the little city.

In the center of the Davis operation was a large coking facility on a mile and a half stretch of the North Fork between Thomas and Douglas. An 1887 experiment with two ovens convinced the coal company that a coking facility would be very profitable. The coal company converted raw coal into coke, the purest form of carbon and the most important by-product of coal. Coke was the premier "reducing agent" fuel in the world at the time, capable of smelting iron ore rapidly into steel through the Bessemer process. In the late 1800's, coke was produced by baking coal in huge stone or brick ovens until its impurities were driven off. The types of impurities driven out of the coal was a function of the amount of oxygen allowed into the oven (which was controlled by doors on the front of the oven) and the resultant temperature in the oven. It required nearly two tons of raw coal to produce one ton of coke. Long rows of "beehive" coke ovens, linked by tracks to the mine and tipple, burned night and day, tended by hundreds of laborers.

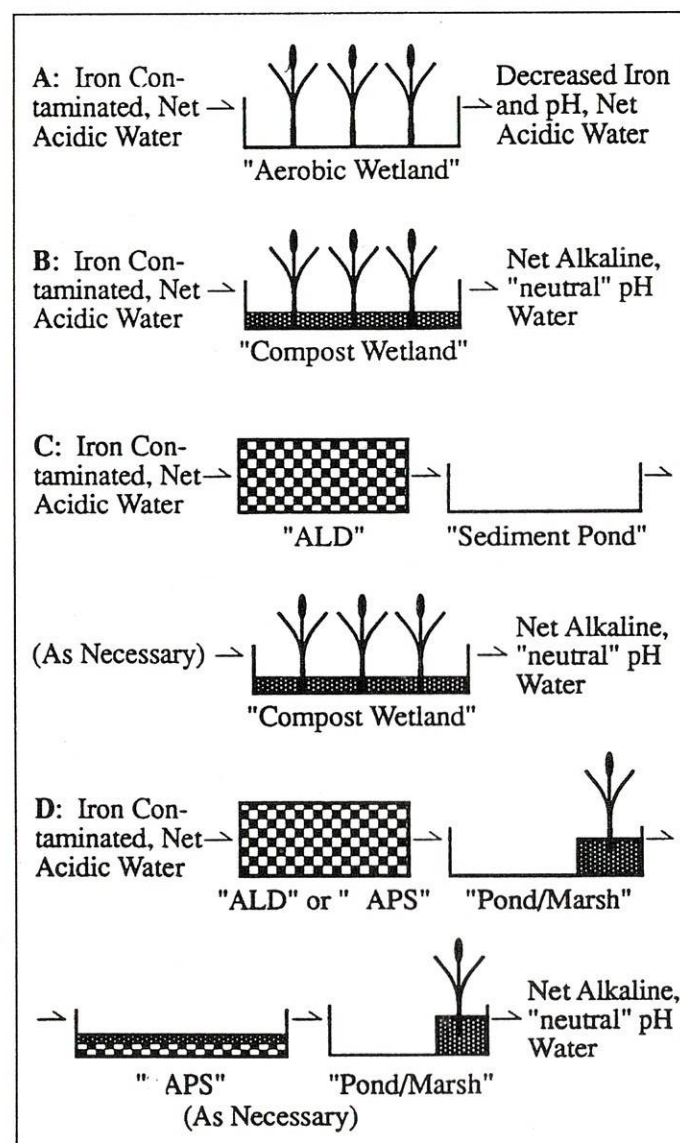
Eventually, Coketon contained 600 ovens. The Davis Coal & Coke Company's cokeyards employed about 150 men and burned for 250 days a year. By 1900, Coketon made Tucker County the third largest coke-producing county in the state. In 1904 alone, Coketon produced 200,000 tons of coke. During each year from 1915 to 1921, the fifteen mines near Coketon shipped over 1 million tons of coal, making it the sixth most productive operation in West Virginia.

In 1915, a change in mining technology revolutionized the steel making process thereby eliminating the need for coke ovens at the mine site. By 1919, there was no coke production whatsoever in Tucker County leaving the long banks of obsolete coke ovens unused. Coal, however, was still mined at the site in record quantities. From 1920 through the 1940's, the company continued production. As the seams were worked out and the mines closed, population slowly declined, and the facility slowly began to shut down. By 1950, only two mines, #36 and #40, were still working and tonnage had fallen to 100,000 by 1954. By 1956, underground mining had ceased altogether with a few surface mining operations producing coal through 1965.

Although time and vandalism have eroded the Coketon complex, significant ruins are nevertheless extant. The town of Thomas retains much of its architectural integrity, featuring the company store and office building, and numerous well-kept and relatively unaltered miners' houses. Poured and cut stone and masonry foundations remain from the power house, ventilation fan housing, and tipple support pillars. Railroad trestles and graded railbeds line the North Fork of the Blackwater. Several mine portals stand open, including the #29 portal. The Chief Inspector of the West Virginia Department of Mines observed in his 1904 Annual Report that "an unusual amount of water is generated at #29, and the drainage is not very good".

The most significant and striking cultural resources of the site are the rows of coke ovens which line both sides of the valley. An entire bank of ovens stands free in the middle of the site (Picture 1), while both walls of the hollow are lined with the brick and stone ovens. The roadbed of the Western Maryland Railroad extends some miles to Hendricks, and features fine cut stone bridges and gorgeous vistas of the canyon below. (The preceding information was excerpted from Stuart McGehee, 1992, "Coketon: Documentation of Historic Resources").





**Figure 1.** Evolution of passive AMD treatment technologies. Letter A represents the first generation of aerobic wetlands, while B shows an anaerobic-compost wetland. Anoxic limestone drains (ALD) were then designed to add alkalinity to the water before passage into an aerobic pond or wetland for metal precipitation and floc accumulation. If needed, then the water could be rerouted into a compost wetland (C). The next phase (D) involved the development of alkalinity-producing systems (APS) which combined ALD and anaerobic-compost wetland technologies. (Adapted from D. Kepler and E. McCleary, 1994, Successive alkalinity-producing systems (SAPS) for the treatment of acidic mine drainage, p. 195-204. In: International Land Reclamation and Mine Drainage Conference, U.S. Bureau of Mines SP 06A-94, Pittsburgh, PA).

## Possible Treatment Systems for the Acid Mine Drainage

The #29 Mine Portal emits acid mine drainage from old deep mine workings of the Davis Coal & Coke underground operations. Depending on the season of the year, acid mine drainage flows out of the mine at the rate of 300 to 1,000 gpm. Analysis of the water has given the following range of water quality:

flow	200 - ??? gpm (3,000 max)
pH	2.8 - 3.7
Acidity	400 - 600 mg/l
Total Iron	25 - 40 mg/l
Ferric Iron	11 - 17 mg/l
Ferrous Iron	14 - 23 mg/l
Manganese	5 - 11 mg/l
Aluminum	30 - 55 mg/l
Sulfates	700 - 800 mg/l
Dissolved Oxygen	<1 - 4 mg/l

Treating this water at an average flow of 500 gpm and 500 mg/l acidity with any one of the conventional **AMD chemical treatment systems** would cost the following amounts per year:

