

20th Anniversary

Surface Mining Control and Reclamation Act

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Cover

Reclamation at this site, a 200-acre steep-slope contour mine in Eastern Kentucky, exemplifies the intent of the Surface Mining Law. When reclaimed in the early 1990's, topsoil was spread on the slopes and grass planted (below). Today, with five years of natural plant succession, native trees and shrubs cover the slopes and reforestation is quickly progressing. With proper planning and effective site management, both economical mining and successful reclamation can be achieved.



About the 20th Anniversary

On August 3, 1977, the Surface Mining Law, which provides authority for regulating coal mining and reclamation on public and private lands, was signed by President Jimmy Carter. Since that time there have been many advances in mining and reclamation techniques and on-the-ground coal mining reclamation accomplishments have been monumental. This success is the work of many people -- citizens, mine inspectors, mine operators, and others -- all working together to implement the Law. At this twenty-year milestone all Americans can be proud of the Law that has preserved long-term environmental quality and land productivity during an era of record coal production.

20th Anniversary

Surface Mining Control and Reclamation Act

A report on the protection and restoration of the
Nation's land and water resources under the Surface
Mining Law

Part 1

United States Department of the Interior
Office of Surface Mining
Washington, D.C. 20240
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INTRODUCTION

Surface mining of coal involves removing overlying soil and rock in order to expose the coal, which typically is 30-90 feet underground. Compared to underground coal mining, surface mining generally costs less, is safer for miners, and usually results in more complete recovery of the coal. However, it also results in much more extensive, though temporary, disturbance of the land, which can cause serious environmental problems unless controls are thoroughly followed and the mined land is carefully reclaimed.

The earliest commercial U.S. coal production began in the 1740's at the Richmond, Virginia coalfield. Beginning in 1807, mining became important enough for the federal government to begin keeping statistics on annual production. During those early years of coal mining, reclamation of mine sites was not required by law; however, in the 1930's, as surface mining became more widespread, the idea of mandatory environmental protection and reclamation started to grow. In 1939, West Virginia enacted the first law to regulate the coal mining industry. Similar laws were enacted by Indiana in 1941, Illinois in 1943, and Pennsylvania in 1945. During that period, coal production accelerated greatly and the surface mining of coal became much more prevalent. During World War II, the demand for coal took priority over environmental concerns, with little consideration for reclaiming the land after mining. Mining pits were not backfilled. Dangerous highwalls were left exposed. Trees and other vegetation were buried by waste material that was simply dumped down the slopes below mines. Topsoil was buried or allowed to wash away. Landslides formed on unstable hillsides. Slopes eroded rapidly because of the lack of vegetation. Polluted water collected in mine pits. Streams became clogged with sediment. Streams and rivers were frequently polluted by acid mine drainage. This vivid image of surface coal mining remains indelible in the minds of most Americans, who remain unfamiliar with modern surface coal mining methods and the changes brought about by the Surface Mining Law.

During the 1950's and 60's, coal production continued to increase and more coal-producing states instituted regulatory programs. Many required permits for mining. Some included inspections. A few made operators post performance bonds to guarantee reclamation when mining was completed. However, due to the variations in those individual programs, it cost less to produce coal in states with less stringent reclamation requirements, giving operators in those states an economic advantage, generally at the expense of environmental quality.

With the 1970's came a surge in the demand for coal resulting from the nation's need for increasing electric power generation, the uncertain supply, and increased cost of imported petroleum-based fuels. The resulting increased coal production prompted a series of state laws, aimed at controlling the environmental effects of surface mining. During this period North Dakota, Wyoming, Colorado, and Montana passed laws to regulate mining and reclamation.

The continuing lack of uniformity among the state surface mining programs and the increase in unreclaimed land and associated pollution of water and other resources caused a growing demand for nationwide regulation of surface coal mining. After many years of debate, Congress passed the Surface Mining Law (Surface Mining Control and Reclamation Act of 1977), which was signed into law August 3, 1977. The Law established a coordinated effort between the states and the federal government to prevent the abuses that had characterized surface and underground coal mining in the past. It also required a balance between the Nation's call for environmental quality and its need for energy resources.

Two major programs were created by the Surface Mining Law:

- An environmental protection program to establish standards and procedures for approving permits and inspecting active coal mining and reclamation operations both surface and underground; and
- A reclamation program for abandoned mine lands, funded by fees that operators pay on each ton of coal mined, to reclaim land and water resources adversely affected by pre-1977 coal mining. In 1990 Congress expanded the Law to include reclamation of mines abandoned after passage in 1977.

The Office of Surface Mining Reclamation and Enforcement (known as the Office of Surface Mining), was created by the Surface Mining Law as a new federal agency within the Department of the Interior. The Office of Surface Mining was charged with the responsibility for preparing the regulations and for assisting the states financially and technically to carry out on-the-ground regulatory activities. Today, the Office of Surface Mining strives to maintain consistency among state programs and ensure compliance with the law and regulations through evaluation of state programs.

Even after years of congressional debate, the Surface Mining Law was considered unworkable by many people. Further, some feared that the Law would be an economic disaster for the coal industry because of the increased operational costs of environmental safeguards and of reclaiming surface mined lands. Those fears, which actually delayed final approval of surface mining legislation until 1977, proved to be mistaken. Instead, the coal industry has met the challenge, using ingenuity and modern technology to operate successfully and responsibly within the law. The result is clear: surface coal mining has truly become just a temporary use of the land. Reclamation begins even before surface coal mining ends in an area, so that without delay the land is either returned to its original use or is improved for new uses that benefit both landowners and communities. So successful is the process in most instances that there is literally nothing to see when the process is complete, and the reclaimed land blends back into its surroundings.

