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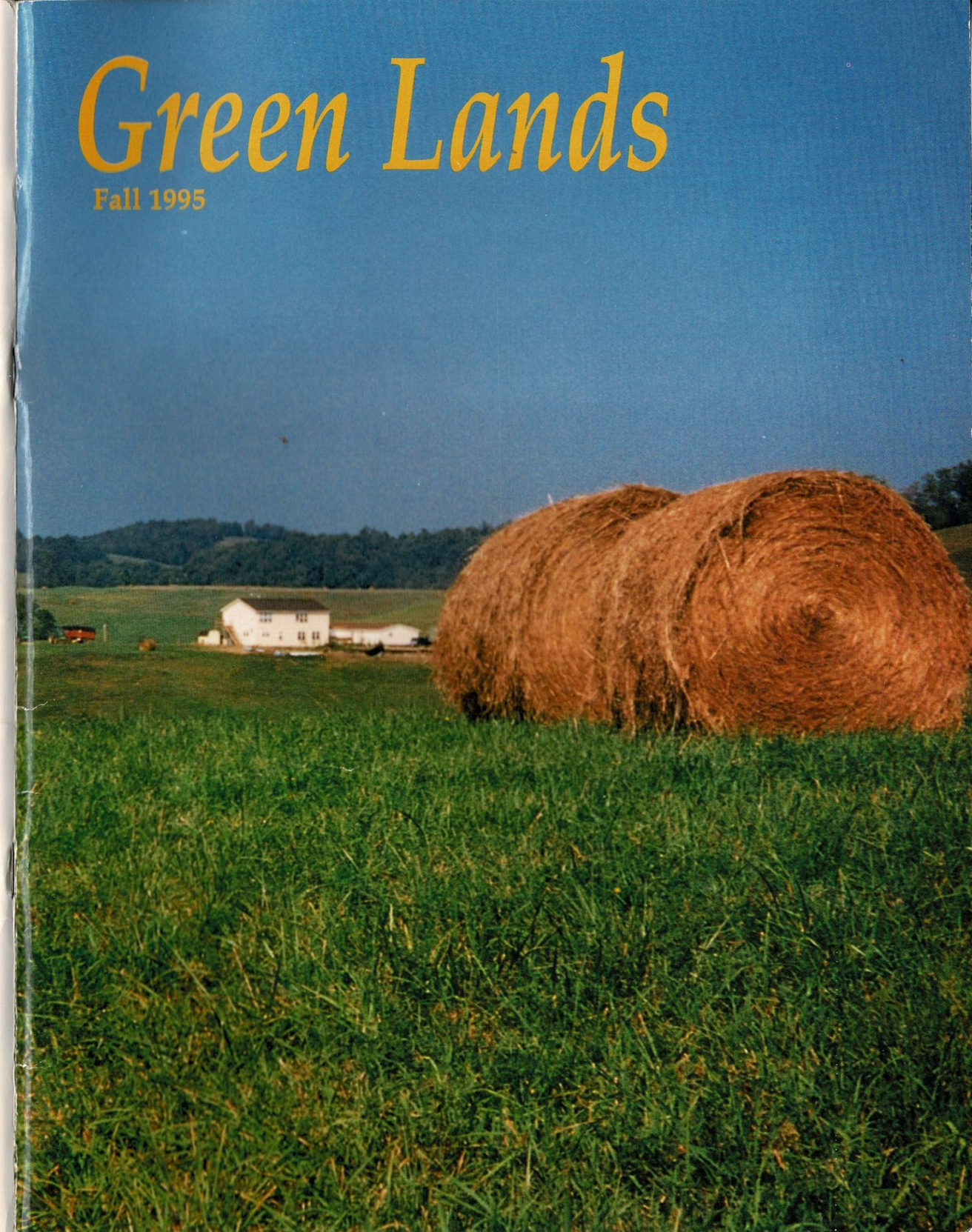
Fall 1995



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For decades, when it comes to loading rock, dirt and coal under difficult circumstances, Hitachi has been the byword for high quality and reliable performance.

Hitachi EX 1800

Continuing in that tradition, Rudd Equipment Company leads the way in offering the widest selection of the **number one** selling hydraulic shovels and excavators in the world.

Built to last. Hitachi's advanced technologies and years of experience are built into every machine, assuring world-class durability and reliability. Our mining customers report machine **availability of over 95%** with **25,000 hours** of continuous operation. And simplified maintenance keeps your cost lower. Hitachi's EX1800 has earned the solid reputation as the **number one** hydraulic shovel and excavator in its class.

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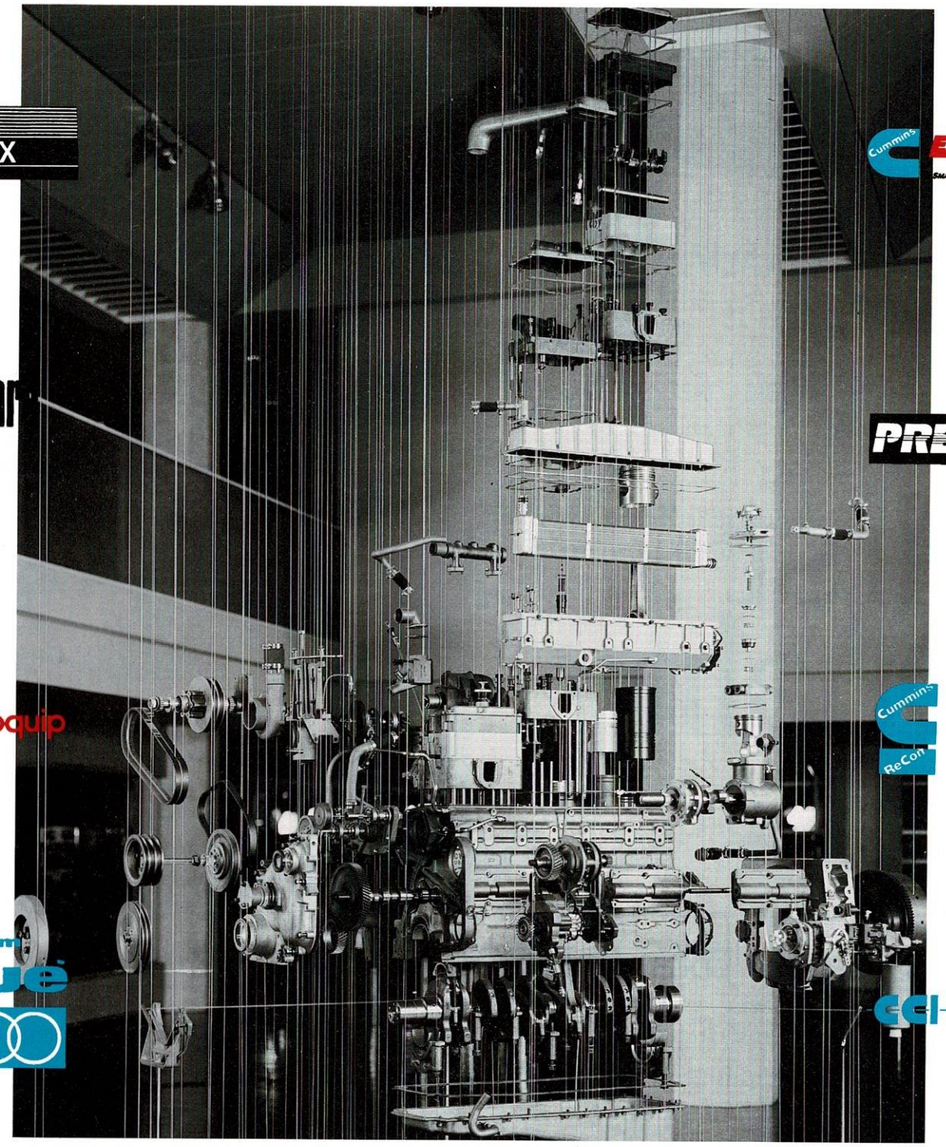

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Fairmont, WV (304) 367-0196	Louisville, KY (502) 491-4263	Evansville, IN (812) 867-4400	Knoxville, TN (615) 523-0446

Green Lands

Volume 25 Number 4

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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
Patriot Mining Co. is one of the state's showcase coal mining companies, with a long history of beyond the call of duty performance. The company's Chaplin Hill mine is profiled, beginning on p. 27.