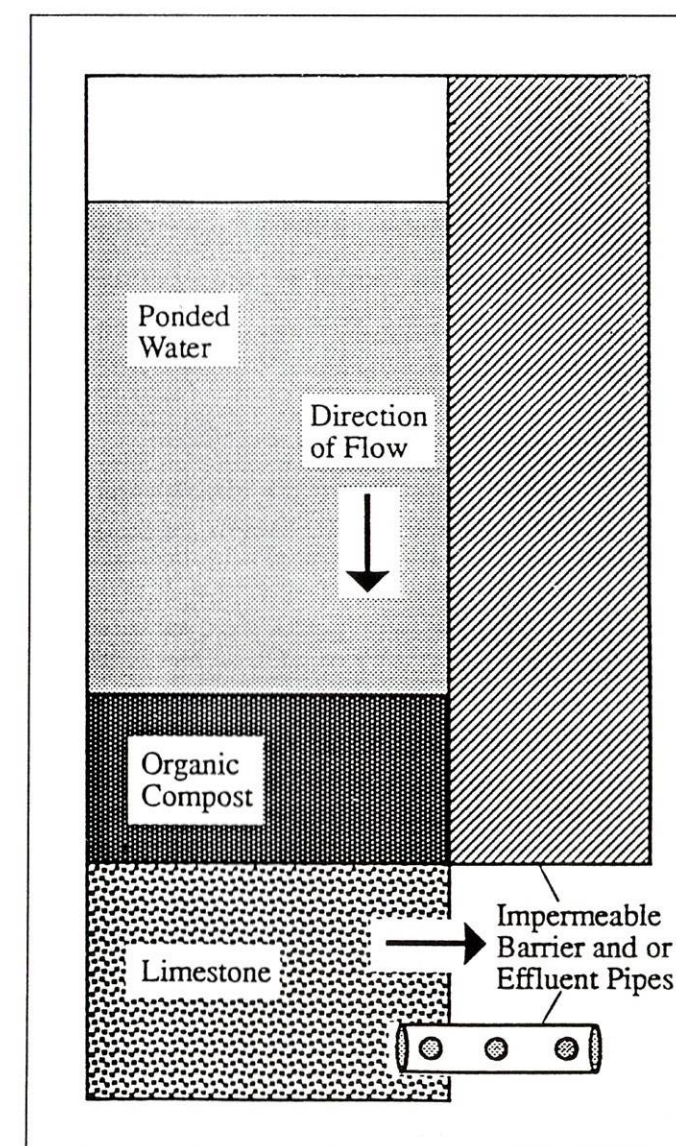
Soda Ash	\$176,500
Ammonia	\$ 65,800
Caustic Soda	\$200,100
Hydrated Lime	\$ 61,300

**Wetlands** have been used to treat AMD because metals in acid mine drainage can be physically filtered by adsorption to organic materials, and the metals can also be oxidized/reduced by microbial reactions in the wetland and removed by precipitation. These processes remove metals from the water and neutralize some of the acidity (Figure 1).

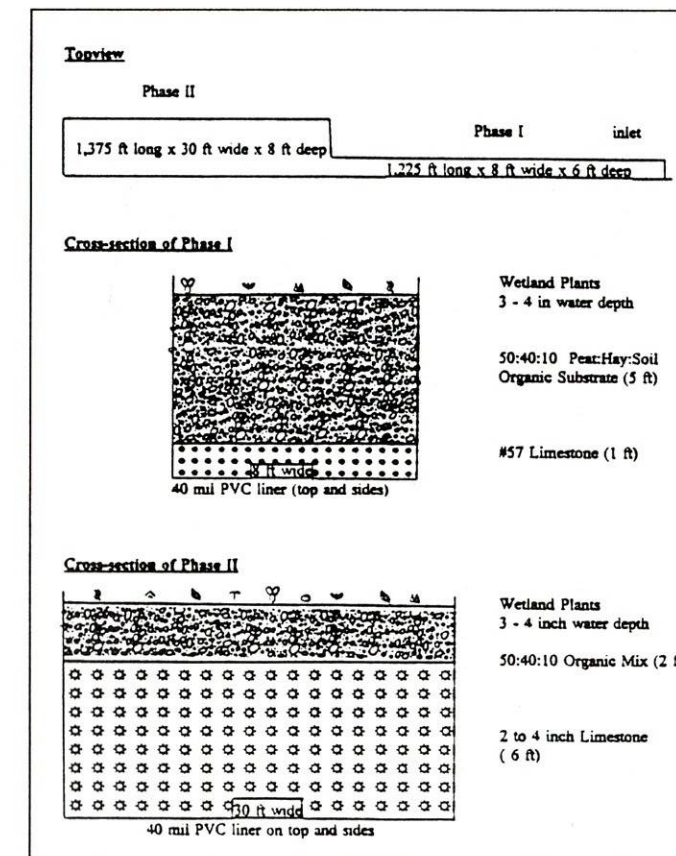
**Anoxic Limestone Drains (ALD)** are used to treat AMD that has low ferric iron concentrations (less than 5 mg/l), and also low dissolved oxygen levels (less than 1 mg/l). Due to the variable ferric iron concentrations and moderate oxygen levels, an ALD was unsuited to treat the drainage by itself.

**Alkalinity-Producing Systems (APS)** combine the use of an ALD and anaerobic compost wetlands. Under current APS designs, ponded water about 3 to 6 ft in depth overlies an 18-inch layer of compost which is over an 18- to 24-inch layer of limestone. Acid water is ponded over the materials and the head created by the column of water

forces the water through the organic material to filter out or precipitate ferric iron and to consume oxygen through organic matter decomposition. Alkalinity may be generated through microbial sulfate reduction. The acid water, now low in dissolved oxygen and ferric iron after passing through the organic substrate, is then directed down into the layer of limestone under the organic matter or through pipes into a conventional ALD (Figures 1 and 2).



**Figure 2.** A cross-sectional view of an alkalinity-producing system (APS) for AMD treatment (Adapted from Kepler and McCleary, 1994).

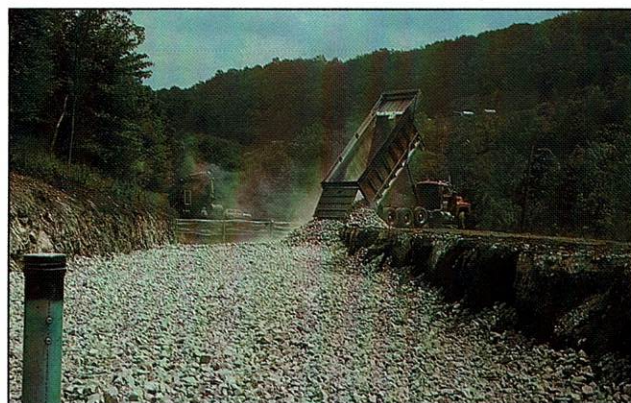


**Figure 3.** Construction specifications of the ALD/Wetland treatment system constructed on the Douglas Highwall AML Project. Topview shows overall dimensions, and cross-sectional views are given for the Phase I (8-ft wide) and Phase II (30-ft wide) sections.

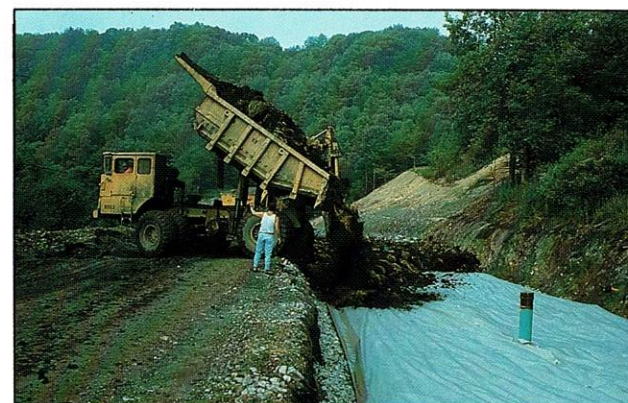


**Picture 1.** One of the 600 potential 2-ton coke ovens on the Douglas Highwall AML Project. Reclamation of the site left most of the ovens intact.





**Picture 2.** Approximately 18,500 tons of 2- to 4-inch limestone was placed in the Phase II section of the treatment system. The limestone was 6 feet in depth.



**Picture 3.** The limestone was overlain by filter fabric, and 2 feet of a mixture of peat, hay, and soil was placed on the surface.