Successful implementation of the Surface Mining Law by state and federal agencies hasn't come easily. The technical problems of reclaiming surface mined land are complex, and the law enacted to protect the environment during mining covers every aspect of coal mine operations. Not every operator has complied. During the past 20 years, and especially during the early part of that period, the problems created by a small number of irresponsible mining operators generated virtually all the public attention, while there was comparatively little recognition for the majority of operators who achieved excellent reclamation and complied with the law.

The Office of Surface Mining and the corresponding state regulatory and Abandoned Mine Land Reclamation programs have formed an effective relationship that is fundamental to the implementation of the Surface Mining Law. Early in the evolution of the program the Office of Surface Mining focused its oversight activities on the states' procedural compliance with processes and procedures. Currently the evaluation focuses more on end results and on-the-ground success of meeting the Surface Mining Law's environmental protection and public participation goals.

This report, which updates and supersedes the Office of Surface Mining's 15-year progress report¹, deals with the accomplishments of the regulatory and abandoned mine land reclamation programs during the first 20 years of the law. Abundantly illustrated, Part 1 of this report presents chapters on the Surface Mining Law, Program Implementation, and short case studies showing active mining operations that have achieved or surpassed what the architects of the Surface Mining Law envisioned. It is a view showing on-the-ground conditions at the 20th anniversary of the Surface Mining Law.

Part 2, *Surface Coal Mining Reclamation: 20-years of Progress, 1977-1997* provides statistical information (including state and national statistics for: coal production, number of mines, enforcement actions -- inspections & citations issued, acreage permitted, acreage of reclamation bonds released, and Abandoned Mine Land reclamation accomplishments). For more information on the Surface Mining Law or its implementation visit the Office of Surface Mining World Wide Web site (<http://www.osmre.gov>). Additional copies of this report may be ordered electronically at the web site or by calling or writing to:

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THE SURFACE MINING LAW

The Regulatory Program

The Surface Mining Law (Surface Mining Control and Reclamation Act of 1977) contains five principal regulatory provisions that form the basis for protecting people and the environment during coal mining and ensuring prompt land restoration afterward. These are carried out by the 24 primacy states and the Office of Surface Mining in federal program states and on Indian lands.

Performance Standards

Performance standards are intended to ensure that all surface coal mining is conducted in a way that protects the environment and the public and ensures that the mined land is restored to productive use following mining. The standards provide a basic level of compliance during coal mining and reclamation.

Permits

Before developing a surface or underground coal mine, an operator must have a permit issued under the Law. An application for a permit to conduct a coal mining operation is a detailed document that consists of text and numeric data describing the proposed mining and reclamation. Information must be furnished on pre-mining environmental conditions, existing land use, proposed mining and reclamation, how the performance standards will be met, and the post-mining land use. This provides the regulatory authority with the information necessary to determine that the operation can be conducted in accordance with the regulations.

Performance Bonds

Before a permit can be granted, an operator must post a performance bond sufficient to cover the cost of reclaiming the site in the event the operator does not complete reclamation. The bond is not fully released until all performance standards have been met and full reclamation of the site (including permanent revegetation) has been determined to be successful — after five years in the East and Midwest, and after 10 years in the arid West. However, the bond can be partially released as various phases of reclamation (backfilling, regrading, revegetation) are successfully completed.

Inspection and Enforcement

If a violation of the Surface Mining Law or of a state surface mining and reclamation law is observed, an inspector issues a notice of violation to the operator. The violation must be corrected within a specific time, and the operator may also have to pay a fine based on the severity of the violation. If the violation is not corrected, a cessation order is issued to stop active coal mining immediately until the infraction is corrected, and the operator must pay a fine. If a violation is especially serious (for example, creates an imminent danger to public health or safety or causes significant damage to land, air, or water resources) the inspector immediately issues a cessation order. An operator must correct all violations in order to continue work or obtain permits for new mines.

Lands Unsuitable For Mining

Congress recognized that certain coal deposits cannot be mined without permanent damage to unique cultural or natural resources. As a result, the Surface Mining Law protects those resources in two ways:

- It prohibits mining within the boundaries of national parks, forests, wildlife refuges, trails, wild and scenic rivers, wilderness and recreation areas; in areas which will adversely affect sites listed on the National Register of Historic Places; and within a restricted distance of occupied dwellings, public roads, buildings, parks, schools, churches, and cemeteries; and
- Provides a process that allows anyone whose interests may be adversely affected by proposed mining to petition to have specific lands designated unsuitable for surface coal mining.

The Abandoned Mine Land Reclamation Program

The Abandoned Mine Land (AML) Program provides for the restoration of eligible lands mined and abandoned or left inadequately restored before passage of the Surface Mining Law.

Fees of 35 cents per ton of surface mined coal, 15 cents per ton for coal mined underground, and 10 cents per ton of lignite mined are collected on all active coal mining operations. The fees are deposited in the U.S. Treasury's interest-bearing Abandoned Mine Reclamation Fund, which is used to pay reclamation costs of AML projects. Expenditures from the fund are controlled through the regular congressional budgetary and appropriations process. The Surface Mining Law specifies that 50 percent of the reclamation fees collected in each state with an approved reclamation program, and from Indian lands where the tribe has an approved reclamation program, are to be allocated to that state or tribe for use in its reclamation program. The remaining 50 percent is used by the Office of Surface Mining to fund emergency projects and high-priority projects in states without approved AML programs; to fund the Rural Abandoned Mine Program² (RAMP), administered by the U.S. Department of Agriculture; to fund the Small Operator Assistance Program³ (SOAP); and to fund additional reclamation of abandoned mine problems directly through state reclamation programs.

