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Old King Coal and the Merry Rapists of Appalachia

Arnold W. Reitze, Jr.*

Conservationists who demand that strip miners do a better job of restoring what they tear up are "stupid idiots, socialists, and commies who don't know what they are talking about. I think it is our bounden duty to knock them down and subject them to the ridicule they deserve."

James D. Reilly, Vice President, Consolidation Coal Co.¹

SHOULD A LANDOWNER be allowed to destroy his own land? Does a man, in his moment on earth, have a right to destroy that earth? Does man own the earth, or does the earth own man? Does man have the right to destroy far beyond his poor power to build? Does man have a right to play devil because he cannot be God?

Hernando Cortes, destroyer of the Aztecs, reputedly told an envoy from Emperor Montezuma that the Spaniards were troubled with a disease of the heart, the cure for which was gold.² So it has been with coal for America and its unfortunate internal colony, Appalachia. America's lust for coal has engendered powerful, throbbing machines that dwarf large houses and shake mother earth. Daily, men and machines destroy or entomb thousands of acres of soil that took thousands of years to form, leaving behind them barren land and streams poisoned by acid running off the mine site.³

The legal system has responded to this destruction with restrictions on the private use of land for surface mining. These restrictions focus almost exclusively on coal mining and include several

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² W. Prescott, The Conquest of Mexico 266 (1909).

³ See G. Zeigler, Div. of Eng'r, Ohio Dep't of Health, Coal Mining in Ohio and Its Effects on Environmental Health, Dec. 1965 (mimeographed).
federal laws of very limited impact,\(^4\) laws in several states,\(^5\) and various local regulations.\(^6\) Surface mining may also be affected by laws dealing with a wide variety of other subjects, such as land development, water pollution, soil and water conservation, and wildlife.

The subject of this article is the nature, scope, and effectiveness of the laws regulating the surface mining industry.\(^7\) Ohio, where surface mining is a major industry, is selected for detailed treatment because its regulation of surface mining is typical of most states and because the author has had his longest period of direct study of surface mining in Ohio.

I. THE PROBLEM

Surface mining is the process of removing the overburden of topsoil, rock, and other material covering a mineral deposit, in order to extract the mineral.\(^8\) It is the counterpart of deep mining, where a shaft is sent to the mineral, and the mineral is moved to the surface through the shaft.\(^9\) Some 15,000 active surface mines in the United States produce 50 different mineral commodities.\(^10\) This mining technique accounted for approximately 80 percent of the total ore and solid fuels produced in 1965.\(^11\)

Surface mining methods are generally classified according to five types: (1) strip mining, (2) auger mining, (3) open pit mining, (4) dredging, and (5) hydraulic mining.\(^12\)

\(^4\) See section III infra.
\(^5\) See text accompanying notes 59-87 infra.
\(^6\) See text accompanying notes 88-96 infra.
\(^7\) For discussions of the collateral subject of a coal lessee's right to disturb or interfere with the use of the surface estate to remove coal, see Mullins v. Beatrice Pocahontas Co., 432 F.2d 314 (4th Cir. 1970); Department of Forests & Parks v. George's Creek Coal & Land Co., 250 Md. 125, 242 A.2d 165 (1968); Stewart v. Chemicky, 439 Pa. 43, 266 A.2d 254 (1970); O'Dell v. McKenzie, 145 S.E.2d 388 (W. Va. 1965); Bailey, Disruptions to Peaceful Coexistence of Surface Owner and Mineral Lessee, 2 NATIONAL RESOURCES LAW. 154 (1969); Manning, Mineral Rights Versus Surface Rights, 2 NATURAL RESOURCES LAW. 329 (1969); 5 LAND & WATER L. REV. 97 (1970).
\(^9\) NATIONAL COAL ASS'N, supra note 8, at 15.
\(^12\) SURFACE MINING, supra note 11, at 33. For a technical treatment of surface mining, see H. NICHOLS, MOVING THE EARTH (1962).
Over half the surfaced-mined ore produced in 1965 was recovered by strip mining.\textsuperscript{13} There are two methods of strip mining: area stripping and contour stripping.\textsuperscript{14} The method used depends on the topography of the area to be mined.

Area stripping is commonly used for coal and phosphate mining when the topography is relatively level. The overburden, which is often as deep as 100 feet or more, is removed by power shovels, draglines, or other types of excavators, leaving a trench or "box cut." After the overburden is removed, the minerals are extracted, usually by smaller equipment. Sometimes blasting may be necessary. When the mineral has been removed from the first excavation, an adjacent cut is made, and the overburden or "spoil" removed from this cut is dumped into the previous cut. The final cut, which may be a mile or more from the original excavation, leaves an open trench as deep as the combined thickness of the overburden and the recovered mineral. Without postmining grading or leveling, area stripping leaves a landscape of roughly parallel ridges of unvegetated spoil, as well as the open trench.

The second kind of strip mining, contour stripping, is the method used to extract mineral deposits from seams lying in hilly or mountainous areas. The contour miner begins removing the overburden at the outcrop of the mineral seam and deposits the spoil at the outer edge of the cut or on the slope below the cut. As the miner digs into the hill, the amount of overburden he must remove becomes greater with the increasing height of the hill. Eventually the height of the overburden makes further extraction uneconomical. This method leaves a bench along the hill or mountain and is characterized by a steep cliff or "highwall," which is the exposed face of the cut. Often the result is a weirdly shaped mountain that looks like a baroque chess piece, the top isolated to all except mountain climbers specialized in scaling "rotten," friable rock.

Both area and contour stripping entail removal of the vegetative cover. The topsoil, subsoil, broken rock, and other strata are then usually mixed together in the spoil, with the precious topsoil at the bottom. The spoil will usually not support vegetation, and the loose

\textsuperscript{13} SURFACE MINING, supra note 11, at 52.

and unstable soil readily washes downhill. In addition, strip mining uncovers sulfur-bearing minerals, such as pyrite and marcasite, which are normally present with minerals extracted by stripping. Water vapor and atmospheric oxygen react with these oxidizable sulfide minerals, whether they occur in rock strata or in the coal, to form sulfuric acid and acid-forming salts such as iron, magnesium, manganese, sodium, potassium, aluminum, and calcium sulfates.\(^\text{16}\) These stripping byproducts inhibit plant growth on the spoil banks and cause contamination of surface and subsurface waters.\(^\text{16}\) Often this acid, called yellowboy, destroys virtually the entire aquatic ecosystem of the streams of a mining district, and this pollution can continue for many years.\(^\text{27}\)

Auger mining usually follows contour stripping. This method permits the recovery of additional tons of minerals after the overburden-mineral ratio has become such that it is uneconomical to continue removing the mineral deposit by contour stripping methods. Augers are also employed to recover minerals located near the outcrop of the mineral seam that could not be extracted safely by earlier deep mining operations. In coal mining, augers, which look like giant wood bits and may be as large as 7 feet in diameter, are used to bore holes into the exposed face of the seam. The coal is extracted in a manner similar to that in which shavings are produced by a carpenter's bit. By inserting sections behind the cutting head of the auger, holes may be drilled to a depth of 200 feet.

Since augering is generally used after the contour stripping phase, it does not create much land disturbance. Augering may, however, induce surface subsidence; and when underground water channels are intersected, it may disrupt natural drainage. It is a wasteful recovery process that leaves most of the coal behind and provides channels for subsurface runoff of mine acid, which can be virtually impossible to control. But since auger operations are economical and therefore profitable, the industry uses this technique with little concern for its harmful side effects.

Open pit mining is characterized by a trough that is quite deep in relation to its surface area. In proportion to the ore obtained,

\(^\text{16}\) See G. Zeigler, supra note 3, at 1.


\(^\text{17}\) See F. GRAHAM, DISASTER BY DEFAULT: POLITICS AND WATER POLLUTION 159-63 (1966). The oldest known strip mine in Pennsylvania dates back to 1815 and is still discharging acid. Id. at 161.
the amount of overburden removed is small. In contrast to other surface mines, open pit mines are worked for a relatively long period of time. The Hull-Rust Iron Mine in the Mesabi Range of Minnesota, which covers less than 1 square mile, produced 190,989,028 tons of iron ore between 1895 and 1950.\textsuperscript{18} The Kennecott Copper Corporation's open pit mine in Bingham Canyon, Utah, has produced 2 billion tons of material since 1906, and mining continues at the rate of 325,000 tons per day.\textsuperscript{19} Sandstone, marble, granite, and limestone quarries, sand and gravel pits, and large excavations producing iron and copper ore are typical open pit mines.

Dredging is used extensively in gold mining and in the mining of sand and gravel. Dredging operations employ suction devices or mechanical equipment such as draglines, "clam shells," and ladder or chain buckets mounted on floating barges or located on land adjacent to the mineral deposits. In sand and gravel operations, most of the material recovered is marketed. In dredging operations for the higher priced minerals, however, almost all of the extracted material is waste, which is deposited near the mining site in tailing piles similar to the spoil piles remaining after strip mining. Often these tailings cause a serious water pollution problem. The destruction of estuaries and their immense web of dependent marine life is one of the common side effects of dredging.\textsuperscript{20}

Hydraulic surface mining, although employed only on a limited scale today, was used extensively in the past to recover gold and other precious metals. In this operation a powerful jet of water is used to erode and wash out a bank of earth. The ore-bearing slurry is then fed into concentrating devices which separate the mineral from the waste. Besides washing out the landscape, hydraulic mining causes sedimentation problems in the streams and rivers which receive the waste material.\textsuperscript{21}

Surface mining can create at least seven environmental problems: air pollution (primarily in and around the mine site); water pollution (acid and siltation); soil destruction; destruction of fish and wildlife habitats; health and safety hazards (soil slides, open pits,

\textsuperscript{18}Lake Superior Iron Ore Ass'n, Lake Superior Iron Ores 142, 176, 214 (2d ed. 1952).


\textsuperscript{20}For an interesting discussion of the destruction of the estuary zone of Texas by oyster shell dredgers, see G. Laycock, The Diligent Destroyers, ch. 13 (1970).

\textsuperscript{21}In the 1880's, hydraulic mining was the subject of a political-legal struggle between mining and agricultural interests in California. The farmers won. See C. Shinn, Mining Camps: A Study in American Frontier Government (1965).
and high walls, for example); noise pollution (local annoyance from heavy machinery, trucks, and blasting); and unpleasant landscapes. While he was Secretary of the Interior, Stuart Udall presented a prepared statement to the Interior and Insular Affairs Committee of the United States Senate, in which he succinctly explained some of the problems created by surface mining. He stated:

1. Every State has had some surface mining activity within its boundaries.
2. Only 14 States have laws relating specifically to the conduct of surface mining operations and the reclamation of surface mined areas, and five of these direct their attention only to coal mining.
3. By January 1, 1965, surface mining had affected more than 3.2 million acres of land.
4. Despite all reclamation efforts by man and nature, and after the lapse of considerable time, about two million acres still need additional reclamation work — this is 3,125 square miles, or an area equal to the combined land area of the States of Delaware and Rhode Island.
5. In 1964 surface mining was biting off an estimated 153,000 acres annually. Only about one-third of the land disturbed that year was adequately reclaimed by man. By 1980 it is estimated, quite conservatively, that more than five million acres will have been affected.
6. Despite the existence of State regulatory laws of some sort, in the opinion of the experts 73 percent of the mined areas reclaimed under existing State regulations in Appalachia required further attention.
7. The adverse effects of surface mining are not confined to the site of the operation. Off-site effects also must be considered. These on-site and off-site effects include:
   (a) nearly 1.7 million acres of wildlife habitat damaged;
   (b) erosion from some spoil banks at rates up to 27,000 tons per square mile per year, compared with only 25 tons per square mile from similar areas of forest;
   (c) approximately 13,000 miles of streams and over 145,000 surface acres of natural lakes, reservoirs and impoundments adversely affected by sediment and acid;
   (d) more than 20,000 miles of [highwalls] remaining — hazardous to public safety, hindering wildlife movement, damaging otherwise attractive landscapes.22

But statistics alone, although important, cannot adequately portray the environmental abuse of surface mining. David McCullough is one of many writers who attempts to portray with words the environmental effects of surface mining:

But the real shattering of the ecology of a mountain begins after the strip miners have come and gone, and the resulting troubles continue for years at a cost no one studying the problem is as yet able to estimate. Even before the rains hit them, the spoil banks begin to move. Full of churned-up slate and mangled trees, spoil banks are highly unstable affairs and slowly succumb to the pull of gravity with a dry, sliding sound one can actually hear. Then, when the inevitable mountain storms strike, rushing water slides into them like a knife. Frequently, like the giant slag heap at Aberfan, in Wales, a spoil bank will let go altogether and thunder down on whatever lies below, which in several instances has been somebody's house. Landslides will block streams and highways, and in the words of a government report, "economic and aesthetic values [are] seriously impaired." But apart from spoil bank damage, even ordinary erosion will cause extraordinary damage in no time. Water races off the mountain loaded with silt, gravel, and the deadly sulfuric acid that drains out of exposed coal or its overlying strata. Creeks that a boy could leap over only a few years ago are now as broad as two-lane roads, blasted out in a way reminiscent of the hydraulic mines of the Old West. Other creeks are so clogged with sludge that they have to be cleaned out two or three times a year at considerable cost to the state.

Slimy with mustard-colored coal silt and poisoned by mine acid, thousands of Kentucky creeks and streams are quite literally "dead"; nothing lives in them; the putrid water is good for nothing, and it stains and poisons just about anything it comes in contact with.\(^\text{23}\)

Surface mining causes still other problems. In Pennsylvania, the operators in the past have left rubble behind to drift down on public highways, requiring removal at public expense.\(^\text{24}\) In 48 states, fish and wildlife habitats have been adversely affected, which is especially significant because several rare or endangered species are found only in restricted habitats in major surface mining areas.\(^\text{25}\) Other problems include the stench of fires which burn in waste piles and the danger, particularly to children, of steep highwalls and pools of water.

Despite these problems, the percentage of bituminous coal and lignite produced by surface mining has increased during the past 20 years.\(^\text{26}\) The high price now paid for coal, combined with the relative ease of entering this business, has encouraged hundreds of small mine operators and heavy equipment owners to seek profits by

\(^{23}\text{McCullough, supra note 1, at 99.}\)
\(^{24}\text{Ade, Strip Mining in Pennsylvania, NAT'L PARKS MAGAZINE, Mar. 1967, at 15.}\)
\(^{25}\text{A few species involved are the masked quail, the Mexican duck, the desert bighorn sheep, the grizzly bear, the greenbacked trout, the trumpeter swan, and the whooping crane. FISH & WILDLIFE SERV., supra note 14, at 19. See also Prinsky, Save the Woodpecker Is the Cry of Canadians Battling Mine Project, Wall Street J., Aug. 6, 1969, at 1.}\)
\(^{26}\text{SURFACE MINING, supra note 11, at 40.}\)
surface mining. In Kentucky alone, the number of strip mine operators nearly tripled in 1970, increasing from 111 the year before to almost 300.27 This rapid expansion makes the best statistical data that is presently available outdated. Present statistics give a picture of surface mining that, however depressing, is not as grim as reality.

If uncontrolled, surface mining and the destruction it causes will increase substantially, for surface mining offers numerous advantages over deep mining. Surface methods allow the use of larger, more efficient machinery and fewer employees. Therefore, production costs are generally lower.28 For example, production per man-day in 1962 averaged a little more than 12 tons for underground methods while strip mining produced 27 tons per man-day, and the difference between the two rates has been increasing.29 With the dramatic increase in the capacity of surface mining equipment since 1963, the surface miner can now nearly double his underground counterpart's production of 18 tons of coal per day.30 Equipment like the Big Muskie, a 27 million pound coal mining dragline used in southern Ohio, can remove 325 tons of overburden at a single pass.31 Even larger machinery is planned. Present plans of the Kaiser Corporation in British Columbia call for new, deeper-working equipment to remove overburden to depths of 480 feet, twice the depth of the deepest strip mine operation in the United States.32 In addition, strip mining recovers 90 percent or more of the mineral deposit compared with a recovery of less than 50 percent for deep mining because in deep mines much otherwise recoverable ore must be left in place to support the mine shafts.33

The safety record for surface mining is also better than for underground methods. Surface mines have escaped the bad publicity created by mine accidents and mining-related diseases such as "black
The fatal accident rate for surface mines is also lower than for underground mines. In Ohio, for example, 137 fatalities were reported for coal mine operations from 1955 to 1969. Of this total, 79 were attributable to underground mines, 54 occurred at surface mines, and 4 occurred at coal preparation plants. In part, however, these statistics reflect the smaller number of men required in surface mining.

