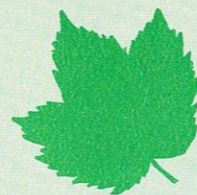


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Green Lands

QUARTERLY

Winter 1971



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West Virginia Surface Mining & Reclamation Assn.

Green Lands

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Reclamation means many things to many people

Thousands of acres of surface mined land are being reclaimed in West Virginia each year and much of this land is being returned more valuable than it was before mining.

Over 85,000 acres have been reclaimed since 1965, and while most of this has been restored for woodland and wildlife use, much has been developed for a higher and better purpose.

Land development is important in the Mountain State, where level, usable ground is the exception rather than the rule. The uses of surface mined land are varied and numerous.

Five airports have been built on old mine sites in West Virginia. The 34 acres that now comprise the Weirton Airport were reclaimed in 1957. Two other commercial airfields are partially on reclaimed land; at Williamson and Rainelle. There are private airstrips at Corrine and Kelly Mountain with a third being planned for Barbour County.

This shopping center, housing 29 shops and businesses and employing nearly 200 people is located on a reclaimed surface mine near Weirton.



Many types of commercial buildings can be found on land reclaimed after coal was extracted by surface mining, including six shopping centers on a total of over 200 acres. Two of these are in Weirton, two in Clarksburg, one in Beckley, and one in Fairmont.

Other commercial developments include a Holiday Inn and Chevrolet dealership (Bridgeport), a drive-in theater (Clarksburg), a hydraulic shop (Gypsy), industrial site (Meadowbrook), two car washes (Fairmont) Austin Powder Magazine (Preston County), Hecks and Sears (Beckley), C & P Warehouse, Manufacturers Light and Heat Building, Monongalia Power Building, a bowling alley, a funeral home, a Masonic Temple and a machine shop, all in Weirton.

Also, in and around Weirton, high school, a grade school, post office, state police barracks, three churches and a Knights of Columbus Building, all located on former surface mines.

(Photos compliments of Dick Kelly
Editor, West Virginia Illustrated)



These 1,500-acres of green, rolling farmland at Weirton used to be a surface mine. The "experts" said it would be 800 years before anything would grow here.

An estimated 13,000 acres have been reclaimed for use as farm and pasture land in West Virginia with principal acreage located near Lumberport, Summersville, Kingwood, Brandonville, Green Valley, Weirton and various other locations throughout the state.

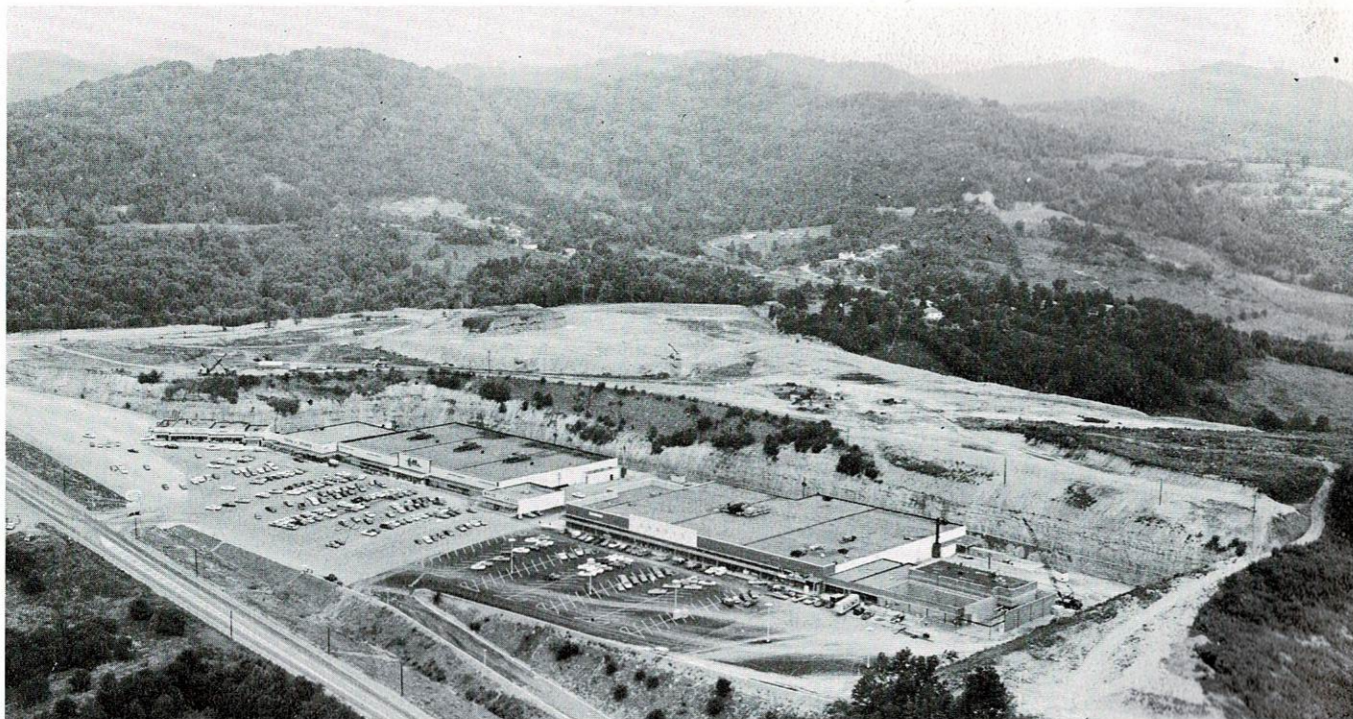
As a result of surface mining, there are many ponds and lakes that offer the potential for fishing and swimming. Organized recreation areas include a 42 acre site with pond and picnic tables at Wayco, the Taylor County Fairgrounds, a playground at Matoaka and a swimming pool in Weirton.

Athletics have definitely not been forgotten as reclaimed sites boast 16 Little League baseball fields and two practice football fields at Weirton, with other fields at Bethany College,

North Fork High School and others.

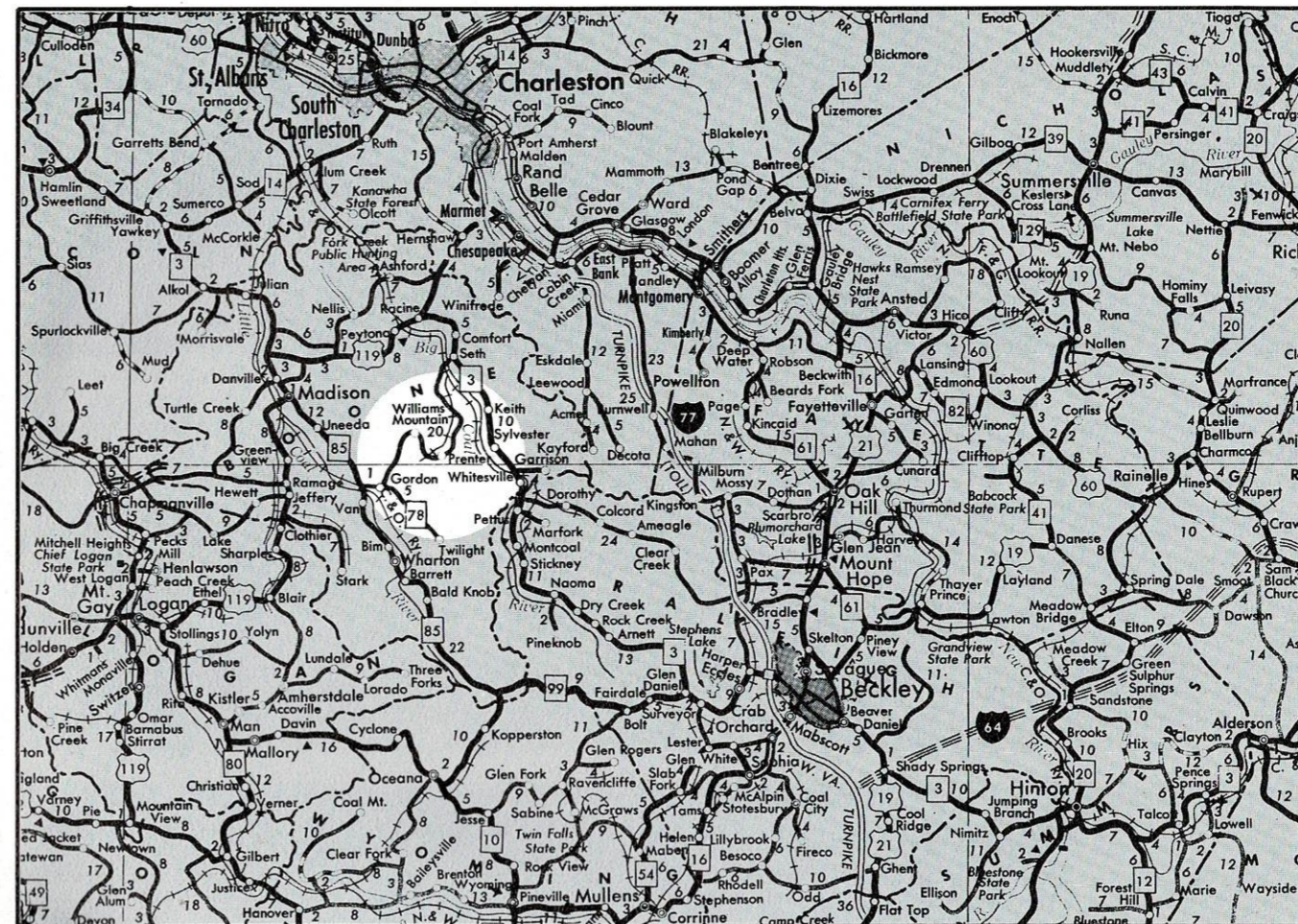
Another important accomplishment of surface mining is that it facilitates the development of other industries by opening up remote areas. There are various oil and gas wells too numerous to mention, plus many timber facilities. Also, an interesting statistic shows that 156 deep mines have been located on former surface mines since 1968 alone.

Obviously, the use of old surface mines for land development is extensive in West Virginia, far too extensive to list them all here, but it is certainly just the beginning. In an average year, the industry disturbs 12,800 acres, but reclaims 15,600. Reclamation is happening in West Virginia in more ways than one.



▲ This 26-acre site on Route 50 near Clarksburg is a former surface mine. Today, this modern shopping complex is providing employment for 350 people and it's still growing. The 30-acre area above the existing structure is now being developed into another shopping plaza.

▼ Adjoining the shopping center is the new Clarksburg-Bridgeport Holiday Inn with 117 units and plans for 70 more when 1-79 is completed.



Ever been to Prenter, W. Va.?

Ever been to Prenter, West Virginia. It's located just about 10 miles south of Seth near Williams Mountain in Boone County.

In the early 1960's, Prenter, was deserted by the coal companies because the deep coal had run out. What was once a prosperous mining community had been turned into a ghost town.

But in 1971, Prenter is prospering, and once again the reason is coal. But now the coal is being surface mined.

Bill Jacobs, the owner of a supply store has observed the evolution of the Boone County community.