Index to Advertisers

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.

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^3 (13.00 m^3)	22 yd^3 (16.82 m^3)	28 yd^3 (21.4 m^3)
High Lift	16 yd^3 (12.00 m^3)	20 yd^3 (15.29 m^3)	26 yd^3 (19.9 m^3)
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)

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Sid Young addresses the Annual Meeting as he completes his term as WVMRA chairman.

Incoming Chairman Don Nicewonder and his wife, Etta help pay tribute to outgoing Chairman Sid Young.

Don Nicewonder becomes 29th WVMRA Chairman

K. Donald Nicewonder of Bristol, VA, is the new Chairman of the WVMRA Board of Directors. Don was elected at the Association's 29th Annual Meeting, succeeding 1994-95 Chairman Sidney R. Young, III of Hampden Coal Co., Inc., Gilbert, WV.

A native of southwestern Virginia, Don started in the coal business in 1959, right out of Emory & Henry College. He hired two other men and worked along side them as a contract miner for Pittston Coal Co.

Don is now the president of three companies involved in contract surface mining in southern West Virginia and southwestern Virginia. His largest current operation is in Mingo County, on a contract basis with Mingo Logan Coal Co.,

He has been a member of WVMRA since 1988 through two of those companies, Premium Energy, Inc. and White Flame Energy, Inc. In 1992, White Flame Energy, Inc. won a Reclamation Award as one of the state's outstanding mining companies. Premium Energy did the construction work on the Mingo Logan mining complex, which has won numerous awards on both the state and national levels.

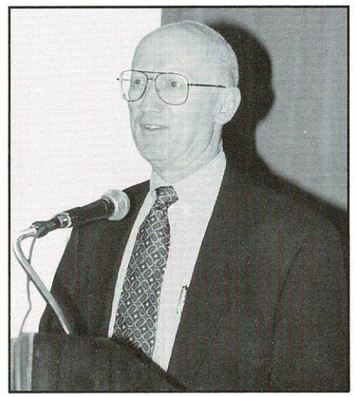
Don has served on the Association Board of Directors for the past three years, including a term as 1st Vice Chairman in 1994-95.

His mining business has branched out into the field of recreational facilities. In 1994, he opened "The Virginian," a private golf club near Bristol which was promptly named one of the two most outstanding new courses in the country for that year. He is also planning a golf related facility on reclaimed acreage in Mingo County.

Don resides in Bristol with his wife Etta. They have one daughter, Kimberly Johnson, and two sons, Kenny and Kevin, both of whom work with their father in the coal business.

Technical Session Speakers

Eli McCoy
WV Division of Environmental Protection
"A Director's View of the
West Virginia Coal Industry"



Herk Sims
Employers Service Corp.
"Workers' Compensation
and West Virginia's Future"

Tom Altmeyer
National Mining Association
"The 104th Congress --
What Can We Expect?"

Other new officers

Markus J. Ladd of Mingo Logan Coal Co., Wharncliffe, WV, was elected to the post of 1st Vice Chairman and James C. Justice, II of Bluestone Coal Corp., Beckley, WV was chosen as 2nd Vice Chairman for the coming year. Wayne H. Stanley of Stanley Industries, Bridgeport, WV, was elected Secretary and William E. Broshears of Eastern Associated Coal Corp., Charleston,WV is the new Treasurer. Daniel T. Pochick of Rish Equipment Co., Bluefield, WV, will serve as Chairman of the Associate Division.

Board members

Four members were newly elected to the Board, including Dan Pochick; James I. Campbell of Maxim Management Co., Lebanon, VA; John K. Skidmore of New Allegheny, Inc., Mt. Storm, WV; and John H. Wellford of Kimberly Industries, Inc., Charleston, WV.

Six others were reelected to the Board, including Don Nicewonder; Sid Young; R. Donald Cussins of Buffalo Coal Co., Bayard, WV; Donald R. Donell of Starvaggi Industries, Inc., Weirton, WV; James H. Harless of Chafin Branch Coal Co., Gilbert, WV; and Bernie E. Dearth, Jr. of Bridgeport Trucking Co., Charleston, WV.

Mark A. White of Arch of West Virginia, Inc. Yolyn, WV and David R. Hibbs of Cummins Cumberland, Inc., South Charleston, WV were selected to fill unexpired terms on the Board.

Former Chairmen

1966-67	Leo Vecellio, Sr.
1967-68	F. B. Nutter. Sr.
1968-69	Arch F. Sandy, Jr.
1969-70	John C. Anderson
1970-72	G. B. Frederick
1972-73	James L. Wilkinson
1973-74	Lawson W. Hamilton,Jr.
1974-75	James C. Justice, Sr.
1975-76	H. L. Kennedy
1976-77	Frank D. Jennings
1977-78	James H. Harless
1978-79	John J. Faltis
1979-80	Charles T. Jones
1980-81	Lawrence A. Streets
1981-82	William C. M. Butler, III
1982-83	Donald R. Donell
1983-84	Tracy W. Hylton
1984-85	Carl DelSignore
1985-86	Dwight M. Keating
1986-87	Theodore J. Brisky
1987-88	James W. Anderson
1988-89	Roy G. Lockard
1989-90	Paul F. Hutchins
1990-91	Kenneth G. Woodring
1991-92	R. Donald Cussins
1992-93	Gerald W. Ramsburg
1993-94	John R. Bryan
1994-95	Sidney R. Young, III

Ed Surgeon (l) presents Lawrence Streets with a plaque designating the retiring former Chairman as an honorary member of the Association Board of Directors.

West Virginia Mining & Reclamation Association

Designates
LAWRENCE A. STREETS
NEW ALLEGHENY INC.
MOUNT STORM, WEST VIRGINIA

AN HONORARY MEMBER OF THE BOARD OF DIRECTORS

For long and dedicated service to the coal industry, to the West Virginia Mining & Reclamation Association, and to the State of West Virginia.

As a continuous member of the WVMRA Board of Directors for 18 years, as Chairman in 1980-81, as a responsible employer, as an innovative practitioner of the art of surface mine reclamation, and as a generous benefactor to the community of Mount Storm, to Grant County and the surrounding area, Lawrence Streets has contributed immeasurably to the success of the organization, and, thereby, to the standing of the coal industry, and to the prosperity of the State of West Virginia.

AUGUST 5, 1995

Left to right, Evelyn and Lawrence Streets, Ed and Arlou Surgeon. Both Lawrence and Ed were honored during the Annual Meeting as they close out distinguished careers in the industry and long records of service to the Association.

Lawrence Streets named honorary board member

Lawrence Streets, one of the Association's pioneer members, has stepped down from active service with New Allegheny, Inc. and from the Association Board of Directors. Lawrence served with distinction on the Board for a total of 20 years, including a term as Chairman in 1980-81.

At the Annual Meeting, Lawrence was honored with induction as an honorary Board member. He joins previous honorees, Fil Nutter, Lawson Hamilton, Jim Compton and the late Jim Justice, Sr. in that capacity.

The Association has also contributed $10,000 in Lawrence's name to the WVMRA scholarship fund at West Virginia University.

Lawrence's plaque was presented by Ed Surgeon of Cummins Cumberland, Inc., another long-time and valued member who is moving into retirement.