In addition, many of the state and federal health and safety laws applicable to deep mining are not applicable to strip mining. The safety provision of the federal statute requires that by December 31, 1972, workers in underground mines must not be exposed to more than 2 milligrams of coal dust per cubic meter. Three-fourths of all Kentucky deep mines fail to meet this standard; and if it is enforced, an estimated 40 percent of all underground mines in the nation will be closed.

Other advantages of surface mining include the ability to mine thin seams (under 32 inches); the ability to mine thick seams (over 10 feet) without excessive loss of coal for supports; and the ability to mine seams of irregular thickness and steeply pitched seams. Successive layers of coal can also be mined, as can coal covered by strata of insufficient strength to provide roofing support. In addition, strip-mined coal is easier to process and clean because it is not as

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36 1969 REP., supra note 35.

37 Citizens to Abolish Strip Mining in West Virginia challenge the assertion that surface mining is safer. In a February 1971 release the group stated:

Those who claim strip mining is safer than deep mining should consider these facts which are based upon statistics from the West Virginia Department of Mines 1969 Annual Report.

Of all injuries in deep mining for that year, 1.59 per cent were fatal, compared to the 5.83 fatality rate for all strip mining (surface and auger) injuries. This is nearly four times greater. More significantly, the report revealed that a strip mine employee runs a greater risk of being killed than a deep miner does — .162 per cent of all those employed in deep mines were killed, compared to .192 per cent of those employed in strip mining.


39 Id. § 842(B)(2).

40 O'Hanlon, Anarchy Threatens the Kingdom of Coal, FORTUNE, Jan. 1971, at 78, 80.
fine as deep-mined coal. Hence, less coal is lost in the preparation for sale.\textsuperscript{41}

The advantages of surface mining — particularly the cost advantage — have contributed to the current boom in the coal industry. The profit margin for that industry has been 12 to 15 percent during the past 3 years, well above that of other industries. The profit on the sale of coal is now between 80 cents and $1 per ton, producing a production profit of about $500 million a year.\textsuperscript{42} Coal prices increased recently from $4 to $6 per ton to as high as $14 per ton and are maintained in part by the export of over 56 million tons a year or 10 percent of the United States production.\textsuperscript{43}

The most important reason for the coal boom is that electric power demands are increasing at 8 percent per year, and the coal industry has been able to meet these demands and protect its competitive position by keeping its costs down.\textsuperscript{44} The competition from fuel oil, nuclear power, and natural gas (all of whose industries receive federal tax or direct subsidies to some extent) puts coal in a position where costs must be minimized in order for the industry to survive.

Nevertheless, profits today in the coal industry are high for a period when reclamation laws, although still inadequate, are stronger than ever before. Mass transportation, better sewage treatment, and air pollution control devices all require power, and power now requires coal. Even if the percentage of electricity generated by burning coal decreases, the increased overall production of power could still allow for high levels of coal consumption.\textsuperscript{45}

\textsuperscript{41}1968 Hearings, supra note 14, at 123-24. (Statement of Edwin Phelps, Vice President of Engineering, Peabody Coal Co.).

\textsuperscript{42}D. McAteer, Coal Mining Health and Safety in West Virginia 371 (1970).

\textsuperscript{43}Forty percent of the exported coal goes to Japan, 25 percent to Canada and most of the remainder to European nations. Most of this coal is low in sulfur — one reason why low-sulfur coal is not available to reduce domestic air pollution levels. L. Beck & S. Rawlings, Coal: The Captive Giant 69 (1971).


The demand for coal should continue because the nuclear boom has run into numerous problems. See generally Hearings on Environmental Effects of Producing Electric Power, Before the Joint Comm. on Atomic Energy, 91st Cong., 1st & 2d Sess., pts. 1 & 2 (1969-70).

\textsuperscript{45}Thus, although the number of nuclear power reactors doubles every 2.4 years (with this rate expected to continue at least through 1980), the demand for more electric power results in the continued building of new coal-powered generation plants. The scarcity of natural gas (which causes eastern companies to deny new service to industrial companies) and the ever increasing dependency on foreign oil make coal an attractive
The electricity used by Americans, particularly in areas using coal for fuel, is priced slightly lower than it would be if adequate environmental protection were required. We have been trading low cost energy yesterday and today for higher cost food and fiber tomorrow when land overturned by surface mining will not produce what it might have if properly reclaimed. The cost of fuel cannot be measured in dollars alone. Americans are paying for electrical power with thousands of acres of land and thousands of miles of streams which have been damaged or destroyed by inadequately regulated surface mining.

Another production cost borne by the public, rather than the power or coal industries, is the destruction of Appalachia’s long-term economic base for the benefit of corporations whose profits do not return as investments in the coal region. The destruction of the land results in an exodus of the capable young people. Those that remain are the very old, the very young, the infirm, and the incompetent, and the opportunity for regional development diminishes. Harry Caudill, perhaps the most eloquent portrayer of the destruction of Appalachia by the coal industry, reports that three-fourths of the production profits leave the mining area. At least four-fifths of the royalties paid by operating companies go to mineral-owning corporations with only nominal expenditures within the Cumberland Plateau. And with increased automation, thousands of jobless people are left as byproducts of the mining industry.

Governmental action is required to control the destructive side effects of surface mining. The action to date has been woefully in-


The drive for environmental protection and the ensuing low sulfur fuel limitations may decrease the market for coal, but offsetting this will be an increase in demand for coal to produce electricity for pollution control machinery. Mullan, The Coal Industry and the Clean Air Problem, 3 NATURAL RESOURCES LAW. 96 (1970). See also Hearings on Air Pollution Control and Solid Waste Recycling Before the Subcomm. on Public Health and Welfare of the House Comm. on Interstate and Foreign Commerce, 91st Cong., 2d Sess., pt. 2, at 645, 882 (1970). Mine-mouth generation of electricity can move air pollution away from urban areas, which usually have the strictest pollution control. Ironically, the economics of the coal industry require that much of the demand for coal be met by strip mining. Unless corrective regulation is soon imposed, the drive for pollution control will contribute to the destruction of our soil, water, and landscape.

See generally 1968 Hearings, supra note 14, at 87 (Statement of Harry Caudill); Brooks, supra note 29; Caudill, Misdeal in Appalachia, THE ATLANTIC, June 1965, at 43; Schrag, Appalachia: Again the Forgotten Land, SATURDAY REV., Jan. 27, 1968, at 14.


48 H. CAUDILL, NIGHT COMES TO THE CUMBERLANDS 372 (1962).
adequate. The responsibility of the government to protect the health, safety, and welfare of its citizens has been poorly met when the basic stuffs of life — air, water, and soil — are sacrificed for generations or longer. The reason for the lack of meaningful surface mining controls may be that we have no land ethic that recognizes the rights of future generations. More pragmatically, those who profit by the destruction of our resource base are well represented in the political arena while few people speak for the future generations.\footnote{See generally A. Leopold, A SAND COUNTY ALMANAC (1966); Nader, Ralph Nader on Man-Made & Man-Remedied Environmental Hazards, NJEA REV., Dec. 1970, at 20, 43.}

There are more than enough legal theories upon which to base a legislative program to protect the land. Traditional legal theory restricts the user of private property to "reasonable" uses which do not interfere with the rights of other property owners.\footnote{See generally, W. Prosser, TORTS 592-633 (3d ed. 1964).} This theory is particularly useful when mining practices cause silt movement or acid development which damage another's property. The prevention of nuisance, trespass, or interference with water rights is sufficient reason for legislation.

A more innovative concept is that government has a fundamental obligation to protect the resources that belong to all citizens in common. This is an interesting philosophical theory and should be explored further. The basic research for this theory has been provided by Professor Joseph Sax.\footnote{See Sax, The Public Trust Doctrine in Natural Resource Law, 68 MICH. L. REV. 471 (1970); 1 ENVIRONMENT L. REV. 599 (1970).}

Under the commerce clause of the Constitution, the federal government has the power to regulate industries that produce goods for commerce.\footnote{See United States v. Darby, 312 U.S. 100 (1941).} An individual state can also regulate surface mines pursuant to the state police power to promulgate laws for the health, welfare, and safety of its citizens.\footnote{See Northern Ill. Coal Corp. v. Medill, 397 Ill. 98, 72 N.E.2d 844 (1947); Maryland Coal & Realty Co. v. Bureau of Mines, 193 Md. 627, 69 A.2d 471 (1949); Dufour v. Maize, 358 Pa. 309, 56 A.2d 675 (1948).}

Despite the existence of legal theories upon which strict surface mining regulation could rest, legislation giving government sufficient regulatory power has yet to be enacted. If we are to deal seriously with the problem, a much more ambitious program than has heretofore been attempted is mandatory. Such a program will, of course, be limited by the constitutional prescription against taking
property without compensation, as well as the usual requirements that laws be reasonable.\textsuperscript{54}

The purpose of statutes regulating resources may be to protect the mineral itself as with the regulations controlling the production of oil to prevent waste and to maintain prices.\textsuperscript{55} Or the purpose may be to indirectly protect soil, water, and landscape by regulating the mineral, as is the purpose of surface mining laws.\textsuperscript{56}

Essential to the development of an effective program is the acceptance by legislatures and courts of the role of government as a planner, for the alternative is the chaos of the present system. Today the planning function of government is seldom acknowledged; instead the general public interest is usually given less weight than powerful economic interests. Television licenses are granted, leases for offshore oil drilling are awarded, and a wide variety of technological developments are financed from the public purse without corresponding general benefits. Since much of the coal mined by destructive surface practices goes to produce electricity — an industry which is already subject to governmental control and planning through public regulation or public ownership of utilities — it is time that the role of planning be more explicitly recognized in the control of surface mining. Regional land use plans, river basin management, and air pollution planning are other areas in which the planning function should encompass surface mining controls.\textsuperscript{57}

An effective program will be difficult to enact and carry out, for the present program represents a political equilibrium. Disturbing such a balance requires political pressure sufficient to displace powerful, vested interests.\textsuperscript{58} We have had surface mining controls for only a little over 30 years, and attainment of even these has been an uphill struggle.

\textsuperscript{54} See generally Bosselman, \textit{The Control of Surface Mining: An Exercise in Creative Federalism}, 9 \textit{NATURAL RESOURCES J.} 137, 156 (1969).

\textsuperscript{55} See generally W. LOVEJOY & P. HOMAN, \textit{ECONOMIC ASPECTS OF OIL CONSERVATION REGULATION} (1967).

\textsuperscript{56} The constitutionality of indirect legislation to protect a resource has been upheld by the United States Supreme Court. Miller \textit{v. Schoene}, 276 U.S. 272 (1928); Ohio Oil Co. \textit{v. Indiana}, 177 U.S. 190 (1900).

\textsuperscript{57} See Reich, \textit{The Law of the Planned Society}, 75 \textit{YALE L.J.} 1227 (1966).

II. THE ROLE OF STATE AND LOCAL GOVERNMENT

The problems created by surface mining, and particularly by coal stripping, have led states to enact reclamation laws. These laws are a recent development. It was not until 1939 that West Virginia, a major surface mining state, enacted legislation to regulate coal stripping. During the following 16 years Indiana, Illinois, Pennsylvania, Ohio, Kentucky, and Maryland enacted similar legislation regulating surface mining and imposing reclamation requirements upon the stripping industry. Between 1965 and 1970, several more states enacted reclamation laws or amended their existing laws and legislation was pending in others. Illinois, Indiana, and West Virginia regulate the surface mining of all minerals. Tennessee exempts only limestone, marble, and dimension stone. Most states, however, regulate only coal.

The constitutionality of state statutes imposing regulations upon the strip mining industry was apparently settled between 1947 and 1949 by three state courts. In 1947, the Supreme Court of Illinois declared the original Illinois statute regulating strip mining un-

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60 Ch. 84, § 1, [1939] W. Va. Acts (now W. VA. CODE ANN. §§ 20-6-1 to -32 (Supp. 1968)).
63 Legislation was pending in Alaska, California, Colorado, Nevada, and North Carolina. See 2 ABA NATURAL RESOURCES L. NEWSLETTER, No. 4, July 1969, at 8.
64 Ill. ANN. STAT. ch. 95, § 180.3(C) (Smith-Hurd Supp. 1971); Ind. ANN. STAT. § 46-1517 (Supp. 1970); W. VA. CODE ANN., 20-6-2 (Supp. 1968).
65 Tenn. CODE ANN. § 58-1523(b) (1968).
66 SURFACE MINING, supra note 11, at 99.
The court found that the act was neither a reasonable exercise of the state's police power to promote public health nor a reasonable conservation measure. The court's major objection to the statute, however, was that its regulation of only coal strippers was unreasonably discriminatory:

But even if the act were valid as a measure designed to protect the public health, or as a conservation measure, it is fatally defective as an unreasonable discrimination against coal strip-mine operators. This court has repeatedly held that where statutes are enacted in the exercise of the police power, only those statutory classifications are valid which are based on reasonable grounds of distinction with reference to the object of the legislation.68

The draftsmen of a new Illinois strip mining statute, enacted in 1961, heeded the objection of the court, and the new statute regulates all strip mines—coal, clay, stone, sand, and gravel.69

The constitutionality of the Pennsylvania statute regulating bituminous coal stripping was tested in Dufour v. Maize.70 The Supreme Court of Pennsylvania upheld the statute as a valid exercise of the state's police power. In so holding, the court rejected the unreasonable discrimination argument that had prevailed in the Illinois court, and held that the classification of bituminous coal strippers was founded on genuine distinctions. The coal operators further argued that the statute deprived them of their property without due process of law and levied taxes upon them that were not uniform. To these contentions, the court replied that in light of the profitability of coal stripping, the additional costs of operation were not so unreasonable that they constituted a taking of property, and that even if the fees and bonds were a tax, they were uniformly levied upon all members of the class.71

In the third case, the Maryland Court of Appeals declared that the exclusion of limestone and slate strip mining from the state's reclamation statute did not deny coal strippers their right to 14th amendment equal protection because quarrying of limestone and slate affected smaller areas than coal mining, left no spoil banks, and entailed no fire or flooding hazards.72 But the statute regulated coal stripping only in one county of the state, and it was therefore struck

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67 Northern Ill. Coal Corp. v. Medill, 397 Ill. 98, 72 N.E.2d 844 (1947).
68 Id. at 106-07, 72 N.E.2d at 848.
69 ILL. ANN. STAT. ch. 93, § 180.3 (Smith-Hurd Supp. 1971).
70 358 Pa. 309, 56 A.2d 675 (1948).
71 Id. at 314-19, 56 A.2d 678-80.
down as an unreasonable discrimination against operators in that county.

A statute which results in complete prohibition of surface mining, such as a reclamation requirement which is so financially burdensome that mining would be unprofitable, presents a different situation. Such a severe limitation on the use of an interest in land may be so onerous and unreasonable as to constitute a taking of property without compensation in violation of the 14th amendment due process clause. Nearly every regulation of property, however, constitutes a taking. The amount of regulation that is allowed before such a taking requires compensation under the due process clause is, and will remain, a gray area. Indirect prohibition through the imposition of costly reclamation requirements, however, would seem a proper exercise of state police power if the purpose of such regulation is to relieve neighboring landowners and the general public of negative social costs, such as harmful water and silt damage, the decline in neighboring property values, and the loss of aesthetic values.

Even a total direct ban on strip mining can be considered a reasonable exercise of state or federal power in areas where the industry is unable to control acid runoff, prevent erosion, or successfully reclaim the mined land or where social and economic destruction of local communities will result. It should be remembered that a ban on surface mining is not a ban on extracting coal but only a limitation on the use of a very destructive method of removal. In West Virginia, a bill was introduced by State Senator Si Galperin that would have banned all surface mining by January 1, 1973. The bill was supported by John D. Rockefeller IV, the secretary of state, as well as a coalition of conservation organizations, but was replaced by a compromise bill in the last half-hour of the session. The new law sets a 2-year moratorium on issuance of strip mine permits in 22 counties. Eleven of these counties have no coal, however, and the remainder are unlikely to see much stripping even without the moratorium.

73 See Note, Constitutional Law — Governmental Regulation of Surface Mining Activities, 46 N.C.L. REV. 103, 116-18 (1967).

74 The West Virginia State Reclamation Board has denied, on aesthetic grounds, an application for a license to strip the overlook at Grandview State Park. See OUTDOOR AM., Oct. 1969, at 2.