"Prenter was a ghost town in 1961 and 62, run down and beat out, because the big coal companies had pulled out," he said. "But now I've watched this town come back to life."

Jacobs gives all the credit to the surface mining industry.

He explains that there are 17 businesses in the area, employing 177 people, that do their business almost exclusively with Surface Miners.

"Ten years ago some of these men worked in small deep mines, but many were on welfare," he said.

There are also three deep mines, employing 45 men, but they account for only about 15% of the total

coal production of the area. He notes that two of these deep mines are still in the experimental stages and it is still uncertain if they will ever reach full production.

He also mentioned that two of the deep mines began only after the area had been opened up by surface mining.

Jacobs points with pride to the fact that of those 177 men, 129 of them are either too old or disabled to get a job anywhere else, but in Prenter, they are welcomed.

"We hire the handicapped because he is a more cautious everyday man that an employer can depend on. He doesn't make the same mistakes twice and most important of all, he's proud to be on the job. He'll give you all he's got," he said.

He points out that the average age of these 129 men is about 59 years old and that if not for surface mining, their only recourse would be welfare.

Jacobs emphasizes, "This whole area is built around surface mining and without it only God knows the damage that would be done."

If you ever go to Prenter, be careful what you say about surface mining. The people there don't like being on welfare and don't want Prenter to be a ghost town again.

CAP ON TOUR

Seeing is Believing

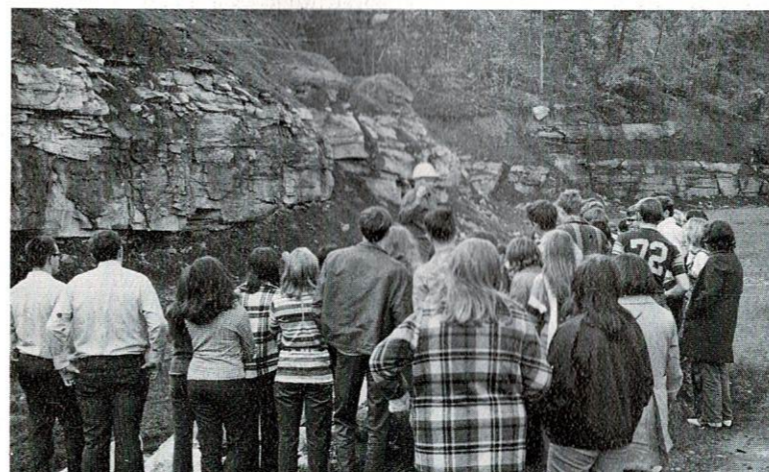
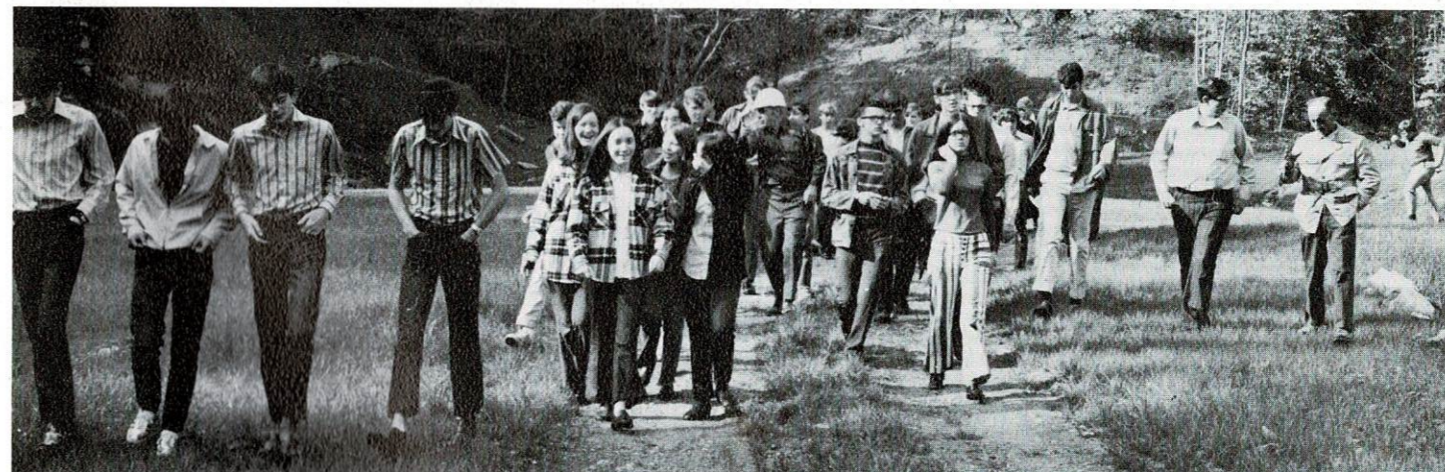
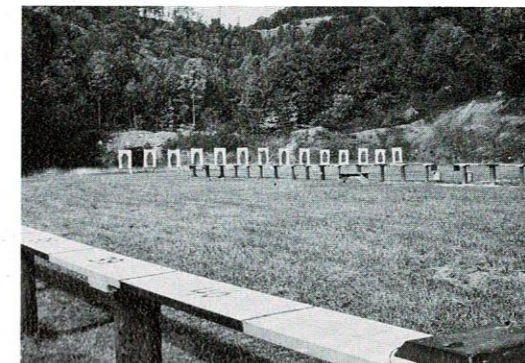
Surface Mining. You can read about it, debate the pros and cons and argue until you're blue in the face, but the best way to find out what's really happening is to go and see for yourself.

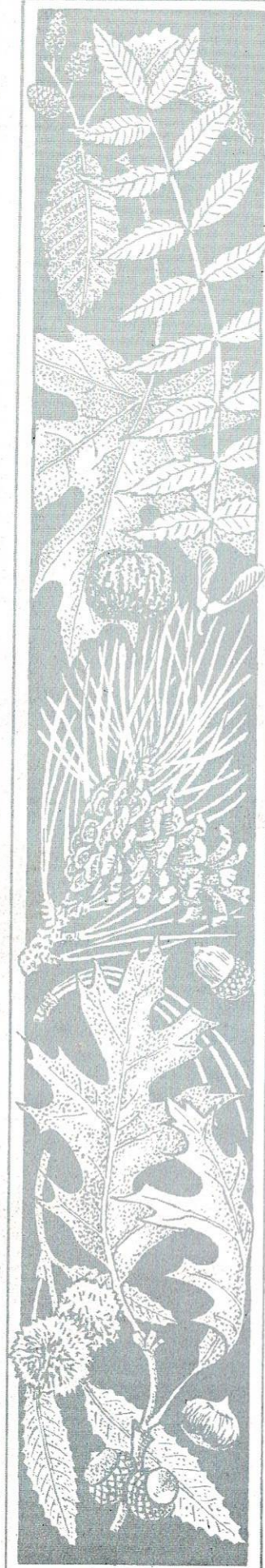
That's exactly what 120 Summersville High School students did last week and the results were expressed best by a school official who said, "It's been a valuable learning experience that just couldn't be accomplished in the classroom."

A. S. Cappellari conducted the tour on his Nicholas County Mining site, giving the students a first hand look at the entire surface mining operation, from initial cut to final grading and seeding. For many it was their first time on a surface mine.

The inquisitive youngsters had many questions, but the tour was well fortified with qualified experts. Fielding the queries along with Cappellari were District Reclamation Inspectors Paul Hamilton and W. W. Wiley along with Charlie Green and Paul Mullens of the Soil Conservation Service.

The last stop on the tour featured an interesting land use project. The James D. Ireland Rifle Range is located on an eight acre site that was mined and reclaimed by Cappellari's company over five years ago. The range is used extensively by the Wadcutters Inc. Shooting Club, the National Guard and Air National Guard, and for the past three years, has been the site of the State Pistol Championship. It is, also, utilized by the 4-H Club, Boy Scouts and an Economic Opportunity group, to teach hunter safety in the summer.





Successful nut tree plantings on bituminous spoil banks

By W. G. Jones



W. G. Jones, conservationist extraordinary, has spent the major part of a very active life in reclamation work in the bituminous coal region of Pennsylvania. In doing so he has supervised the planting of over 35 million trees and shrubs. Since his "retirement" early last year, he has planted several hundred thousand more. Mr. Jones is recognized nationally as a authority on the subject. He also has written a book "The New Forest" which describes and handsomely illustrates, in full color, reclamation efforts on surface-mined land in Clearfield County, Pennsylvania. It is believed to be the only book in print which deals with reclamation of surface-mined land in coal.

In 1968 he was named Pennsylvania's Outstanding Conservationist, and is the recipient of the Pennsylvania Forestry Association's Distinguished Service Award for 1966 to 1969.

He is a member of the Pennsylvania Forestry Association, the American Forestry Association, Outdoor Writers of America, and is active in numerous other conservation groups. He is a Clearfield County Soil Conservation Director.

In his home town of Philipsburg, Pa., he acts as Shade Tree Commissioner and is Activities Chairman of the Village Beautification Council.

Mr. Jones is a graduate of Bucknell University (1929) with a major in Biology.

CHINESE CHESTNUT

Many theories and much astonishment exists as to why trees and shrubs grow so well on the inhospitable rocky soils of these "reclaimed" spoil banks. Amazingly enough, some tree species grow even better here than on good farm soil. Such is the Chinese chestnut.

In 1954 we purchased fifty one-foot seedlings of this valuable nut tree, and as it was my first experience in planting them, set out twenty-five on good farm soil, and twenty-five on the worst looking, rough, broken sandstone spoil we had at the site. Now, fifteen years later it is interesting to note that all of the twenty-five planted on good soil have died, and that none of them ever bore any nuts. Of the twenty-five



Chinese Chestnuts

planted on spoil, all are still thriving and have consistently borne good crops of large sweet-tasting nuts. Some of the later were bearing nuts only four years after planting, and only four feet high! They have only one disadvantage as a tree. Their growth habit is shrubby, and these varieties will never make a timber type tree.

Fortunately, such devoted scientists as Dr. Richard Jaynes of the Connecticut Agricultural Experiment Station are engaged in the long and arduous process of genetically selecting and developing a timber type of Chinese chestnut, or hybrid thereof. Posterity will owe him much!

One individual tree of the twenty-five still growing is, in some respects, a freak or genetic deviate of some sort. The nuts it bountifully produces are even smaller than those of the original native American chestnut, and are truly sweet and delicious. The nuts borne by the other trees in this group are typical of the species, being somewhat smaller than the European variety of chestnut found in our supermarkets, but much more flavorful and better eating. They're a genuine treat every fall, and it's a race between me and the wild game as to who gets them first!



*Chinese Chestnut
in bloom.*

The foregoing quotation from my recently published book **"The New Forest"** is actually a condensation of the work we have done, and the experience we have had in planting nut trees on the open pit mining spoil banks here in Pennsylvania.

The writer is neither a professional forester nor an agronomist, so that although we have planted several thousand nut tree seedlings, our method of selecting strains and varieties has been strictly non-scientific, as we have planted both seeds and seedlings of various nuts "as they were available". Had we been more selective and more scientific in our approach, we would no doubt have had by now some valuable data to offer.