**Picture 4.** Thirteen sampling tubes were installed in the treatment system. Each tube contains 5 ports from which water and sediment samples can be extracted from 5 different depths in the system.



**Picture 5.** Aerial photograph of the Douglas Highwall AML Project before construction. Highwalls and benches can be observed on the left along with a large refuse pile on the right. The North Fork of the Blackwater River is in the center paralleled by the railroad bed. This picture was taken on May 11, 1992 before construction occurred.

### The Treatment System at the Douglas AML Site

During the planning and engineering phases of this AML project, the decision was made to treat this water with a combination of passive systems. The system designed at the Douglas Highwall project is different from the systems shown in the figures. The system has two phases and employs an aerobic/anaerobic wetland at the surface, underlain by varying amounts of limestone (Figure 3). This system is different than other APS designs because the amount and thickness of organic matter is much greater and near the surface so that wetland plants can be established in the organic substrate. Such a system with this design has not been constructed on an actual mine site. The system is designed to facilitate four processes:

1. Remove ferric iron in the water by: 1) adsorption to or precipitation in the organic substrate in the surface of the treatment system, and 2) microbial ferric iron reduction producing soluble ferrous iron in the anaerobic sediment,
2. Remove the dissolved oxygen in the water by consumption of the oxygen through organic matter decomposition,
3. Add alkalinity to the water by: 1) microbial sulfate reduction in the anaerobic zone of the organic material, and 2) limestone dissolution from the ALD, and
4. Precipitate metals in the catchment basin before the water is discharged into the North Fork of the Blackwater River.

### Construction Specifications

The AMD treatment system was constructed by digging a large trench along the old railroad grade. The first phase of the trench is 1,225 feet long by 8 feet wide and 6 feet deep ( $1,225 \times 8 \times 6 = 58,800$  cubic feet or 2,178 cubic yards). About 1 foot of gravel-sized limestone (#57) was placed on the bottom with 5 feet of organic material (a peat, hay, and soil mixture, 50:40:10) over the top. The Phase I trench was filled with about 750 tons of limestone and about 1,800 cubic yards of organic material.

The second phase of the trench is 1,375 feet long by 30 feet wide and 8 feet deep ( $1,375 \times 30 \times 8 = 330,000$  cubic feet or 12,220 cubic yards). About 6 feet of 2- to 4-inch limestone was placed on the bottom with 2 feet of organic material over the top. This area was filled with about 18,500 tons of limestone and about 3,000 cubic yards of organic material (Pictures 2 and 3).

In total, 19,000 tons of limestone and 4,800 cubic yards of organic material were placed in this ALD/Wetland System.

### Operation and Function

This AMD treatment system will function by introducing approximately 240 gpm of acidic water from the #29 Portal into the ALD/Wetland System. Much of the ferric iron in the water will precipitate or be adsorbed onto the organic material in the surface of the wetland. If ferric iron comes into contact with limestone, ferric hydroxide will form around the limestone and make it less reactive for neutralization. Another portion of the ferric iron may be reduced by microorganisms forming soluble ferrous iron. Ferrous iron does not form a coating on limestone at pH 7 or less. It is important that the ferric iron be removed or reduced in the water as it moves downward through the organic substrate. Another concern is the potential coating of limestone or plugging of limestone pores by aluminum hydroxides. Aluminum adsorption and/or precipitation should also occur in the organic matter substrate as the water pH reaches 5.0 or above. The small amounts of oxygen in the acid water should be scavenged by microorganisms decomposing the organic matter as the water moves through the organic substrate. With little or no ferric iron and little oxygen, the limestone in the ALD/Wetland System should dissolve and add alkalinity to the water.

At the end of the passive treatment system, a small aeration and metal precipitation pond was constructed to catch/trap the metals before the water is discharged into the North Fork of the Blackwater. The metal hydroxide sludge that accumulates in the pond will have to be periodically cleaned out of the pond.

### Calculated Longevity

Based on 240 gpm and 500 mg/l acidity, the treatment longevity of this drain with its 19,000 tons of limestone (95% CCE and 75% dissolution) is estimated to be 50 years. Organic material has a finite capacity to adsorb metals, so the longevity based on the capacity of the organic material may be less than 50 years. Wetland plants have been transplanted into the wetland and these plants will deposit additional organic material annually through die-back. Little information exists on the longevity of organic substrates in AMD-treating wetlands.

### Monitoring of Metal Removal and Water Quality Changes

Thirteen sampling stations were installed in the ALD/Wetland treatment system (Picture 4). Eight sampling tubes (labeled A through H) were placed about 150 ft apart in the 8-ft section. Tubes I through M were placed in the 30-ft section about 275 ft apart. West Virginia University researchers (Skousen, Sexstone, Garbutt, Sterner, and Cliff) will monitor water chemistry at different depths of the substrate and at different distances from the beginning of the system. They will also evaluate the chemical and biological reactions occurring in the system over time.

#### Calculations of Iron Inputs and Residence Time

**Iron Inputs** at 240 gpm and 30 mg/l iron.

$$30 \text{ mg/l} \times 3.78 \text{ l/gal} = 113.4 \text{ mg/gal}$$

$$113.4 \text{ mg/gal} = .1134 \text{ g/gal}$$

$$.1134 \text{ g/gal} = .0002498 \text{ lbs/gal} \times 240 \text{ gpm}$$

$$\times 60 \text{ min/hr} \times 24 \text{ hr/day} \times 365 \text{ day/yr}$$

$$31,500 \text{ lbs iron per yr or } 86 \text{ lbs iron per day}$$

**Residence Time** at 240 gpm

$$388,800 \text{ ft}^3 \times 35\% \text{ porosity} = 136,080 \text{ ft}^3$$

$$\times 7.49 \text{ gal/ft}^3 = 1,019,239 \text{ gal}$$

$$240 \text{ gpm} = 345,600 \text{ gal/day}$$

$$28.3 \text{ liters} = \text{ft}^3 = 7.49 \text{ gal}$$

$$1,019,239 / 345,600 = 2.95 \text{ days}$$





**Picture 6.** Aerial photograph from nearly the same point as picture 5. The highwalls were eliminated on the left and the refuse pile has been regraded on the right. The ALD/Wetland system is located on the right side of the road and continues around the corner at the top of the picture. This picture was taken in September 1993.

### Land Reclamation Construction Highlights

The Douglas Highwall AML Project contained approximately 62 acres of steeply sloping mine spoil and refuse, and roughly 4,200 linear feet of highwall that was vertical from 35 to 55 feet in height (Picture 5). Open and collapsed mine entries were also within the project limits. Reclamation of the site included these specifics (Picture 6):

- elimination of 4,200 feet of highwall,
- excavation and handling of 360,000 cubic yards of material,
- 62 acres of land were backfilled and revegetated,
- 5,300 feet of V-shaped subdrain were constructed on the pavement of the surface mine bench at the base of the highwall and covered during backfilling,
- 555 linear feet of underdrains were installed in various locations throughout the job,
- 550 linear feet of riprap were placed for erosion control along the regraded slope along the river,
- 1,500 linear feet of trapezoidal-type, fabric-form-lined ditch were installed to receive discharges from the subdrains prior to outletting into the river,
- 7,600 linear feet of silt control were placed on the project,
- 6 wet seals and/or modified seals were installed on open mine portals,
- the county road above the #29 mine entry was stabilized using 150 tons of stone and 53 cubic yards of grout.

### Preliminary Results of the ALD/Wetland System

The treatment system was constructed in August 1993. It developed leaks and was unable to hold water. During December 1993, the contractor removed the organic matter and limestone, and installed a 40 mil PVC liner along the bottom and sides of the trench. The limestone was replaced in the lined trench, overlain by filter fabric, and the organic matter was returned to the trench. This process was completed by 15 December 1993.