75 CENTRAL ATLANTIC ENVIRONMENT NEWS, No. 3, March 31, 1971, at 7. See also Schneider, Strip Mining in Kentucky, 59 KY. L.J. 653, 665 (1971), wherein the author reviews the history of strip mining regulation in Kentucky and discusses total prohibition as a possible reform measure.
State reclamation laws, while differing in detail, have much similarity in general outline. A state administrative agency is given authority to oversee the reclamation program. This is usually the department of natural resources or conservation or a smaller administrative unit such as the bureau of mining. The state agency requires an operator to obtain a permit or a license prior to mining. The information that must be supplied on the application for a license varies from state to state from the detailed to the superficial. A fee must be paid for the license, which generally is valid for 1 year. The states vary considerably in their grounds for denying a permit. Common grounds for denial are the danger of uncontrollable sedimentation, experience which shows that acid water pollution cannot be prevented, and the operator's past failure to meet strip mine reclamation requirements. To assure compliance, most states require the filing of a performance bond of a set amount, usually $100 to $500 per acre. An operator that fails to obtain a license before mining is usually subject to a fine and sometimes imprisonment.

After mining is completed, the operator is required to grade the land to provide a more natural topography. Covering of the exposed coal face or seam is required, although requirements vary with regard to the "final cut" in area stripping. Other requirements concerning land treatment vary not only from state to state but also with the type of operation and local conditions. Various requirements exist concerning drainage, prevention of silting, pollution control, refuse disposal, control of fire hazards, and construction of access roads.

After grading is completed, coal operators are required to plant a suitable vegetative cover. Details concerning how the replanting must be accomplished vary considerably. Generally, either trees or grasses are planted. If trees are to be used, they must be capable of survival in the harsh environment of spoil material. The selection depends on the amount of stone in the soil, the soil texture, the kind and amount of aggregation, and chemical conditions. In some states the reclamation can be carried out on substitute lands.

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77 See U.S. Dep't of Agriculture, Forestation of Strip-Mined Land in the
Failure to complete reclamation can result in a fine or forfeiture of the bond. Moreover, many states make the failure to comply with these laws grounds for revoking the right to mine in the state. Most states have a reclamation fund where monies received by the state for licenses and bond forfeitures are used for reclaiming lands or administering the mining reclamation program.

Although in general, the reclamation statutes are fairly consistent from state to state, the effectiveness of the programs often varies. Some states have difficulty enforcing their laws effectively because of a lack of funds, a lack of qualified manpower, an inefficient division of authority, or the inflexibility of their statute.

One federal study of partly and completely reclaimed surface-mined land in 29 states showed that 46 percent of the land had been restored by natural forces, 51 percent by private industry, and the remaining 3 percent by government entities. Reforestation, even when carried out, failed to control siltation or acid production during the period following mining. An examination of selected reclaimed sites throughout the United States revealed that vegetative cover was effective at 29 percent of the sites, inadequate at 53 percent, and that an additional 18 percent of the sites were considered incapable of supporting vegetative covering.

The many books and articles that have been written about the environmental abuses by surface miners since these reclamation acts were passed, as well as the profusion of government reports and studies, provide convincing proof that such legislation has been ineffective. Furthermore, the reliance upon state reclamation legisla-
tion may have reduced the total amount of reclamation undertaken by the strip mining industry because local governments were preempted from imposing their own regulations.\textsuperscript{81}

More effective planning can result in more successful reclamation. But the laws must first be changed. Much of the reclamation effort is directed toward meeting legal tests for reclamation. The result is legally reclaimed land that looks like the surface of the moon.\textsuperscript{82}

Meaningful reclamation efforts will be expensive. The federal government has estimated the cost of basic reclamation as follows: reinforcement of existing vegetation on 611,000 acres — $86 million; planting and conditioning soil of 775,000 acres — $196 million; intensive treatment of 374,000 toxic or severely damaged acres — $126 million; grading 198,000 acres of contour benches — $40 million; grading 186,000 acres of area stripped — $18 million; providing proper drainage for 567,000 acres — $111 million; channeling excess water from the mine sites — $10 million; repairing the damage from 860 of the 1,700 linear miles of spoil bank slides — $13 million; repairing or obliterating 6,000 linear miles of haul roads — $18 million; treating 7,000 linear miles of stream beds damaged by sediment — $22 million; stabilizing pond levels in 500 ponds covering 145,000 acres — $2.5 million; providing one access route per mile of highwall — $5 million; safeguarding hazardous conditions by fencing and warning — $10 million.\textsuperscript{83} These figures total $657.5 million. Another federal study estimates that basic reclamation of coal mining areas of Appalachia alone would cost $251 million.\textsuperscript{84}

These costs are substantially greater than costs of reclaiming land as part of an ongoing operation. In 1964, reclamation by private industry averaged $302 per acre nationally and $265 per acre in


\textsuperscript{81} For a summary of federal laws regulating or affecting surface mining, see \textit{SURFACE MINING, supra} note 11, at 97-99.

\textsuperscript{82} As of January 1, 1965, of a total 3,187,800 acres disturbed by strip mining in the United States, 2,040,600 were still in need of treatment. \textit{U.S. DEP'T OF AGRICULTURE, RESTORING SURFACE-MINED LAND 3} (1968).

\textsuperscript{83} \textit{SURFACE MINING, supra} note 11, at 82.

\textsuperscript{84} \textit{U.S. DEP'T OF THE INTERIOR, supra} note 10, at 42.
Ohio. The lower figure for Ohio can, in part, be attributed to the lower reclamation costs associated with area stripping compared with contour stripping, the former being more prevalent in Ohio, and to the more expensive reclamation requirements of other states.

A survey of the requirements imposed by the reclamation acts of 10 states is included in appendix A of this article. This material is taken from charts prepared by the federal government reflecting the laws as of January 1, 1968, and has been updated by the author through a review of the statutes and by correspondence with the relevant state authorities. No attempt has been made to follow regulations, administrative practices, or changes in court interpretations.

An important development is the move toward broad state environmental agencies to administer state regulations. For example, on December 3, 1970, the Pennsylvania Department of Environmental Resources, which will be responsible for regulation of mines, was created. Such agencies should be more amenable to conservation pressure than the traditional natural resource and mining agencies.

Local regulation of surface mining is permissible, but it is more limited in its scope than state regulation. In some states, state strip mining laws may preempt local action. If a municipality regulates through zoning, however, a conflict with state law may be avoided.

The United States Supreme Court has adopted what is regarded as a permissive attitude toward local regulation of surface mining. And the Court recently upheld a zoning ordinance completely prohibiting surface mining where the mine operator failed to show that the regulation was unreasonable or that compliance would reduce...
the value of all his property. The prohibition of surface mining in developed residential districts is commonly upheld, but blanket prohibitions by local governments have usually been struck down.

The Supreme Court of Ohio has upheld local zoning ordinances that prohibit surface mining in densely populated areas. But the court has struck down as unconstitutional a similar zoning ordinance which constituted a blanket prohibition of strip mining and had no relation to the character of the area in which the prohibition was sought to be enforced. It should be noted, however, that the fact that Ohio cities have strong "home rule" authority makes local mining ordinances in that state less objectionable to the courts than in states that do not recognize such authority. Local governmental powers to regulate surface mining are more limited in most of the other states, although the right to prohibit mining in populated areas and the right to prevent nuisances provide more legal power than is generally exercised.

III. THE ROLE OF THE FEDERAL GOVERNMENT

Mining operations on federally-owned lands, including the national forests, must comply with federal mining laws. Most minerals extractable by surface methods are covered by the Mineral Leasing Act of February 25, 1920. This Act requires an operator to obtain a lease granted at the discretion of the Secretary of the Interior in order to mine coal, phosphate, sodium, potassium, oil, etc.

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84 Smith v. Juillerat, 161 Ohio St. 424, 119 N.E.2d 611 (1954). The court recognized the validity of zoning ordinances which limited the use of land in the interest of public welfare.

85 East Fairfield Coal Co. v. Booth, 166 Ohio St. 379, 143 N.E.2d 309 (1957). The land on which the township sought to prohibit strip mining was located at the edge of the township approximately 2 miles from residential areas. The court observed that the value of the land for stripping was great compared to its value for agriculture purposes. Id. at 382-83, 143 N.E.2d at 311-12. There was no projected comparison of the value of the land after stripping was completed and its present agricultural worth.

86 OHIO CONST. art. 18, § 3.

oil shale, native asphalt, solid and semisolid bitumen, and bituminous rock on federal lands. The 1920 Act excludes all lands acquired by the federal government from private owners, covering only lands which were acquired from a foreign government or given up by a state when the Nation was founded.

Acquired lands are covered by the Mineral Leasing Act for Acquired Lands of 1947. A prerequisite for leasing acquired lands is the consent of the head of the executive department or independent establishment which has jurisdiction over the lands. He may prescribe conditions necessary to insure adequate preservation of the lands for the primary purpose for which they are being administered. Acquired national forest land, for example, may be leased by the Department of the Interior only with the additional consent of the Secretary of Agriculture, who can impose stipulations, as requested by the Forest Service, for protection of the land.

Under the Act of May 11, 1938, and other acts which apply to specific reservations, Indian lands can also be leased. The Commissioner of Indian Affairs uses standard lease forms requiring that the lessee surrender the land in good condition and cooperate in reseeding.

These leasing arrangements provide a legal basis for greater protection of public lands than is possible on private lands, although the political and economic power of the industrial users of public lands limits the effectiveness of the leasing power in controlling the mining industry. The effectiveness of federal leasing arrangements is particularly suspect in light of the alleged maltreatment of Indians by the Bureau of Indian Affairs. On the Navajo and Hopi Indian reservations in Arizona, the Peabody Coal Company, under an agreement approved by the Department of Interior, has recently begun stripping what will be the world's largest strip mine. The Department of Interior allegedly helped power companies — who are building large coal-burning power plants on the reservations to produce electricity for Los Angeles — to convince the Indians

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89 SURFACE MINING, supra note 11, at 98.
91 SURFACE MINING, supra note 11, at 98.
that they should lease their lands at unreasonably low rates, before
the use of nuclear power renders the coal worthless.\textsuperscript{104} The Interior
Department's Bureau of Indian Affairs has similarly been criticized
for failing to enlighten the Indians about the adverse effects of
strip mining and about the air pollution which will result from the
use of their lands.\textsuperscript{105}

In addition to the leasing requirements, there are other federal
statutes which relate to mining on federal lands.\textsuperscript{106} The Mineral
Act of 1947\textsuperscript{107} gives the Secretary of the Interior authority to re-
quire good conservation practices when sand, gravel, and stone are
taken from public lands. The Act of July 23, 1955\textsuperscript{108} reserves to the
federal government the right to manage and dispose of surface re-
sources of any mining claim prior to the issuance of a patent for the
claim, but the provision is ambiguous as to the exact surface miner-
als to which this right accrues. And section 402 of Reorganization
Plan No. 3 of 1946\textsuperscript{109} requires the Secretary of the Interior, with the
approval of the Secretary of Agriculture, to regulate the use of min-
eral deposits on certain lands acquired by the United States under
statutes such as the Bankhead-Jones Farm Tenant Act\textsuperscript{110} and the
Weeks Act.\textsuperscript{111}

\textsuperscript{104} Id. at 16.
\textsuperscript{105} Id. The adequacy of the protection afforded under the leases to Peabody Coal
Company is even more questionable in view of the fact that they were agreed to by the
Hopi Tribal Council, which represents only the Progressives and not the Traditionalists
within the tribe. The Traditionalists still adhere to the dictates of the Hopi religion,
which forbids any disturbance of the land except to the extent necessary for their sur-
vival. Even where the land must be disturbed — in the raising of crops for example —
the Traditionalists strive to restore it to its natural condition. See Barnes, \textit{Los Angeles
The Hopi religious leaders have now filed suit, asserting that the leases were unlawfully
approved by the Secretary of the Interior. \textit{Id.}

The leases will bring the Hopi Tribal Council $1 million. In the past, however, the
lease of mineral rights has brought the Indians only limited benefits, such as a few job
opportunities, because the income from the leases often provides only those services
which the Bureau of Indian Affairs would otherwise provide free to those without re-

See generally Craig, \textit{Cloud on the Desert}, \textit{Environment}, July/Aug. 1971, at 20, 24,
where the author suggests that the Four Corners Plant — one of six power plants
planned for a four state area, and located on Navajo lands — may be the world's worst
single source of air pollution after completion of its final units. See also Josephy, \textit{The
Murder of the Southwest}, \textit{Audubon Mag.}, July 1971, at 52.

\textsuperscript{106} For a summary of miscellaneous federal statutes relating to mining on federal
lands, see \textit{Surface Mining, supra} note 11, at 121.
\textsuperscript{109} 5 U.S.C. § 133y-16 (Sec. 402) (1964).
When nonfederal lands are involved, as is the case in 94.7 percent of the acres affected by surface mining, the federal government has little power. The federal government is, however, attempting to assist in solving the problems of surface mining on nonfederal lands. The Appalachia Regional Development Act of 1965, covering 373 counties in Alabama, Georgia, Kentucky, Maryland, New York, Mississippi, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, and West Virginia, established the Appalachian Regional Commission to study the natural resources and problems of Appalachia, including the surface mining problem, and to plan and coordinate programs to improve the region. In 1967, Congress amended the Act to direct the Appalachian Regional Commission to study the effects of strip mining. In addition to the services of the Bureau of Mines, to which the above study was delegated, and the Appalachian Regional Commission, a special panel of experts on mine drainage pollution was convened by the National Research Council of the National Academy of Sciences — National Academy of Engineering to advise and assist in the investigation. Although the Bureau of Mines, the Appalachian Regional Commission, and agencies with a tangential interest in surface mining are studying the problems and making recommendations, there is little reason to believe that Congress intends to provide a meaningful surface mining program or to spend the necessary sums to successfully carry out such a program. Most of the activity under the Appalachian Regional Development Act involves deep mining, and most of the projects funded have been undertaken in the anthracite fields of Pennsylvania.

112 SURFACE MINING, supra note 11, at 102.
114 Id. § 403.
115 Id. § 102.
116 Id. § 205(c). For the results of this study, see APPALACHIAN REGIONAL COMM'N, supra note 16.
118 A 20-year program to abate mine drainage problems would cost $6.6 billion. APPALACHIAN REGIONAL COMM’N, supra note 16, at 13.

A joint federal-state program to control mine water in the anthracite region of Pennsylvania was established by the Act of July 15, 1955, 74 Stat. 934, as amended, 30 U.S.C. 571-76 (1964), and by Act No. 82 of the Pennsylvania General Assembly dated July 7, 1955. Two types of mine-water control projects are conducted under this legislation. One consists of pumps to control water from inactive mines, and the other
The federal government has approved "in principle" the reclamation of an abandoned surface mine near Steubenville, Ohio. Under the Appalachian Regional Development Act, the federal government will provide 75 percent of the nearly $1 million cost of developing a 100 acre lake and park.120

The Department of Agriculture, through the Soil Conservation Service, has provided some technical assistance and financing to landowners and operators in the Soil and Water Conservation Districts of the Appalachian states. Between 1960 and 1964, more than 66,000 acres of mined land in Appalachia were treated through this service. Sixty percent of this acreage was planted with trees, and more than 350 water-control structures were installed.121

Another area of Department of Agriculture interest is the problem of revegetation techniques for effective reclamation. A project in West Virginia involves experimentation with plants that can tolerate some toxicity and neutralization of the soil through fertility management.122 The Department of Commerce, through the Area Redevelopment Administration (Economic Development Administration), also provides funds for reclamation demonstration projects.123

The Bureau of Mines is an active government agency dealing with reclamation efforts, but it functions primarily as a mining industry research organization and has little apparent interest in surface mining problems other than its attempts to exploit salvageable minerals in mine refuse.124 The Bureau has pursued such activities under the Solid Waste Disposal Act,125 and these activities should be further encouraged by the Resource Recovery Act of 1970126 with its provisions for mineral waste research and grant programs.127 The Office of Saline Water, the Geological Survey,
and the Bureau of Sport Fisheries and Wildlife also have research programs and demonstration projects, often in cooperation with the Bureau of Mines. These projects are commendable, but it is questionable whether the Bureau of Mines will vigorously press for surface mining controls or adopt any position opposed by the mining industry. The public is not always aware of the Bureau’s position because the Secretary of the Interior speaks in public for the Bureau and also represents the diverse views of the Department and the President.