However, even with this shotgun approach we have arrived at one main conclusion: Nut trees **do** grow, thrive and **bear** on most types of bituminous spoil banks, and—a word about the latter before proceeding further: Most of the overburden lying above the coal seams here in central Pennsylvania is totally lacking in limestone or other calcareous material. As a result, the pH of the spoil material usually ranges from 3.0 to a high of 4.5. Analysis shows only 1/10 of 1 percent nitrogen. The material is heavy in iron, sulfur and manganese.

As for texture of the spoil, my planting crews often jokingly tell me that I should give them

a bucket of dirt instead of a bucket of water in which to carry the seedlings! Fortunately, in this latitude, and at this elevation of 1600 feet, a temperature change of 50 degrees within 24 hours is not uncommon (a 70 degree change has been recorded) so that weathering of the rocks down to soil-size particles occurs fairly rapidly. On some of the worst "rockpiles", we now have at least a six-inch layer of finer material after only ten years exposure to this rather severe weathering process.

Planting is done by hand with a mattock, as machine planting is impossible, with large submerged rocks to upset both planter and planting machine after only a few yards' travel. Hand planting is naturally more time consuming, and hence more expensive, but is far more effective survival-wise.

THE BROWSE PROBLEM . . .

Pennsylvania has an extremely large deer herd, and we are right in the center of the heaviest deer population. Browsing is a problem.

On newly-leveled spoil banks where **any** type of deer cover is totally absent, browsing is practically non-existent, as the deer stay away from such open areas, and young trees can become well established. However, where a

stand of five or six foot conifers exists, it is impossible to later establish a planting of nut trees in the open spaces of the pine or spruce plantation, as the deer keep the young seedlings clipped to ground level, with dozens of shoots emerging from the roots.

In the matter of named varieties of Chinese chestnut, within the past five years we have begun to concentrate on "abundance." Of the few hundred six-foot seedlings we have set out, most are showing better form, straighter stems and less tendency to root sucker. Small developing side branches are, of course, pruned off when they appear. The same is done with root suckers.

OTHER NUT TREES . . .

When the Howard (Pa.) nursery was transferred from one state agency to another in the late 50's, most of the growing nursery stock was cleared out so that a completely fresh start could be made. Among the trees removed at that time was a bed of 700 black walnut whips (of doubtful ancestry) about three or four feet high. We were fortunate enough to secure these and planted them on a very dark gray shale spoil area, keeping our fingers crossed. Much to our delight and amazement we had better than 90% survival, and at this writing, many are 18 to 20 feet high and bearing nuts. Unfortunately, the nuts are small and thick-shelled, similar to the nuts we found attached to some of the seedling roots at the time of planting, but they do prove one thing: Black walnuts will grow on acid spoil banks.

In the past few years we have planted about a half-bushel of stratified butternuts, with fairly good success and now have about 150 two-foot seedlings doing well.

Hazel nuts planted as two-foot seedlings a few years ago are thriving, and this spring show signs of bearing nuts this fall. A Mr. Thomas of the Popular Spring trout hatchery at Grampian, Pennsylvania, has been getting excellent crops of hazel nuts for several years on the reclaimed spoil bank on his property.

CONCLUSION . . .

There are many joys and rewards in planting these supposedly barren areas once stripped for coal and seeing them bloom once again, but by far the most rewarding experience is in seeing the nut trees survive, thrive and produce bountiful crops of food nuts each fall for both man and our wildlife friends.

**FEDERAL LEGISLATION ON SURFACE MINING
TESTIMONY OF THE
SURFACE MINERS AUXILIARY OF WEST VIRGINIA**

**By
Mrs. Joyce Massie
Subcommittee on Minerals, Materials and Fuels
Senate Committee on Interior and Insular Affairs
November 29, 1971
Statement of Mrs. Joyce Massie
Member of Surface Miners Auxiliary of West Virginia**



We Love West Virginia, Too

My name is Mrs. Joyce Massie. I am a housewife and live in Beckley, West Virginia with my husband Charles and our fifteen month old daughter. I appear today representing the Surface Miners Auxiliary of West Virginia, a woman's organization made up primarily of wives and family members of surface mine workers.

West Virginians are proud people. My husband and I are proud to be native born West Virginians and we want to continue living in our home state. Also, my husband is proud to be a surface miner, and I, like the many women I represent, am proud of my husband and what he does.

I admit my husband plays a small part in a large industry that serves this energy-hungry nation of ours, but I am proud, just as he is, to be associated with an industry that is so vital to the United States.

My husband has always been a truck driver. During the 1950's he hauled coal for a deep mine operation. In 1957, when the industry was down, my husband was laid off. He tried to find a job in West Virginia, but failed. The competition was too great for the few jobs that did exist. We didn't want to leave our state, but Florida was the only place he could find suitable employment.

For two years my husband worked as a driver for a furniture company. Finally, he received an offer to drive a truck for a surface mine operation back in West Virginia. We returned because we love and want to live in our native state . . . it meant a lot to us then, and it means a lot to us now. My husband found a permanent job and has been working on a surface mine ever since. We were accepted and respected, and, most of all, we were West Virginians once again.

Then in 1969, surface mining started to become a controversial issue. The newspapers said it was destroying private property, endangering the lives of innocent people, and ruining our beautiful state. One newspaper said everybody should get their guns and shoot all surface miners on sight. In one short year a segment of the public was against my husband and it seemed we were no longer welcomed in our state as we were a year earlier.

With all that I read during that period, I'm embarrassed to admit that for a time I doubted my husband when he told me that most of what I had been reading was not true.

I became concerned with my husband's future and especially about the possibility of leaving again. I thought about the friends and relatives we would be

leaving behind. I thought about our daughter and how we both wanted her to grow up in West Virginia, just as we did. Finally, and most important, I was concerned about the lives of innocent people that the newspapers said were being endangered and the property that was being damaged by surface mining. Being a religious person, and even though this job meant a lot to our family, I did not believe that anyone had a right to infringe upon the rights of others.

I investigated the information I read in the papers, and I'm glad I did. First I've discovered that no innocent victims were ever killed or seriously injured as a result of surface mining. But, I did find cases where property was unintentionally damaged. As I understand it, though, in West Virginia, when this occurs the person is entitled to sue for triple damages and many have received just compensation for damage done to their property.

I was also concerned about reclamation in West Virginia and what was being done to keep it beautiful. My husband showed me what his company is doing to reclaim surface mined land, and I was impressed. I then found that the industry in West Virginia reclaimed more acres of land in the United States than any other state. I became proud again, just as proud as my husband, because men like him are working hard to supply our nation with the much needed coal, and at the same time are a vital part of our economy, and, equally important, are protecting the environment. I'm convinced that West Virginia will be as beautiful twenty years from now as it was twenty years ago, and that our baby will be able to enjoy the same things my husband and I had when we were growing up in the most beautiful of the United States, provided, of course, that reason prevails in this surface mining issue.

Knowing that reclamation is working in West Virginia . . . and it is working . . . it's hard for me to understand why there are some people in our state that want to put my husband, and thousands of men like him, out of work. It is harder for me to understand how in a state like ours where unemployment has been a problem, some people want to cause more. Personally, it's hard for me to understand why these same people are trying to force us to leave our state once again.

I know we will have to leave our state if surface mining were abolished. My husband is a truck driver and is unskilled. And, the last time he was out of work, there was no demand for the unskilled in West

Virginia. Unfortunately, my husband is too old to learn a new trade.

Some people tell me that deep mining can pick up the slack in production and will hire twice as many people than are presently employed by surface mining. But, I have also been told that it will take three to five years to establish a deep mine. And also, it will take at least fifteen years to gear up production to replace the thirty million tons that would be lost through abolition of surface mining. What do we do while we're waiting those fifteen years? Further, as I understand, much of the coal in West Virginia and other states cannot be mined successfully and economically by means other than surface mining.

I am also told that my husband can find a job driving a truck for road construction. We know this is false because West Virginia is at its peak in highway construction and there are many experienced truck drivers out of work.

I am also told that a truck driver on a surface mine that produces coal can find a job on a surface mine operation that strips for minerals other than coal, like iron ore. It's hard for me to understand how it's possible to abolish one job but not the other if they do the same thing. I'm sorry if I sound confused, but I can't understand why it's not okay for my husband to haul from a coal pit, but it's fine to haul from an iron ore pit.

We have a new law in West Virginia designed to protect the environment. Before it's given an opportunity to prove its effectiveness, abolition, not regulation, is still the issue. I sincerely believe that this industry is doing more today than it did yesterday to solve its problems, and I also believe that it will do more tomorrow if given the proper opportunity, guidance, and time.

I, and the women I represent, feel strongly that abolition is unjust and represents discrimination. The industry needs guidance, not elimination. We feel strongly that it is the duty of government to find a rational solution to this problem, not an irresponsible solution designed to force thousands of men to join the ranks of the already unemployed millions.

We feel that it is unjust to take our husbands' jobs away while others continue to work, and at the same time, forcing families to leave the state we love in order to make a living.

Personally, my husband and I had to leave West Virginia once . . . we don't want to leave again.

Industry in the News

Limit to Stripping Law Urged

It is impossible to eliminate environmental effects of strip mining, but attempts in that direction could halt the process, an industry spokesman told a House subcommittee.

"With no guidelines to govern or limit the requirements to be imposed by the regulations, the power to prohibit mining would be unlimited," Dennis M. Olsen, counsel for the Phosphate Land Conference, told the subcommittee on mines and mining which is considering a number of bills to regulate the industry.

"The intent and purpose of clauses of the bills speaks in terms of preventing and eliminating adverse environmental effects," Olsen said. "This is impossible."

Rep. Craig Hosmer, R-Calif., challenged Olsen, saying Olsen wanted not only the teeth, but the jawbone and gums removed from the bill.

Hosmer said the conference spokesmen apparently assumed that regulation would be arbitrary and capricious and sought instead to substitute the industry's judgment. "That's like putting the wolf in the hen house," he said.

Olsen countered that the conference was not suggesting that, but rather was asking Congress to write adequate guidelines for regulation.

"It is essential that there be guidelines limiting the authority of the administering agency," Olsen said. "Otherwise, industry will find its mining methods being dictated by an agency without an opportunity or basis for challenging its authority."

'Strip' Position Given

Representatives of the National Coal Assn. said recently the industry supports federal rules for strip mining if they are administered by the state.

"We support federal surface mining legislation which sets forth broad mandatory criteria for the states to follow in developing the specific regulations," Carl Bagge, association president told the Senate mineral subcommittee.

Bagge said that proposals for direct federal regulation "could end up by imposing uniform regulations on all the states regardless of existing conditions."

Edwin R. Phelps, president of Peabody Coal Co., said that requiring that

land reclaimed after strip mining be restored to a natural beauty makes enforcement a matter of taste.

"So long as the land is turned to productive use, the choice of that use should be left to the mine operator," he said.

Representatives of the coal association and of the United Mine Workers Union agreed they are against the banning of strip mines.