Ed has been affiliated with WVMRA since its inception in 1966. He served on the Board for 12 years and was Chairman of the Associate Division in 1990-91.

The Association's first Chairman, Leo Vecellio, Sr. and his wife Evelyn made the trip from Florida to attend the 29th Annual Meeting.

Tracy and Betty Hylton (l) of Perry and Hylton with Louie and Sharon Southworth of Jackson & Kelly.

Scenes from *The Greenbrier*

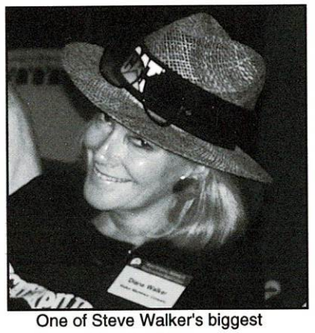
Lawson Hamilton (c) greets Don and Joan Donell.

Four of Cummins Cumberland's finest, Ed and Arlou Surgeon, Jan and Dave Hibbs.

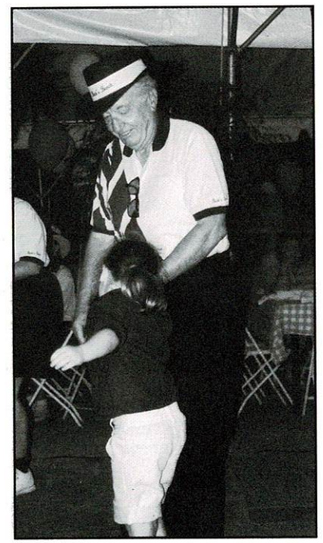
Triangle Surety Agency was one of many Associate sponsors of the reception. Left to right are Sandra Ferguson, Kathy Jacobs, Fred Ferguson, John Jacobs, Bonnie and Joe Scholl.

Polka dots were in bloom this year at the Welcoming Reception. Left to right are Cathy Boergers, Kathy Meehan, Sandra Thomas, Elizabeth Power and Marie Green.

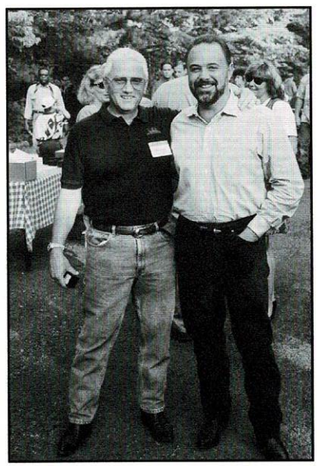
Newlyweds Bob and Brenda Raines were practically celebrating their honeymoon at the Greenbrier.



One of Steve Walker's biggest fans -- his wife, Diane.



Two prominent members of "Buck's Bunch" take a turn on the dance floor.



Phil Cooper (l) and Ralph Ballard of Wind River Resources relax in the sunshine before night falls on the Coal Miners' Party.

Annual Meeting Prize donors and sponsors

Sponsors - Associate Members' Welcoming Reception

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Bridgeport Trucking Company
Cascades Coal Sales, Inc.
Cecil I. Walker Machinery Company
Civil & Environmental Consultants, Inc.
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Trojan Corporation
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United National Bank
Varel Manufacturing Company
Vibra-Tech Engineers, Inc.
Western Pocahontas Properties Ltd. Partnership
Worldwide Equipment, Inc.

Prize Donations

MONTE CARLO NIGHT
Austin Powder Company (Herm DeProspero) - $75
Beckwith Machinery Company (Dave Trueman) - $100
Crown Hill Equipment, Inc. (Chris Supcoe) - $200
Cummins Cumberland, Inc. (Dave Hibbs) - $100
Eaglehawk Carbon (Dave Brafford) - $100
Ensign Bickford Company (Dick Gotcher) - $100
Fielding Hydroseeding, Inc. (Ed Brown) - $100
Foster Supply Inc. (Chuck King) - Fireproof Safe
Gibson-IRECO. Inc. (Grant Schrader) - VCR
K & P Mining (Mike Perilli) - $100
Kimberly Industries, Inc. (John Wellford) - $100
Liebherr America (Robert Fiorenza) - $50
Logan Corporation (Joe England) - Putter
Mountain-Valley Explosives (John Bussey) - $50
Mt. State Bit Service, Inc. (Paul Laskody, Jr.) - $50
Nelson Brothers, Inc. (Wade Bowman) - $200
PM Enterprises, Inc.
(Shannon Westerman) - Shirts & Jackets
Peter's Creek Coal Association
(Flick Goldsmith) - Briefcase
RMI, Ltd. (Dave Haden) - Golf Caddy
Republic Industries (John Krebs) - Gold Coin
Robinson & McElwee (Joe Price) - $50
Rudd Equipment Company (John Smith) - $100
Sturm Environmental Services, Inc.
(John Sturm) - 2 free water tests
Trojan Corporation (Jim Bertiaux) - $50
Vencill Corporation (Delmer & Ernest Vencill) - $100
Vibra-Tech Engineers, Inc.
(Mark Trimble) - Framed Numbered Print
Western Pocahontas Properties Ltd. Partnership
(Nick Carter) - $50
Worldwide Equipment, Inc.
(Terry Dotson) - Personal CD Player

More Prizes and Door Prizes

GOLF TOURNAMENTS
Anderson of West Virginia
(Tom Meehan) - $10,000 for hole-in-one
Beckwith Machinery Company (Dave Trueman) - $100
Cascades Coal Sales, Inc. (Flick Goldsmith) - $100
Crown Hill Equipment, Inc. (Chris Supcoe) - $100
Cummins Cumberland, Inc. (Dave Hibbs) - $100
Driltech, Inc. (Tim Murphy) - $100
Ensign Bickford Company (Dick Gotcher) - $50
Fielding Hydroseeding, Inc. (Ed Brown) - $100
Flat Top Insurance Agency (Charlie Carter) - $100
Forke Brothers - The Auctioneers (Bill Flynn) - $200
Gibson-IRECO, Inc. (Tim Zeli) - $75
Heavy Machines, Inc. \(Jim McNeil) - Lynx "Boom Boom" 5 Wood
Hitachi Construction (Ed Garbarino) - Golf Bag & Putter
Kimberly Industries, Inc. (Steve Cvechko) - Driver, Iron & Putter
Liebherr America (Robert Fiorenza) - $50
Logan Corporation (Cal Nelson) - $100
Morton Specialty Insurance Partners, Ltd.
(Rob Rappold) - Portable Telephone
Mountain-Valley Explosives (John Bussey) - $50
Mt. State Bit Service, Inc. (Paul Laskody, Jr.) - Blaster's Lamp
Penn Line Service, Inc. (Larry Roberts) - $100
Petroleum Products, Inc. (Tom Taylor) - $100
Rudd Equipment Company (John Smith) - $150
"TEAM DYNO" (DYNO NOBEL, Bruce Woods; Gibson-IRECO, Inc., Grant Shrader, Rick Tankersley & Tim Zeli; Mountain-Valley Explosives, John Bussey; & Mt. State Bit Service, Paul Laskody, Jr., - Beer Carts
Union Carbide Corporation (John Rader) - Trophy
Vencill Corp. (Delmer & Ernest Vencill) - $100
Worldwide Equipment, Inc. (Terry Dotson) - Golf Bag

CHILDREN'S PUTTING TOURNAMENT
Austin Powder Company (Tim Warden) - Trophies
Cascades Coal Sales, Inc. (Flick Goldsmith) - $50
Cummins Cumberland, Inc. (Dave Hibbs) - $25
Gibson-IRECO dba Lilly Explosives (Rick Tankersley) - $75
Mountain-Valley Explosives (John Bussey) - $25
Triangle Surety Agency, Inc. (John Jacobs) - $50 Bonds (2)
Western Pocahontas Properties Ltd. Partnership
(Nick Carter) - $50