During the spring of 1994, approximately 30 to 100 gpm of "clean" water (pH of 6.7, slightly net alkaline water, < 2 mg/l iron, < 1 mg/l manganese and aluminum) was pumped from the North Fork into the trench to fill the wetland and establish anaerobic conditions. Of the 65 total sampling ports available for sampling (13 sampling tubes at 5 depths), only 25 ports had sufficient water for extraction. Examples of water quality data for June before acid mine drainage was introduced are shown in Table 1. Alkalinity was 12.5 mg/l in the river water, and alkalinity rose to 212 mg/l

coming out of the treatment system. Similarly, calcium increased from 200 to 1282 mg/l. The limestone is apparently dissolving. Acid mine drainage was introduced into the system on July 20, 1994. The first water sampling was conducted on August 15, 1994. Water quality data from the beginning (Tube A), middle (Tube E), and end (Tube M) at several depths are shown in Table 2. The pH of the portal water (influent) in August was 3.7, acidity was 394 mg/l, iron was about 25 mg/l, and aluminum was 30 mg/l.

At the first sampling tube (A) approximately 100 ft into the system, water extracted from the 2-foot port (A 2) showed a pH of 3.2, 300 mg/l acidity, and 12 mg/l iron. In the middle of the 8-ft section (sampling tube E located about 750 ft from the front of the system), pH was between 3.7 and 6.4 from the 2-ft to 6-ft ports, while acidity was decreased by half. Iron was less than 3 mg/l in all ports, and aluminum was slightly decreased.

In the last sampling tube (M located about 50 ft from the end of the system or 2500 feet from the front), water pH at all depths was greater than 7.0, the water showed a net alkalinity of about 100 mg/l, and very small amounts of iron, manganese, and aluminum were found in the water. Calcium increased from 500 mg/l at the influent to around 1,500 mg/l. The effluent water going over a notched weir at the end of the system was similar in quality to the water extracted in sampling tube M.

Water samples were also taken in September 1994 (Table 2). Influent pH was 2.9, acidity was 406 mg/l, while iron and aluminum were close to August concentrations. In sampling tube A, water pH at 2 ft was 3.0 and acidity was 269 mg/l. At 4 ft, the pH was 5.3 and net acidity was 20 mg/l. At sampling tube E, pH varied with depth from 3.6 to 5.3 and acidity was between 60 and 215 mg/l. Metal concentrations were 1 to 14 mg/l for iron, 5 mg/l for manganese, and 1 to 25 mg/l for aluminum.

At the end of the treatment system (sampling tube M), water pH was greater than 6.3, net alkalinity was greater than 200 mg/l, and little iron, manganese, and aluminum were found. Calcium concentrations were increased from 500 mg/l at the influent to 1,800 mg/l at sampling tube M. Effluent water quality was similar to that in sampling tube M.

Preliminary data shows that the system is effectively raising pH from around 3.0 to greater than 6.0. Acidity is being reduced from 400 mg/l to 0, and alkalinity is being increased from 0 to about 200 mg/l. All the iron, manganese, and aluminum is being filtered or precipitated in the ALD/Wetland system. Water samples will continue to be extracted quarterly.

**Table 1.** Preliminary water quality data from the ALD/Wetland passive treatment system at the Douglas Highwall AML site in June, 1994. Relatively clean water from the North Fork of the Blackwater River was being introduced into the system. Thirteen sample tubes were installed in the system labeled A through M, and water sampling ports were placed a 1-ft intervals from 2 to 6 feet in depth in the tubes. For example, water data for the A 2 sampling port was extracted from the first sampling tube (100 feet from the front) at 2 feet in depth in the system.

Sample Site	pH	Acid	Alkalinity	Fe	Mn	Al	Ca
----- mg/l -----							
Influent	7.0	9.4	12.5	0.2	0.4	0.3	204
Tube							
A 2	6.8	40.6	31.5	2.2	0.4	0.2	199
A 4	6.5	28.1	37.5	0.5	0.3	0.1	248
A 6	7.0	3.1	50.0	0.2	0.3	0.1	260
M 4	6.9	34.4	237.5	0.0	0.2	0.0	1210
M 6	7.0	21.9	212.5	0.0	0.1	0.0	1281



**Table 2.** Water quality data from the ALD/Wetland passive treatment system at the Douglas Highwall AML site in August and September, 1994. Acid mine drainage was introduced into the system on July 20, 1994. Sampling sites are as described in Table 1. Tube A is 100 feet from the beginning, E is 750 feet from the beginning, and M is 50 feet from the end, or 2550 feet from the beginning.

Sample Site	pH	Acid	Alkalinity	Fe	Mn	Al	Ca
----- mg/l -----							
<b>August Sampling Date</b>							
Influent	3.7	393.7	0	24.3	5.7	30.9	537
Tube							
A 2	3.2	300.0	0	12.6	7.5	32.0	691
A 4	5.5	106.3	37.5	21.9	6.5	8.1	1117
A 6							
E 2	3.7	143.7	0	2.3	2.7	14.9	606
E 4	3.7	237.5	0	1.5	5.5	23.7	866
E 6	6.4	31.3	31.5	0.1	3.4	0.4	1475
M 2	7.4	18.8	56.3	0.4	0.2	0.1	912
M 4	7.4	25.0	106.3	0.1	0.3	0.1	1595
M 6	7.4	18.5	118.8	0.1	0.2	0.0	1477
Effluent	7.3	18.8	75.0	0.3	0.1	0.3	1290
<b>September Sampling Data</b>							
Influent	2.9	406.3	0	20.1	6.4	33.1	522
Tube							
A 2	3.0	268.7	0	13.6	7.0	29.3	717
A 4	5.3	66.8	50.0	6.3	5.8	0.2	1592
A 6							
E 2	5.3	118.7	0	14.2	5.5	0.7	1411
E 4	3.6	212.5	0	3.5	5.0	25.0	806
E 6	4.4	62.5	6.3	1.3	5.5	4.3	1265
M 2	6.4	62.0	237.5	3.8	0.4	0.1	1800
M 4	6.6	18.6	237.5	0.2	0.1	0.1	1837
M 6	6.6	18.0	243.8	0.1	0.1	0.1	1806
Effluent	6.7	0	231.3	0.1	0.0	0.0	1974

**Table 3.** Average water flows and quality in the North Fork of the Blackwater River during various months from 1991 to 1994. Measurements were taken weekly and average values were calculated for flow, acid, and elemental concentrations. The range of water pH is also shown. The sampling site is located downstream from the Douglas Highwall AML Project. Acid load was calculated by flow (gpm) x acid (mg/l) x .000186 to give tons of acid per month.

Date	Flow	pH	Acid	Fe	Mn	Al	SO <sub>4</sub>	Acid Load
	gpm		----- mg/l -----					Tons/month
Sep 91	10,100	3.5 - 3.5	99	12	3	—	275	186
Oct 91	5,310	3.3 - 3.3	186	11	4	—	324	184
Nov 91	5,050	3.3 - 3.4	139	11	3	—	374	130
Dec 91	16,190	3.4 - 3.5	77	9	1	—	76	232
Oct 92	3,236	2.3 - 3.5	142	10	5	14	316	85
Nov 92	6,667	3.7 - 4.4	58	9	1	5	55	72
Dec 92	15,610	3.5 - 3.7	66	5	1	6	48	192
Jan 93	15,410	3.2 - 3.7	83	7	1	7	86	238
Feb 93	10,250	3.1 - 3.8	97	7	2	9	140	185
Mar 93	24,280	3.2 - 4.0	67	4	1	6	347	303
Apr 93	26,140	2.9 - 3.4	104	7	1	6	104	506
May 93	5,625	2.1 - 3.2	136	6	2	10	134	142
<b>Start of Construction</b>								
Jun 93	2,737	3.0 - 3.3	95	6	2	9	195	48
Jul 93	1,570	2.8 - 4.3	153	10	3	15	357	45
Aug 93	890	3.0 - 3.2	172	11	3	16	340	28
Sep 93	950	3.1 - 3.9	126	11	3	17	227	22
Oct 93	2,425	3.5 - 4.1	73	8	2	9	140	33
Nov 93	20,680	3.5 - 3.6	55	6	1	7	66	212
Dec 93	17,430	3.2 - 3.9	71	8	2	9	106	230
Jan 94	16,090	3.3 - 3.8	88	6	1	6	139	263
Feb 94	28,620	2.9 - 3.6	164	11	2	9	211	873
Mar 94	27,300	3.0 - 3.7	96	6	1	7	137	487
Apr 94	20,510	3.5 - 3.9	87	5	1	7	142	332
May 94	18,940	3.3 - 4.2	78	5	2	6	141	275
Jun 94	8,390	3.3 - 4.4	89	6	2	9	195	139
Jul 94	7,940	3.3 - 4.4	77	5	2	8	117	114
Aug 94	21,340	3.5 - 4.6	56	4	1	5	71	222
Sep 94	5,860	3.1 - 4.0	116	7	4	7	244	126