Bagge called proposals for a ban irresponsible. Joseph R. Brennan director of research and marketing for the UMW, said the union opposed a ban "as a matter of policy and, logic."

"Strip mining is an economic, efficient and safe way to produce coal," Brennan said.

H. L. Kennedy Praised

Representatives of the West Virginia and National Wildlife Federations toured a controversial strip mine near Coopers Rock State Forest recently and concluded it was one of the best they'd seen.

"I've looked at about 40 strip mines, and I like this one better than any I've seen from the standpoint of protecting the environment," Dave Bratner, president of the West Virginia Wildlife Federation, said.

The strip mine viewed by a tour of 15 persons Wednesday was one begun recently by the H. L. Kennedy Co. after eight months of legal haggling.

The federations took the tour, directed by personnel from the State Natural Resources Department, after receiving complaints from citizens who said siltation and acid mine drainage from strip mines were ruining natural trout-fishing streams.

Alan Krug, a representative of the National Wildlife Federation, said the Kennedy mine was a "typical operation" and said he could see no reason to oppose its continued operation.

Krug said the wildlife federation does not oppose strip mining as long as the environment is protected.

Bratner said he was impressed with the steps Kennedy had taken to catch siltation and other drainage before it reached streams.

Gov. Arch A. Moore, Jr. asked the natural resources department in February to suspend Kennedy's permit until the situation could be reviewed. The State Reclamation Board of Review unanimously ruled to allow Kennedy to strip mine the area near the scenic state forest.

Strip Mining Ban Could Cost In Human Value

The administration's chief environmentalist told a Senate subcommittee today a ban on strip mining may prove more costly in human values than mere regulation of the industry.

Chairman Russell E. Train of the Council of Environmental Quality (CEQ) recommended the Congress adopt an administration bill which gives states a two-year period to adhere to federal guidelines.

Train was a witness as the Senate Interior Subcommittee on Minerals heard testimony on a series of surface mining bills.

Strip mining is a method of extracting minerals, especially coal, from the earth by scraping away the top soil, exposing the minerals.

Subcommittee Chairman Frank E. Moss, D-Utah, said about two million acres of stripped land in the nation were in need of rehabilitation at an estimated cost of \$658 million.

One bill, backed by Sen. Gaylord Nelson, D-Wis., would outlaw strip mining within six months of enactment.

Train disagreed with that measure. "Foreclosing surface coal mining would mean more reliance on other forms of mining which have not at all been proven to be less damaging to human values."

"In light of the cost advantages of surface mining, it may prove cheaper in human and economic terms to require surface miners to be environmentally responsible than to rely solely on underground mining."

Pros, Cons Appear At Mining Hearing

West Virginians from both side of the strip mining issue again appeared before a House subcommittee studying the issue recently, and one member of the subcommittee predicted some sort of strip mine control bill would come out of the hearings.

The Interior subcommittee on mines will come up with a bill prompted "largely by the political necessity for us to appear to be doing something," said Rep. Sam Steiger, R-Ariz.

"The committee's going to pass something and some of it's going to hurt you," Steiger told members of the American Iron Ore Association.

West Virginia State Senators Louise Leonard and Si Galperin appeared before the panel on opposing sides, with State Del. Ivan White, D-Boone, joining Galperin.

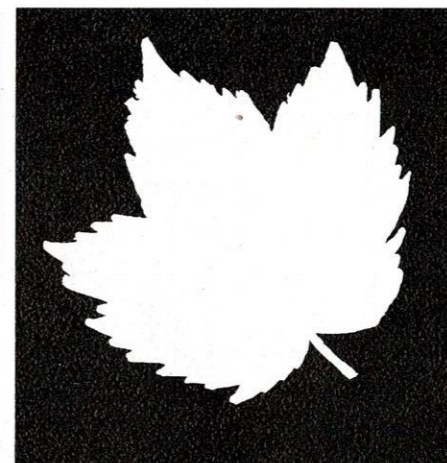
Mrs. Leonard, R-Berkeley, asked "Is the oil industry abolished when spills and well fires occur? It is equally ridiculous to talk about abolishing a method of coal production."

Galperin, D-Kanawha, who authored an unsuccessful strip mine abolition bill in the last session of the West Virginia Legislature, charged that "when state administrations can be bullied by giant corporate interests, there is little incentive to adopt or enforce meaningful rules and regulations."

Mrs. Joyce Massie of Beckley, W. Va., appeared as a representative of the Surface Miners Auxiliary, a woman's organization made up mostly of wives and family members of surface miners. Her testimony centered mainly on the job requirements in West Virginia and the needed employment opportunities given by surface mining. She said no other field could absorb men who would lose their jobs if strip mining were abolished.

Mrs. Massie also said that reclamation of strip mines is possible and that it is being done.

"I'm convinced that West Virginia will be as beautiful 20 years from now as it was 20 years ago, and that our baby will be able to enjoy the same things my husband and I had when we were growing up in the most beautiful of the United States, provided, of course, that reason prevails in this surface mining issues," she said.



Expanded Complaint Filed To Strip Suit

A Braxton County woman and a strip mining company moved recently to expand their \$595,000 lawsuit against persons they say acted to terminate a strip mine operation.

The suit, as it was filed Sept. 17, originally charged five Braxton County conservationists, Secretary of State John D. Rockefeller IV and the Appalachian Research and Defense Fund with acting in concert and individually to terminate an operation in Braxton County.

The suit was filed by Pearl Dennison, who owns the site in question, and the Tri-State Mines and Minerals Co., which was mining on Miss Dennison's land.

Attorneys for the defendants charged that the original suit was vague and failed to charge any specific act or acts committed by them. They also said it didn't charge any breach of duty nor obligation to the plaintiff.

The expanded complaint filed Monday specifically charges the defendants, "particularly Rockefeller," with causing false news releases on the controversial strip mine near Sutton Lake.

In addition, it claims that the defendants "falsely represented the distances" of the proposed strip mining operation in regard to the lake, as well as falsely representing possible damage from pollution to the reservoir.

The operation, near the Kanawha Run campsite on the north side of the lake, was the center of strong controversy as stripping opponents charged it would result in pollution and siltation of the popular fishing reservoir. Operations were ordered suspended by the state.

Abolitionist Wants Violence

The president of the Kentucky conservation group "Save Our Kentucky (SOK)" told a U.S. Senate subcommittee Tuesday unless there is prompt legislative action Appalachian residents would resort to violence to end strip mining. "If strip mining is not abolished in Appalachia, it will be the most dangerous occupation in America," James Branscome told the subcommittee on minerals, materials and fuels.

'Wild Sex Party' At Strip Mine Site Nets Arrest Of 14 Persons

A widow with an infant child was among a group of 14 persons arrested at what lawmen termed "a wild sex party" near Manchester, Ky. a few days ago.

Those arrested included five teenage girls.

Clay County Sheriff Clarence (Cotton) Gibson, four of his deputies, a Kentucky State Trooper and a constable combined to make the raid about a mile west of Manchester in an area known as Little Goose.

Sheriff Gibson said two women and a man managed to flee the scene before capture and warrants were later issued for their arrests.

Gibson said the nine males and five females were in or around several autos at the scene, a deserted strip mine area, and car radios and stereos were going full blast.

He also said one female was nude and several others semi-nude.

A large quantity of alcoholic beverages was confiscated, said Gibson. The sheriff also said the autos at the scene were confiscated and towed to Manchester, with the owners later paying the tow bills.

The lawmen indicated they had heard rumors of "wild sex parties" going on in the area and received an anonymous tip about the one which they raided.

The raid occurred about midnight Saturday.

An infant child was also at the scene of the raid, said Sheriff Gibson, and the tot was taken into town to be given proper care.

Clay County Judge Herman Lewis fined 12 of these arrested \$20 each of disorderly conduct charges. Two of the 14 arrested refused to pay their fine initially and were placed back in jail.



This overall picture of the Bridgeport High School athletic field shows the new improvements. (1) 8ft. Cyclone fence, (2) dressing

room, (3) scoreboard, (4) quartz playing lights, and (5) goal posts. The new backstop is out of the picture on the right.

A Special Salute!

A special salute this month goes to our members in the Clarksburg-Bridgeport area for their work and financial support of the new improvements at the Bridgeport High School athletic field.

This past summer these operators, along with other interested groups in the area, donated a great deal of time and expense in an effort to up-grade the high school's athletic facilities. They are now among the best in West Virginia.

The improvements include a 30' x 60' dressing room, modern goal posts, 16 quartz lights, new scoreboard, a backstop on the baseball

field and a new concession stand is now under construction.

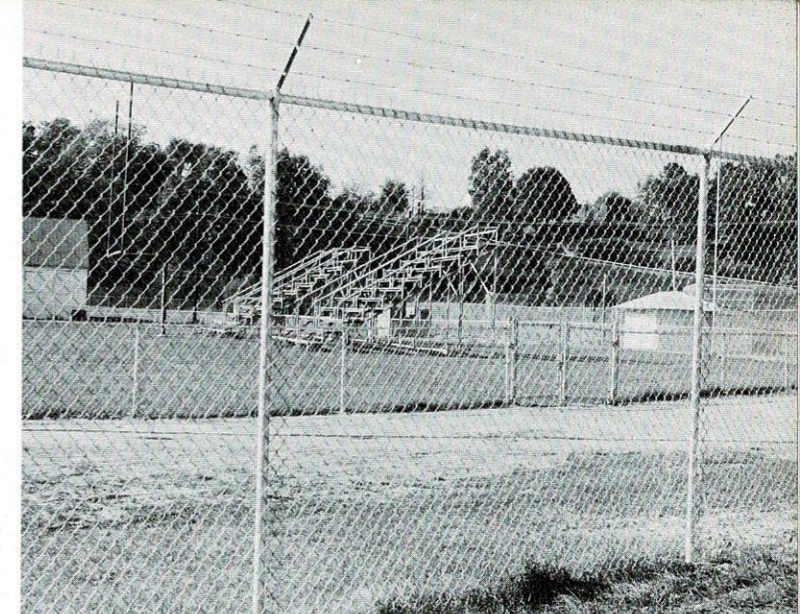
The new eight foot cyclone fence that surrounds the entire athletic field and a four foot fence around the football field were paid for by surface mine operators at an estimated cost of \$14,000.00.

Erection of the fence was a four stage process, beginning on July 29 and ending on August 31.