BOWLING TOURNAMENT
Cummins Cumberland, Inc. (Dave Hibbs) - $50
First Union National Bank (Stuart Swanson) - $100
Flat Top Insurance Agency (Tom Giffen) - $100
Jackson & Kelly (Dan Stickler) - $50
Logan Corporation (Cal Nelson) - $50
Mt. State Bit Service, Inc. (Paul Laskody, Jr.) - $50

CHILDRENS' BOWLING TOURNAMENT
Austin Powder Company (Tim Warden) - Trophies
Cascades Coal Sales, Inc. (Flick Goldsmith) - $50
Cummins Cumberland, Inc. (Dave Hibbs) - $25
Gibson-IRECO dba Lilly Explosives (Rick Tankersley) - $75
Mountain-Valley Explosives Co. (John Bussey) - $25
PNC Bank, N.A. (Dale Stein) - $50
Triangle Surety Agency, Inc. (John Jacobs) - $50 Bonds (2)
Western Pocahontas Properties Limited Partnership
(Nick Carter) - $50

FISHING TOURNAMENT
ICI Explosives USA (Charlie Miller) - Fishing Equipment
Ingersoll-Rand Company (Jim Green) - $50
Kanawha Stone Company (Art King) - $50
Mt. State Bit Service, Inc. (Paul Laskody, Jr.) - $50
Nelson Brothers, Inc. (John Holliday) - $50
Trojan Corporation (Jim Bertiaux) - $50
Vibra-Tech Engineers, Inc. (Mark Trimble) - Rod & Reel

TENNIS TOURNAMENTS
Cummins Cumberland, Inc. (Dave Hibbs) - $50
Ingersoll-Rand Company (Jim Green) - $50 + Trophy
Mountain-Valley Explosives (John Bussey) - $100
Penn Line Service, Inc. (Larry Roberts) - $50
Skelly and Loy, Inc. (John Gunnett) - $150
Sturm Environmental Services, Inc. (John Sturm) - $50
Walker Machinery Company (John Williamson) - $100

TRAP TOURNAMENT
Austin Powder Company (Herm DeProspero) - $50
Mt. State Bit Service, Inc. (Paul Laskody, Jr.) - $50
Nelson Brothers, Inc. (John Holliday) - $50
Robinson & McElwee (Joe Price) - Trophies
Trojan Corporation (Jim Bertiaux) - $50

FUN RUN
Austin Powder Company (Herm DeProspero) - $50
Cummins Cumberland, Inc. (Dave Hibbs) - $50
ICI Explosives USA (Waller Caldwell) - Running Shoes
Trojan Corporation (Jim Bertiaux) - $50
Western Pocahontas Properties Ltd. Partnership
(Nick Carter) - $50

NEW CHAIRMAN'S BREAKFAST
Black Diamond Construction, Inc. (Bill Casto) - $100
Crown Hill Equipment, Inc. (Chris Supcoe) - $100
Cummins Cumberland, Inc. (Dave Hibbs) - $100
Ensign Bickford Company (Dick Gotcher) - $50
Fielding Hydroseeding Inc. (Ed Brown) - $100
Hitachi Construction Machinery Corporation
(Ed Garbarino) - Hitachi TV
Ingersoll-Rand Company (Jim Green) - $100
Kimberly Industries, Inc. (John Wellford) - $100
Liebherrr America (Robert Fiorenza) - $50
Nelson Brothers, Inc. (Wade Bowman) - $50
Penn Line Service, Inc. (Larry Roberts) - $50
Rudd Equipment Company (John Smith) - $50

NAME TAG DRAWING
Crown Hill Equipment, Inc. (Chris Supcoe) - $100
Cummins Cumberland, Inc. (Dave Hibbs) - $100
Ensign Bickford Company (Dick Gotcher) - $100
Fielding Hydroseeding Inc. (Ed Brown) - $100
The Greenbrier (Lee Doggett) - Weekend at The Greenbrier
Ingersoll-Rand Company (Jim Green) - $100
Kimberly Industries, Inc. (John Wellford) - $300
Logan Corporation (Cal Nelson) - $100
Long-Airdox (Mike Hastings) - 13" Color TV
Nelson Brothers, Inc. (Tab Hudson) - $150
Rudd Equipment Company (John Smith) - $100

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Buck's Bunch, five time winner of the General Division 'Company Pride" Award.

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Ford Coal is the only competition in sight for the 'Buck's Bunch' dominance of the Company Pride Award, and that's only if the judging is done before bedtime.

"Buck's Bunch," is a dominator in search of competition.

The powerful "Bunch," a loose coalition of Buck Harless associates, strolled away from Kate's Mountain with its fifth consecutive General Division Company Pride title.

"Company Pride" awards are given at the Annual Meeting during the Friday night "Coal Miners' Party."

Contestants are judged on their display of company pride through tee-shirts, caps, etc. Creativity and sheer numbers also count very heavily.

The winners claim possession of the traditional bronze lunch bucket for a year, then receive a permanent plaque commemorating the achievement.

Competition generally runs hot and heavy in the Associate Division, where perennial power Austin Powder prevailed in '95. The Associate silver bucket went to Anderson of West Virginia, which never fails to add a little flair to the evening.

Ford Coal, a former power depleted by age and attrition, is rebuilding its force literally from the ground up, but is many grandchildren and several years away from posing a serious threat to the formidable "Bunch" from Gilbert.

Perennial power Austin Powder rose to the top of the Associate Division, taking home the bronze bucket.

—— COMPANY PRIDE ——

Buck's Bunch would like to have a little push from their fellow general members. "I'm afraid we'll lose our competitive edge if somebody else doesn't put forth a little effort," said an unidentified spokesman.

Next year is the Association's 30th Anniversary, an excellent opportunity for general members to express the pride of employment.

This debonair band representing Anderson of West Virginia captured the silver lunch bucket in the Associate Division.

The 600,000 square foot main office building is the centerpiece of an impressive 1,000 acre complex.

FBI Center illustrates post mining land use

Harrison County has historically been one of West Virginia's major coal counties. Clarksburg and Bridgeport share a common heritage of coal mining and now are benefiting from the second life of various tracts of land that wedge in from the north between those two communities. Three shopping centers along US Rt. 50, atop Bridgeport Hill, have been constructed at various times on previously mined land. A major automobile dealership on the Clarksburg side of the hill sits on reclaimed land

In recent years, a lot of attention has been directed toward the Pete Dye Golf Club, crafted from land with previous history as an Indian hunting ground and a family farm, as well as a coal mine.

Now, a major new facility has risen from the former coalfields of Harrison County. The Criminal Justice Information Service Division of the Federal Bureau of Investigation has relocated from Washington DC to a state-of-the-art facility on a thousand wooded acres of previously mined land in an area loosely defined by the communities of Clarksburg, Bridgeport and Shinnston.

The area was surface and deep mined for a long period stretching from the 1950's through the early 1980's. Several different companies were involved, notably Grafton Coal Co. and Fresa Construction Co. In fact, the Fresa family has been involved in the area for two generations. Even the FBI must abide by environmental regulations. So, when construction of the complex removed two previously existing drainage ponds, the agency had to "mitigate" the loss with replacement "wetlands." Much of this preparatory earthwork was done by Fresa Development Co., which is run by Mike Fresa, whose father, M.W. Fresa, founded Fresa Construction Co.

Each of the five modules in the main building boasts its own impressive entrance.

Construction was done in a manner befitting the importance of the project, complete with a four lane roadway throughout the complex.

When the need arose for a new FBI facility, U.S. Senator Robert C. Byrd said "Why not West Virginia?" Senator Byrd was instrumental in the eventual selection of Harrison County as the site for the ultramodern FBI center. Site preparation got underway in October of 1991, and building construction started the following year.