Surface mining is barely mentioned in the First Annual Report of the Council on Environmental Quality, published in 1970, and then only as a source of sediment and acid. But these problems are not mentioned at all in the 1970 Report of the National Goals Research Staff, nor are they discussed in the President’s Message on the Environment of February 10, 1970. Thus, legislation which would move the federal government into this area of social concern in a meaningful way is not pressed with much vigor.

The Tennessee Valley Authority is the Nation’s largest purchaser of bituminous coal for producing electricity. Half of the coal purchased by TVA is produced by strip mines, and TVA has been regularly charged with failing to use its power as a major coal consumer to regulate surface mining. Justice William O. Douglas has been among the most outspoken critics of its practices for many years.

Probably in response to such charges, TVA, in 1965, began including reclamation provisions in its contracts and inspecting surface mined sites to insure compliance with those provisions. Today, coal operators who sell to TVA are required under the TVA contracts to take steps to prevent water contamination as mining progresses. After mining is completed, the contracts require revega-

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128 SURFACE MINING, supra note 11, at 78.
129 See COUNCIL ON ENVIRONMENTAL QUALITY, 1ST ANN. REP., ENVIRONMENTAL QUALITY 37 (1970).
131 See text accompanying notes 163-78 infra.
133 See H. CAUDILL, supra note 48, at 318-21; Steif, supra note 132.
At the end of fiscal year 1967, TVA had under inspection 57 contracts — 30 in Tennessee, 23 in Kentucky, 2 in Virginia, and 2 in Alabama — covering an estimated 5,500 acres mined by 24 companies. \(^{138}\) Thus TVA, as the purchaser of 20 percent of the coal produced in its five-state procurement area, has used its contract power as a partial answer to inadequate state law. The TVA has also proposed an $8 million plan to reclaim abandoned strip mine sites, but this proposal has been lost in the political jungle. \(^{137}\)

Although TVA's attempt to provide additional protection through contract clauses appears to be an important step in reducing surface mining devastation, these contracts may be largely paper protection. The Appalachian coal mining industry is dominated by TVA and other electric utilities whose large purchases of coal give them the power to compel good mining practices and adequate reclamation. \(^{138}\) Nonetheless, it appears that the destruction of Appalachia continues at the sufferance of TVA and that TVA, like the states, has chosen to sacrifice long-range environmental goals for the immediate benefits of low-cost electricity. \(^{139}\)

The one area in which the federal government has had some impact is the control of mine acid. Under the Federal Water Pollution Control Act, \(^{140}\) the federal government can require states to establish water quality criteria. \(^{141}\) When discharge into the water reduces the water quality to a level below the standards set by the state, the Act empowers the state to stop the discharges. \(^{142}\) In response to this statute, states have zoned waters for uses based on scientific parameters. If the state uses alkalinity-acidity or pH as one of its criteria, it has the power to require abatement of mine acid drainage when the acidity of the waters is raised by the discharge to a level which violates the state's water quality standards. When state criteria and supporting implementation plans are approved by the Environmental Protection Agency, they become federal standards.

\(^{136}\) TENNESSEE VALLEY AUTHORITY ANN. REP. 10 (1967).


\(^{138}\) See Steif, supra note 132.


\(^{141}\) Id. § 466g(c).

\(^{142}\) Id. § 466g.
and can be enforced by the federal government. Siltation can be similarly controlled if the state sets standards based on turbidity and suspended solids. Other provisions in the federal Act, including the Clean Water Restoration Act of 1966, provide for grants for research and development to help states prepare comprehensive programs for water pollution control. In 1970, section 14 of the Water Quality Improvement Act added a provision allowing for federal participation in acid and other mine water pollution control demonstration projects of state or interstate agencies. Such agencies are required to pay not less than 25 percent of the costs of such projects. Funding authorization is limited to $15 million, a figure that even if appropriated, would not begin to solve the problem. Although its several provisions thus afford the tools to curb some of the detrimental effects of surface mining, the entire federal water pollution control program has been but marginally effective in general, with a limited impact on surface-mining pollution.

Another area of new activity is the Army Corps of Engineers permit system. The Corps is authorized, under the Refuse Act of 1899, to require permits for discharge into navigable waters. This provision has been ignored for many years, but the Corps now requires industries that discharge waste into waters to obtain a permit. This requirement may eventually be applied to mine operators who pollute surface waters. The Corps is also authorized under the Rivers and Harbors Flood Control Acts of 1970 to study the effects of strip mining on navigable rivers and water resource projects and to report within 1 year on the measures necessary to mitigate adverse conditions due to strip mining projects.

But these federal activities deal only with the effect of surface

143 Id. § 466g(g)(1); see Dunkelberger, The Federal Government's Role in Regulating Water Pollution Under the Federal Water Quality Act of 1965, 3 NATURAL RESOURCES LAW. 3 (1970).


148 See McCann, 90% of Firms Miss Waste Permit Filing, The Plain Dealer (Cleveland, Ohio), July 2, 1971, § A, at 1, col. 1.

Environmentalists in Michigan have sought to enjoin the issuance of these permits, charging that a permit allows the holder to pollute surface waters while being immune from prosecution under the Refuse Act. See Wall Street J., Apr. 13, 1971, at 14, col. 3.

149 84 Stat. 1818.
mining on rivers and lakes and have limited effect on the total problem. Apparently the only successful federal program in the area of surface mining has been the carrying out of studies. Given the political power of the coal industry and its opposition to any governmental activities, including studies, the creation of an effective federal program has been successfully thwarted.

As an alternative to ineffective or nonexistent federal controls, interstate compacts are regularly proposed as a means of solving problems that cut across state boundaries, particularly when the problems are common to a region. Interstate compact organizations such as the Ohio River Sanitation Commission,150 which functions primarily to control water pollution, have a limited effect on surface mining.

Other more comprehensive compacts for water pollution control in the Appalachian area are needed to deal with mine acid pollution. In 1969, over 5,700 miles of streams — three-fourths of them concentrated in Pennsylvania, Maryland, and West Virginia151 — were continuously polluted by mine acid.152 The Delaware River Basin Compact and the Susquehanna River Basin Compact are examples of the more sophisticated compacts being used today, which provide comprehensive plans to deal with all aspects of water pollution.153 Another modern compact is the proposed Potomac River Basin Compact, which would replace the simplistic and limited Potomac River Sanitation Compact with a modern multipurpose agency.154

In 1964, the Kentucky General Assembly directed its Legislative Research Commission to study the feasibility of an interstate compact on strip mining and to enlist the cooperation of the Council of State Governments.155 At the same time, the Conference of Southern Governors made a similar request of the Council of State Governments.156 In response, the Council of State Governments prepared a draft of an Interstate Mining Compact in 1965.157

151 Letter from James Rhodes, States' Cochairman, and John B. Waters, Jr., Federal Cochairman, Appalachian Regional Commission, to the President, June 30, 1969, in APPALACHIAN REGIONAL COMM’N, supra note 16 (preface).
152 APPALACHIAN REGIONAL COMM’N, supra note 16, at 27.
154 Id. at 66.
156 Id.
157 Id. at 7-10.
Compact would create the Interstate Mining Commission, made up of the governors of the party states or their representatives, and supporting technical committees. The function of the commission would be to supply advice and exchange information; its powers would be so limited that little else would or could be accomplished. Each party state would agree to enact strip mine reclamation laws—a somewhat meaningless provision in view of the ineffectiveness of state legislation today. To become operative, the Compact required ratification by four states. In 1967 the Compact was adopted by Kentucky and Pennsylvania, in 1969 by North Carolina, and in 1970 by Oklahoma. Now that the Compact is beginning to function, a meeting is planned for the spring of 1971 to begin a program. Ten other states have expressed an interest in becoming part of the Compact.

Although the federal government has not developed a meaningful program for improving the reclamation efforts of the states, legislative proposals in this area have become common. A proposal for federal strip mine control, which provided for bonding of operations and grading of disturbed land, was made in 1940 by Representative Everett Dirksen. In 1949, Representative Brooks Hays introduced a bill which provided for federal-state cooperation in restoring mined land. Until his defeat in 1968, Senator Frank Lausche of Ohio was an active proponent of strip mining laws. In the House, Representative Saylor has introduced strip mine legislation continuously for almost a decade; however, the bills have never been brought up or discussed, despite Saylor’s position as the ranking Republican on the Interior Committee.

The recommendations of the Department of Interior set out in appendix B should be considered a minimum program. These recommendations have inspired numerous bills, introduced from 1967 through 1970, which would provide for federal regulation of sur-
face mining and for federal-state cooperation in reclamation programs.\textsuperscript{167} For example, on February 23, 1970, Senator Gaylord Nelson introduced S. 3491, titled the Mined Lands Restoration and Protection Act of 1970.\textsuperscript{168} The bill was referred to the Senate Committee on Interior and Insular Affairs, from which it never emerged. Representative Ken Hechler, a Democrat from West Virginia, introduced an identical bill as H.R. 17569.\textsuperscript{169} Although these bills indicate that the need for federal legislation in this area is being recognized, all such proposals have fallen short of enactment.\textsuperscript{170}

Perhaps 1971 will be different. On January 25, 1971, Senator Gaylord Nelson introduced a bill for regulation of present and future surface and strip mining and for the conservation, acquisition, and reclamation of surface and strip mined areas.\textsuperscript{171} Senator Henry Jackson has introduced a bill providing for cooperation between the Secretary of the Interior and the states with respect to the future regulation of surface mining operations.\textsuperscript{172} In addition, Senator Jackson introduced the Administration's Mined Area Protection Act of 1971.\textsuperscript{173} Although all of these bills are weak, Senator Nelson's bill does provide for the banning of strip mines in steep, mountainous areas, and it would authorize federal action if states fail to regulate the coal industry.

The strongest bill in the 92d Congress is that proposed by Representative Hechler.\textsuperscript{174} This bill would ban all strip mining of coal. As of April 6, 1971, it had attracted 65 cosponsors from 23 states. Because of the many cosponsors, three identical bills have been introduced in the House,\textsuperscript{175} and Senator Nelson has introduced the same


\textsuperscript{170} One problem which must be averted in any final enactments is private enrichment from the expenditure of public money for mining controls.


\textsuperscript{172} S. 630, 92d Cong., 1st Sess. (1971).

\textsuperscript{173} S. 1176, 92d Cong., 1st Sess. (1971).

\textsuperscript{174} H.R. 4556, 92d Cong., 1st Sess. (1971).

Representative Hechler has compared his bill to its weak counterpart proposed by the Administration as follows:

First, my bill applies to surface and underground coal mines located or planned anywhere in the United States, including those in Federal lands and Indian lands.

The administration's bill transmitted to the Congress on February 10, 1971, does not apply to Indian lands. Further, the administration's bill does not require any regulation of these operations in the case of coal mining on "federally owned lands or land held in trust by the United States for Indians." It merely authorizes . . . Federal agencies "which have jurisdiction over land on which mining operations are permitted" — but apparently not those where minerals are reserved — to promulgate, at their discretion, "environmental regulations to govern such mining operations."

The administration's bill covers all minerals.

My bill applies only to coal mining operations. I believe that the principal environmental problem that has caught the attention of the public is coal mining. I do not wish to confuse this issue by trying to regulate these other industries at the same time, although I would not object to efforts to control all minerals where necessary.

Second, my bill provides that it be administered by the Environmental Protection Agency.

The administration's bill proposes that the Interior Department administer the program.

The Interior Department is a management agency; it manages lands and resources. It is also interested in increased mineral production. Its record in trying to regulate the coal industry for health and safety has been dismal.

My bill and, for that matter, the administration's bill, does not provide a management function. Both bills are standard-setting and regulatory bills. EPA now has a similar function in the case of air and water pollution control and the control of pesticides. Many of the environmental problems associated with coal mining center around air and water pollution. It is, therefore, logical and reasonable for EPA to have this function. Furthermore, inasmuch as forest lands of the Department of Agriculture's Forest Service are involved, it is logical to place control in the Environmental Protection Agency rather than the Interior Department.

Third, my bill declares that "the public has a right to enjoy a safe and healthy human environment" and to expect that Federal, State, and local governments "will protect this right."

This administration's bill has no similar declaration.

Fourth, my bill prohibits the opening of any new abandoned, or inactive surface coal mine. It also requires, in the case of existing surface coal mines, that EPA shall promulgate regulations within 30 days after enactment governing the content of reclamation plans for such mines; the regulations shall require that all surface coal mining operations shall cease within 6 months after enactment, except those necessary to reclaim the lands; the operators of such

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mines shall submit for EPA's approval reclamation plans within 60 days after enactment; and the failure of an operator to submit a plan for approval or to comply with it shall not relieve him of his responsibility to do so.

The administration's bill does not prohibit all surface coal mining. In fact, for at least 2 years such mining would go unregulated under the administration's bill.

Fifth, my bill would prohibit any underground and surface coal mining in areas of the national wilderness system.

The administration's bill has no similar provision.

Sixth, my bill would require that no surface coal mining be conducted at national forests, and that underground coal mining in the national forests be conducted so as not to damage or destroy any area of the forests or the natural resources thereof.

The administration's bill has no similar provision.

Seventh, my bill would control underground coal mining so as to reduce or eliminate adverse environmental effects. It would require that EPA publish, within 90 days after enactment, regulations prescribing national environmental control standards for active and planned underground coal mines and that those regulations, after public comment, shall be finally promulgated 90 days later. Then, each of the 50 States must adopt after public hearings, and submit to EPA, within 6 months after such promulgation, a plan for the effective implementation, maintenance, and enforcement of these promulgated EPA regulations. EPA will approve those plans which provide for permits or licenses for underground coal mines and for renewal thereof at least every 3 years; for performance bonds; for reports on the actions taken or planned to protect the environment and the effectiveness of such actions; for prohibiting the opening of new underground coal mines where such mining would result in a violation of applicable air or water quality standards or would be detrimental to health or welfare; for timetables to insure compliance with the plan; and for periodic revision of the plans.

If EPA finds that a State has failed to submit a plan, or that it has been disapproved, or that a State fails to make revisions in it after notice from EPA, the Administrator of the Environmental Protection Agency must issue regulations covering such operations in the State which shall then apply to such operations.

The administration's bill would give the States up to 2 years to submit approvable regulations governing surface and underground coal mines.

The administration's bill also provides in section 201(a)(2) that the mining operations must not "result in a violation of applicable water or air quality standards." But section 201(b) of the administration's bill directs that the State regulations "shall be further elaborated" by the Secretary of the Interior through "guidelines" which he must issue 30 days after enactment. These are issued without any opportunity for public comment on them. We have seen the disastrous effects of not providing for public review of regulations and guidelines before they are finalized in the case of coal mine health and safety regulations published by Under Secretary Fred J. Russell — since resigned.
This section of the administration’s bill also directs that the guidelines “shall attempt to assure that State regulations provide the operator of a mining operation sufficient flexibility to choose the most economically efficient means of meeting the requirements of section 201(a)(2)” which relate to air and water quality standards. I cannot understand the meaning of this provision or the need for it. Neither the Clean Air Act, nor the Federal Water Pollution Control Act, prevent anyone subject to air or water quality standards from choosing whatever means necessary to achieve the requirements of the standards. Thus, this provision is not necessary. If that is the case, why is it in the bill?

The administration’s bill provides that if a State fails to submit environmental regulations within 2 years after enactment, the Secretary of the Interior must “promptly” issue them, but no time is established for doing so.

Eighth, my bill provides for civil and criminal penalties and for injunctions and other actions to enforce its provisions, regulations, and plans.

The administration’s bill has similar provisions, but its civil penalties are only applied after 15 days of continuing violations.

Ninth, my bill provides for citizen class action suits as does the Clean Air Act Amendments of 1970.

The administration’s bill contains no similar provision.

Tenth, my bill protects employees who notify EPA of violations or testify regarding enforcement of the act from being discharged or discriminated against. This provision is also in the Federal Coal Mine Health and Safety Act of 1969.

The administration’s bill does not.

Eleventh, my bill provides up to 90 percent grants for reclaiming abandoned or inactive coal mines under plans to be submitted to EPA for approval and where the Administrator finds such reclaiming is feasible. The requirements for such plans [are] set forth in the bill.