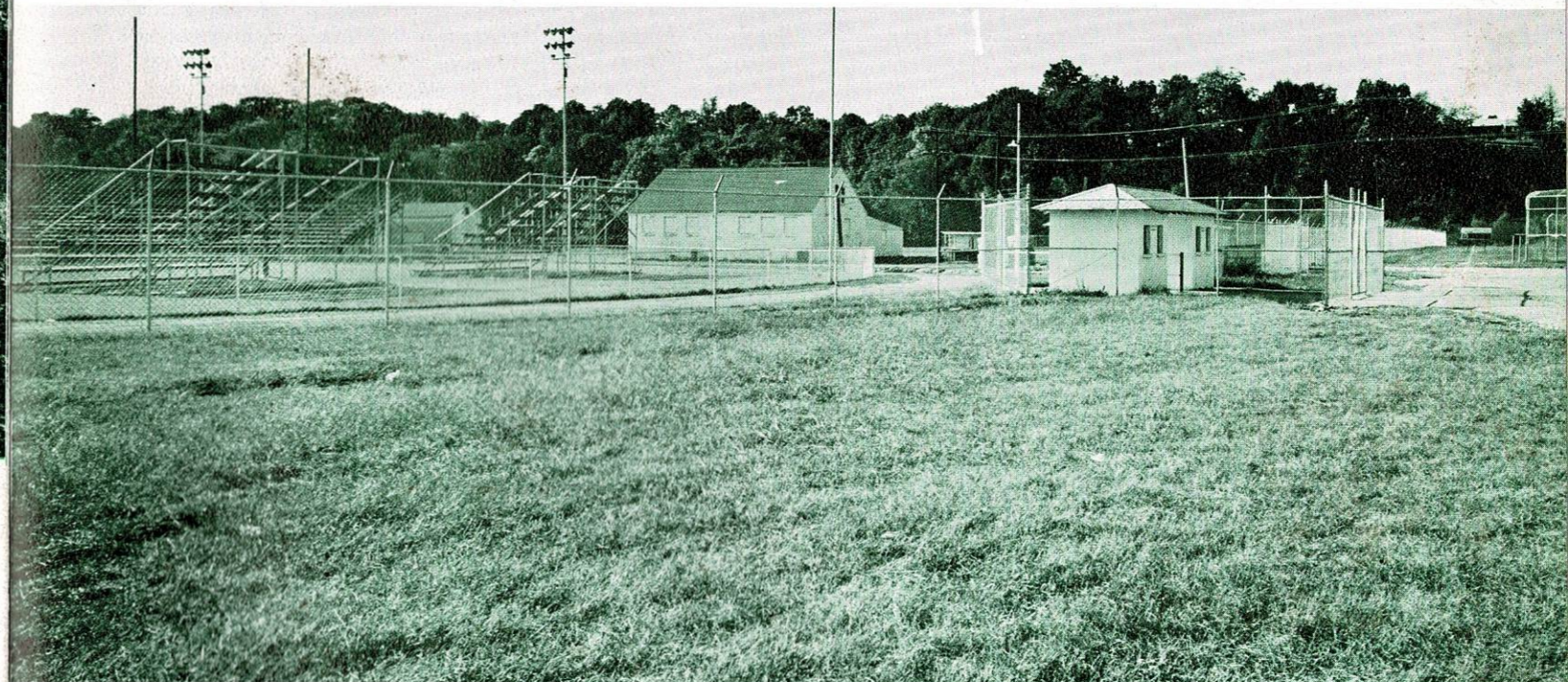
This is just one of the many examples in West Virginia, where surface miners are doing more than their share to make their community a better place to live.



This new eight foot Cyclone fence was donated to Bridgeport High School by local surface mine operators at a cost of \$14,000.00. It was erected in August and surrounds the entire athletic field to help prevent vandalism.



This view shows the shorter, four foot fence that surrounds the football field to keep the spectators off the playing surface.



All these new improvements at the Bridgeport athletic field easily make it one of the finest in West Virginia.

Our hats are off to:
Grafton Coal Company
King Knob Coal Company
Barbour Coal Company
R. N. White Contracting Company
Appalantic Corporation
Thompson Coal & Construction, Inc.

Coal Service Corporation
Wesgin Mining Company, Inc.
Lang Brothers
West Virginia Coals
Fresa Construction Company
Bell Mining Company
LaRosa Fuel Company

About the Association

ANNUAL MEETING IN CHARLESTON

Big things will be happening at the Daniel Boone Hotel on December 10th and 11th, as the annual meeting of the West Virginia Surface Mining and Reclamation Association rolls into Charleston.

The Research Steering Committee will conduct a meeting on Thursday the 9th, but the actual program begins with the Board of Directors' meeting at 11:00 A.M. on the 10th, followed by election of new officers and the annual business meeting.

Saturday morning features guest speakers Dr. Jay Hilary Kelley, Dean, School of Mines at WVU; William Parks, Bureau Chief, U.S. Bureau of Mines; and James S. Bennett, State Conservationist, Soil Conservation Service, followed by a technical session in the afternoon.

The Awards Banquet begins at 7:30, with Ira S. Latimer making the presentations, followed at 9:30 by a dance in the ballroom.

While the men are hard at work on Saturday, the ladies will be entertained by a brunch at 10:00 A.M., then a tour of Sunrise Museum and Art Gallery.

NORTHERN MEMBERS HOLD MEETINGS

Under the direction of David Atchinson of our Bridgeport Office, the northern members of the Association have established a policy of conducting monthly meetings.

The regular meetings are being held for the purpose of getting the membership more involved in and aware of the activities of the Association.

Executive Director Dick Vande Linde and Assistant Director Ben Lusk have appeared at past meetings, discussing different phases of the Association. Preston County Engineer Floyd Stiles and West Virginia University Agronomist Dr. Richard Smith have also presented technical information and advice.

A special membership campaign has been initiated, with most of the help and guidance coming from the LaRosa Fuel Co. and the R. N. White Contracting Co., that, if successful, should significantly increase our numbers in the north.

Several other projects have been discussed and may be implemented as a result of the regular meetings.

Meetings have been held regularly since September, with notification of time, date and place being sent to all the members in the northern half of the state from the Bridgeport Office.

There will be no meeting in December because of the Annual Meeting in Charleston.

Las Vegas Convention

The Association was well represented at the American Mining Congress Convention in Las Vegas last October. Although the statistics aren't available, it seemed as though West Virginia had more people present than any other state.

Over 12,000 miners from all over the United States attended one of the largest displays of machinery ever. At the Convention Center an interested person could find every type of mining equipment possible. . . from hand tools to draglines, conveyors to explosives.

The Australian exhibit caught the attention of a lot of people. The theme of its display was "They don't call the Australians Diggers for nothing". By the size of the exhibit, it's easy to tell that Australia's got "a lode of" mining equipment.

One of the highlights of the show occurred when a company filled the bucket of a huge endloader with water and placed a sailboat inside. It was piloted by a shapely model in a bathing suit. (There's no truth to the rumor that one of our members offered more for the model than he did for the machine.)

Bernie Folio of Clarksburg who is known worldwide for the great parties he hosts, out did himself in Las Vegas. Most conventioners when in Las Vegas usually spend their time at hospitality suites, cocktail parties or attending one of the many shows, but, Bernie decided to have a picnic. If you're thinking that the Nevada sun got to our well-liked Northern board member, you're wrong. Members in attendance all agreed that Bernie's Picnic, highlighted by expertly prepared sausage sandwiches, was one of the most relaxing and enjoyable afternoons ever spent.

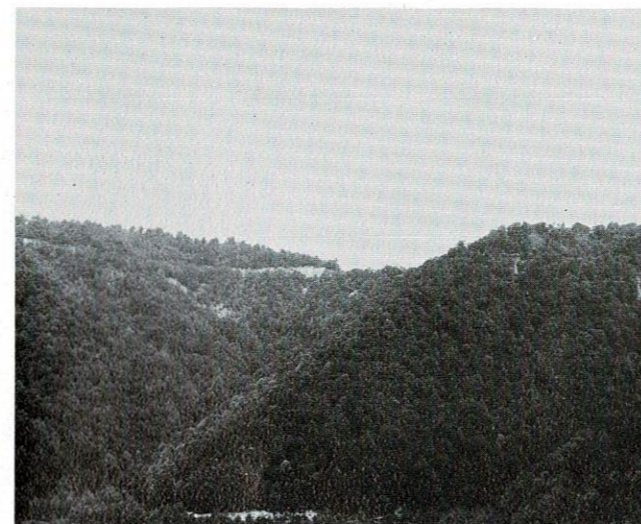
While the wives (Mesdames Baldini, Nutter and Folio) sat around the picnic table solving all the world's problems, the men demonstrated their outstanding athletic skills. Tracy Hylton, Ben Lusk and, of course, Bernie defended West Virginia's good football reputation in a game of touch football (that would have made any one of the Green Bay Packers envious of the strength, speed and stamina exhibited on that field) against several ex-Clarksburg residents who are now living in Nevada.

Vic Baldini gathered all the male youths around him and gave lessons in baseball while Fil Nutter kept a watchful eye on his daughter and all the other little children playing in the park. Incidentally, Fil's daughter, Felicia, was celebrating her fourth birthday in Las Vegas, for the fourth straight year.

The picnic was a change of pace for Las Vegas and also was a welcomed change of pace for those hard working surface miners from West Virginia who probably hadn't been on a picnic in years.

Speaking of Bernie Folio, it also should be noted that he's doing a lot to tell the surface mining story, but, of course, in an unusual way. He has this large billboard on route 73 right outside Bridgeport on the way to Morgantown. Last month his sign raised a lot of brows when it read, "Surface Miners. . . Have a Happy Thanksgiving, Jay May Make It Your Last."

Gil Frederick's absence at the convention was obvious to all in attendance. Gil explains that he would have liked to have been there, but couldn't because he and his wife just had a beautiful baby girl and didn't quite feel up to the trip. Being a strong man generally, Gil recovered quickly from the ordeal in only a few short days, with the help of his loving wife Brenda.



Buffalo Mining Co., a subsidiary of the Pittston Co., has done multiple-seam mining here since 1950. Reclamation has nearly obliterated the scars. The line of one highwall is barely visible near the top of the hill; an earlier operation near the bottom of the picture is even more hidden. The scene is near Lorado in Logan County.

PROGRAM

ANNUAL MEETING OF THE WEST VIRGINIA SURFACE MINING AND RECLAMATION ASSOCIATION

December 10 and 11, 1971

Daniel Boone Hotel, Charleston, West Virginia

FRIDAY, DECEMBER 10th

11:00 A.M.	
Board of Directors' Meeting	Room 404
12:30 P.M.	
Board of Directors' Luncheon	Room 416
2:00 P.M.	
Business Meeting and Election	
General Members	Parlor C
Associate Members	Parlor B
3:00 P.M.	
Annual Business Meeting	Parlors B & C
	President Frederick, Presiding
5:00 P.M.	
Meeting of Newly Elected Board of Directors	Parlor C

SATURDAY, DECEMBER 11th

7:30 A.M.	
Men's Breakfast	Parlor C
9:00 A.M.	
Technical Session	Ballroom
	Bernard J. Folio, President, Explosives, Inc., Clarksburg, Presiding
	Dr. Jay Hilary Kelley, Dean, School of Mines, West Virginia University, Morgantown
	William Parks, Bureau Chief, U. S. Bureau of Mines, Mount Hope
10:30 A.M.	
Coffee Break	
10:45 A.M.	
Technical Session Continues	Ballroom
	Donald L. Hinkle, President, Hinkle Brothers, Inc., Clarksburg, Presiding
	James S. Bennett, State Conservationist, Soil Conservation Service, Morgantown
	Showing of Film, "Greening of Augusta"

12:15 P.M.

Men's Luncheon (Buffet) Ballroom

1:30 P.M.