Some $200 million later, landscapers are putting the finishing touches to the overall development, as carpenters ready the day care center for November occupancy. All other functions are up and running and every bit of it is first class.

Until recently, access has been from the west end, just across Smith Chapel Road from the Pete Dye Golf Club. Presently, the site can also be reached from Saltwell Road, north of Bridgeport. A dedicated interchange from Interstate 79 and 2.5 miles of access road to the main gate is under construction, with completion projected by the end of 1995.

The complex consists of the Service Center, Central Plant, Child Development Center, Visitor Center and Main Building.

The Service Center is a 70,000 square foot facility which serves the warehouse, delivery checkpoint, vehicle service and maintenance & supply functions. The Central Plant houses electrical and mechanical equipment in a 50,000 square foot building. The 16,500 square foot Child Development Center, complete with a one acre playground, is designed to serve up to 150 children of on-site employees.

The centerpiece of the complex is the visually stunning Main Building, which consists of five three story office towers, a total of 600,000 square feet or about one-fourth the size of the agency's DC headquarters. It includes a 500 seat auditorium, a 600 seat cafeteria, a fitness exercise area and employee lounges on each floor of each module. Outside facilities include a ball field, a jogging and nature trail, a bike path and parking for 1900 cars.

Approximately 1,200 FBI employees are presently at work in the facility, which will eventually house a work force of 2,500. The complex is expected to reach full capacity in 1998 or 1999.

Landscapers are putting the finishing touches on the $200 million FBI Center.

About 250 people have transferred from the DC area. The remainder were hired locally. Beyond the next door neighbor communities, the FBI presence has enhanced many other north central West Virginia communities with both an influx of employment opportunities and a boost to the population, plus the accompanying economic benefits to housing and other support industries. In addition to Harrison County, FBI employees are living in Morgantown, Fairmont, Grafton and as far south as Weston and Buckhannon.

Harrison County has been one of the major benefactors of the concept of post mining land use. That's as it should be, since Harrison holds such a proud heritage in the coal industry.

However, these are not isolated examples. Throughout the coal counties of West Virginia, mined lands have experienced a "second life," as hospitals, schools, golf courses, shopping centers and recreational facilities. In the case of Harrison, as many others, it's also a second life for the community.

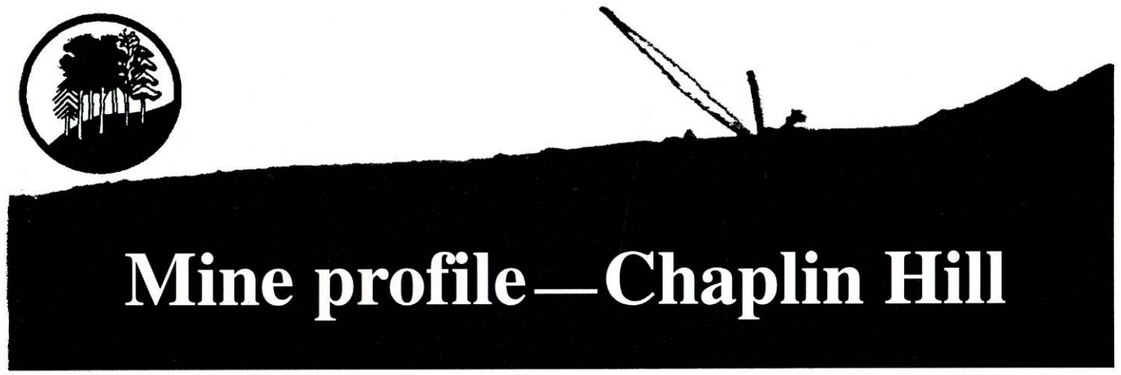
The 16,500 square foot Child Development Center is nearing completion.

Our quality of life begins when
you load it out
and then put it back.

Using Caterpillar equipment
from Walker Machinery,
Pioneer Construction's
award-winning work exemplifies
reclamation at its finest.

Mining and reclamation.
Good for the family.
Good for West Virginia.

Walker CAT



Mine profile—Chaplin Hill

Company	Patriot Mining Co., Inc.
Mine	Chaplin Hill No. 1 & 2
Location	One half mile west of Osage, just off I-79 in Monongalia County
Active Permits	O-34-85, S-1021-92, S-1007-93, S-1005-94, S-1004-95
Bonded Acreage	Reclaimed - 378, Active - 514
Employees	38
Annual Production	900,000 tons
Life of Operation	Five years
Mining Method	Contour cut and point removal
Equipment Spread	17 yard hydraulic shovel, three 85 ton rock trucks, various other dozers, loaders & trucks
Coal Seams	Waynesburg and Waynesburg "A"
Coal Characteristics	Shipped raw, 11,800 BTU, 16 ash, 1-2.5% sulfur
Transportation	Coal trucked to local power plants and nearby rail and river terminal on the Monongahela River for loading onto barges and Contail
Market	Electric utilities on Monongahela and Ohio Rivers and in northern West Virginia
Post Mining Land Use	Hayland and pasture

The best of northern West Virginia mine reclamation leaves the casual observer wondering exactly where the mine took place.

Patriot Mining puts best foot forward

Anker Group, Patriot Mining, Chaplin Hill — this is the chain of command for one of the state's more amazing success stories.

Patriot Mining Co. mines coal. Anker Group is its parent company. Chaplin Hill is its primary mine. They all operate in Monongalia County, home of the state's largest university, right in the middle of an area which is extremely sensitive environmentally, in a region economically hard hit by the latest round of Clean Air Act revisions.

Yet, Anker, Patriot and Chaplin Hill continue to be good advertisements for West Virginia coal mining.

Established in 1974, the Anker Group consists of six companies which produce over four million tons of coal annually. All operations are equipped with modern coal preparation plants and unit-train loadouts. Anker Energy is the sales agent and provides other support services to the mining companies.

The largest of these is Patriot Mining Co., founded in 1978. Over the past 17 years, Patriot has run surface mines in the West Virginia counties of Preston, Monongalia, Taylor and Harrison, as well as Garrett County, MD and Greene County, PA. It has also operated four contract deep mines. Current annual coal production is over 2 million tons, 40% from surface mines. In addition, Patriot has two power ash disposal and recycling facilities in Preston County, which together handle up to half a million tons of ash annually.

Patriot Mining is one of West Virginia's most decorated companies. It was one of 11 companies to win the 1991 Excellence in Surface Mining and Reclamation Award from the federal Office of Surface Mining. Patriot also won Reclamation Awards from the State of West Virginia in 1984 and 1993. The company has also won numerous Mountaineer Guardian Awards for fatal free coal production.

Recently, OSM presented Anker Group President John Faltis with the "Trailblazer Award," for the company's lead role in developing the "River of Promise" shared commitment to clean up the Cheat River watershed.

The practice of contemporaneous reclamation is evident in this overview of Patriot's active operation adjacent to a reclaimed area.

At its Chaplin Hill mine, Patriot uses a 17 cubic yard hydraulic shovel, loading overburden directly onto rock trucks.

Effects of Land Reclamation and Passive Treatment Systems on Improving Water Quality

by Ben Faulkner and Jeff Skousen

Introduction

Acid mine drainage (AMD) is receiving much attention at the federal level due to the signing of an agreement to address this problem by the Office of Surface Mining (OSM) and the Environmental Protection Agency (EPA). Both of these agencies have determined that AMD from abandoned coal mines is the single biggest water quality problem in Appalachia. The Appalachian Clean Streams Initiative is a broad-based program with a goal to eliminate AMD from abandoned coal mines. Its mission is to coordinate involvement of interested parties in AMD and facilitate application of technologies to improve water quality in Appalachia. In West Virginia, the Governor's Stream Restoration Program has similar goals.