In some states, particularly in the West, problems stemming from abandoned non-coal mines are more severe than those caused by coal mines. The Office of Surface Mining may approve the expenditure of Abandoned Mine Land funds to abate hazards on those lands where the states certify that threats to public health and safety exist from non-coal sources and that all abandoned coal sites have been addressed.

Emergency Projects

Emergency projects are those involving abandoned coal mine lands that present an immediate danger to the public health, safety, or general welfare. Typically, emergencies include landslides near homes and across roads, subsidence occurring under houses and public buildings, mine and coal waste fires, and open shafts discovered near populated areas. Because public health, safety, and property can be seriously threatened by abandoned mine emergencies, the capability for rapid response is critical. Reported emergencies are usually investigated within 24 hours and abated in less than a month. Emergencies are addressed through the Office of Surface Mining's three Coordinating centers (in Pittsburgh, Pennsylvania; Alton, Illinois; and Denver, Colorado) and by states which have established their own emergency reclamation programs (Alabama, Alaska, Arkansas, Illinois, Indiana, Kansas, Montana, North Dakota, Ohio, Virginia, West Virginia). During the 20 years under the Surface Mining Law more than 4,000 emergency projects have been completed.

High-Priority Projects

The Law sets out six priorities of eligibility for reclamation funding. The highest-priority projects protect public health, safety, general welfare, and property from the potential danger (as opposed to imminent danger, which categorizes them as emergency projects) and from the adverse effects of abandoned coal mining problems. The Law requires that these priorities be reflected when selecting the order of reclamation projects.

Subsidence Insurance Program

The Surface Mining Law authorizes states and tribes with approved reclamation programs to use Abandoned Mine Land funds to establish self-sustaining, individually administered programs to insure private property against damage caused by land subsidence resulting from abandoned underground coal mines. Such programs are in operation in Colorado, Indiana, Kentucky, Ohio, West Virginia, and Wyoming.

Clean Streams Initiative

In 1995, the Clean Streams Initiative⁴ began as a partnership to clean up acid mine drainage problems using private and governmental resources. To date 14 projects have received funding and a growing number of citizen groups are becoming involved with this unique stream restoration program.

PROGRAM IMPLEMENTATION

A primary objective of the Surface Mining Law is to establish uniform national regulatory standards for protecting the environment during mining and for reclaiming land after it is disturbed by current and future surface coal mining. In recognition of the wide range of climatic and geologic conditions in coal-producing areas, Congress provided that, with Interior Department approval, individual states may establish their own programs for regulating surface and underground coal mining and reclamation on private land. The standards for state programs must be at least as effective as the federal standards.

Initial and Permanent Regulatory Programs

Congress recognized the importance of establishing regulations to implement the Law as quickly as possible, while recognizing that the preparation of such complex regulations would be a lengthy process following enactment. Consequently, a two-phase schedule was established. An abbreviated initial program was put in place immediately, followed by a more extensive and detailed permanent regulatory program. The initial program regulations were published in December 1977, and mine permits issued by states after February 1978 were required to conform with those regulations. Regulatory provisions contained in the initial program included 12 basic performance standards, continuation of existing state permitting, bonding, and enforcement processes (although if those features did not already exist, they did not have to be added), a federal inspection frequency of once every six months, joint state and federal inspection and enforcement in states that had existing programs, and the prohibition of mining in the specific areas listed for special protection in the Surface Mining Law.

Permanent program regulations were published in March 1979, following extensive review and comment from the public, including the coal industry and environmental groups. The regulatory provisions in the permanent program expanded those in the interim program by including the implementation of all performance standards contained in Surface Mining Law, a new permitting process, a requirement for performance bonds, an increased inspection frequency (one per month), a new enforcement process, and a process for designating lands unsuitable for surface mining. The regulations for the permanent program have been revised several times since 1979; more revisions can be made as needed or when new mining and reclamation techniques are developed. Such changes were anticipated by Congress; in fact, a provision in the Law for experimental practices encourages advances in mining and reclamation techniques, and people can petition the Office of Surface Mining to consider additional regulations they think are needed.

State Regulatory Programs

States have the principal role in implementing the Law. For a state to have primacy (authority to regulate coal mining operations within its borders), it must enact a program that demonstrates its capability to carry out the provisions of the Law. Specifically, states are required to:

- Establish laws that are no less stringent than those standards contained in the Surface Mining Law and that regulate all critical aspects of surface coal mining and reclamation operations;
- Provide penalties for violations of the laws, regulations, and permit conditions;
- Create an agency with sufficient administrative and technical personnel and adequate funding to operate the program; and
- Establish a process for the effective implementation, maintenance, and enforcement of a permit system for all coal mining operations.

Once a state's program is approved by the Secretary of the Interior, the state has primacy—that is, the state becomes the regulatory authority for surface and underground mining of coal on private (non-federal and non-Indian) lands within its borders. From February 1980 to March 1983, 25 states passed legislation and developed regulations consistent with the federal requirement and thus attained primacy. The expenses primacy states incur in operating their approved regulatory programs are shared by the Office of Surface Mining on a 50-50 basis.

Federal Regulatory Programs

The Surface Mining Law encourages state authority over mining and reclamation. However, if a state chooses not to develop its own program, the Office of Surface Mining is required to regulate all surface and underground coal mining and reclamation operations within that state. The Office of Surface Mining is also required to regulate all such operations if the state does not implement, enforce, or maintain its program adequately.

Eleven states with coal reserves elected not to establish their own regulatory programs. Of these, only Washington has active surface coal mining. Tennessee repealed its regulatory program in 1984, and there are currently 12 states (Arizona, California, Georgia, Idaho, Massachusetts, Michigan, North Carolina, Oregon, Rhode Island, South Dakota, Tennessee, and Washington) with federal programs in effect.