Technical Session Continues Ballroom

W. F. Watts, Vice-President, R. D. Watts Insurance Agency, Inc., Beckley, Presiding
Development of the Preplan—Floyd Stiles, Mountain State Surveying Company, Kingwood

Movement & Placement of Overburden—F. B. Nutter, Sr., President, Mynu Coals, Inc., Charleston

Methods of Regrading—R. N. White, President, Appalantic Corporation, Bridgeport
Development of a Planting Plan—Frank W. Glover, Assistant State Resource Conservationist, Soil Conservation Service, Morgantown

3:00 P.M.

Coffee Break

3:30 P.M.

Technical Session Continues Ballroom

Charles W. Gooding, Ohio Seed Company, West Jefferson, Ohio, Presiding

Selection and Handling of Trees & Shrubs—B. J. Warder, Assistant Chief, Division of Forestry, Department of Natural Resources, Charleston

Selection and Handling of Mulch—William T. Plass, Principal Plant Ecologist, U. S. Forest Service, Princeton

Planting by Hydroseeder—James White, Reclamation Superintendent, Ranger Fuel Corporation, Bald Knob

Planting by Helicopter—Joseph Priestly, Chief Pilot, Hummingbird Air Service, Charleston

6:30 P.M.

Social Hour

7:30 P.M.

Awards Banquet Ballroom

Toastmaster—Jack R. Fairchild, President, Fairchild Equipment & Supply Company, Beckley

Presentation of Awards—The Honorable Ira S. Latimer, Jr., Director, Department of Natural Resources, Charleston

9:30 P.M.

Dance Ballroom

Don Boyd Orchestra

NOTE: All meals on Saturday are being prepared from products grown on reclaimed surface mined lands.

LADIES' PROGRAM SATURDAY, DECEMBER 11th

10:00 A.M.

Brunch Cardinal Room
(Followed by Tour of Sunrise Museum & Art Gallery—Christmas "Trees of the Nation" display)

A \$25.00 registration fee will be assessed for each person attending.

REGISTRATION Mezzanine

Friday, December 10th 10:30 A.M.-3:00 P.M.

Saturday, December 11th 8:30-10:30 A.M.

11:30 A.M.-2:00 P.M.

6:00-7:00 P.M.



Nothing But the Facts

FACT SHEET ON WEST VIRGINIA SURFACE MINED COAL IN 1970

(Editor's Note—The following information was gathered from sources of The National Coal Association, The U.S. Bureau of Mines, The West Virginia Department of Mines, The West Virginia Coal Association, The West Virginia Department of Employment Security and the Department of Natural Resources.)

1. In 1970, surface mined coal production in West Virginia totaled 27.6 million tons, or 1/5 of the total 144 million tons of coal produced in the Mountain State.
2. The 1970 production of 27.6 million tons from surface mining was an increase of 8.7 million tons over the 1969 figure of 18.8 million tons. Deep mine production was down 4 million tons from 120.4 million tons in 1969, to 116.4 million tons in 1970.
3. A comparison of production trends between January and June of 1970 and 1971 shows underground out-put declined by 8.4% while surface mining increased 26.3%. Total coal production was down 3.0%.
4. West Virginia was the leading coal producer in the U.S. in 1970 and has held that position continuously since 1931. However, the Mountain State ranks only 4th in surface mine coal production. Kentucky is the leader with 62.6 million tons (50% of total); Ohio 37.2 million tons (67%); and Illinois with 33 million tons (50%).
5. After the first 9 months of 1971, West Virginia's coal production supremacy is being challenged. At the end of September, West Virginia had produced 104.5 million tons, to Kentucky's 104.1.
6. The Department of Employment Security lists the average weekly wage for a West Virginia coal miner at \$194.93. This means the surface mine industry paid out over \$55.9 million in wages last year.
7. West Virginia has also consistently been the leading state in reclamation with 19,918 acres reclaimed in 1968, 17,117 in 1969 and 13,245 in 1970.
8. Although most of West Virginia's reclamation has been directed towards woodland and wildlife development, many thousands of acres have been developed for higher and better use. Some reclaimed acres include airports (6), homes (475), shopping centers (6), many farms and cattle ranches, various commercial buildings and numerous athletic fields and recreation areas.
9. Opening up remote areas by surface mining has also benefited other industries, such as facilitating the development of oil and gas wells and timbering operations. Also, since 1968, 156 deep mines have been started on surface mine sites.
10. With a total of 27,657,000 tons, surface miners in West Virginia produced over 5,000 tons per man in 1970.



FACT SHEET ON U.S. SURFACE-MINED COAL IN 1970 (Editor's Note—the following fact sheet is a courtesy of the National Coal Association.)

1. In 1970 surface-mined coal production totaled 264.1 million tons, or some 44 percent of the total of 602.9 million tons of bituminous and lignite coal production.
2. The 1970 production of 264.1 million tons from surface mines was up 50.8 million tons, or 23.8 percent over the 1969 production of 213.4 million tons. The 1970 production of 338.8 million tons from deep mines was down 8.3 million tons, or 2.4 percent, from the 1969 level of 347.1 million tons.
3. Approximately 198,015,000 tons, or some 75 percent of the 264.1 million tons of surface-mined coal produced in 1970, were shipped to U.S. steam-electric utilities.
4. The 198 million tons amounted to 59.8 percent of some 331.4 million tons of 1970 bituminous coal and lignite production shipped to U.S. electric utilities.
5. The 198 million tons of surface-mined coal shipped to the utilities represents the equivalent of some 431.8 billion kilowatt-hours of electricity which, when compared with the actual 1970 experience, would amount to:
 - a. 28.2 percent of total electric energy production of 1,529.6 billion kwhrs.
 - b. 34.2 percent of 1,259.5 billion kwhrs produced by fossil fuels (excludes hydro and nuclear).
 - c. 33.7 percent of 1,282.3 billion kwhrs produced by all fuels, including nuclear power.
6. The estimated 431.8 billion kwhrs of generation from surface-mined coal closely approximates the total 1970 generation of electricity in the New England, South Atlantic and East South Central Census Regions (18 states and the District of Columbia).
7. The estimated 431.8 billion kwhrs generation from surface-mined coal is the equivalent of the output of some 62 nuclear generation plants of 1,000 MW capacity each, operating at 80 percent of plant capacity.
8. In barrels of oil equivalent (converted on basis of 24 million Btu/ton of coal and 6.3 million Btu/bbl of oil):
 - a. 198 million tons of surface-mined coal equals some 752.5 million bbls of imported oil valued at \$2.3 billion, on basis of \$3 per bbl.
 - b. 264.1 million tons of surface-mined coal equals some 1,003.7 million bbls of oil valued at over \$3 billion.
9. Some 264 deep mines (of 1 million tons annual capacity) would be required to produce the 264.1 million tons of coal produced by surface mines in 1970.
10. The capitalization cost of 264.1 new deep mines would range from some \$3.2 billion to \$3.7 billion (\$12 to \$14 per ton of annual capacity).
 - a. It requires approximately 3 to 5 years for a new deep mine to reach full production.
11. In 1970 the approximate number of workers at bituminous coal and lignite mines (excluding mill workers) was: Deep mines, 100,500; surface mines 24,800. (Preliminary data from Office of Accident Analysis, U.S. Bureau of Mines.)
12. Underground production of bituminous and lignite coal in 1970 totaled 338,788,000 tons. (338,788,000 tons divided by 100,500 average men working daily (excluding mill workers) equals 3,371 tons per man per year.)
13. Some 78,358 deep mine workers (excluding mill workers) would be required to produce 264.1 million tons of coal (on basis of 1970 experience).
14. Assuming that all surface mine workers (24,800) would accept employment at deep mines, an additional 53,558 miners would be required to produce 264.1 million tons of coal.
15. On a 1970 basis, the estimated wages and salaries (including vacation and holiday pay) of mine production workers (including supervisors and on-site office workers and excluding mill workers) required to produce 264.1 million tons of coal would be:
 - a. Deep mines: \$745 million
 - b. Surface mines: \$248 million
16. On basis of Item 15, it would cost an additional \$497 million in wages and salaries to produce the 264.1 million tons (of surface-mined coal) at deep mines. (Increased cost of some \$1.88 per ton in additional wage and salary expense.) If you have any further questions about these statistics, please contact the West Virginia Surface Mining and Reclamation Association.

The Lighter Side... Stripping and other Stuff

There will not be a Stripper of the Month Award given in December because with 76 members voting, the contest ended in a 76-way-tie. Next month, you guys will not be allowed to vote for yourselves.

* * *

It's rumored that the "Jay for Governor Nickle-a-Plate Land Raising Dinner" had to be cancelled last month because the man with the nickle refused to show up.

* * *

This month Green Lands Quarterly would like to pay special tribute to those workers striking against the Charleston Gazette. For some reason we always like to support a righteous cause in the face of injustice and tyranny.

* * *

The Eager-Beaver Award goes to all our members who diligently worked night and day while recently stationed in Las Vegas for the American Mining Congress Convention. Three cheers for the boys.

* * *

We received these letters, following the first issue of GLQ and thought we'd share them with our readers.

Editor:

When I heard there was a movement to ban stripping back in West Virginia, I just couldn't believe it. People just don't realize the total loss of jobs, income and tax revenue that would accompany a ban on stripping, not to mention the morale of the men. They say it hurts the environment. Well I've been stripping for a long time and I think it's not only a good business but provides a service to West Virginia and all the other states.

Please send information and applications for joining the Ladies Auxiliary, because we want to help fight this thing too.

Your friend and supporter
BLAZE STARR

* * *

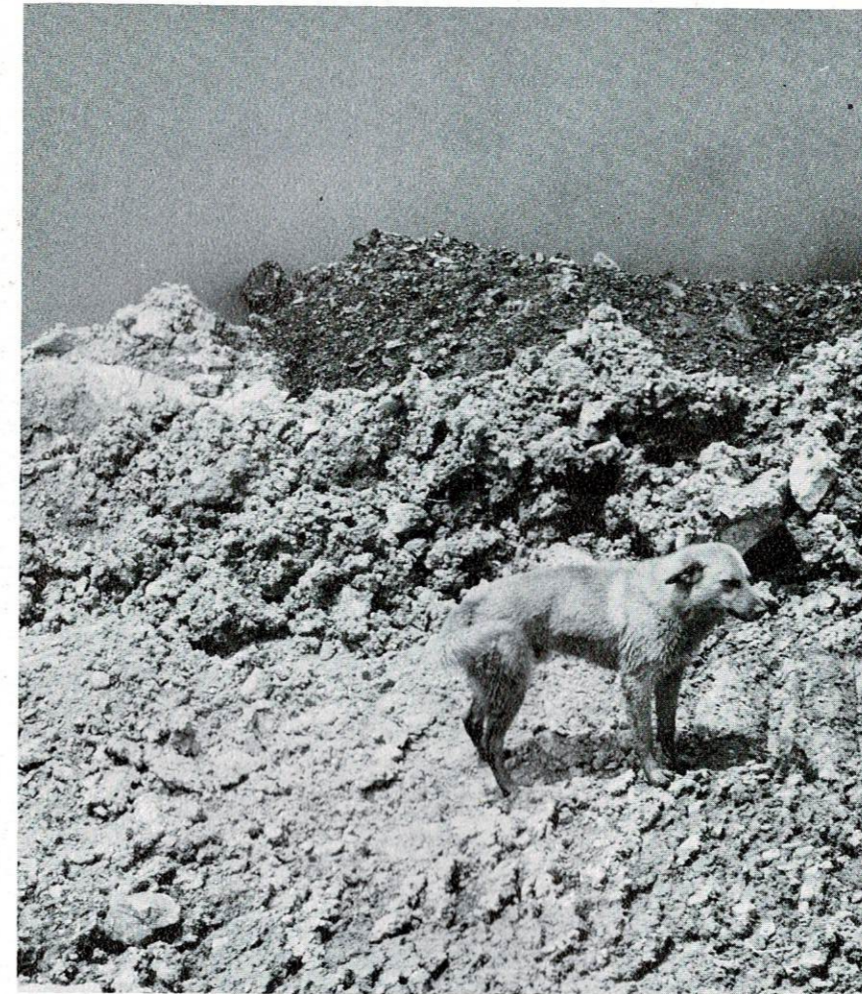
Editor:

I just read your Green Lands and I think it stinks! This slick publication is filled with lies, lies, lies, and isn't gonna stop me or the 50,000 people I represent. We're gonna get you strippers.