The administration’s bill has no similar provision.177

A possible compromise bill providing for more stringent penalties than the administration’s bill (up to $10,000) and a reclamation schedule for orphan lands has been introduced by Representative Lloyd Meeds of Washington.178

The power of the coal industry and the competitiveness of the states hinder the development of long-range surface mining programs. Socially conscious citizens are demanding that well organized, politically sophisticated industries include in their production costs those costs now borne by society and spend money to prevent general harm to the unorganized, unrepresented, diffuse citizenry, many of

whom are yet unborn. Industry has responded to this demand by spending large sums for lobbying efforts to perpetuate the institutionalized stealing by corporations from nearly every American through false advertising, consumer frauds, designed obsolescence, and social and environmental destruction. Because any change in the destructive practices of the coal industry would threaten the existing political structure, the needed reforms will be resisted.

IV. THE SURFACE MINING INDUSTRY IN OHIO

Mining is a major industry in Ohio with production valued at approximately $460,374,000 in 1969, the eighth consecutive year of record highs. Although a dozen counties accounted for the major production, all the counties in the state contributed except Fulton County on the northwestern border.

Coal is the most important mineral resource of Ohio. With reserves of 42 billion tons of bituminous coal in the eastern and southeastern portions of the state, Ohio should remain a significant coal producer. In 1969, surface mines supplied about two-thirds of the total coal with the remainder coming from underground mines. Of the over 32 million tons of coal recovered by surface methods, 91

181 An example of this resistance is federal and state government opposition to the attempts of VISTA and the Appalachian Volunteers to organize eastern Kentuckians to oppose strip mining. See Good, Kentucky's Coal Beds of Sedition, THE NATION, Sept. 4, 1967, at 166; Schrag, Appalachia: Again the Forgotten Land, SATURDAY REV., Jan. 27, 1968, at 14.
182 Ohio is endowed with a valuable supply of bituminous coal:

The bedrock in Ohio consists of limestone, shale, and sandstone which were originally deposited as soft sediments in or near an ocean that covered parts of Ohio during the Paleozoic Era. This era began about 600 million years ago and lasted for about 375 million years. Many limestone beds formed from the shells of animals that lived in the ancient ocean. Sandstone and shale beds formed from layers of sand and mud that accumulated on the ocean floor or on the shore near the sea.

During the last 100 million years of the Paleozoic Era, Ohio was covered by large swamps in which plants grew abundantly. Thick layers of partly rotted plants, called peat, formed on the floors of the swamps. From time to time rivers or the ocean spread layers of mud and sand over the beds of peat. During the 225 million years since the end of the Paleozoic Era, the layers of peat have slowly been changed to bituminous coal. U.S. DEP'T OF THE INTERIOR, NATURAL RESOURCES OF OHIO 35 (1963).

185 Id.
percent was produced by area and contour stripping methods. Only 1,782,414 tons were recovered by auger mining.\(^{186}\)

Among the high coal producers in 1969 were Belmont, Harrison, Jefferson, Muskingum, Noble, and Tuscarawas counties\(^{187}\) — part of the economically depressed area known as Appalachia. The combined tonnage of Belmont, Harrison, and Jefferson counties represented 59 percent of the total coal produced in Ohio in 1969.\(^{188}\)

Other minerals extracted by surface methods also contribute to the state's economy. Limestone and dolomite are found in many locations in the state.\(^{189}\) Ohio is a leading clay-producing state, yielding about 3 million tons in 1969.\(^{190}\) Clay shale from coal-bearing rock is also mined.\(^{191}\) Lime production exceeds 3 million tons a year and is found principally in Sandusky County.\(^{192}\) Gypsum has been mined along the shores of Lake Erie since 1822, and 300,000 to 400,000 tons per year are mined.\(^{193}\) Two million tons of sandstone quarried each year make Ohio the Nation's leading producer of sandstone.\(^{194}\) The state also produced 48 million tons of sand and gravel in 1969,\(^{195}\) as well as stone, iron oxide pigments, zinc pigments, gemstones, and peat.\(^{196}\)

Since coal mining began in Ohio in the early 1800's, some 4 billion tons of coal have been extracted, and Ohio has ranked consistently among the Nation's top coal producers.\(^{197}\) Early recognized as an important element of the state's economy, coal was first extracted from deep mines with the primitive pick and shovel and later with the modern mechanical continuous miner. Strip mining, as we know it today, was first used in Ohio for the extraction of coal in 1914. The demand for coal during World War I and World War II caused a steady and substantial increase in the amount of coal recov-


\(^{187}\) Id. at 8.

\(^{189}\) Id. at 2.

\(^{189}\) U.S. Dep't of the Interior, supra note 182, at 26.


\(^{191}\) Id. at 26.

\(^{190}\) U.S. Dep't of the Interior, supra note 182, at 29.

\(^{192}\) Id.; 1969 Rep., supra note 35, at 27.


\(^{195}\) U.S. Dep't of the Interior, supra note 182, at 25.

\(^{196}\) See Surface Mining, supra note 11, at 110.
ered by stripping. Surface mining now accounts for 64 percent of Ohio's total coal production.\textsuperscript{198}

Production of coal in Ohio for 1969 totaled 51,193,028 tons, marking an increase for the eighth consecutive year and 2.9 million tons in excess of the previous high in 1968.\textsuperscript{199} Of the 328 mines which reported coal production in 1969, 267 reported production from surface mine operations, including strip and auger operations.\textsuperscript{200} Although the production of underground-mined coal has continued to rise in the past few years, surface methods still account for approximately two-thirds of the coal mined in the state.\textsuperscript{201}

The trend in the Ohio coal industry has been that of fewer mines producing greater quantities of coal. In 1918, which prior to 1968 was the year of greatest coal production for the state, 1,427 mines were operating.\textsuperscript{202} The average coal production was 33,580 tons per mine.\textsuperscript{203} By comparison, in 1967, 410 mines were in operation, producing an average of 111,931 tons per mine.\textsuperscript{204} In 1967, 62 percent of the reported tonnage was recovered from 25 mines in the over 500,000-tons-a-year category.\textsuperscript{205} This trend toward larger mines is most obvious in surface method production. In 1969, nearly 50 percent of the coal mined by surface methods was produced by five companies employing large-scale machinery on expansive sites.\textsuperscript{206}

The surface mining firms are some of the state's biggest landowners. The Hanna Coal Company is the largest coal producer and the largest surface mine operation in Ohio.\textsuperscript{207} It owns an estimated 130,000 acres.\textsuperscript{208} Hanna Coal Company is a division of Consolidation Coal Company,\textsuperscript{209} the Nation's largest coal company in terms of assets and coal reserves.\textsuperscript{210} After negotiations in 1966,
Continental Oil Company (Conoco) purchased Consolidation Coal Company to form what is termed a "total energy complex." The purchase of Consolidation Coal Company by Conoco — both fierce competitors in the energy market — indicates a trend toward the consolidation of ownership of energy sources.

The reasons for the merger are not hard to find. Consolidation Coal had recently acquired extensive holdings in the coal fields of the mountain states. The West has relied heavily on hydroelectric projects to produce cheap electricity, but there are few damsites left, and cheap nuclear power still looks a long way off. Consequently both coal and natural gas stand to be used in increasing amounts in the production of electricity. They presently compete with one another. Boilers at generating stations can be switched from one fuel to the other in response to the price of each. Continental is the ninth largest natural gas producer in the country, and with its hands on new coal fields in the West, it is in a position to influence development of both fuels.

Company sources gave another reason for the merger: Consolidation Coal had an important edge over competitors in coal-to-gas research. The Interior Department had given Consolidation $10 million in research funds to design, build and operate a pilot plant to make gas from coal at Cresap, West Virginia. The Bureau of Mines claimed that gas could be made from coal at costs ranging from 10½ cents to 15 cents per gallon. It costs from 12½ cents to 14 cents per gallon to refine crude oil into gas.

The oil companies want to control coal in part because coal competes with oil and natural gas, but also because they recognize the potential for turning coal into gasoline. Gasoline is the major money maker for the oil men, and they want to keep tight hold of any development in that field. To do so, oil firms buy coal companies; they also lobby vigorously within the federal government to insure that the development of coal is forestalled.

Development of alternate energy sources depends a great deal on how much research is carried out. While the Government spends billions of dollars each year on weapons and other war-related research, it devotes only $368 million a year in research into conversion and transmission of energy. Of that total, $311 million goes to the development of nuclear power, but only $26 million is allocated to researching the liquefaction of coal. In the past most of that money went to two coal companies — Consolidation and Pittsburgh Midway — which are owned by petroleum combines. The effect of this is to retard the development of coal as a fuel. J. R. RIDGEWAY, THE POLITICS OF ECOLOGY 127 (1970).

There are twenty-one men on Continental's Board of Directors. Leonard F. McCullum, the chairman, is also on the board of trustees of the Morgan Guarantee Trust Company and the Chairman of the Capital National Bank. J. Paul Austen is also on the boards of both Continental Oil and the Morgan Guarantee Trust Company. Thus, it is not surprising that the Morgan Guarantee Trust Company is Continental's main bond trustee. There are a total of 18 banking institutions represented on the board of directors of Continental Oil. Some of those not already mentioned are the Chase Manhattan Bank, the Bankers Trust Company, and the Mellon National Bank and Trust Company, all among the Nation's largest banks in terms of total assets. Continental's transfer agent is the Morgan Guarantee Trust Company, and its registrars are the Bankers Trust Company and the Chase Manhattan Bank.

The directors of Continental Oil are also represented on the boards of directors of twenty-three mining companies, eight major industrial companies, three utility companies, and scores of other institutions. Among the companies represented are Union Carbide (the 28th largest coal producer), American Telephone and Telegraph, General Electric, the Chrysler Corporation, Deere and Company, and Ford Motor Company of Canada.

The Rockefeller family owns substantial control of Continental Oil. Continental was one of the 33 companies formed in the wake of the 1911 United States Supreme Court decision against the Standard Oil of New Jersey monopoly [221 U.S. 1 (1911)]. And today the Rockefellers still own 300,000 Continental shares, for a 1970 market
Peabody Coal Company, another of the Nation’s largest coal producers, was Ohio’s second largest coal producer in 1969. The assets of Peabody were sold to Kennecott Copper Corporation, one of the world’s largest copper producers, in March 1968 for about $600 million.

Ohio’s third largest coal producer is the Central Ohio Coal Company, a wholly-owned subsidiary of the Ohio Power Company, a major electrical generating company in Ohio. The mine lands are owned by Ohio Power and leased to its subsidiary, which supplies coal to Ohio Power’s Muskingum River and Philo generating plants. These plants produce electricity for industrial and domestic consumption. Central Ohio’s 1969 coal production was 3,157,489 tons.

The other two companies among Ohio’s top five are small operations compared to the companies described above. B & N Coal, Inc. produced 1,473,555 tons by the surface method in 1969. R & F Coal Co. produced 1,450,471 tons.

The reported value of Ohio’s coal production in 1967 was $177,244,000, an increase of $14,000,000 over 1966. Twenty-five percent of the increase, however, was the result of a rise in the average price of coal per ton from $3.78 in 1966 to $3.86 in 1967.

value of $22.3 million. Other families (and corresponding foundations) with substantial ownership of Continental stock are the Mellons, the Morgans, and the Hannas. L. BECK & S. RAWLINGS, COAL: THE CAPTIVE GIANT 65 (1971).

214 BUSINESS WEEK, Dec. 7, 1968, at 104. The purchase seems to represent a major diversification move by Kennecott.

The structure of Kennecott’s board of directors is similar to that of the Continental Oil Company. Walter H. Page is on the boards of directors of Kennecott and the Morgan Guarantee Trust Company. The Morgan Guarantee Trust Company was instrumental in financing Kennecott’s acquisition of the Peabody Coal Company. There are 24 other banks represented on Kennecott’s board of directors, including the First National City Bank of New York, the Chemical Bank of New York, and the Chairman of the Board of the Marine Midland Bank. The Morgan Guarantee Trust Company is Kennecott’s transfer agent, and the Chase Manhattan Bank is its registrar. The Morgan Guarantee Trust Company owns 17.5 percent of Kennecott’s outstanding stock.

In addition, Kennecott directors are on the boards of directors of 22 mineral companies. These include the Getty Oil Company (the nation’s 15th largest oil producer), the Jet Oil Company, and the Southwest Illinois Coal Corporation (the nation’s 15th largest coal producer). Kennecott directors are also on the boards of two utility companies, 10 industrial companies, and scores of other companies and organizations. L. BECK & S. RAWLINGS, supra note 212, at 65.

216 Id. at 34.
217 Id. at 33, 55.
218 Id. at 37, 43, 48.
219 1967 REP., supra note 202, at 3.
220 Id.
During 1969, the value of coal mined in the state increased to $212,438,000.222 Again this increase was due not only to the increased tonnage mined, but also to the increase in price to an average of $4.1497 per ton.223 During 1967, average monthly state coal mine employment increased to 7,538, 2 1/2 percent over that of 1966.224 These figures, however, do not indicate the decrease in the average annual employment of production workers from 5,558 to 5,465.225 In 1969 the average monthly coal mine employment increased to 7,842 with an increase in production workers to a monthly average of 5,886.226 The state coal industry's total wage and salary bill for 1967 was $52,834,394, a decrease of approximately 21 1/2 percent from the industry's 1966 wage and salary payments.227 In 1969, it increased to $69,258,992.228 The calculated annual average wage in 1967 for production workers, however, increased 1 percent over 1966, to $7,361;229 by 1969, it had increased to $8,587.230

Coal plays an important part in the economy of the state, but it also reduces land values and ad valorem taxes. An Ohio study of the period 1918 to 1937 showed tax decreases ranging from 13 to 53 percent following strip mining.231 Furthermore, the coal industry is undertaxed. There is no extraction or mineral tax in Ohio. There is no state corporate income tax, and only a limited corporate franchise tax.232

The property tax is the major state tax imposed upon the Ohio coal industry. The tax on equipment used in the business is substantial, and for the mining counties it can amount to a sizeable portion of total revenues. But these taxes are no different from

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223 Id. at 11.
224 This figure includes all supervisory, technical, and clerical workers and those in central preparation plants and central shops. 1967 Rep., supra note 202, at 3, 16. From 1939 to 1966, the average annual employment in Ohio's coal mines decreased 66 percent. In 1939, 21,642 persons were employed in Ohio's bituminous coal mines. See generally National Coal Ass'n, supra note 8.
232 C. Glander, Ohio Taxation 210 (1967).
those paid by other industries, and the former do not substantially benefit the county and local governments in the mining area, since real property tax rates are low. Furthermore, until coal lands are mined, they are usually valued no higher, and often lower, than their value for agriculture, even though their value as coal lands may be substantially higher. During mining operations the value of lands increases for tax purposes, but such increased value lasts for only the few years it takes to mine the coal seam, and it drops thereafter.²³³ Mr. James Herzog reports:

Across Ohio the story of strip mining is repeated over and over on the tax rolls. Where land once had value and could be taxed to support schools, now it is valueless and a burden to the rest of the community.

In Stark County, 10,752 of the county's 376,000 acres were stripped between 1914 and 1969.

Generally in Stark, stripped land is appraised at $25 an acre. Marginal farmland there is appraised at $150. Good farmland's value is from $250 to $450 an acre. Sandy ground goes for $95. Assessments in Stark are 40 pct. of the appraisal price — thus $10 an acre is the assessed value of stripped land.

When the auditor learns that land is about to be stripped, he automatically puts a $600 appraisal on each acre. But often he doesn’t learn the land is being stripped, and the miner is in and out before he can act.

In Harrison County nearly one-fifth of the county has been stripped since 1914 — 45,523 acres out of 258,000. A spokesman for the county auditor in Cadiz said most stripped land is appraised at $20 an acre.

Meanwhile, good bottom land is appraised from $150 to $200. Grazing land goes from $100 to $125, the spokesman said. Some reclaimed land has been reappraised for as high as $80 an acre, he added.

When land is about to be stripped, the appraisal value jumps to $400 an acre. But as soon as the land is carved out, the figures [drop] to almost nothing.²³⁴

The problem of tax responsibilities of the coal industry is one that deserves a separate study by those who do not directly or indirectly represent the industry. It is a complex problem resulting from the weaknesses of the entire state tax system and the grievous faults of the property tax.²³⁵ It is further complicated by the fact that the

²³³ See J. Hyslop, Ohio Reclamation Ass'n, Strip Mining in Eastern Ohio: Blessing or Curse? 9-10 (1964).
coal industry is active in economically depressed areas of the state where tax income from agriculture is very low and other industries are nearly nonexistent. Thus, the coal industry can rightfully claim that their payments represent a substantial portion of what tax money does flow to the state government from the area. Furthermore, the southern two-thirds of Ohio’s coal-bearing plateau has been and will continue to be subject to little demand for either agricultural use or housing. Only about one-third of the sandstone and shale soil will remain agriculturally useful under present reasonably projected market conditions. Nevertheless, the conditions in Appalachia after many years of mining dramatically demonstrate that the coal industry does not bring prosperity to mining regions.