The Office of Surface Mining also regulates surface coal mining on Indian lands and is assisting four Tribes (Crow, Hopi, Navajo, and Northern Cheyenne) in developing programs for regulating coal mining operations on Indian lands, in anticipation of future authority from Congress to approve Indian primacy programs.

Federal Lands Programs

The Surface Mining Law requires the Secretary of the Interior to implement a program for all surface and underground coal mining and reclamation on federally owned land—a feature that is significant because the federal government owns vast coal reserves. In the West, 60 percent of the 234 billion tons of identified coal reserves is federally owned. However, any state with an approved regulatory program may enter into a cooperative agreement with the Secretary of the Interior to regulate surface coal mining and reclamation on federal lands within the state. Currently twelve states (Alabama, Colorado, Illinois, Montana, New Mexico, North Dakota, Ohio, Oklahoma, Utah, Virginia, West Virginia, and Wyoming) have signed cooperative agreements to regulate mining and reclamation operations on federal land.

State & Indian Land Reclamation Programs

As soon as states establish approved regulatory programs, they are eligible to submit Abandoned Mine Lands (AML) reclamation programs to the Secretary of the Interior for approval. Beginning with Texas in 1980, OSM has approved state reclamation programs so that currently all primacy states except Mississippi have approved Abandoned Mine Land reclamation programs. In addition, during 1988 and 1989 the Navajo, Hopi, and Crow Tribes received approval for their Abandoned Mine Land programs. Once states gain approval of their reclamation programs, funds are distributed through grants to correct abandoned mine problems through reclamation. By the end of 1996, more than \$4.3 billion had been collected for the Abandoned Mine Reclamation Fund, with more than \$2.7 billion provided for completion of reclamation projects.

Federal Reclamation Program

Until states had approved Abandoned Mine Land reclamation programs, the Office of Surface Mining completed both high-priority and emergency reclamation projects. Work done now under the Federal Reclamation Program is principally high-priority reclamation projects in non-primacy states and tribes, and emergency problems in states and for tribes that do not operate their own emergency programs.

Reclamation





on in Appalachia

Before the Surface Mining Law, coal mining in Appalachia resulted in widespread destruction of the land. That story was described by a number of authors⁵ and is still the image of mining that persists in the minds of many Americans. By contrast, this mining and reclamation operation is an example of what can be accomplished in Appalachia. Through a dedicated effort of following the Surface Mining Law, mining was completed without environmental damage and the land now provides an abundant wildlife habitat.

Located South of DeBord, Kentucky, on the Crum Branch of the Middle Fork River, Coal-Mac, Inc., and their mine operator, the Rifle Coal Company, began mining in March 1989 and completed all reclamation by September 1991. Mountain top removal operations, such as this 215-acre mine, are typical in this area of Appalachia. This mining method removes the top of the mountain and either reclaims it to approximate original contour or a relatively flat terrain.

Backfilling and regrading of this mine was configured to enhance the creation of a wildlife habitat post-mining land use. Many of the slopes were shaped to conform to natural areas adjacent to the mine site. Other areas were graded to maximize the benefits of permanent ponds, ditches, and nearby forest areas. The use of terraces and rock-lined ditches within the backfill provided erosion control and diversity that will function as permanent watercourses many years in the future.

Mining at this site was made more difficult due to the existing abandoned mine disturbance on the site that had occurred before enactment of the Surface Mining Law. Many times such abandoned mines create difficulties due to limited topsoil and the extra work needed to reclaim the sites. However, here the abandoned mine problems were included in the permit area and reclaimed as part of the mining and reclamation operation. When reclamation was completed almost 10,000 feet of abandoned highwalls were totally eliminated and another 2,000 feet of abandoned benches were utilized for spoil storage, thus eliminating or partially eliminating additional highwalls.

The reclamation bond was released in November 1996 and today this reclaimed mine site is rapidly maturing into an excellent wildlife habitat. Native trees are becoming established and the sediment control ponds that have been retained as permanent water sources add diversity to the habitat.



Conifers planted as small seedlings when the reclamation was completed in 1991 are now well established trees.

Prior to the Surface Mining Law, coal mining often left a barren, unreclaimed landscape. Today, mining and reclamation is a temporary use of the land and when properly done productive long-term land uses are all that remains when mining is completed.



To prevent erosion, rock-lined waterways were constructed where surface water flows down steep slopes (left).

Permanent impoundments have reduced the speed of surface water runoff and developed into a diverse aquatic habitat (below).





The thick vegetation and rock-lined waterways on this reclaimed mine site have eliminated erosion and sedimentation. This is a very dramatic difference from the picture in Appalachia before the Surface Mining Law.

Agricultura





Land Use

Topsoil is important in reestablishing native vegetation and in crop, forage, and timber production. Removal and replacement of all topsoil is required by the Surface Mining Law unless it is demonstrated that selected subsoil or spoil is better suited to grow plants

Permanent impoundments included in the reclamation provide farmers with water for livestock and greatly add to the wildlife habitat.

The Lynnville Mine, located in Southern Indiana, was operated from 1979 - 1986 by Solar Sources, Inc. This area was extensively farmed in the 1930's and 40's; but, the highly eroded soils and sloping land resulted in abandonment of most of the agricultural activities.

During mining, soil on nearly all of the 520 affected acres was removed and replaced on the reclaimed land to prime farmland depths (48 inches), even though nearly 250 acres were non-prime farmland where soil could have been replaced at the 12-inch depth required for non-prime farmland. However, the operator's commitment to extra soil replacement has restored the land to a level capable of supporting a wide variety of current and future agricultural uses.