Cordially
(ANONOMOUS)

P.S. You stink!

* * *



Who says wildlife can't exist on surface mined land?

Editor:

I just loved your first issue of Green Lands. It was simply beautiful. I think you are doing a great job down there and would like to wish you all the luck in the World.

LOVE MOM

* * *

In a recent letter-to-the-editor that appeared in the Charleston Gazette, one reader wrote:

"The strippers say if we don't strip the economy will suffer.

The abolitionists say if we strip, the ecology will suffer.

Our choice, it seems, is either polluted prosperity, or pure poverty.

However, we should make one thing perfectly clear, later.

* * *

The "Scrooge Award" goes to the administration of the Charleston Gazette for firing hundreds of employees one month before Christmas. When asked for a statement, a spokesman for the paper retorted, "Bah humbug!"

* * *

The "Humbug Award" goes to the editors of the Beckley Raleigh Register for the never ending efforts to put thousands of people out of work, anytime.

* * *



Drilling and Blasting...

Backbone of Mining Industry

by George H. Tousley

The drilling and blasting program is the backbone of any mining operation. If the drilling and blasting operation is poor, there is no way to make the rest of the operation efficient.

A good drilling and blasting program needs skilled people. The ideal supervisor for a good program is one who:

1. Has some theoretical knowledge.
2. Has a great deal of technical skill.
3. Is fanatically dedicated to safety, care, and attention to details.
4. Has had many years of experience.
5. Has a "feel" for the art.

Unfortunately for the mining industry, such men are very rare. Fortunately, drilling and blasting programs are run by people, and people have the unique ability in this world to overcome by the use of **ideas**.

It is the intent of this writer to relate **ideas**, soundly backed by accepted theory and practice, which can be applied to any problem.

And the first idea that I want to put across; and which I shall repeat, again and again, is: **DON'T WASTE THE DRILLING, DON'T WASTE THE POWDER.**

We shall get into many complex problems as we progress in this series, but the basic theme is still this simple idea.

In order to make sure we are all talking about "apples and apples, and oranges and oranges", I beg your indulgence while we begin very simply.

It is assumed that you all know what is meant by the following terms: Blasting Cap, Fuse Cap, Electric Blasting Cap (EBC), Detonating Fuse or Cord (Generally Called "Primacord", a registered trade mark of Ensign-Bickford), Delay Cap, Safety Fuse.

And from there we will start with:

EXPLOSIVES

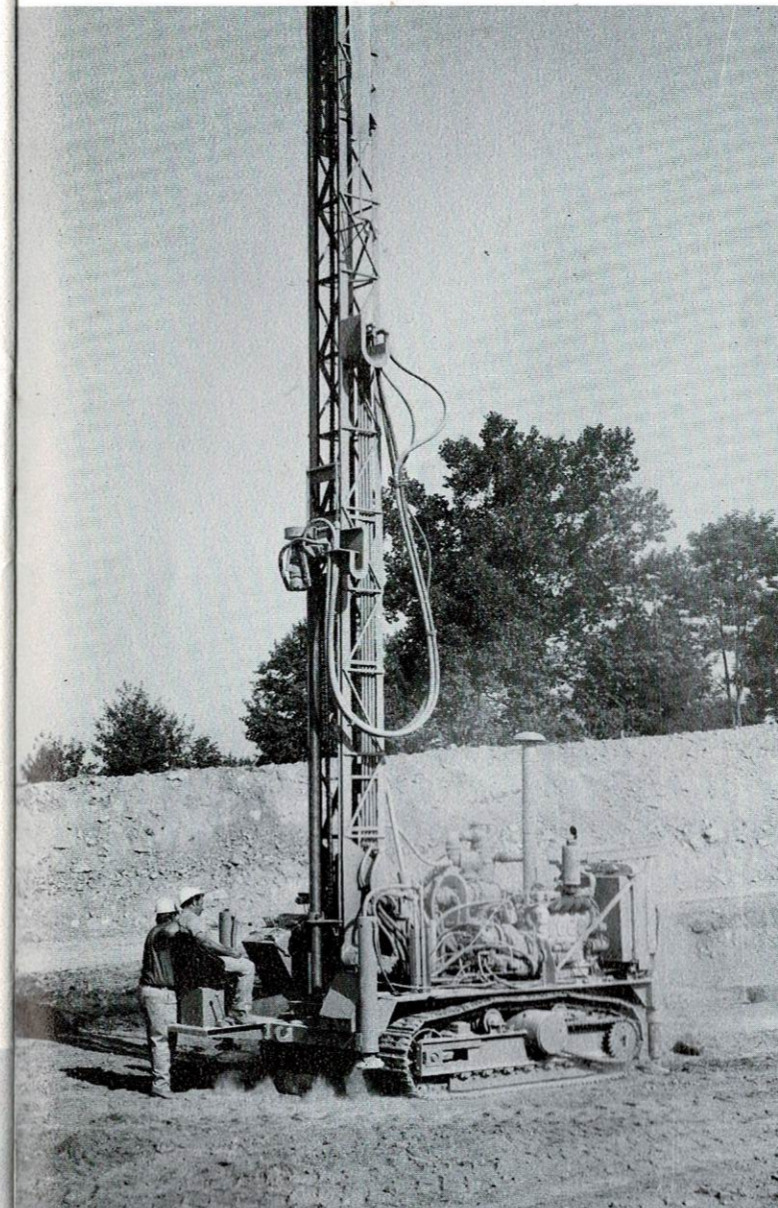
COMMERCIAL EXPLOSIVES in use today are solid substances which, with sufficient cause, turn into gases at an extremely rapid rate, with the output of a great deal of heat. This process is called **DETONATION**.

In order for detonation to begin it is only necessary to apply sufficient heat at a sufficiently high temperature to the explosive.

The amount of heat necessary to initiate detonation varies according to the type of explosive, and this is the basis on which most explosives are classified. The standard basis being the blasting cap, broadly classifying explosives as **CAP-SENSITIVE** and **NON-CAP-SENSITIVE**.

The greatest portion of cap-sensitive explosives are made sensitive by the use of nitroglycerin, and these were the explosives used nearly 100% until the early 1950's. In using these explosives, it is only necessary to insert a blasting cap or a piece of detonating cord into the explosive, in order to detonate it.

Non-cap-sensitive explosives comprise more than 80% of all explosives used in the United States, and the major ingredient is ammonium nitrate. Ammonium nitrate will detonate with no additives of any kind, but its sensitivity is very low, and its efficiency can



be increased by adding some ingredients. The gaseous products of the detonation of ammonium nitrate alone, contain quite good-sized quantities of oxygen. Adding a fuel to the explosive results in added heat output, and seems to increase the sensitivity of the product. The most common, and cheapest, fuel used is plain diesel fuel oil, hence the common name ANFO (ammonium nitrate-fuel oil). It is a simple ingredient to add, and a very small amount of mixing results in a reasonably consistent product.

Though the temperature of a blasting cap is high enough to detonate ANFO, the amount of heat is not sufficient to do so. Therefore, an intermediate cap-sensitive-explosive is used to provide the amount of heat necessary. This explosive is called a **primer**. Common primers are various grades of nitroglycerin-sensitized dynamites, and **cast primers**. A cast primer contains a large amount of TNT, with addition of some other even higher energy materials. The materials are melted together and poured into a mold. The resultant product is cylindrical in shape, hard, waterproof. It usually

contains two holes, lying in the direction of the long axis of the primer. One hole for a cap, the other a detonating cord tunnel, so that either may be used.

For our purposes, we will only consider the properties and actions of ANFO, since it is the most widely used, and other explosives act in much the same manner.

So—in a typical modern blast we have a chain of ingredients: **Cap to Primer to Main Explosive Charge**.

Alternately: **Cap to Detonating Cord to Primer to Main Explosive Charge**.

ACTION OF EXPLOSIVES IN THE BLASTHOLE

When the main explosive charge is initiated by the heat from the primer, the particles around the primer begin to detonate (change to a gaseous state) with a release of a considerable amount of heat. This heat energy raises the temperature of the gases to several thousand degrees. The hot gases initiate the detonation of the adjoining particles of ANFO, the end result being a continuous advance of detonation from particle to particle throughout the main explosive charge. A very slow motion picture would show a white-hot flame front advancing up the borehole, much as a rifle bullet travels up a gun barrel. The speed with which this wave travels up the blasthole is called the **Rate of Detonation** or **Detonation Velocity**. Though most people consider an explosion to be instantaneous, it is far from that. Rates with which we concern ourselves are in the 10,000 feet per second to 15,000 feet per second range. This is only a few times faster than a high velocity rifle bullet.

The evolution of gases from a solid in a closed vessel (the blasthole), with consequent raising of temperatures, results in pressures of several hundred pounds per square inch. These gases under pressure have the ability to do work, just as steam in a boiler has the capacity to do work. The only difference is in the magnitude of the pressures involved, and the time period over which the work is done. The time period is so short that the horsepower range is truly phenomenal.