### Preliminary Results on Water Quality in the North Fork of the Blackwater River

Flows have been measured at a gauging station and water samples have been extracted and analyzed for pH, acidity, and elements since 1991 (Table 3). The water was measured downstream of the Douglas Highwall Project. No clear trends are obvious at this early date after construction. However, average water flow during September through December, 1991 was 9,163 gpm and acid concentration was 125 mg/l. For the same period in 1993, average water flow was 10,371 gpm and acid concentration was 81.2 mg/l. The total acid load from September through December based on these data was 732 tons in 1991 and 497 tons in 1993.

From January to September 1993, flow averaged 9,761 gpm and acidity averaged 115 mg/l. During the same time in 1994, flow averaged 17,221 gpm and acidity was 94.5 mg/l. Construction at the Douglas Highwall Project began on June 1, 1993 and was completed October 21, 1994. The project has not gone through final inspection and the contractor has not yet been released from his obligations on the site.

### Acknowledgements

Alan Sexstone and Keith Garbutt are co-investigators on this project. The author also acknowledges the extensive work of Pat Sterner and John Cliff in water collection and water analysis. Special thanks go to the West Virginia Division of Environmental Protection and to Triad Engineering, Inc. for initiating West Virginia University's involvement in the project. Special appreciation is extended to Director David Callaghan, Dave Broschart, and David L. Smith. Breckenridge Corporation was the contractor on the site and thanks go to Alan Shreve and Tim Stump for allowing WVU employees to be on site at various times during construction. Acknowledgement is given to Triad Engineering and Sheila Vukovich (WVDEP) for the River water data in Table 3, and to Buffalo Coal Company for aerial photographs. Funding for conducting the research on this project comes from the U.S. Bureau of Mines and the National Mine Land Reclamation Center.

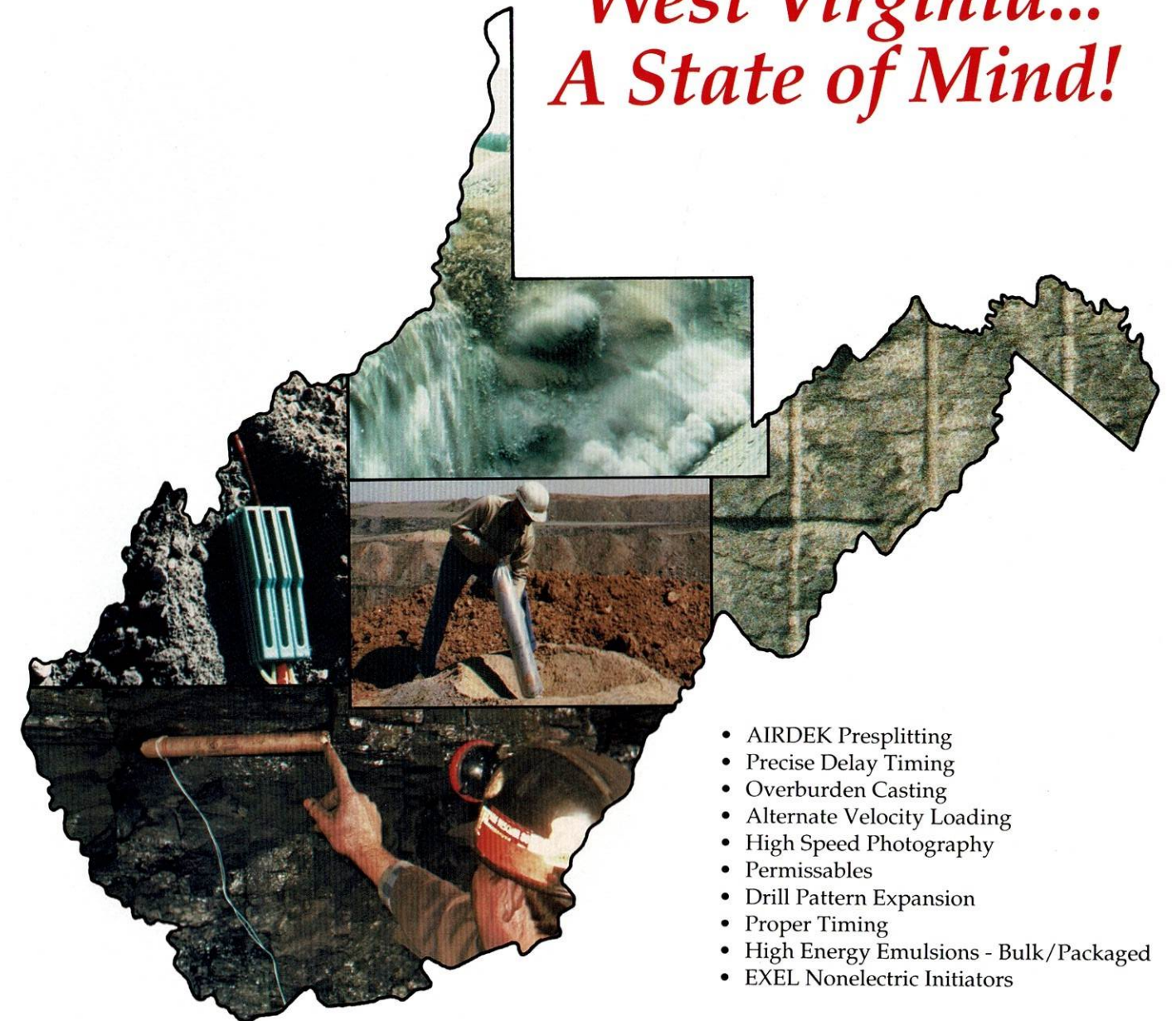
## ONLY FOR NOW

## ACORDIA OF WEST VIRGINIA offers

- UMWA Health Benefits
- Fully Insured, A+ Carrier
- Competitively Priced

Call: Hoppy Turner or Shirley Trotter at  
(304) 252-6375

## West Virginia... A State of Mind!



- AIRDEK Presplitting
- Precise Delay Timing
- Overburden Casting
- Alternate Velocity Loading
- High Speed Photography
- Permissibles
- Drill Pattern Expansion
- Proper Timing
- High Energy Emulsions - Bulk/Packaged
- EXEL Nonelectric Initiators

*ICI Explosives USA, Inc. - Appalachian Division*  
*A State-of-the art Explosives Distributor*

**Call us for an on-site evaluation of your drilling and blasting program.**  
Danny Perry, District General Manager • Beckley, West Virginia • (304) 252-8505



A distributor of ICI explosives products



# Restore Natural Beauty



We're a proven leader in land and mine surface reclamation. And we make it easy. For over 35 years, we've been giving nature a hand with seeding, mulching, and landscaping.