In Kentucky, the undertaxation of the coal industry has become a political issue. Kentuckians are beginning to realize that tax dollars are being drained from populous Jefferson County in western Kentucky to poor counties of the east, which ironically contain some of the greatest mineral wealth in the country.

V. HISTORY OF THE OHIO RECLAMATION LAW

Because most of the damage done by surface mining occurs to off-site landowners and to the general public, there is little incentive for the coal miner to reclaim the land after stripping. In many areas, particularly in Appalachia, the costs of good reclamation efforts can exceed the value of the land after reclamation. In addition, the common practice of stripping land leased from another gives the coal miner no economic incentive to protect the land. Occasionally land owned by a coal mining company and located so that it has value for other purposes, such as home building, will be reclaimed voluntarily; but rarely do reclamation efforts exceed those required by law. Therefore, mining reclamation will rarely occur unless required by strict laws enforced by a professional inspection staff.

It is difficult to enact effective legislation because the power of the destroyers of natural resources is great and the public is apathetic to harm which is dimly perceived. Nevertheless, realizing that only public regulation of surface mining could protect the environment, conservation-mined citizens obtained the passage of Ohio’s first strip-mine law, the Strip Coal Mining Act, which became effective January 23, 1971.

236 See 1968 Hearings, supra note 14, at 28.
The Act required the operator to level the tops of spoil banks to not less than 15 feet in width and to revegetate the banks with trees, grass, or shrubs. To insure compliance, the operator was required to post a bond of $100 per acre with a minimum bond of $1,000. The operator was also required to obtain a permit to strip mine, for which he paid a $50 fee. Licensing was administered by the Division of Mines of the Department of Industrial Relations. Reclamation was supervised by the Director of the Ohio Agricultural Experiment Station and the State Forester.

Two years later, the General Assembly passed a new coal mine reclamation act, the Coal Strip Mine Land Reclamation Act, which became effective on July 23, 1949. The new law required a $50 license fee and an additional fee of $10 for each acre of land to be stripped. The bond rate was increased to $190 an acre — $140 an acre for grading and $50 an acre for planting. The Act consolidated the licensing and reclamation responsibilities under a new agency, the Division of Reclamation in the Department of Agriculture.

The 101st General Assembly amended the Act, effective October 13, 1955, substantially tightening its provisions. The most important change was the requirement that the chief of the Division of Reclamation "shall refuse to issue a license to a strip-mine if it is determined that the applicant has failed to comply with the provisions of the strip-mine act." This provision gave the state real enforcement power, for the miner could be denied the right to do business in Ohio if he failed to meet legal reclamation requirements. Another change added auger mining to the methods of coal mining subject to licensing and reclamation requirements. The bond requirement was again raised, from $190 to $220 an acre — $170 an acre for grading and $50 for planting. If the operator desired to strip land not described in his original license application, he was permitted to file an amendment to the application, revising his estimate of land affected, and to deposit the proper license fee and bond for the increased acreage. Under a specific penalty provision, the operator was required to file an amendment when he exceeded his affected-acreage estimate by more than 10 percent. The operator was also required to grade the loose debris in the last cut of an operation to facilitate possible coverage with water.

The General Assembly amended the Act again in 1959,\textsuperscript{241} transferring the Division of Reclamation from the Department of Agriculture to the Department of Natural Resources. The coverage of the Act was also broadened. Before 1959, the reclamation law did not apply to persons who removed or intended to remove less than 250 tons of coal by strip mining within 12 successive calendar months or to those who removed an amount of coal constituting less than 25 percent of the total annual tonnage of all minerals removed from any particular ore operation. The 1959 amendment expanded the definition of "operator" by eliminating the second exception, thus broadening the Act to cover those operators who strip mine for coal in conjunction with the extraction of other minerals but whose total coal production from a given operation amounts to less than 25 percent of the tonnage of all minerals removed. The 1959 amendment also provided that the state could survey land strip mined prior to the effective date of the First Reclamation Act to determine its suitability for reclamation. The state could acquire any eroded land or land affected by coal strip mining which remained unreclaimed as the result of substitution and reclaim such land for agriculture, forests, recreation, wildlife, or water conservation. The amendment also provided for a continuing survey of land acquired by the state with a view toward devising the most effective and economical plan of reclamation.\textsuperscript{242}

The last amendment to Ohio's Reclamation Act was made in 1965.\textsuperscript{243} Mr. James Herzog wrote of its legislative history:

In 1965 such a proposal was put in the hopper by Sens. Ed Garrigan of Akron, Oliver Okasek of Northfield, Robin Turner of Marion and the late Edmund Sargus of St. Clairsville.

When the bill came before the Senate's Agriculture and Conservation Committee, a subcommittee — Sargus, Collins and Max Dennis of Wilmington — was assigned to study it.

"It was apparent that Sargus and Collins had significantly different viewpoints," said Dennis, who chaired the agriculture committee that year.

Dennis, whose position was key, said: "My role was one of attempting to mediate opposite viewpoints."

Statehouse observers recall that the struggle over the bill was one of the toughest the legislature has seen. When the bill came before the full committee, 72 amendments were offered — many written by the Ohio Reclamation Association, according to Dennis.

\textsuperscript{241}Vol. 128, § 1, [1959] Ohio Laws 1231.
\textsuperscript{242}Dickman, \textit{The Strip Mine Reclamation Program in Ohio}, 64 OHIO J. SCI. 166 (1964).
\textsuperscript{243}See OHIO REV. CODE ANN. §§ 1513.01-27, .99 (Page Supp. 1970) [hereinafter cited as CODE].
Dennis said the committee and the Senate “finally decided mining interests simply couldn’t stay in business” if a tough bill were passed.

Sargus, a lawyer from the heart of strip-mining country, was caught in the midst of a dogfight. One statehouse observer recalls that a coal industry representative told Sargus: “If you continue to pursue this bill, we will destroy you politically and professionally.”

Garrigan, a member of the committee, recalled: “I was personally upset by the devastation in the State of Ohio. I thought it an example of blatant inhumanity to rape a natural area and leave it in this condition.”

He added: “You are virtually building monsters in the sky with high walls. For the benefit of future generations I was a co-sponsor of the bill.

“When we went through hearings on the measure, it was accepted with 72 amendments. It lost any identity to what it was.”

Garrigan withdrew his name from the “emasculated” substitute measure that came out of committee.

Supported by petitions that carried 250,000 signatures, conservationists had hoped for success with the 1965 measure.

But, according to Garrigan: “It was a case of ‘little people’ fighting a big economic block. In mine country I am sure every legislator is supported by people associated in some aspect of the mine industry.”244

The resulting bill, although weak, is an improvement in the reclamation law. An important change was the expansion of the definitions of “strip mining,” “operator,” and “operation.” The 1965 amendment expands these definitions to include surface mining in which the operator removes overburden “for the purpose of determining the location, quality, or quantity of a natural coal deposit.”245

There has been no judicial determination construing these amendments. The new language implies, however, that a coal operator who removes overburden to determine the quantity, quality, or size of the deposit is required to reclaim the “area of land affected,”246 even if he intended to remove or did remove less than 250 tons of coal from the earth. Such a construction would exclude from the reclamation requirements of the Act only those coal operators who intended to remove or did remove less than 250 tons of coal within 12 successive calendar months from any one operation and who did not remove any overburden to determine size, quality, or quantity of the natural coal deposit, and those operators who removed or intended to remove from any one operation less than 250 tons of coal within 12 successive calendar months by the

245 CODE §§ 1513.01(A), (B), (F) (Page Supp. 1970).
246 Id. § 1513.01(D).
auger method.\textsuperscript{247} As a result of the prevalent use of test excavations to determine whether a major mining effort is justified, virtually all stripping for coal is now covered by the Act. Even auger mining is often preceded by overburden removal. But regardless of its inclusion under the Act, auger mining accounts for a very small percentage of coal mined in Ohio.

The new law requires a license fee in the amount of \$75 plus an amount equal to \$15 for each acre of land to be stripped.\textsuperscript{248} The bonding requirement was raised to \$300 an acre\textsuperscript{249} — \$225 for grading and \$75 for planting.\textsuperscript{250}

One of the more important changes is an added provision which authorizes the chief of the Division of Forestry and Reclamation to make an order denying a license to strip land where prior experience has shown that "substantial deposition of sediment in stream beds or on land not owned by the person owning the land described in such application or amendment thereto cannot feasibly be prevented . . . ."\textsuperscript{251}

The new law also includes additional reclamation requirements to be completed by the coal operator. As in former laws, the surfaces of the spoil banks are required to be graded to a "gently rolling topography," and the required width of tops of isolated spoil bank was increased to 30 feet.\textsuperscript{252}

The Act also requires the operator to prevent, if possible, the drainage of acid water or silt-laden water which is harmful to any stream or adjoining lands.\textsuperscript{253} This buttresses earlier enacted provisions requiring the minimizing of acid drainage.\textsuperscript{254}

VI. THE OHIO LAW:
RECLAMATION OF STRIP-MINED LAND

A. State Policy

Most state strip mining statutes include a statement of legislative purpose or public policy, typically averring that the statute is an exercise of the police power for the health, safety, and welfare of

\textsuperscript{247} Id. \S 1513.19.
\textsuperscript{248} Id. \S 1513.07(A).
\textsuperscript{249} Id. \S 1513.08(A).
\textsuperscript{250} Id. \S 1513.16.
\textsuperscript{251} Id. \S 1513.07(A)(6).
\textsuperscript{252} Id. \S 1513.16(A).
\textsuperscript{253} Id. \S 1513.16(E).
\textsuperscript{254} Id. \S 1513.161.
The Ohio statute contains no such statement of public policy, although some of its provisions declare specific purposes, such as increasing water supply and controlling floods, erosion, and water pollution. To clarify the aims of the statute and to lend legislative support to the creation of standards for protection of Ohio's land for future generations, the Ohio law should include such a statement of policy. Protection of the land would be further insured by broadening the purposes of the statute to include preservation of aesthetic values and maintenance of fertility at its premining level.

B. Administrative Responsibility

Strip mining (defined to include any mining requiring removal of the overburden before extraction of the mineral) is subject to reclamation requirements administered by the Division of Forestry and Reclamation of the Department of Natural Resources. Inspections and other activities required by the Act are carried out from eight district field offices.

There are two major weaknesses in the authority of the Division of Forestry and Reclamation to adequately regulate surface mining. First, the Division has authority only over coal mining. Yet many of the environmental problems caused by surface mining are not limited to coal stripping. The Division seems to be reluctant to regulate the mining of all minerals, however, perhaps because such an expansion of its duties would require policing the entire state, rather than only the coal region. This is a limited view of governmental responsibility. Surface mining of any mineral creates spoil banks, strips vegetation, and causes erosion. Furthermore, some operators presently mine for shale and leave coal as spoil because it is more economical to throw the coal away than to become subject to the reclamation law. To avoid this waste of an important mineral, at least those minerals associated with coal should be subject to the statute, even if the Division considers it economically impossible to regulate all minerals.

The second major weakness is the Division's limited ability to deny a license if it knows that irreparable harm will occur. A 1965

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\text{255 See}, \text{ e.g., } \text{ILL. ANN. STAT. ch. 93, § 180.2 (Smith-Hurd Supp. 1971); IND. ANN. STAT. § 46-1501 (1965); PA. STAT. ANN. tit. 52, § 681.2 (1966).}
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\text{256 See}, \text{ e.g., } \text{CODE §§ 1513.16(D), 1513,161(A)-(B) (Page Supp. 1970).}
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\[
\text{id. § 1513.01(A).}
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\text{id. § 1513.04.}
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amendment to the Reclamation Act allowed the denial of a license if experience showed that deposition of sediment in stream beds or on land owned by another could not be prevented or if there was not probable cause to believe that the area could be reclaimed to the standards provided in the Act. The danger of acid drainage or the possibility that the area cannot be successfully revegetated should also be grounds for the denial of a license; and even these changes, while necessary, may not adequately protect the land.

Even if the Division had broader authority to deny licenses, however, the fear of appeals by the industry may keep it from effectively employing that power. Since only a person claiming to be aggrieved or adversely affected by a regulation — that is, a member of the coal industry — may bring an appeal, the Division can avoid any adverse effects of its decisions by interpreting any discretionary power under the statute in favor of the coal industry. The prevalence of this approach is suggested by the almost total absence of Ohio court cases challenging decisions under a regulatory program that requires considerable expenditures by large and powerful businesses. It seems that a vigorous state program would lead to more litigation.

The Act could provide assurance of effective use of the power to deny licenses by affording any member of the public the specific right to appeal a decision to grant a license. Anyone appealing a decision of the Division whether a member of the mining industry or a member of the public, should have the burden of proof and be required to show that the Division acted unreasonably. This would prevent specious suits and provide a standard for meaningful judicial review.

The chief of the Division of Forestry and Reclamation has the power to adopt and promulgate regulations governing the administration of the Reclamation Act. He shares rule-making power with the Reclamation Board of Review, which is discussed below. The chief can promulgate rules without holding a public hearing or following other requirements of Ohio’s Administrative Procedure Act. If any person requests a copy of the rules, the chief is required to furnish a copy without charge. This freedom from the procedural protection of the Administrative Procedure Act is unnec-

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259 Id. § 1513.07(A)(6).
260 Id. §§ 1513.12-.14.
261 Id. § 1513.04.
262 Id. § 1513.06; see text accompanying notes 324-26 infra.
263 Id. §§ 119.01-.13.
264 Id. § 1513.04.
cessary and should be changed by the legislature. The public participation permitted by Ohio's administrative procedures is so limited, however, that even if this exemption were changed, it would still be difficult to view the Division's rule-making function as a part of the democratic process.

The Ohio Division of Mines, in the Department of Industrial Relations, is responsible for mining health and safety. This Division has the power to control mining operations near public highways.

C. Licensing

Anyone mining more than 250 tons of coal annually or removing overburden for examination or testing purposes must obtain a license. The cost is $75, plus $15 for each acre estimated to be affected. The law provides for amendments to the original application for a license if the operator desires to strip land not described in the application or if the number of acres of land affected by the operation exceeds by more than 10 percent the applicant's original estimate of acres to be affected. At the time of filing such amendments, the operator is required to pay the chief $15 for each acre so added to the area of land allowed to be affected by the operation. The license is valid for 1 year, with renewal options available.

A license must be obtained for each strip mining operation, but the Act fails to specify what constitutes an operation so as to require a separate license. So far, all mines belonging to a single company have been deemed to be within close enough proximity to each other to require only a single license. A single company's mines are usually not located in more than two or three counties.

In applying for a license, a coal mine operator must provide detailed information about his operation. In addition to the name and address of the applicant, the application for a license must provide a full description of the land to be stripped, with sufficient detail to distinguish it from other lands; an estimate of the number of acres to be affected by the stripping operations; the name and address of the owner of the land to be stripped; the owner's written...

265 Id. § 4151.03 (Page 1965).
266 Id. § 4153.11.
267 Id. § 1513.07(A) (Page Supp. 1970).
268 Id. §§ 1513.07(B)-(C).
269 Id.
270 Id. § 1513.07(A)(6).
consent to entry by the applicant, his agents, and any official of the Division of Forestry and Reclamation; and a description of the technique to be used in the mining operations and the reclamation process.\textsuperscript{271} The consent requirements make little sense because an operator with a valid mineral lease can get a court order compelling the landowner to consent. Thus, the administrative regulations permit filing of the mineral lease in place of obtaining the landowner's written consent.\textsuperscript{272} A license may be denied by the chief if he determines that substantial deposition of sediment in stream beds or on neighboring land cannot be prevented,\textsuperscript{273} or if an operator is not in compliance with the Reclamation Act.\textsuperscript{274}

These provisions give the Division some control over reclamation planning prior to the commencement of mining. Reclamation aims are so limited and the amount which the operator is required to spend per acre is so low, however, that reclamation of high quality is rarely possible.