Most of the landowners were actively involved in the reclamation of their properties, and the company's cooperative agreements, both written and "handshake" variety, have improved on-the-ground reclamation by incorporating local farming knowledge into the final stages of reclamation. These farmers have harvested silage, hay, soybeans, corn, and wheat from the reclaimed land.

This example of mining and reclamation has rejuvenated the land's agricultural productivity. Today the reclaimed mine site is completely integrated with the surrounding Southern Indiana agricultural landscape. When mining and reclamation are done correctly under the Surface Mining Law, the coal resource is recovered and it is difficult to identify the areas that were mined.



The success of topsoil handling is measured by the land's crop productivity after reclamation. Crops grown on this reclaimed farm land have consistently been above required yields.

Prior to 1977, when the Surface Mining Law was passed, it was common practice to remove the topsoil and overburden in one operation. This resulted in the loss of valuable topsoil that was essential to reestablishing vegetation and productive agricultural land uses.



The deep reclaimed soils on this site provide farmland that is suitable for all crops grown in Southern Indiana (left). This small stream was mined through and reclaimed. Today clear water flows in the stream channel just as it did before mining (below).





This reclaimed mine site has been returned to productive farmland and is indistinguishable from the surrounding Southern Indiana landscape.



Working with
Owners



Blasting, machinery noise, increased truck traffic, and loss of well-known landscape views are constant problems for citizens living near active mining operations. However, this company's involvement with the public and property owners in planning the mining and reclamation operation illustrates that successful mining can be achieved in proximity to residences. Encouraging the public

The Cheslock-Hendershot Mine was located adjacent to the town of St. Clairsville, Ohio. Covering more than 400 acres with over 150 homes situated within 1,000 feet, the area was mined from 1984-1988 by the R & F Coal Company.

To help alleviate property owners' apprehensions and keep everyone better informed about the mining and reclamation, the company initiated public meetings prior to starting the operation. This gave residents of St. Clairsville and the surrounding area an opportunity to work with the company so their concerns could be addressed before problems developed. Encouraging the public to get involved and understand the mining process minimized the impact of mining in such close proximity of homes. For example, mining near the residential area started during the winter months and progressed away from the largest concentration of homes to lessen the impact of air and noise pollution. Tandem coal trucks were used to minimize noise, and the haulroad was constructed to divert truck traffic away from most of the homes.

During reclamation, cropland and pasture land soils were restored to a total depth of three feet rather than the required six inches. This has resulted in above average crop yields and very rapid return to long-term agricultural land use.

A portion of the land which had been previously mined and abandoned was reclaimed to provide facilities for the St. Clairsville Junior Sports -- a local organization supporting recreational activities for the area youth. Today, in addition to the five athletic fields, this area at the edge of town has developed into a major recreation facility where families can be seen fishing in the pond, jogging, chipping golf balls, or enjoying the picnic area.

Mining at this site was a temporary use of the land. Now, with the reclamation bond released, the land continues to develop and flourish just as the surrounding unmined land. Several new homes have been built, a businessman has developed an office/warehouse complex, and the rolling fields provide productive agriculture on the reclaimed land.

th Property

to get involved and understand what was happening minimized the impact of mining on this community, and in the end resulted in positive benefits for all.

Prior to the Surface Mining Law, blasting at surface coal mines was unregulated and a common problem was overloaded blasts. This resulted in flyrock, frequently causing damage to nearby structures and adjoining properties. Operating under the Law, this operation was able to mine successfully even though there were more than 150 homes within 1,000 feet of the permit boundaries.



A small pond constructed during reclamation now provides a park-like setting adjacent to the sports complex (left). The reclaimed hay land illustrates how close the mining came to the adjacent residences (below).





As part of the mining and reclamation plan, a portion of the mine was reclaimed to provide recreational facilities for St. Clairsville area youth. Special meetings were held between the mining company, Ohio Division of Reclamation, and the Director of St. Clairsville Junior Sports, to work out details and ensure agreement with the planned recreational complex (above left). Four ponds were included in the reclamation plan for aesthetics and wildlife enhancement (above right). During mining, one foot of topsoil and two feet of subsoil were removed and stored separately. The soil was restored, seeded with alfalfa, red clover, timothy, and orchard grass, and today is used for hay production (left).

Small minimum reclamatio





e operator on

The Surface Mining Law authorizes up to 10 percent of the fees collected for the Abandoned Mine Reclamation Fund to be used to help qualified small mine operators obtain technical data needed for permit applications. In 1996, 145 small mine operators received assistance for: engineering analyses necessary to determine hydrologic impact, cross-section maps and plans, geologic drilling, archaeological and historical information required for the protection of environmental values, and pre-blast surveys.

Between 1986 and 1990 this 123-acre site located at the border of Tennessee and Kentucky was mined by the W.H. Bowlin Coal Company. W.H. Bowlin is a small coal operator -- mining less than 300,000 tons per year.

Prior to mining this site along Interstate 75, it was covered with old spoil pits and ridges left from an abandoned 1940's coal mine. Everyone traveling northbound on I-75 from Tennessee to Kentucky could see the aftermath of mining as it was done before the Surface Mining Law was enacted. Now, after reclamation, the northbound traveler would have to be told there was once a surface mine there, because the mined area once again looks like the unmined land surrounding it. Although the many thousands of people who see this site every day don't realize it, the re-mining and reclamation of this site has had a dramatic impact on the public perception of coal mining under Surface Mining Law -- after reclamation you can't tell it's been mined.

Today, with the bond released, this reclaimed mine site is typical East Kentucky pasture land with grazing cattle and abundant wildlife in the adjoining thickets. In addition, this outstanding reclamation shows that the size of the operation is not related to the quality of the completed work.