Several technologies are available for dealing with AMD. Backfilling and revegetation together are one way of reducing acid loads from current mining operations or abandoned mine sites. Covering acidic refuse or other acid-producing materials on a site with good soil materials and establishing vegetation has a major impact on reducing acid concentrations in water. More importantly, revegetation often decreases the flow of water from these sites by encouraging infiltration into soil and evapotranspiration by plants. If the majority of the water from an abandoned site is coming from underground mines, then surface treatments may show a limited effect on reducing acid loads.

Active treatment systems collect AMD into ponds and apply alkaline chemicals which raise water pH, neutralize acidity and cause precipitation of metals. Although effective, active treatment is expensive when the cost of equipment, installation, chemicals, and manpower are considered (Skousen et al. 1990, 1993). Passive treatment systems provide a cost effective means of improving water quality since they do not require continual additions of chemicals. Passive systems have demonstrated substantial improvements in water quality in some cases, while other situations using passive technologies have shown less dramatic results. Construction costs can be large initially depending on the size and specific design of the system.

Federal and state watershed restoration programs emphasize reclamation and the use of passive treatment systems to treat AMD. This is really the only alternative because AMD treatment by chemicals is so expensive in terms of the large initial capital investment and installation costs and, even more significantly, annual maintenence and chemical costs. Reclamation and revegetation is costly. but depends on the amount of backfilling, grading, soil preparation, and seeding. Passive treatment systems may also have large initial construction costs like reclamation. However, reclamation and passive treatment costs are generally incurred once (if done properly) and do not require annual maintenance and chemicals.

Overview of Passive Treatment Systems

Constructed wetlands are a desirable altemative for treating AMD. Wetlands are valuable ecological systems. They provide habitat for numerous plant and animal species, present to the landscape with aesthetic appeal, improve the quality of water that passes through them, and remove metals from water by physical and chemical processes (Skousen et al. 1992). There are four dominant processes which occur within wetlands, anyone of which has the ability to remove metals from AMD. First, metals can be removed by plant uptake (Hedin 1989). Sphagnum has an ability to accumulate iron (Gerber et al. 1985), and Typha also accumulates small amounts of iron (Sencindiver and Bhumbla 1988). Second, metal removal can take place as a result of adsorption to organic substrates. Organic substrates, such as peat and compost, can remove metals by adsorption, chelation, and cation exchange processes (Wieder and Lang 1986). Third, metals can be removed by oxidation and hydrolysis (Hedin 1989). Ferric iron, for example, precipitates as water reaches pH 3.5 or above, provided there is greater than I mg/l dissolved oxygen in the water. Once in the ferric state, iron will hydrolyze and precipitate as iron hydroxide. To aid in oxidation and precipitation processes, bacteria can be introduced through inoculation of constructed wetland substrates (Henrot and Wieder 1990). Fourth, metals can be removed by microbial reduction processes through the metabolism of anaerobic bacteria. Bacteria such as Desulfovibrio utilize organic matter and sulfate as electron acceptors and energy sources, thus reducing sulfate into sulfide which can then combine with hydrogen and iron (Hedin et al. 1988). The net gain is an increase in pH and alkalinity, and a decrease in metals and acidity (McIntyre et al. 1990).

Aerobic Wetlands are generally used to collect water and provide residence time so metals in the water can precipitate. The water in this case usually has net alkalinity and metals precipitate as the water is held in the pond. Wetland species are planted in these systems for aesthetics and to add some organic matter, but the organic matter is not necessary to the function of the system (Figure 1A).

Anaerobic Wetlands contain a layer of limestone in the bottom of the constructed wetland. The limestone is overlaid by organic material and wetland species are transplanted into the organic substrate (Figure 1B). These systems are used when the water has net acidity. Alkalinity must be introduced into the water before dissolved metals will precipitate. The alkalinity can be generated in an anaerobic wetland system in two ways (Hedin and Nairn 1990). Certain bacteria, Desulfovibrio and Desulfotomaculum, can utilize the organic substrate (CH_20) as a carbon source and sulfate as an electron acceptor for growth. In the bacterial conversion of sulfate to hydrogen sulfide, bicarbonate alkalinity is produced:

$$S0_4^{-2} + 2\,CH_20 = H_2S + 2\,HCO_3^- \qquad (1)$$

Alkalinity can also be generated as the limestone under the organic material dissolves and reacts with acidity in the wetland:

$$CaCO_3 + H^+ = Ca^{+2} + HCO_3^- \qquad (2)$$

The limestone continues to dissolve when kept in an anaerobic environment because iron in the water does not precipitate or coat the limestone. Both of these processes, bacterial sulfate reduction and limestone dissolution, produce higher pH water and add bicarbonate alkalinity for water treatment.

Anoxic Limestone Drains (ALD) are trenches of buried limestone into which acid water is diverted (Figure ID). With limestone dissolution, the net result is an increase in water pH and alkalinity. There are many water quality parameters that must be evaluated if an ALD is to add alkalinity for long time periods including: flow rate, dissolved oxygen content, acidity and alkalinity, ferric and ferrous iron concentrations, and aluminum concentrations (Skousen 1991). If the parameters are all within specified ranges as prescribed by Hedin and Nairn (1992), an ALD should function properly. Once the pH of the AMD has been raised and upon exiting the ALD, the water is aerated and metal oxidation, hydrolysis, and precipitation can proceed in an aerobic pond or wetland.

Limestone has been placed in other structures for AMD treatment. It has been placed in 24-inch corrugated pipe and installed underground (rather than in an underground trench). Septic tanks have also been filled with limestone and AMD introduced into the tanks. AMD from a deep mine was introduced into the bottom of a 7-foot diameter tank filled with 6 feet of limestone (similar to the diversion well described by Arnold in 1991). The water has a hydraulic head of more than 30 feet that causes the limestone bed to fluidize slightly. The water is predominately anaerobic, moves upward through the limestone and flows out the top of the tank. The limestone does not become coated and metal precipitates settle in a sump outside of the tank. These applications have been used on steep slopes in lieu of underground trenches or open channels, and on sites that have poor access and small flows.

Figure 1. Schematic diagrams of passive treatment systems. Only aerobic and anaerobic wetland systems have plants in the systems.