The chief can also refuse to issue a license if he finds that there is no probable cause to believe that reclamation required by section 1513.16 can be accomplished.\textsuperscript{275} This provision affords little power to deny a license, however, because section 1513.16 requires only that the operator grade and plant. The Act does not require successful treatment of the land, and vegetation need not survive beyond 1 year.\textsuperscript{276}

D. Bonding

Surety bonds payable to the state must be submitted to assure performance of reclamation requirements.\textsuperscript{277} The bond must be for $300 per acre of affected land, but not less than $2,000 in total.

\begin{itemize}
  \item \textsuperscript{271} \textit{Id.} §§ 1513.07(A)(1)-(6).
  \item \textsuperscript{272} Ohio Div. of Forestry \& Reclamation Admin. Reg. No. 1 (Apr. 11, 1966).
  \item \textsuperscript{273} \textit{Code} § 1513.07(A)(6) (Page Supp. 1970).
  \item \textit{Ohio Div. of Forestry \& Reclamation, Strip Mine Reclamation in Ohio} 8 (1970), states that a license may be denied if silt and toxic materials cannot be contained. The author can point to no statutory or administrative regulatory support for this statement, although the last clause of section 1513.161(A) might be so interpreted: "[The operator shall] employ all practicable mine closing measures consistent with safety requirements to minimize the formation and discharge of acid mine drainage and sediment." \textit{Code} § 1513.161(A) (Page Supp. 1970). Although this may be a correct interpretation, it is not apparent that field inspectors are instructed to so apply the provision.
  \item \textsuperscript{274} \textit{Code} § 1513.07(A)(6) (Page Supp. 1970).
  \item \textsuperscript{275} \textit{Id.}
  \item \textsuperscript{276} \textit{Id.} §§ 1513.07(B)-(C).
  \item \textsuperscript{277} \textit{Id.} § 1513.08.
\end{itemize}
Cash, United States Government securities, or certain negotiable certificates can be used in lieu of a surety bond. A cash or securities deposit is held in trust by the state treasurer, who is responsible for its safekeeping. The operator may demand all interest or other income from the securities as it becomes due and may withdraw all or part of the cash or securities upon the deposit of cash or securities of equal value. If the securities deposited with the treasurer mature or are called for payment, the treasurer is required to convert the proceeds of the redemption or payment into such other securities as the depositor may designate. The performance bond or deposit is broken down into two elements corresponding to the different phases of reclamation; $225 is assigned to assure the performance of all work other than planting (grading, construction of earth dams, preventing acid water or silt-laden water drainage), and $75 is assigned to assure planting.\(^\text{278}\)

When the operator has completed all preplanting reclamation, he must so inform the chief in writing. If the chief approves such reclamation, he is required to issue to the operator and his surety a release of the surety bonds or other security in an amount equal to $225 for each reclaimed acre.

After the operator completes the planting under his own plan or under an alternate plan suggested by the chief, the operator is again required to inform the chief of the completion and request approval of the work. If the chief approves the planting plan and within 1 year finds that such planting was successful, he is required to issue to the operator and his surety a release of his surety bonds or other security held on deposit in an amount equal to $75 for each acre in the affected area. The chief has up to 5 years to determine the success of an unapproved planting plan. If the planting is unsuccessful, the operator can be ordered to replant; and when such replanting is completed, the operator has a right to the release of the remainder of his surety bond or other security, regardless of the success of the second planting.\(^\text{279}\)

E. Reclamation Requirements

Within 60 days after the end of the year during which the operator was licensed or 60 days after the operation has been completed or abandoned, the operator must file a duplicate report on

\(^{278}\) Id. § 1513.16.

\(^{279}\) Id.
forms provided by the chief. The report must include detailed information of the operation and a map, certified as accurate by the operator and a surveyor, showing the area affected. Prior to the expiration of 2 years after filing this report, the operator is required to reclaim the land. The operator can avoid this time requirement, however, by filing a Form 42, Extension of Time for Reclamation. Thus, miners are able to delay reclamation either by mining an area slowly or by claiming that they plan to return to an abandoned mine. There is no societal benefit from allowing the mining to continue for an extended period of time. Restoration should be required to begin under all circumstances within 4 or 5 years after mining begins. Moreover, special attention should be given to lands which are not replanted within 6 months after mining is completed or abandoned.

1. Grading of Spoil Banks.— The operator is required to grade the surface of all spoil banks in the affected area and reduce the landscape to "gently rolling, sloping, or terraced topography." In areas where spoil banks contain isolated peaks, the operator is required to grade the tops of such peaks to a nearly level surface at least 30 feet wide. Piles of loose coal, mine refuse, and other debris on the bottom of the final cut must be graded to a relatively uniform topography so that they may be covered by water. If the final cut is not to be filled with water, the operator must cover any loose coal or debris and any exposed coal seam with overburden essentially free from toxic material. There is evidence to indicate that the amount of such overburden required by the statute and the regulations thereunder often is not sufficient to prevent the leaching of sour water from the mined area.

The Reclamation Act encourages construction of earth dams in the final cut of sufficient height and efficiency to impound water above the coal seam. The lakes and ponds thus created are used to increase the supply of available water and to provide flood, erosion, or water pollution control. Water impounded in the final cut

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282 Id. § 1513.16.
284 CODE § 1513.16(C) (Page Supp. 1970).
286 CODE § 1513.16(D) (Page Supp. 1970).
may also be used for recreation, a use added by the 1965 amendment to the Act.\textsuperscript{287}

The statute does not require that highwalls be reduced. The problems created by highwalls in Ohio are not severe. There is little evidence that highwalls attract children who are injured by falls therefrom. Nor is the isolation of land, preventing human and animal use, a serious highwall problem in Ohio.\textsuperscript{288}

The Ohio statute states that acid drainage must be prevented only "if possible,"\textsuperscript{289} thus failing to insure absolute protection. During mining operations, however, practices to minimize acid drainage and sedimentation must be observed.\textsuperscript{290} To facilitate reclamation, large rocks and toxic material should be buried, and topsoil should be placed on the surface.\textsuperscript{291} These requirements need not be observed, however, because the provisions are nullified by the words "where possible," "reasonable care," and "wherever possible."\textsuperscript{292} For example, topsoil is rarely segregated to allow for quick revegetation even though this is called for in the statute "where possible."\textsuperscript{293} The best reclamation results are produced when a dragline on the edge of the pit removes and segregates the soil and overburden, while a shovel in the pit digs the coal. But this technique is not always used because it increases mining costs. The duty to segregate topsoil when possible seems to be interpreted to mean that if this method costs money, it need not be followed.

2. Access Roads.— Access roads to facilitate firefighting and reclamation are required, but the only specific requirement is that grades shall be 10 percent or less where reasonable and practicable, and that roads must be stabilized by vegetation where necessary.\textsuperscript{294} Refuse coal or other refuse may not be used to build the access roads.

3. Planting Requirements.— Before he begins to plant an area, the operator must file his plan for planting with the Division and request approval.\textsuperscript{295} If the chief finds that the nonplanting work

\textsuperscript{287} Id.

\textsuperscript{288} Nationally some 34,500 miles of highwalls exist, some of them up to 1700 feet high. Fifteen percent of a sample examined were inaccessible. U.S. DEP'T OF THE INTERIOR, EFFECTS OF SURFACE MINING ON THE FISH AND WILDLIFE RESOURCES OF THE UNITED STATES 11 (1968).

\textsuperscript{289} CODE § 1513.16(E) (Page Supp. 1970).

\textsuperscript{290} Id. § 1513.161(A).

\textsuperscript{291} Id. § 1513.161(B).

\textsuperscript{292} Id. §§ 1513.161(B)-(C).

\textsuperscript{293} Id. § 1513.161(B).

\textsuperscript{294} Id. § 1513.16(B).

\textsuperscript{295} Id. § 1513.16(F); Ohio Div. of Forestry & Reclamation Admin. Reg. Nos. 8, 10-13 (Nov. 19, 1965).
has been completed and that the planting is likely to be successful, he will approve the plan. If he finds that the planting is not likely to be successful, the chief will suggest an alternate plan that will not cost more than $75 per acre. In either situation, as long as the preplanting reclamation is completed, $225 of the bond is released. The operator can then replant pursuant to his own approved or unapproved plan or under an alternate plan prescribed by the chief. If he follows his own approved plan or one prescribed by the chief and the planting is successful 1 year after it was undertaken, the operator has fulfilled his statutory obligation, and the remaining $75 per acre of his bond is released. If the plan is not successful, the operator must replant in accordance with an order of the chief. Such an order cannot require expenditure of more than $75 per acre, and upon completion of the second planting, the operator's $75 bond is released. If the operator follows his own unapproved plan, the chief has 5 years to determine its success. If it is unsuccessful, the operator must replant under a plan satisfactory to the chief or forfeit $75 per acre for future reclamation.

The Reclamation Act does not require that vegetation survive. The maximum effort the operator is required to make is a second planting. Thus many reclaimed areas are as barren as the moon. This provision allows operators and their trade associations to advertise that they plant millions of trees, without adding that a large percentage die. This does not mean the replanting universally fails, but a national survey of cover conditions in Appalachia showed that effective protective cover had been established on only 48 percent of the disturbed land. Thirteen percent of the land had potentially effective cover; on 28 percent the survival rate was found to be inadequate; and 11 percent was considered unplantable. Further complicating a meaningful analysis of reclamation efforts is the fact that revegetation can take place naturally if the soil is not toxic and the slopes are not excessively steep. Natural revegetation occurs slowly, however, and usually consists of weeds, shrubs, brambles, and grasses. From the information supplied to the federal government, it appears that 46 percent of the surface-mined land that has been partially or completely reclaimed was restored by natural forces.

In areas of the state where the overburden is not highly acidic, revegetation is possible. But where the soil has a low pH, the chance

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297 SURFACE MINING, supra note 11, at 74.
of successful planting is minimal. Few trees or plants can tolerate a pH below 4, which renders the soil toxic.\textsuperscript{288}

In eastern Ohio where stripped land is often highly acidic, the tree traditionally favored for replanting has been the black locust. The black alder is also considered a wise choice and is relatively disease resistant. The hybrid poplar and the European alder are also popular. Other reclamation efforts use leguminous shrubs or suitable grasses.\textsuperscript{299} Some popular coverings are crown vetch, red clover, ladino and sweet clover, millet, sunflower, bicolor lespedeza, Kobe and Korean lespedeza, Kentucky 31 fescue, and timothy.\textsuperscript{300}

Where the soil is too toxic for successful replanting, the acid can be neutralized by the use of chemicals, such as phosphorus, and natural materials, such as mulch.\textsuperscript{301} Other imaginative reclamation efforts include the use of effluent and sludge from a municipal waste treatment facility as soil conditioners.\textsuperscript{302}

Thus, technology is capable of revealing potential methods for reclaiming some of the otherwise barren strip-mined lands. The Ohio law, therefore, should put the burden on the operators to provide not only reclamation efforts but also reclamation success, by requiring that a certain percentage of grasses or trees survive at least 2 growing seasons. If reclamation success would be impossible to achieve due to an area’s highly acidic overburden, the land should not be mined.

The operator may apply to the chief for an extension of time in which to complete any part or all of the reclamation work.\textsuperscript{303} If the chief determines that completion of the reclamation work within the prescribed time would economically or practically impair the operator’s mining operation, he is required to make an order fixing a reasonable extension of time. For example, extensions may be obtained if definite plans have been made to conduct further mining

\textsuperscript{288} See Forest Serv., U.S. Dep’t of Agriculture, Forestation of Strip-Mined Land in the Central States 9 (1960).

\textsuperscript{299} For a discussion of suitable choices for revegetation, see J. Oxenham, ReclaimingDerelictLand 131-37 (1966).

\textsuperscript{300} Surface Mining & Reclamation Ass’n, Questions and Answers About Surface-Mining Activities in Eastern Kentucky 5 (undated).

\textsuperscript{301} Martin & McDavid, supra note 122, at 2.


Such research projects will help to lessen future reclamation costs, but public funding of the projects cannot be justified when it simply reduces the expenses of the coal industry in meeting its public obligation to effectively reclaim strip-mined land.

\textsuperscript{303} Code § 1513.16 (Page Supp. 1970).
on the affected land, such as proposed auger operations into existing highwalls, or if completing the reclamation work would interfere with existing mining operations or definitely planned future mining operations, such as where the operator is conducting or plans to conduct mining operations under a different license on land adjacent to the affected land. A recent publication of the Division states that extensions will be granted when highly toxic land is not suitable for planting. The Division states that given sufficient time, natural processes may break down toxic spoil materials and exhaust their acid-producing potential, thus forming a kind of topsoil which will support plant life. The Division did not observe, however, that during this period annual sediment yield will be about 30,000 tons per square mile or 10 times the maximum of undisturbed lands and that the acidity will be reduced by the acid’s leaching into the waters of the state. The report also did not indicate the maximum period for which reclamation requirements would be extended.

4. Substitution of Sites.— If the operator desires, he may file an application (Form 21) to perform his reclamation on a substitute piece of land of at least the same number of acres as the land affected by his operation. The landowner of the substitute land and the landowner of the land that will not be reclaimed must consent. The application must fully describe the substitute area and include a map certified by a registered surveyor. The total area of the substitute land must contain at least the number of acres of spoil banks found in the original area.

Under this substitution provision, it is possible that stabilized land, perhaps partially reclaimed by natural processes, will be subject to reclamation efforts, while recently mined, unstable land is allowed to erode and leach acid. For this reason the provision should be amended to require approval of the chief, and such approval should require a clear showing that the state’s reclamation program would benefit by the substitution.

F. Auger and Contour Mining

Augering requires a license and reclamation efforts similar to

305 Ohio Div. of Forestry & Reclamation, supra note 273, at 6.
those required for strip mining.\textsuperscript{308} In view of marginal effectiveness of the auger method, the method's potential for environmental harm, and the very limited use of augering in Ohio, consideration should be given to prohibiting this method of mining.

Contour mining should also be prohibited. Its propensity for off-site damage from silt and acid results in social harm outweighing any benefit that might flow from this method of coal production. Contour mining takes place in areas where soil quality makes revegetation very difficult, and damage to the soil and water continues long after the operation has ended. With the increasing size and efficiency of strip mining equipment, there is no good reason for continuing the destructive practices of contour mining; in many instances, the coal seams in hilly areas may now be reached by area stripping.\textsuperscript{309} It has been calculated nationally that 1,700 miles of outslope are affected by massive slides, some of which occurred after the areas had been reclaimed. Because most state reclamation laws, including Ohio's, direct their requirements to area mining, contour mining continues with no truly applicable requirements.\textsuperscript{310} If contour mining is to be allowed, it should at least be limited to grades of 26 degrees or less, as it has been in Kentucky, although it is difficult for spoil material to stabilize on a slope greater than 20 degrees. It should be noted, however, that even if slope limitations are imposed on contour mining, erosion and sediment damage to streams will still occur under this method.

G. Penalties

The most meaningful penalty arises from the chief's power to refuse to issue a license to any applicant who has not complied with the state strip mining requirements.\textsuperscript{311} It is relatively easy, however, for a small corporation or a division of a large corporation to avoid this penalty by dissolving and creating a new corporation when the predecessor corporation has failed to comply with the strip mining law. The Act should be amended to give the chief the power to deny a license to a new corporation operated by a miner who has previously failed to reclaim.

Operation of a strip mine without a license, failure to file an

\textsuperscript{308} Id. § 1513.19; Ohio Div. of Forestry & Reclamation Admin. Reg. No. 7 (Nov. 19, 1965).

\textsuperscript{309} See text accompanying notes 29-32 supra.

\textsuperscript{310} \textsc{Surface Mining, supra} note 11, at 54. See Schneider, \textit{Strip Mining in Kentucky}, 59 Ky. L.J. 652 (1970-71).

\textsuperscript{311} \textsc{Code} § 1513.07(A) (Page Supp. 1970).
amendment to the application for a license, failure to pay a license fee, and failure to deposit a surety bond or other security are misdemeanors. A conviction results in a fine of not less than $300 nor more than $1,000, payable to the county in which the offense occurs.\textsuperscript{312} The failure of miners to obtain licenses is not a significant enforcement problem. Fly-by-night operators occasionally try to mine with a small power shovel and a dump truck, but such occurrences are relatively unimportant.

Violations of section 1513.161 dealing with water control, spoil placement, and stream pollution are also misdemeanors, subject to the same fines,\textsuperscript{313} and each day of violation is a separate offense.\textsuperscript{314} This penalty is nearly impossible to impose, however, because violations of the section are difficult to prove. But regular administrative supervision with power to revoke the licenses of violators can insure that the requirements of section 1513.161 are met.