We're committed to customer satisfaction. Our long term customers stand as proof. And if that's not enough, just ask to see one of our completed sites. We bring beauty to places you would never dream possible.

We're reliable, yet innovative. We're Penn Line Service.

So for your next reclamation project, call 800-448-9110 and ask for Ron Hill. Let us help you restore natural beauty.

**PENN**  
**LINE SERVICE INC.**

*Diverse Dimensions in Specialty Contracting*

Scottdale, PA 15683 • 412/887-9110

## Keep An Open Mine

In mining, productivity is the name of the game. And downtime due to tire failure can slow down or even shut down the most productive mine.

Trouble is, rocks, debris, and other hazards too often make mincemeat out of tires. Even brand new ones.



Which is why Michelin developed the X Mine radial for mining equipment and the XHD1 radial for haultrucks. They're super tough to survive even the most punishing job sites.

Michelin radials may cost a little more initially. But when you consider the alternative - tire failure and downtime - they're a bargain.

And when you buy Michelin radials from McGrew Tire you can expect professional service and application expertise that can save you money by increasing your productivity even further.

Michelin radials and McGrew Tire. No wonder so many people are keeping an open mine.




**McGrew**  
**Tire**  
**Company** 

Logan, WV  
(304) 752-1676

Holden, WV  
(304) 239-2674  
(304) 239-3269

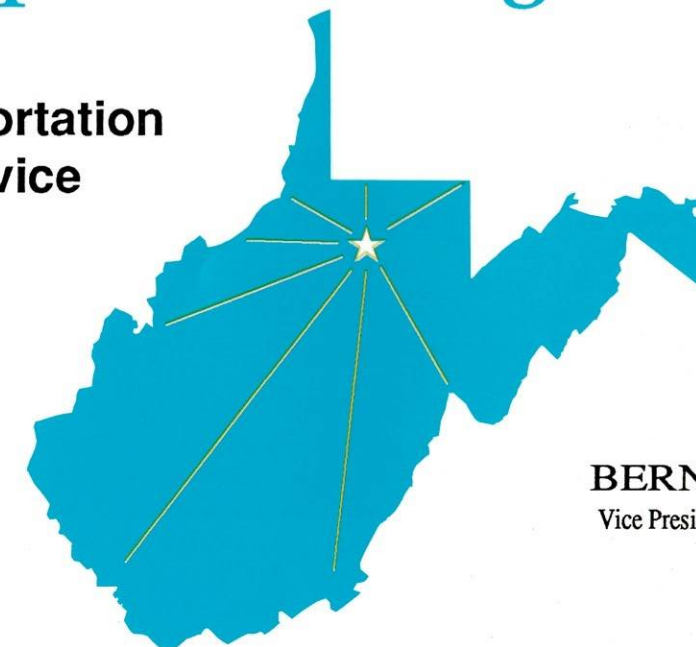
Danville, WV  
(304) 369-4661

Flatwoods, WV  
(304) 765-3642

**MICHELIN**  
BECAUSE SO MUCH IS RIDING  
ON YOUR TIRES. 

## Bridgeport Trucking Company

**Transportation  
Service**



**BERNIE DEARTH,**  
Vice President and General Manager

33 Walnut St.  
Shinnston, WV 26431

(304) 592-1052  
FAX 592-1054





Helen Curry (second from left) and her Burch Junior High coal students on the future airport site in Mingo County.

## Coal in the real classroom

During each the last several years, WVMRA, the West Virginia Coal Association and the Peters Creek Coal Association have sponsored a four day "teach the teachers" program each summer. "Coal in the Classroom" is designed to expose public school educators to the many positive aspects of the coal industry.

There were nineteen participants in the 1994 program, held at the MSHA Academy in Beckley. The group visited Eastern Associated Coal's Harris complex in Boone County, going underground in the Lightfoot No. 1 Mine and touring the Rocklick Preparation Plant. They also saw first hand the state's largest dragline at Catenary Coal's Samples Surface Mine in Kanawha County. Complementing the mine visits were tours of APCO's Glen Lynn electric generating facility and Fairchild International's equipment manufacturing plant.

But this year's program had a different and special result. One teacher returned home with the idea of really spreading the word about coal in West Virginia. Helen Curry, a teacher at Burch Junior High School in Mingo County, shared her experiences and her excitement about coal with Burch principal Tom Slone. Helen's idea was to teach coal in her classroom to one group of students for 45 minutes each day for an entire six-week period.

If that effort proved successful, Ms. Curry and Mr. Slone planned to assemble a second, third and fourth group for subsequent classes. Mr. Slone demonstrated great open mindedness and flexibility by authorizing Ms. Curry to put together her unique lesson plan for this detailed examination of coal.

Burch Junior High is the first school in West Virginia where the young people have been provided an extended opportunity to learn specific details about the state's most important industry. Ms. Curry has completed the first six-week program and is in the middle of training her second group of students. All together, approximately 100 junior high students will be benefiting from this program during the current school year.

The actual lesson plan for the students includes review of coal publications, video tapes, hands-on classroom exercises, lectures from coal industry speakers, and at least one onsite visit to a coal mine or coal related facility. The initial class visited the nearby Cumberland River Mining complex at Ragland, in Mingo County. The visit included a surface tour of the preparation plant and contract underground and surface mining operations.



James Simpkins' greenhouse on his Mingo County mine site.

The students were surprised to learn that one of the mining contractors, James Simpkins, has incorporated some long range thinking into his post mining plan. Simpkins has prepared his mountain top removal surface mining site for possible development into a commercial airport with potential of having a huge, 8500 foot runway.

Simpkins has also been working with scientists from West Virginia University in an effort to produce a special root enhancing fungus. If this project meets the expectations of Simpkins, business partner Walden Hatfield and others who share in this effort, this fungus will be grown in

greenhouses on the reclaimed surface mine and shipped by air directly to purchasers throughout the country.

Post mining use of surface mine sites in southern West Virginia may be a key to future economic development in these areas where flat land is at a premium. This pilot project in Mingo County is an excellent example of one of the lasting benefits of surface mining in West Virginia.

Helen Curry's students, many of whom are from coal mining families living close to Cumberland River

Mining, got an opportunity to personally see the mining process and the postmining use of land, all in one visit.

Ms. Curry will continue to fine tune her innovative lesson plans with each of the four groups, making the final product valuable to other educators. Her experiences in developing this first extended "Coal in the Classroom" program will surely be shared with the teachers who get an opportunity to participate in the 1995 and later "Coal in the Classroom" programs.

In addition to Cumberland River Mining, other area mining operations have volunteered to assist Ms. Curry by providing visiting speakers and by hosting mine tours. Those operations include Northland Resources, Hampden Coal and A.T. Massey Coal.



James Simpkins explains the fungus growing process.



## WHY YOU SHOULD CONSIDER A WASTE OIL FURNACE

"It's both environmentally responsible and cost efficient to burn your waste oil."