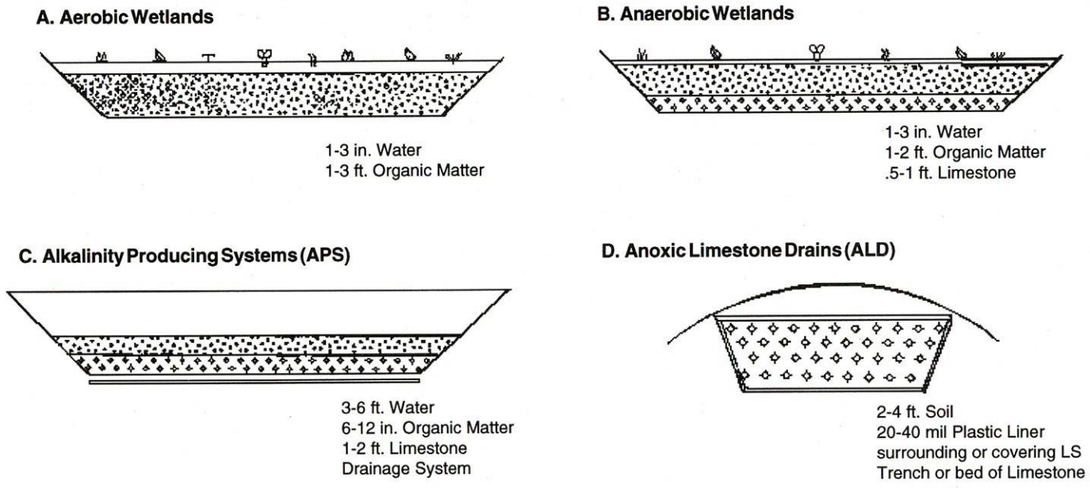
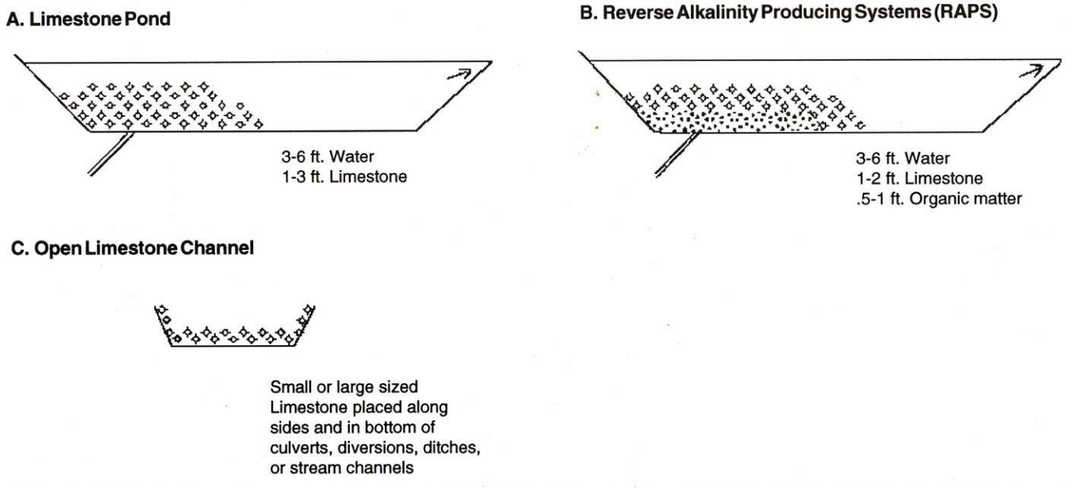


Figure 2 . Schematic diagrams of A) Limestone Ponds B) Reverse Alkalinity Producing Systems (RAPS) and C) Open Limestone Channels.



Alkalinity Producing Systems (APS or SAPS) combine the use of an ALD and an anaerobic wetland (Kepler and McCleary 1994). Water with oxygen concentrations greater than I mg/l are often a design limitation for ALDs. In situations where the dissolved oxygen concentrations are above I or 2 mg/l, the water can be introduced into a pond with the following design (Figure IC). A drainage system must be installed in the bottom of the pond. The drainage pipes are overlaid by 12 to 24 inches of limestone which are then overlaid by 6 to 12 inches of organic material. Three to 6 feet of water are ponded on top of the organic layer. It is critical that the head of water forces the water through the slowly permeable organic material. Usually a ratio of 5:1 (feet of water:feet of organic material) is adequate. The principle is to introduce the semi-aerated water into the pond and cause the water to move down through the organic matter to: 1) filter out ferric iron or reduce it by microbial iron reduction to ferrous iron, and 2) reduce oxygen concentrations by microbial decomposition of organic matter. The reduced (oxygen-poor) water then continues downward into the limestone picking up additional alkalinity by limestone dissolution. The water then outflows through the drainage system in the bottom of the pond having a pH of 6.0 and a much higher level of alkalinity. The treated water is then aerated and the metals precipitate in a sedimentation pond, aerobic wetland, or anaerobic wetland. Changes in the design are possible like the system installed at the Douglas Abandoned Mine Land Project (Skousen 1995).

Limestone Ponds (LSP) are a new passive treatment idea in which a pond is constructed on the upwelling of an AMD seep or on an underground water discharge point. Limestone is placed in the bottom of the pond and the water flows upward through the limestone (Figure 2A). Based on the topography of the area and how the water emanates from the ground, the pond can be built to pond water several feet deep (from 4 to IO feet deep) with I to 3 feet of limestone. The pond is sized and designed to retain the water for I or 2 days for limestone dissolution, and to keep the seep and limestone under water. If some coating occurs by aluminum or iron hydroxides, the limestone in the pond could be periodically stirred with a backhoe to either uncover the limestone from precipitates or to knock or scrape off the precipitates. If the limestone is exhausted by dissolution and acid neutralization, then more limestone can be added to the pond over the seep.

Reverse Alkalinity Producing System (RAPS) could be installed in a similar application as the Limestone Ponds. If the water is not anoxic (more than I or 2 mg/l dissolved oxygen but less than 5 mg/1) as it emanates from the ground, a pond can be constructed at the upwelling of the seep (like the LSP) and organic matter may be layered in the bottom of the pond, overlaid by limestone (Figure 2B). In this situation, metals in the water may be filtered and adsorbed as they pass through the organic matter, iron and sulfate may be reduced by microorganisms, and oxygen in the water may be decreased by microbial decomposition of organic matter. The water then continues upward through the limestone picking up additional alkalinity. Again, 3 to 6 feet of water can be ponded covering the organic matter and limestone, thereby maintaining anaerobic conditions. The water can exit at a spillway or outlet, having a pH of 6.0 and containing excess alkalinity. Upon aeration, hydrolysis and precipitation reactions can remove metals. When organic matter or limestone becomes less effective for acid neutralization, recharging the system with organic matter and limestone may be accomplished.

Observations of field systems which rely on water flowing through organic matter indicate rather large amounts of porous organic material are needed to convey water, and that a hydraulic head of water is required to force water through organic matter. In fact, our experience suggests only moderate water flow volumes can be passed through organic material even with a head of water, and that the flow volume decreases with time due to compaction and/or other factors that reduce pore space in organic material. In RAPS, water movement will be upward through the organic material against gravity perhaps helping keep the organic material loose and less compacted.

Open limestone channels (OLC) were introduced in a 1994 Green Lands article last fall (Ziemkiewicz et al. 1994) as another way of introducing alkalinity to acid water (Figure 2C). The assumption in the past has been that armored limestone (limestone covered or coated with iron or aluminum hydroxides) ceases to dissolve. Based on some preliminary measurements at WVU and on a series of experiments by Penn State researchers, limestone dissolution decreases by 80% upon armoring (one-fifth as effective), but the limestone does not completely stop dissolving.

OLCs offer another passive treatment option where long channels of limestone can be used to convey acid water to a stream or other discharge point. Based on flows and acidity concentrations as well as potential channel lengths, cross sections of stream channels (widths and heights) can be designed with calculated amounts of limestone to treat the water.

More limestone, obviously, is needed when the water causes armoring, reducing its dissolution rate. Nevertheless, alkalinity can be generated under these conditions, albeit slower than with fresh limestone. Sloping the channel or providing other channel configurations can help reduce the possibility of floc or sediment buildup and causing burial of the limestone. These sloping channels or other configurations, however, may also reduce contact time between limestone and acid water.

Table 1. Effects of backfilling and revegetation at selected bond forfeiture sites in West Virginia.

	BEFORE			AFTER			
	Flow (gpm)	Acidity (mg/1)	Load (lb/dy)	Flow (gpm)	Acidity (mg/1)	Load (lb/dy)	% Change
SITE							
Benham	41	527	259	10	500	60	-77
Cowaco	178	14	30	147	14	25	-17
Crane	29	98	34	20	50	12	-65
Daugherty N	379	314	1428	179	353	757	-47
Daugherty S	293	1158	4072	145	211	367	-91
Hamrick	5	37	2	79	-6	-6	-100
J&D	5	1	0	0	1	0	-100
Jacob	3	387	14	*5*	*-15*	-1	-100
Keister 79	69	93	77	38	-9	-4	-100
Kodiak 3052	20	11	3	1	-25	0	-100
P.B.T	7	1	0	0	1	0	-100
Pierce Cmplx	395	58	275	76	165	150	-45
Wemer	35	42	18	65	-44	-34	-100
Weston Coal	63	360	272	20	-65	-16	-100
XW Corp.	38	49	22	40	-18	-9	-100
Zinn	100	30	36	0	-1	0	-100

Table 2. Effects of ALDS, wetlands and diversion wells at selected bond forfeiture sites in West Virginia.