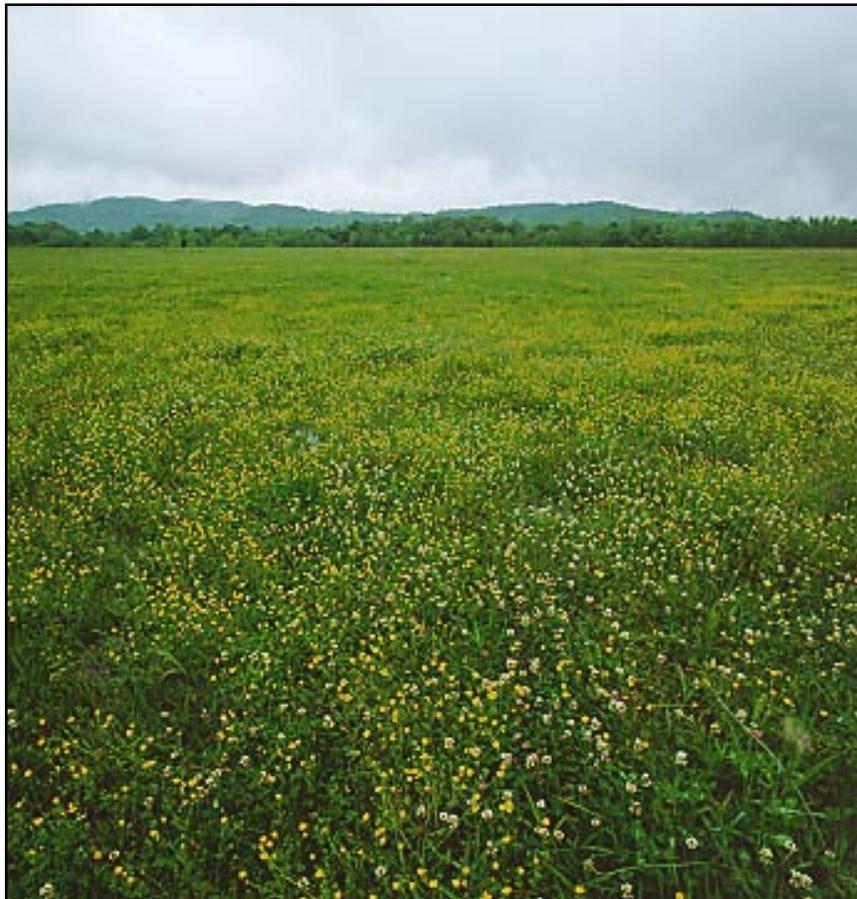


This East Kentucky site has been re-mined and reclaimed, and is now a productive cattle farm.

Prior to the Surface Mining Law, reclamation was not a uniform requirement and most mines were left abandoned and unreclaimed. Many coal companies have reclaimed abandoned mine lands while mining adjacent properties or as part of a re-mining operation. Recognizing that economic conditions may limit opportunities for reclamation through re-mining, the Office of Surface Mining is advancing initiatives designed to encourage industry to apply re-mining techniques to accomplish reclamation of abandoned coal mines.



Five acres of water impoundments provide an outstanding habitat for geese, ducks, herons, and a host of fish (center). Prior to re-mining, this site was covered with abandoned mine spoil pits and ridges, today it's full reclaimed (below).





Native trees and shrubs are rapidly becoming established on the reclaimed land.



Preservation
features



Wooded draws are a natural feature of the North Dakota landscape that provide critical habitat for wildlife. Traditionally mining operations mine through these draws and then reclaim them. Although this has met with success, the Bellaire Corporation's Indian Head Mine took a new look at working with these unique natural features -- they left the wooded draws alone. Instead of mining through them, they mined around them.

Begun in 1922, Indian Head is one of the oldest surface mines in the country. Today the mine has been completely reclaimed. It's now used as productive cropland and native grassland for cattle grazing.

The undisturbed wooded draws contain one of the largest diversities of wildlife in the mine area. The shrubby habitat provides ample shelter, food, and protection for many wildlife species. These wooded stands are now surrounded by re-claimed native rangeland, presenting a more diverse habitat for birds and animals to utilize. Beginning in 1994, cattle grazing was implemented on the reclaimed native rangeland encompassing these wooded draws. Now, in addition to the wildlife benefits they provide, draws offer the cattle protection from the hot summer sun.

The company's recognition of the wooded draws' unique value, and its innovative handling of them, has resulted in reclamation that has quickly re-integrated with the surrounding unmined North Dakota landscape.



Water management facilities added during mining prevented runoff and sedimentation and prevented damage to the existing vegetation.

By preserving the wooded draws, this mine operator has ensured the vegetation remains in its pristine state. The extra work needed to accomplish this reclamation has eliminated environmental impacts and provided reclamation that is already part of the natural landscape.

on of existing

A natural feature of the North Dakota landscape, wooded draws contain a diverse group of trees and shrubs.

The Surface Mining Law requires operators to minimize disturbances and adverse impacts on fish, wildlife, and related environmental values, and to enhance these resources where practicable. Prior to the Law, fish and wildlife, historical, or cultural resources were seldom considered or preserved. Now the mining impact to these features is an important part of the planning and permitting process.



Prickly Pear growing in the wooded draws (left). Wildlife found in the wooded draws includes a broad range of small mammals, big game animals, and birds (center). Today, the wooded draws are integral with the reclamation and cattle use them for shelter (bottom).





Preserving the wooded draws eliminated the years necessary to reestablish mature vegetation (above left). The permanent impoundments included in the reclamation are a source of water for livestock and wildlife (above right).



Phase II performance bond release has been achieved on the wooded draw areas and surrounding reclaimed native rangeland. These areas will be eligible for Phase III release (full bond release) in 1999.