- ☐ EPA Approved
- ☐ Reduces Heating Costs
- ☐ Increase Your Profits
- ☐ Eliminates 'Cradle to Grave Liability
- ☐ Eliminates Disposal Costs



For a Free Demonstration CALL



Charleston 744-3493

Beckley 800-369-4687

Clarksburg 623-6336

## TRIANGLE SURETY AGENCY, INC.

- Specializing in
- Reclamation
  - Self-Insurance and
  - Financial Guarantee Bonds

Suite 970 One Valley Square  
Charleston, West Virginia 25301  
Telephone (304) 342-4989 • (800) 551-4989

MAGNETITE For Your PREP PLANT



Akers Supply, Inc.  
Matewan, W. Va.  
304/426-4422

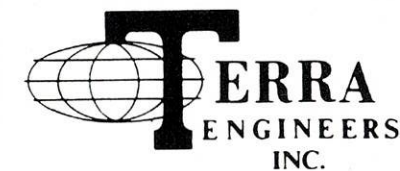
Akers Magnetite, Inc.  
Ceredo, W. Va.  
304/453-2222

SEEDING, MULCHING, FERTILIZING, TREE PLANTING

*J & G Seeding, Inc.*  
CABIN CREEK, WEST VIRGINIA 25035

GLENN CHAMBERS  
JOHN CHAMBERS

PHONE 595-1509



George A. Hall, Ph. D., P. E. • Ira S. Latimer, Jr., Geologist

1624 1/2 Kanawha Boulevard, East  
Charleston, WV 25311  
(304) 346-7035

*Specializing in Media and Public Relations for the Coal Industry.  
Government Relations, Polling, Crisis Management*

**NEW DIRECTIONS MEDIA**

2 Port Amherst Drive  
Charleston, WV 25306  
(304) 925-6141 FAX (304) 926-1136

Leslie H. Milam

Nelson A. Sorah

## NJE Nell Jean Enterprises Outdoorsmen

Corbra - Midland - Uniden  
CB Radio & Accessories  
Scanners

Proto - SK  
Hand Tools

Ingersoll-Rand - Matika  
Power Tools

Fram - Autolite  
Filters - Spark Plugs

Carhartt  
Work & Hunting Clothes

Georgia  
Work Boots  
Farm - Ranch  
Hard Toes  
Metatarsals  
Made in U.S.A.

Beckley Plaza  
behind Pic 'n' Go







## EAGLE CARBON, INC.

Caustic Soda • Anhydrous Ammonia • Soda Ash Briquettes  
Environmental Consultants • Quicklime  
Road Oyl (for dust control and road stabilization)

Todd A. Dean • Highway 41 • Box 1636 • Summersville, WV 26651 • 872-1646

### Erosion Control At Its Best With ENVIROSEAL

- Soil stabilization during revegetation
- Dust control
- Erosion control -- coal storage
- Coal pile freeze prevention

### Maintenance Of Vegetated Areas

- Reseeding
- Fertilization
- Liming

### Refuse Treatment For Revegetation With Or Without Soil

### Wildlife Seeding



• HYDROSEEDING & SOD PRODUCTION •

CHARLIE PRICE  
President

P. O. Box 90 Malden, WV 25306 304-925-4753

## MORTON SPECIALTY INSURANCE PARTNERS, Ltd.

Charles S. Morton  
President

**Property/Casualty & Bonding  
Insurance Programs for  
established commercial &  
industrial accounts**

- Coal mining
- Contractors
- Financial Holding Companies
- Manufacturing
- Oil & Gas
- Utilities
- Wholesale Distributors

An Insurance Agency established with a purpose  
- To build a locally owned insurance agency founded  
on the principles of providing specialized insurance  
services for our selected customer groups. An  
agency built upon Innovation and a service strategy  
designed with the customer in mind.

895 United Center, 500 Virginia St. East  
Charleston, West Virginia 25301  
Telephone (304) 345-1070  
Telecopier (304) 345-1074

## COAL CALENDAR

### January

25-28 **6th Annual Mountain State Coal  
Classic**, Raleigh County Armory,  
Beckley, WV, contact Jim Justice, P.O.  
Box 1085, Beckley, WV 25802, (304)  
252-8528.

### February

31-5 **West Virginia Mining & Reclamation  
Association, Semi-Annual Meeting**,  
Aruba Hyatt Resort & Casino, Aruba,  
contact Patty Bruce, WVMRA, 1624  
Kanawha Boulevard East, Charleston,  
WV 25311, (304) 346-5318, FAX 346-  
5310.

3-8 **Contractors Association of West  
Virginia, Mid-Year Meeting**, Aruba  
Hyatt Resort & Casino, Aruba, contact  
CAWV, 2114, Kanwha Blvd E.,  
Charleston, WV 25311, (304) 342-  
1166.

### March

22-24 **West Virginia Technology Design  
Exposition 95**, Charleston Civic  
Center, Charleston, WV, contact Pat  
Parsons, Expo -95, 2114 Kanawha  
Blvd. E., Charleston, WV 25311, (304)  
342-3976, FAX 342-1074.

### April

11-12 **2nd Annual Mine Health & Safety  
Workshop**, Washington, D.C., contact  
Fred Shear, Pasha Publications, 1616  
North Fort Myer Dr., Suite 1000,  
Arlington, VA 22209, 1-800-424-2908  
or (703) 528-1244, FAX 528-1253.

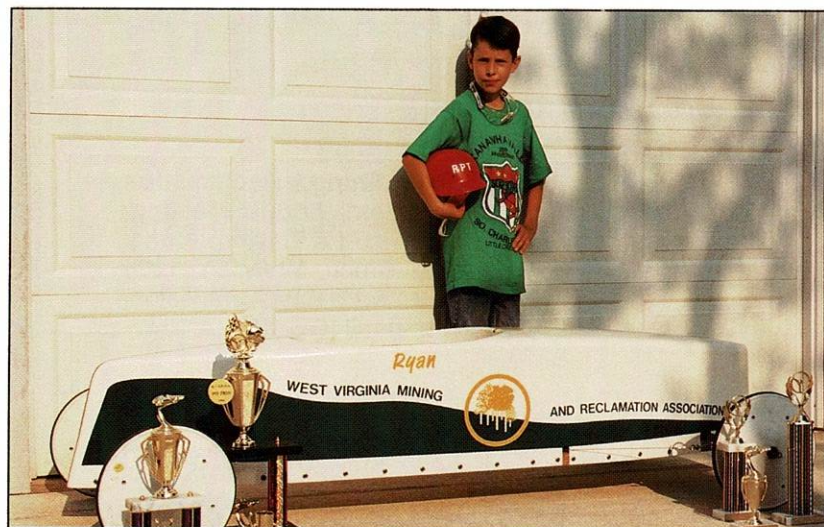




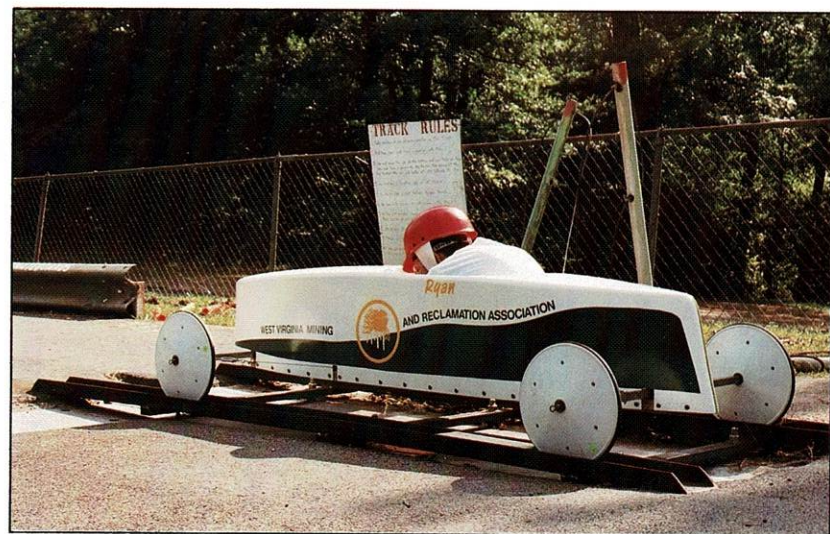
## Association Notebook

### WVMRA a winner in Soap Box Derby

The Association's colors are flying high in Charleston area soap box Derby competition. Sponsored by WVMRA, 9 year old Ryan Trimble, races a sleek looking gravity powered vehicle decked out in Association green and gold, sporting our distinctive logo on each side.



Ryan Trimble with his WVMRA racer and his growing collection of trophies.



Ready to roll at Little Creek Park.