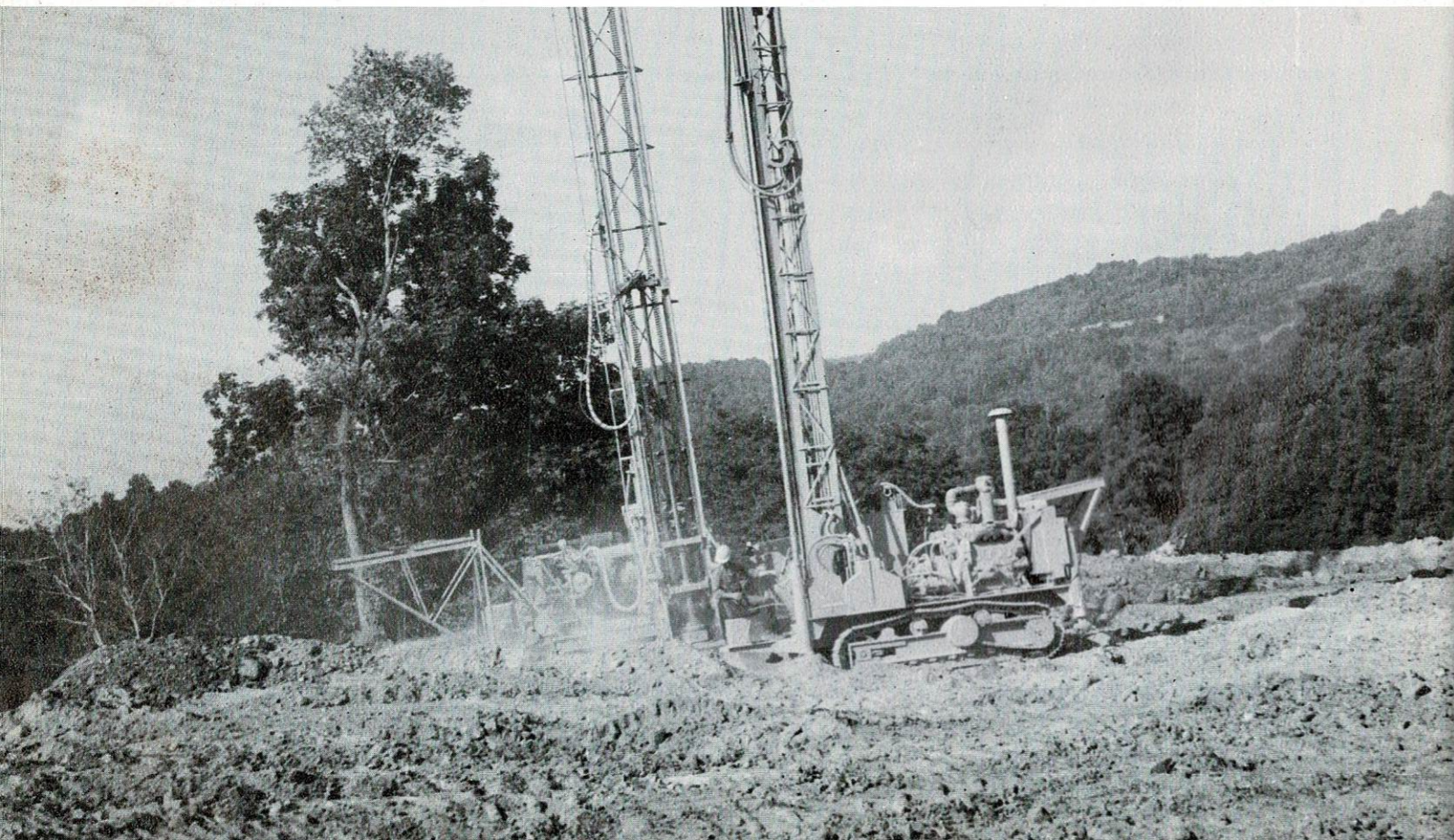
The energy of the gases is put to work much the same as the explosive in a fragmentation bomb. In a bomb the pressures become high enough to burst the casing and throw fragments to a considerable distance. The casing of the blasthole is the rock surrounding it. Throwing rock fragments to any great distance is a waste of energy, as well as being dangerous, so the amount of explosive put in the blast is calculated to throw the rock only far enough to make easy digging.

Remember that the blasthole acts as a pressure vessel, with forces equal in **all** directions until the vessel ruptures or leaks.

Mr. Tousley was graduated from the University of Arizona College of Mines and is considered to be one of the nation's most knowledgeable men in the blasting industry.

He has worked in various underground metal mines in western United States and throughout South America. For the past 18 years he worked for various explosive and machinery companies holding positions like sales engineer, regional manager and manager of national mining sales.

He is presently manager of Rotary Blasthole Drill Sales for I-R Equipment Corporation in Pittsburgh.





Elk Creek is "Alive"

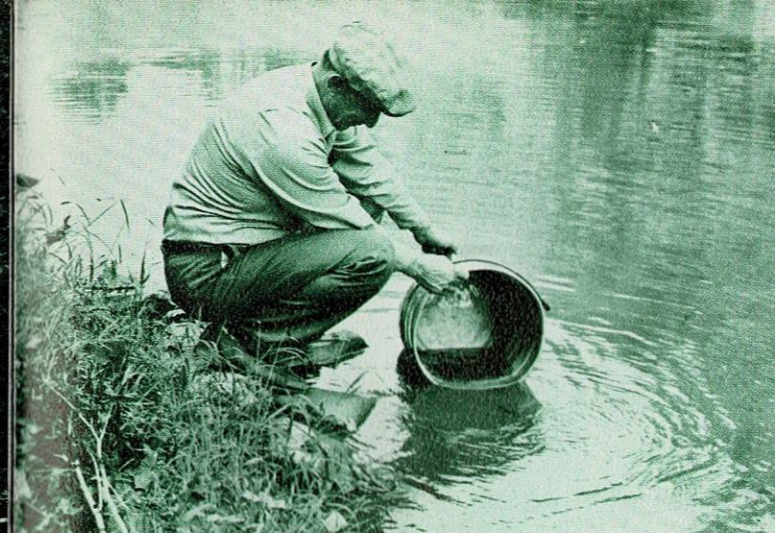
Fish are living in Elk Creek for the first time in over twenty years. The stream was destroyed by acid mine drainage during World War II.

Special Reclamation Fund at Work

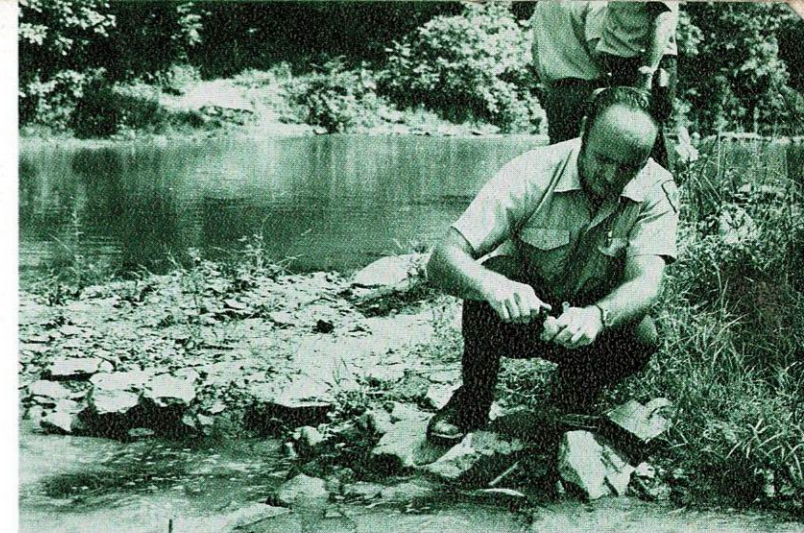
Reclamation is happening in Harrison and Barbour counties and for the first time in over twenty years, there are fish living in Elk Creek.

The clean-up is being spear-headed by the Harrison County Elk Creek Pollution Control Inc., in conjunction with local, state and federal agencies, plus the special reclamation fund, which is solely supported by the surface mining industry.

This fund, which is administered by the West Virginia Department of Natural Resources, was set up at the request of the surface mining industry in 1963, for the purpose of reclaiming "orphaned banks" or those surface mines that have never been reclaimed.



The Elk Creek clean-up was spearheaded by Nutter Fort resident Sandy DeMark. He is president of the Elk Creek Water Pollution Association.



An inspector from the Department of Natural Resources checks the P.H. of the water. The P.H. of Elk Creek has risen from 3.2 to 6.0 in the last three years.



September 9, was a big day on Elk Creek. Here are just a few of the people, whose time and effort helped bring the stream back to life.

Since that time, each operator has paid \$30. into the fund for every acre of land he disturbs by current surface mining. This adds up to over \$3.5 million that has been placed at the disposal of the DNR for special reclamation.

During the past Legislature, the amount per acre was raised from \$30. to \$60. to help facilitates the funds use.

According to Gino Colombo, Delegate from Harrison County, all of Elk Creek's marine life was destroyed by acid mine drainage from the numerous deep and surface mines that were developed to help fulfill the increased power needs during World War II. These areas were never reclaimed and the stream remained polluted.

Then in early 1968, a few concerned citizens circulated a petition that produced the names of 10,000 people who were interested in cleaning up the stream, and the miracle of Elk Creek had begun.



DNR employees unload the large mouth bass that were stocked in September. Small mouth bass and other suitable specimens will be stocked in the future.

"People told me it could never be done," Colombo said. "And at that time the possibility seemed very dim, because funds were not available for such a project."

He noted that a task force meeting was held in March of 1968, with representatives from Elk Creek, The Soil Conservation Service, the U.S. Department of Agriculture and the DNR, to study the problems and acquire the money. It was at this time that the Reclamation Division of the DNR approved special reclamation funds for the project.

Over \$100,000 has already been spent in the Elk Creek area so far, and according to Ben Greene, Chief of Reclamation for the DNR, this figure may reach \$150,000 before the project is completed.

The actual reclamation work is being done by Reclamation Industries, Inc., an affiliate of the R. N. White Construction Co. of Bridgeport, and consists of backfilling, and regrading the surface



It all began in 1968, when a few concerned citizens in the Nutter Fort area decided something should be done. Soon after, a petition produced 10,000 names of interested people, and the Elk Creek Water Pollution Association was born.

Here, the large mouth bass that were stocked, make their way out of the bucket and into the stream. Reclamation work is still going on in the Elk Creek watershed, but water quality is high enough for fish and wildlife.



mines and closing off the deep mines, thus eliminating acid drainage, soil erosion and sedimentation. The seeding was done by the Soil Conservation Service and the Planning and Development Department of the DNR. Approximate cost per acre for reclamation has been \$680.00.

Jim Califf, Reclamation Inspector for Harrison County, said, "Since work began the P.H. of the water has risen from a low of 2.8 to 6.5 or 7.5." (Water must maintain a P.H. of 5.5 to support marine life.)

In September, the stream was stocked with large mouth bass and according to Sandy DeMark, President of the Harrison County Elk Creek Pollution Control, Inc., "The fish are doing very well and this coming spring there will be another stocking."

"The surface miners have greatly improved the water quality of Elk Creek and it's trib-

utaries," he said. "The cooperation of the industry has been very good."

Land owner Albert Paugh is very happy with the reclamation work that's been done. "The grass is growing; now I have good pasture land," he said, "and the cattle couldn't drink the water before, but now they can."

Elk Creek Pollution Control is now financing studies that will determine the exact location of acid drainage, siltation, community sewage or any form of pollution.

DeMark also cited the Harrison County Court, The Harrison County Watershed and the Senic River Clean Streams Project for their cooperation but he admits that the job is not finished.

But it has been proved in Harrison County, that by working with the coal industry, and federal, state and local government, these problems can be solved. Good reclamation has brought Elk Creek back to life.



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