A wide-angle photograph of a lush green field, likely a prairie or meadow, stretching to a flat horizon. The sky is a vibrant blue, dotted with soft, white cumulus clouds. The foreground is filled with tall, green grasses, some showing signs of being cut or mowed. The overall scene is bright and open.

Powder R reclamat



ion Basin

In 1977, when the Surface Mining Law was signed, the tremendous coal production in the Powder River Basin was just beginning and there were many unanswered questions concerning the reclamation of this semi-arid land. This example of reclamation at the fourth-largest producing mine in the country shows that responsible reclamation under the Law is working.

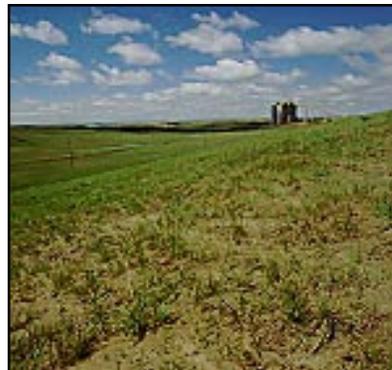
Twenty years of experience has shown that Powder River Basin coal can be recovered and the land successfully reclaimed under the Surface Mining Law.

As one of the largest producing coal mines in the country, Kerr-McGee's Jacobs Ranch Mine near Gillette, Wyoming, has reclaimed thousands of acres of mined land.

Since it began production in 1978, this mine operation has successfully reclaimed the semi-arid mine land and returned it to cattle grazing and wildlife habitat. Today the mine is known for its prolific herds of antelope, deer, and elk that populate the reclaimed area.

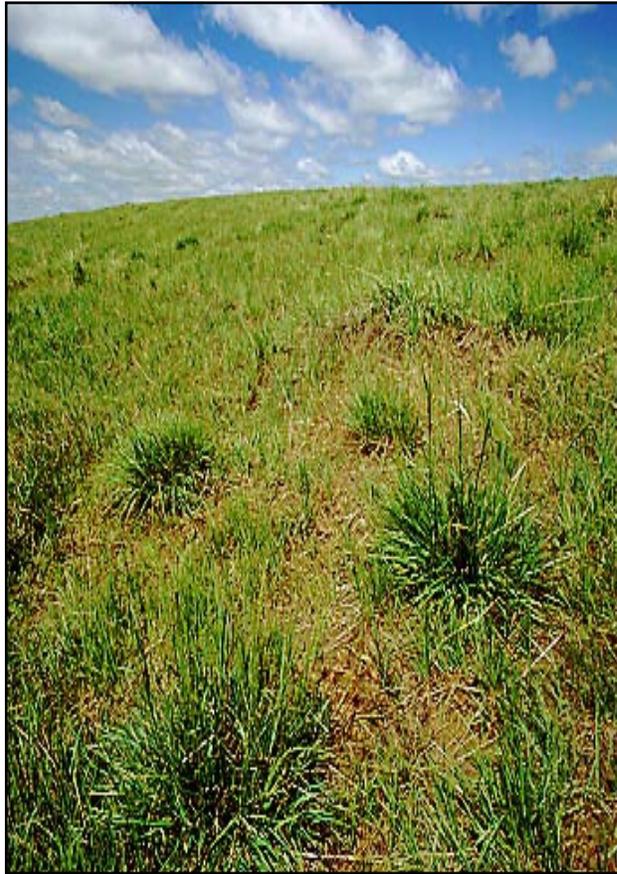
Under the Surface Mining Law, bond release in the West requires a ten-year demonstration of self-sustaining vegetation performance after reclamation of an area. Several years of successful cattle grazing on the reclaimed area must also be demonstrated. Thus bond release serves as the final certification of the successful completion of the coal mine regulatory process. To date over 2,700 acres of land have been permanently reclaimed, approximately 1,750 acres returned to cattle grazing, and the reclamation bond release process begun. A key to the success at this mine is the integration of the mining and reclamation, with reclamation receiving the same high priority as other vital mining activities.

The reclamation at this mine has improved the forage and altered the landscape to enhance the habitat for big game, other wildlife, and domestic cattle. The productivity of reclaimed lands is over one and one-half times greater than on adjacent native range, greatly increasing the carrying capacity of the land. In this semi-arid environment of the Powder River Basin, where a substantial portion of America's coal is mined, the Surface Mining Law is working and the land is being returned to its natural condition.



This reclaimed mine land is difficult to distinguish from native Wyoming rangeland.

To receive Phase III (final) bond release under the Surface Mining Law, an operator in the West must achieve a ten-year demonstration of self-sustaining vegetation performance after reclamation of the mine site. Several years of successful cattle grazing on the reclaimed area must also be demonstrated. This bond release serves as the final certification of the successful completion of the regulatory process. At this 20-year milestone Western mines are beginning to receive final bond release on the reclaimed land.



Native plants used on this reclaimed mine land can endure the harsh semi-arid Wyoming climate. The use of native species that are capable of self-regeneration on the site can be expected to provide a permanent rangeland environment (left). The creation of ecological niches that offer shelter or nesting opportunities leads to a greater diversity of wildlife on a reclaimed site. This rock cairn provides rodent habitat. Species that prey on rodents are likely to frequent the site once the rodents become established (below).





Permanent impoundments on this reclaimed mine provide a valuable source of water in this semi-arid environment.



The first pe
the Surface



In 1980, the operator of this Montana site received the first permanent program mining permit under the Surface Mining Law. Today, the place that was once a coal mine is productive Montana grazing land.