In his first season of "All American" racing, Ryan represented the Association well, finishing just short of the winner's circle in local competition at Little Creek Park in South Charleston.

At the start of the fall season, Ryan took first place in a field of 24 racers, putting himself in position for a strong run at the 1995 field, which culminates in a trip to Akron, OH for the world championships.

Ryan's proud father is Mark Trimble of Vibra-Tech Engineers, Inc. Mark reports that the WVMRA logo has attracted quite a bit of attention. "Ryan's car is always one of the best looking racers on the track. It's amazing how many people recognize the logo. Those who don't are interested in learning what it stands for."

### New members

Five companies were approved for membership during the Board of Directors' Meeting in October, two in the General Division and three in the Associate Division. In addition, we are pleased to announce the reinstatement of charter member **Grafton Coal Co.** of Bridgeport, with Jerry Righman as the representative.

Welcome to the following new members and their representatives:

**GENERAL DIVISION** - **Acme Limestone Co.**, Fort Spring, WV representative - Tony DiRico; **Three-C Mining, Inc.**, Volga, WV, representative - Carl Carbonara.

**ASSOCIATE DIVISION** - **Civil & Environmental Consultants, Inc.**, Cincinnati, OH, representative - Robert Kalchthaler; **Richard M. Lewis Co.**, Charleston, WV, representative - Dick Lewis; **TERRADON Corp.**, Nitro, WV, representative - Dana Burns.



## Association Notebook



The Conrail Express, reminiscent of old time luxury railroad dining cars, makes ready for departure from the Dickinson Yards at Quincy.

### Peters Creek Coal Association rides Conrail Express into the mountains

The Peters Creek Coal Association traditionally convenes twice a year, once for golf, and once for a movable feast.

Peters Creekers used to board the riverboat West Virginia Belle for a Kanawha River dinner cruise, but the Belle was sold out of the area, and so PCCA turned to the railroad for eat-on transportation.

For this year's fall outing, the "Conrail Express" was pressed into action, transporting two trainloads of passengers from Conrail's Dickinson Yards at Quincy on a round trip to the High Power Mountain mining operation in Nicholas County.

A sumptuous meal was served in route, and the day was capped by the traditional dinner at Edgewood Country Club in Charleston, where PCCA officials distributed a dazzling array of door prizes to an overflow crowd.

The Peters Creek Coal Association is a nonprofit organization composed of members engaged in the mining, transportation and sale of coal and related activities. The events are open only to PCCA members. For membership information, contact Mike Perilli at (304) 872-4586.



## Miller & Miller Auctioneers Inc.

The Only Auction Company With:

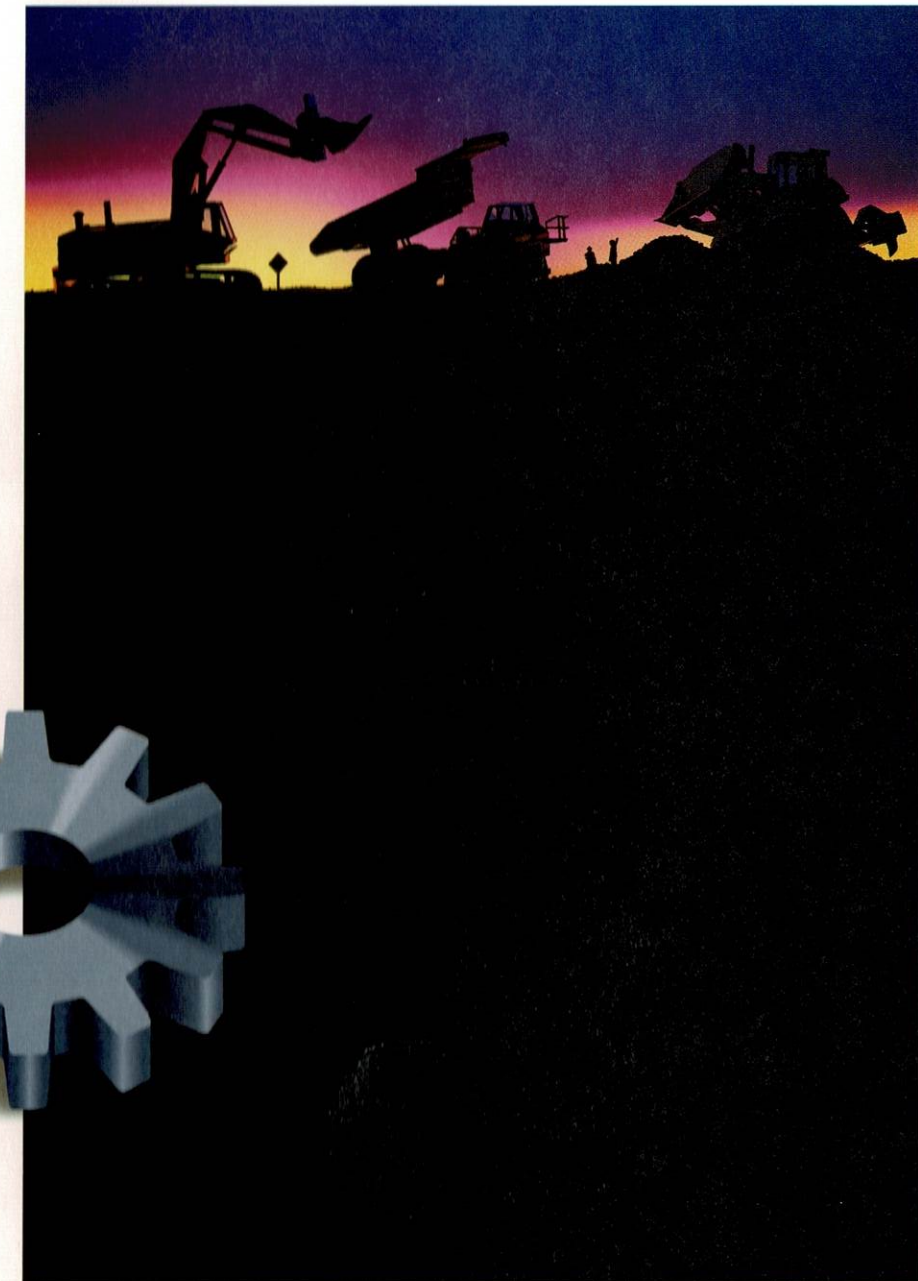
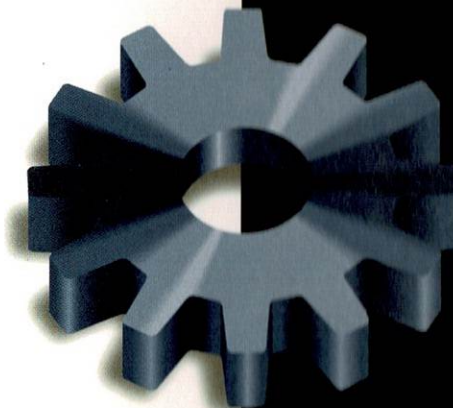
Over 33 years of Expertise  
The Largest U.S. Owned and Operated Auction Company  
Advertising Backed by Market Research  
Professional Make-Ready  
Unmatched Sale Day Performance  
Easy and Prompt Settlements  
Financial Stability  
Experienced Service Oriented Staff

THE CHOICE IS YOURS



2525 Ridgmar Blvd.  
Fort Worth Texas 76116  
1-800-433-7240  
Fax 817-732-5552

SHAPING THE HORIZONS OF THE FUTURE



For nearly a century, Beckwith Machinery Company has been helping customers shape the future by providing superior equipment and service in the construction, mining, energy and material handling industries. Those who look to shape new horizons look to Beckwith.

**BECKWITH**   
Machinery Company

ROUTE 76E AND ROUTE 50 • BRIDGEPORT, WV 26330 • 304-842-2222