	BEFORE			AFTER			
	Flow (gpm)	Acidity (mg/1)	Load (lb/dy)	Flow (gpm)	Acidity (mg/1)	Load (lb/dy)	% Change
SITE							
Greendale S	75	487	438	70	350	294	-33
Greendale R	104	194	242	96	155	179	-26
Harvey	8	208	20	3	182	7	-67
Keister 77	13	265	41	8	219	21	-49
Kittle ALD- 1	20	576	138	12	-228	-33	-100
Kodiak 2044	25	233	70	1	-168	-2	-100
Lillybrook	147	4	7	13	-44	-7	-100
Lobo Capital	83	411	409	63	249	188	-54
Pierce Cont.	9	190	21	27	98	32	55
S. Kelly	15	2432	438	27	1386	449	3
Z&F	10	2405	277	9	788	89	-68
Galt (div well)	20	282	68	20	83	20	-71

Methods

The effect of backfilling and revegetating surface mines on water quality was investigated by evaluating data collected by personnel of the Bond Forfeiture Program of the West Virginia Division of Environmental Protection (WV-DEP). The effects of installing ALDS, wetlands and diversion wells on acid loads from several West Virginia minesites were also assessed based on data from WVDEP.

Flows and concentrations were collected and averaged for a period of at least six months prior to backfilling or installing passive systems. Data since this mitigative effort have also been averaged for the study period ranging from three months to six years. Acid load (flow *x* concentration) decreases were the principal measures of success, although dilution was accounted for at some sites by measuring magnesium concentrations. Iron, manganese, aluminum and sulfate concentrations were also analyzed, but are not shown in this article. For further information about backfilling and revegetation methods or about passive system design on a specific site, please contact the authors and we will make this data available to you.

Results and Discussion

From WV-DEP data, backfilling alone reduced the acid load substantially or improved the water quality to the point of meeting effluent limits (Table 1). Water flow was reduced on 12 out of the 16 sites. On those sites where flow was not reduced (Hamrick, Jacob, Werner, and XW Corp.), water quality changed from acid to alkaline. In only two cases (Daugherty N and Pierce Cmplx) was the acidity increased in the water due to reclamation, but the flow was reduced dramatically causing a 45% decrease in acid load.

These results demonstrate that backfilling on these sites reduced total acid load either by reducing the flow or by reducing acidity concentrations in the water, or both. This observation has been made by us as well as many individuals familiar with surface mining and reclamation in the field. However, historically, this trend has been poorly documented.

Backfilling remains the primary approach to reducing water quality problems at surface mines. If the pavement is visible and toxic material is present, appropriate material handling to keep toxic material "high and dry" in the backfill is desirable. Lining the pit with alkaline material and lime products will also reduce the acidity produced on-site. Alkaline by-products in place of lime must be evaluated carefully to determine the actual amount of delivered neutralizer per dollar. Trucking costs can be substantial. Encouraging controlled, rapid runoff and discouraging recharge into zones of pyritic backfill materials will help reduce the total acid load from the site.

The four wetland systems (Keister, Pierce, S.Kelly, and Z&F) have been discussed in detail elsewhere (Faulkner and Skousen 1994), but additional data has been included in the values shown in Table 2. Two of the systems (Keister and Z&F) reduced acid loads from 50% to 70%. The other two systems (Pierce and S.Kelly) have shown increases in flow, but large reductions in acidity concentrations. However, total acid loads increased by 3% at the S.Kelly site and by 55% at the Pierce site.

Wetlands consistently reduced iron concentrations, although seasonal variation in removal rates was common. Manganese, sulfate and aluminum concentrations were reduced less dramatically and less reliably. Wetlands containing limestone as a substrate or as a component of the humic strata out-performed those without limestone in the substrate (Faulkner and Skousen 1994).

Anoxic limestone drains reduced acid loads from 26% to l00%. Three of the systems produced net alkaline water, while the other four ALDs reduced acid concentrations 13% to 45%.

Passive treatment systems are an attractive means of dealing with AMD at many sites. If the passive system is sized for the pollutant load, reductions in flow, acidity and metals can be realized. While effluent limits cannot be reached in all situations, improvements in water quality can be attained to preserve existing downstream water uses or reduce further treatment efforts. Even a small discharge with moderate acidity at a remote site requires considerable costs for labor and maintenance of chemical systems, but can be effectively ameliorated by careful backfilling and installation of an appropriate passive system.

The Galt diversion well showed reductions in acidity from 282 mg/i to 83 mg/l, a decrease of 71 %. This well has been in for over two years and our data shows that acidity decreased but fluctuated seasonally, iron and aluminum concentrations were reduced, and manganese concentrations were unchanged by treatment. Costs for installing the diversion well with limestone were about $8,000. No other limestone has been added to the well. Treating the small deep mine discharge with sodium carbonate briquettes would have cost about $20,000 per year.

Several studies on limestone treatment of AMD were conducted in the early 1970's with conflicting results (Bituminous Coal Research 1970, Hill 1968, Wilmoth 1974, Wilmoth and Hill 1970). We are testing the potential clogging and armoring of limestone with aluminum and iron hydroxides. We plan to conduct experiments where synthetic acid water containing only aluminum and hydrogen ions are neutralized by limestone. Similar experiments will then be conducted with only iron (ferrous only and ferric only) and hydrogen ions. Then combinations of metals will be done to evaluate interactions between these two ions on limestone dissolution. We hope to add new information and clarify the role of limestone in AMD treatment.

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Association Notebook

Winter Meetings

As a reminder, the 23rd West Virginia Mining Symposium is scheduled for January 10-12, 1996 at the Holiday Inn Charleston House in Charleston. Also, now is the time to make plans for the Association's 1996 Semi-Annual Meeting. WVMRA will return to Marriott's Desert Springs Resort in Palm Desert, CA, the site of the 1994 event. The meeting will run from January 30 - February 4.

Further details on both meetings will be forwarded to the membership as they are developed. These two events will kick off the Association's 30th Anniversary celebration.

Scholarship Fund Grows

Association Chairman Don Nicewonder (at left in top photo) presents a check for $10,000 to the West Virginia University College of Engineering & Mineral Resources. The contribution was made in honor of retiring WVMRA Board member Lawrence Streets. Accepting for the University are WVU Foundation President Jim Robinson and Royce Watts, Interim Associate Dean of the College.

Chairman Nicewonder, on behalf of the Association, also donated $2,500 to fund a graduate student for cooperative research on the decline of the woodcock. Accepting the check is Dr. David Samuel (at left in bottom photo), WVU Professor & Program Coordinator of Wildlife Biology in the College of Agriculture & Forestry.

New members

During the last two meetings, the Board of Directors has approved six companies were approved for membership, including one in the General Division and five in the Associate Division.

Welcome to the following companies and their representatives:

GENERAL DIVISION - AMVEST Minerals Corp., Kingsport, TN, representative - Donald B. Sult.

ASSOCIATE DIVISION - Crystal Resources, Inc., South Charleston, WV, representative - Phil Longenecker; **D & R Clearing**, Summersville, WV, representative - Danny S. Clay; **Liebherr-America Inc.**, Newport News, VA, representative - Robert F. Fiorenza; **Steptoe & Johnson**, Charleston, WV, representative - Steven P. McGowan; **Titan Rentals Inc.**, St. Albans, WV, representative - William O. Tracy, III.