Operated by the Western Energy Company, the Rosebud Mine has been an outstanding example of the workings of the Surface Mining Law over the past 20 years. Here, thousands of acres of land have been mined and reclaimed to native rangeland, significant accomplishments were achieved preserving historical artifacts prior to mining, and the company has made a significant contribution to encourage scientific research in the field of land reclamation.

Now the real questions are: What does the reclamation look like today? Has it passed the test of time? Here at the Rosebud Mine, the dual post-mining land uses are livestock grazing and wildlife habitat. During the last six grazing seasons, more than 4,000 head of livestock grazed on the reclaimed rangelands. Local ranchers whose cattle graze this land report excellent livestock weight gains using the reclaimed pastures. On top of that, the reclaimed rangeland provides excellent wildlife habitat. During 1996 almost 100 species of wildlife were seen on the mine site.

When this permit was issued under the new Surface Mining Law there were many unanswered questions about the possible success of the reclamation and its impact on the natural environment. In 1997, when a picture is still worth a thousand words, this is mining and reclamation under the Surface Mining Law.

Almost 36,000 coal mine permits have been issued under the Surface Mining Law since 1977. Mining operations under these permits have steadily improved in their quality of reclamation and record of compliance. Today, with 20 years of experience, the success of the Surface Mining Law can be seen in the coal fields where on-the-ground conditions have dramatically improved since 1977.



Mining was underway in 1980 (far left), and just five years later cattle grazing was introduced on the reclaimed land (left). To day, the rangeland on this reclaimed mine site is integrated into the surrounding Montana landscape (below).

Permit under the Surface Mining Law



Young trees grow on the reclaimed mine land that blends into the unmined adjacent forest.

Special care and attention to detail by the company and its employees can be seen on the ground at this Montana mine. Broad environmental protection is practiced, and as mining continues, grasslands are reclaimed in a manner that results in cover and productivity levels consistently higher than those found in adjacent native rangelands. At the site of the first Surface Mining Law permit, the mine operator is improving the total ecosystem for livestock, wildlife, and the local citizens.



Prior to mining, native American petroglyphs or rock carvings were identified near the mine (bottom right). The company preserved the ancient artifacts by removing slabs from the sandstone rocks to safeguard the petroglyphs (center). Today one slab is displayed at the entrance to the state museum in Helena.

Native rangeland grasses were planted every spring and fall followed by native shrub planting. The planting process used at this mine resulted in over 90 percent success (left and bottom left).





Silver sagebrush seedlings planted on the reclaimed land have become well established in this semi-arid Montana climate.



When construction of a nearby county airport threatened the destruction of a sod-roof pioneer cabin, the mining company saw the value of the cabin's historical significance and moved it to safety (left). Today, it is permanently located on reclaimed prairie, looking just about the same as it did in its original Montana setting (far left).

REFERENCES AND FOOTNOTES

1. U.S. Department of the Interior, Office of Surface Mining. *Surface Coal Mining Reclamation: 15 Years of Progress: 1977-1992; Part 1*. Washington, D.C. August 3, 1992. 53 pp.; Part 2: Statistical Information 78pp.
2. The Rural Abandoned Mine Program (RAMP), authorized by Section 406 of the Surface Mine Law, provides for the control and prevention of erosion and sediment damages from unreclaimed abandoned mine lands.
3. The Small Operator Assistance Program (SOAP), authorized by Section 401(b)(1) and 507(c) of the Surface Mining Law, authorizes up to 10 percent of the fees collected for the Abandoned Mine Reclamation Fund to be used for technical assistance to help qualified small mine operators obtain technical data needed for permit applications. Operators who produce fewer than 300,000 tons of coal per year are eligible for assistance.
4. The Clean Streams Initiative began as a broad-based program to eliminate acid drainage from abandoned coal mines. Today the program is more focused, with a clear goal of cleaning up acid drainage problems using a combination of private and governmental resources. The success of cooperative solutions to acid drainage problems has been building from the grassroots level in recent years. Watershed associations, community groups, and recreation associations are working together, with funding from government (federal, state, and local) and private sources. This cooperative approach supports greater efficiency and gets better results from the expenditure of public funds. The Clean Streams Initiative is a opportunity for a partnership to solve one of the major environmental problems facing the ecosystems of the coalfields.
5. E.g., Caudill, Harry M. *My land is dying*. E.P. Dutton & Co.; New York, N.Y. 1971; U.S. Department of the Interior. *Surface mining and our environment*. Washington, D.C. 1967.

CREDITS

Photographics used in this report were taken by Chuck Meyers, Office of Surface Mining, U.S. Department of the Interior.

The mining and reclamation operations shown in this report are:

1. Coal-Mac, Inc. and the Rifle Coal Company. Permit number 880-0084, near Debord, Kentucky.
2. Solar Sources, Inc., Lynnville Mine. Permit numbers 79-76, 80-139, 81-160, and S-00068, near Lynnville, Indiana.
3. R & F Coal Company, Cheslock-Hendershot Mine. Permit numbers D-0387, D-0551, D-0657, and D-0727, near St. Clairsville, Ohio.
4. W.H. Bowlin Coal Company. Permit number 518-0270, in Whitley County, Kentucky, just north of Jellico, Tennessee.
5. Bellaire Corporation (an affiliate company of The North American Coal Corporation), Indian Head Mine. Permit numbers: 42, NAIH-7905, NAIH-8001, NAIH-8103, NAIH-8201, NAIH-8306, and NAIH-8504, near Beulah, North Dakota.
6. Kerr-McGee Coal Corporation, Jacobs Ranch Mine. Permit number 271-T3, near Wright, Wyoming.
7. Western Energy Company, Rosebud Mine. Permit numbers SMP 86003A, 80003B, 85003C, 86003D, 81003E, and 85003P, near Colstrip, Montana.



Surface Mining Control and Reclamation Act