The failure to perform reclamation duties properly is not a criminal offense, but it can result in forfeiture of the surety bond or other security and the denial of future applications for a license.\textsuperscript{315} If the chief finds a violation, he must notify the operator in writing. The operator’s failure to correct the violation within a reasonable time allows the chief to cancel the operator’s license.\textsuperscript{316} If an inspector discovers a violation, he must report it to the chief, who in turn must notify the operator of the violation.\textsuperscript{317} In addition to any penalties that may apply to the specific violation, the chief can request that the Ohio attorney general seek a court order to enforce compliance or restrain violations of the Act.\textsuperscript{318}

If the chief at any time finds that an operator has failed to reclaim within the 2-year time limit, he must declare a forfeiture of the bond in the amounts of $225 for each acre where the operator has failed to perform preplanting reclamation work and $75 for each acre which has not been planted.\textsuperscript{319} The total forfeiture is then certified to the attorney general, who is responsible for collection. Since bond forfeitures are the result of failure to perform the required

\textsuperscript{312} Id. \textsuperscript{313} Id. \textsuperscript{314} Id. \textsuperscript{315} Id. \textsuperscript{316} Id. \textsuperscript{317} Id. \textsuperscript{318} Id. \textsuperscript{319} Id.
reclamation work, the chief is required in such cases to make an order cancelling the strip mining license of the operator.

H. Appeal Provisions

The chief of the Division of Forestry and Reclamation has the responsibility of administering the provisions of the state’s strip mine Reclamation Act. He is also required to adopt and promulgate regulations governing the administration and enforcement of the Reclamation Act. All findings, determinations, or adjudications by the chief which affect the rights, duties, or privileges of an operator or his surety or of an applicant for a license must be made by a written order, containing findings of fact upon which the chief’s decision is based. And, as discussed previously, orders of the chief are not subject to the provisions of the Administrative Procedure Act.

A person aggrieved or adversely affected by a regulation adopted and promulgated by the chief is permitted to appeal to the chief for repeal or amendment of the regulation. The chief is required to conduct a hearing on the request, for which he may subpoena witnesses, records, and papers. Upon completion of the hearing, the chief is required either to make, by written order, a denial of the appeal, or to repeal or amend the regulation.

Any person aggrieved or adversely affected by an order of the chief may appeal to the Reclamation Board of Review for an order vacating or modifying the chief’s order. The board consists of five members appointed by the Governor. The appeal must be in writing and contain the order complained of and the grounds upon which the appeal is based. The appeal must be filed with the board 30 days after the appellant receives notice of the chief’s adverse order. Upon application by the appellant, the board may suspend the order complained of, pending determination of the appeal. The board has the power to subpoena witnesses and records, to administer oaths, and to hear evidence from either party which it deems admissible. The board hears the appeal de novo, and either

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320 Id. § 1513.04.
321 Id. § 1513.11.
322 Id. §§ 119.01-.03; see text accompanying notes 263-64 supra.
323 Id. § 1513.12.
324 Id. § 1513.13.
325 The board is composed of a representative of the mining operators, a representative of the public, a forester, an agronomist, and a person experienced in earthgrading. Id. § 1513.05.
party to the appeal may submit evidence. If the board finds that the order is unlawful or unreasonable, it may vacate the order. It can then make another order, also containing a written finding of the facts upon which the order is based.

The law provides that the order of the Reclamation Board of Review is final unless vacated by the Court of Common Pleas for Franklin County or by other legal process. If the appeal is based on questions of law and fact, the court will hear the appeal from the board de novo. The court hears questions of law upon assignment of errors filed or set out in the briefs. Here, as before the board, the parties may offer any evidence which the court deems admissible. The filing of an appeal does not automatically suspend the order complained of, but to prevent unjust hardship, the court may suspend the order. Only if the court finds that the board's order was unreasonable or unlawful may it vacate the order and make a new order which the board should have made. The judgment of the Court of Common Pleas is final unless reversed, vacated, or modified on appeal.

The provisions of the Reclamation Act governing appeals from orders and regulations of the chief and the Reclamation Board of Review are not the only appeal procedures which an appellant may pursue. The law is clear that the doctrine of exhaustion of administrative remedies does not operate to deny an appellant the right to bring suit in the courts to protect and preserve his rights.

The appeal provisions of the Ohio law do not adequately protect the public interest. Any citizen should have the opportunity to demand the enforcement of the Act by the chief with the right of appeal to either the board of review or the Court of Common Pleas in a trial de novo. Appeal from a decision of the board should also be allowed, based on the record and such additional evidence as the court deems proper.

I. The Bond Forfeiture Fund

The Ohio law provides for a strip mine reclamation fund into which all funds collected from the forfeitures of bonds or other security are placed, together with moneys paid to the chief under section 1513.16. Section 1513.16 allows the chief to waive planting requirements, upon payment of $75 per acre by the operator, where

326 Id. § 1513.14.
327 Id. § 1513.13.
328 Id. § 1513.18.
planting is not feasible or where the public interest does not require compliance. The chief uses these sums to replant areas where planting requirements have been waived. Money from the strip mine reclamation fund may be spent only after an appropriation by the Ohio General Assembly for the purpose of reclaiming land affected by strip mining. This appropriation requirement is an unnecessary interference with normal administrative activities of the Division of Forestry and Reclamation.

The reclamation financed by this fund is carried out by private contractors, who are awarded a contract on the basis of the lowest and best sealed bid. Each contract can cover all land which has not been reclaimed by an individual operator. If the fund is insufficient, the entire area must be reclaimed to the extent that the sums available permit. If more money is available than is needed, it is transferred to an administrative fund.

Because of the loss of the right to mine in Ohio for the failure to comply with reclamation requirements, few operations forfeit money to the strip mine reclamation fund. In 1967 only two operators failed to comply with reclamation procedures, and they forfeited $10,998 to the state. There is insufficient administrative flexibility or discretion to use this small amount to achieve maximum reclamation. When the state is supervising reclamation, the land always loses.

Another surface mining fund is the reclamation fee rotary fund. This fund is maintained at $10,000 from fees collected for strip mine licenses pursuant to section 1513.07. If an operator affects fewer acres than he has paid a license fee to mine, he is entitled to a refund which comes out of this fund.

Both of these funds funnel money to the strip mining administration and reclamation reserve fund. This fund is made up of the license fees not needed to maintain the reclamation fee rotary fund at $10,000 and the funds that remain after the forfeited bond funds are used for reclamation. At the end of the fiscal year, an amount equal to that year's cost of administering the Division of Forestry and Reclamation and of enforcing chapter 1513 of the Ohio Revised Code is transferred to the state's general fund. Thus,

329 Id. § 1513.16(F).
330 Id. § 1513.18.
331 Id. § 1513.181.
332 OHIO DIV. OF NATURAL RESOURCES ANNUAL REP. 3 (1967-68).
334 Id. § 1513.18.
the strip miners, through their acreage and license fees, pay the cost of administering the law. Any money remaining is expended as soon as possible for reclaiming land affected by strip mining or other eroded land purchased or acquired by the state, including land affected by strip mining prior to January 1, 1948, and land that is unreclaimed because of substitutions authorized by the Act. Little money, however, remains in the fund.

J. Orphan Lands

Some strip-mined lands are never fully reclaimed. This may occur for several reasons. The land may have been mined prior to the first strip mine reclamation law of 1948. It may have been stripped under one of the predecessors to the present law and thus not reclaimed to existing standards. Substitute land may have been reclaimed under section 1513.16(F).

In Ohio, as of January 1965, there were 171,600 acres in need of reclamation. Only Pennsylvania has more unreclaimed and partially reclaimed land. Ohio had 105,100 acres that were completely reclaimed, but this figure represents a legal test only partially related to the physical quality of the land. Even this legally reclaimed land presents many problems. Although the lands were revegetated, the vegetation may have died. Acid and silt may still drain from lands after reclamation has been completed.

The total amount of unreclaimed or improperly reclaimed land is not large when compared to the total area of the state, but it can be a significant blight in portions of mining counties. By January 1, 1970 surface mining had affected 3.22 percent of the land in 27 coal-bearing counties in Ohio. These figures, while seemingly small, meant that 269,513 acres were affected by surface mining, of which 45,213 acres were affected before 1948 and are therefore not subject to the reclamation law.

The most equitable way to finance the reclamation of land not

\[^{335}\text{Id. § 1513.181.}\]
\[^{336}\text{Id. §§ 1513.20-21.}\]
\[^{337}\text{Vol. 122, [1947] Ohio Laws 730.}\]
\[^{338}\text{SURFACE MINING, supra note 11, at 111.}\]
\[^{339}\text{Id. at 74.}\]
\[^{340}\text{Div. of Forestry & Reclamation, Ohio Dep't of Natural Resources, Coal Strip Mining Statistical Rep., Mar. 1, 1971, reproduced in App. C infra.}\]
presently subject to the statute would be to tax each ton of coal mined in the state. Alternatively, a tax could be imposed on coal sold within the state, on coal sold as fuel within the state, or on coal sold for generating electricity. The money from the fund would be used to reclaim only that land which is not subject to the present law. The purpose of the tax, therefore, should be to create a fund for reclaiming land as rapidly as possible, rather than to use revenue raising measures to modify the conduct of mining operators.

Some states have programs to reclaim orphan lands. West Virginia, for example, requires current surface mining operators to pay a special $30 per acre fee, which is used to reclaim orphaned land. These funds, approaching $1 million in 1968, can be used to obtain federal matching funds. In Pennsylvania, "Operation Scarlfit" is a multimillion dollar effort to correct past abuses of coal mining, financed by a $200 million conservation bond issue, General Assembly allocations of $300,000 to $500,000, and federal funds.

Under present Ohio law the chief may acquire land for reclamation. Reclamation must be carried out by private contractors selected through the sealed bid procedure. The reclamation plan must be approved by both the chief and the director of the Department of Natural Resources. After reclamation is completed the land may be transferred to another state institution or with the approval of the attorney general and the director of the Department of Natural Resources, it may be sold if the sale is advantageous to the state. The money for the sale must go to the general fund, a requirement that limits the financing of further reclamation.

Besides the need for funds to reclaim orphan lands, the Division may need the power of condemnation to allow the combining of pieces of land to accomplish successful reclamation and to avoid windfall profits to those holding state-reclaimed land.

State reclamation efforts on private lands might also be considered if such reclamation would not profit the private landowner. Some of the orphan land in northeastern Ohio could, if purchased by the state and reclaimed, meet the recreational needs of the citizens; land in the less populated southeastern quadrant, near large blocks

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341 W. VA. CODE ANN. § 20-6-17 (Supp. 1968).
342 See SURFACE MINING, supra note 11, at 77-78.
345 Id. § 1513.22.
346 Id. § 1513.25.
of public land, might better remain in private hands. The acquisition of land through purchase or condemnation by the state for retention or resale after completing reclamation would normally seem the best method of protecting the state's reclamation investment. Every effort should be made, however, to allow land presently being used as a residence by the owner to remain in private ownership. In such cases, liens, easements, or remainder estates held by the state could be used to prevent private enrichment from state efforts.

K. Acid Drainage

Acid mine drainage is a continuing problem that is limited, but not prevented, by reclamation efforts. The only way to prevent acid drainage is to prohibit mining in areas where it may occur. Even stopping all mining would not end the problem, however, because much acid drainage is produced by abandoned mines. In Appalachia, underground mines, which represent 58 percent of the total number of acid sources, produce 71.3 percent of acid drainage; surface mines are responsible for 12 percent of the acid drainage, but account for 28.4 percent of the acid sources.\(^{347}\)

Acid-producing materials underlie significant portions of the coal fields of northern Appalachia, making the area responsible for most of the pollution from mine acid in this country. Acid drainage affects 10,500 miles of streams either continuously or intermittently.\(^{348}\) Even intermittent pollution presents a grave problem because it kills sensitive water life, significantly changing a stream's ecosystem.

In Ohio acid-producing materials underlie extensive areas, particularly the New Lexington-Straitsville-Crooksville area and the Raccoon Creek drainage basin. In these two areas, little reclamation, other than grading spoil banks, has been accomplished.\(^{349}\) The problems in Ohio, however, are not severe when compared to neighboring states, such as Pennsylvania:

In contrast to the coal measures in neighboring coal-producing states, most of the coal measures in Ohio contain numerous calcareous members such as limestone, dolomite, calcareous shales and clays, marls, and limey conglomerates. These naturally occurring materials furnish sufficient alkalinity to most of Ohio's streams to neutralize the acid mine drainage that enters them under normal

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\(^{347}\) APPALACHIAN REGIONAL COMM’N, supra note 16, at 36, 41.

\(^{348}\) Id. at 22. This figure represents approximately 6 percent of the total 187,000 miles of streams with perennial flows in river basin drainage areas that are entirely or in part underlain by coal. Id.

\(^{349}\) G. Zeigler, supra note 3, at 4.
atmospheric conditions. Problems arise when the products of oxidation accumulate in place during drought periods and are then flushed out by heavy precipitation, thereby acid-slugging the receiving stream.\footnote{Id. at 2.}

Pennsylvania’s problem is much more serious than Ohio’s, but a significant number of Ohio’s streams are continuously affected by acid drainage, and others are intermittently or potentially affected.\footnote{See APPALACHIAN REGIONAL COMM’N, supra note 16, at plate 1-N.}

To carry out the needed mine acid program would require substantial funds. These funds should be raised by a tax on each ton of coal mined. Acid pollution is a social evil created by the mining industry. The money for carrying out a mine acid abatement program should be obtained from present mining operations rather than from the public through a sales tax on coal as might be permissible in the orphan lands program. The aim should be to make each ton of coal reflect the cost of production from its particular mine — including the cost of environmental protection at that mine.

The chief of the Division of Forestry and Reclamation should have the power to deny a license where the danger of acid drainage is great. For example, some lands subject to mining have almost no topsoil. Virtually all the earth turned over on such land may be highly acid or highly alkaline, preventing the development of a ground cover which would normally deter acid drainage. To intelligently exercise the power to ban mining would require an extensive program of premining soil testing to provide data on the acid content of the soils. The chief should also have the power to require operators to continue efforts to abate mine acid drainage from their previous operations as long as the operators are doing business within the state. An operator’s responsibility for such abatement should continue for at least 5 years to allow adequate surveillance of reclaimed sites.

Other efforts to minimize acid water drainage require a careful administration of state water pollution control efforts. Water draining from strip-mined areas should be of the same quality before and after mining. If it is not, it should be treated with lime chemical neutralizing agents. This treatment should continue as long as acid water is draining from the land. The areas tested should include access roads and spoil areas. Neutralization, however, has its harmful side effects. It is costly, produces large volumes of watery sludge,
and greatly increases the hardness of the effluent due to the formation of highly soluble calcium sulfate.\footnote{For methods of abating acid drainage, see \textit{Appalachian Regional Comm’n}, supra note 16, at 52-53; Struthers, \textit{180,000 Stripmine Acres: Ohio’s Largest Chemical Works}, 46 \textit{Ohio Farm \& Home}, No. 4, July-Aug. 1971, reprinted by Ohio Agricultural Experiment Station, Wooster, Ohio; Pa. State Univ. College of Earth \& Mineral Sciences Section, Experimental Mine Drainage Treatment Facility, Hollywood, Pa. (undated information release).}

\section*{L. The Future of Ohio Reclamation}

Ohio’s reclamation statute insures basic reclamation efforts. Of the 224,300 acres affected since 1948, 82.4 percent have been legally reclaimed. Trees have been planted on 119,078 acres, forage has been planted on 61,896 acres, and 7580 acres have either been reclaimed for other uses including ponds or are toxic and unplantable.\footnote{Div. of Forestry \& Reclamation, Ohio Dep’t of Natural Resources, Statistical Reclamation Rep., Licenses Issued, Acres Affected, Acres Reclaimed, March 1, 1971 (photocopied), \textit{reproduced in App. C infra}.} This means that in Ohio, any substantial improvement in existing practices will require a better law.\footnote{A better law does not insure the end of environmental abuse. \textit{See} Stevens, \textit{Strip Mining Control: How Is It Working?}, The Courier-Journal \& Times (Louisville, Ky.), Aug. 31, Sept. 1-4, 1969, at 1.} Stronger requirements for the segregation and replacement of topsoil,\footnote{For the industrial view that segregation is too costly, see Hyslop, \textit{Some Present Day Reclamation Problems: An Industrialist’s Viewpoint}, \textit{64 Ohio J. Sci.} 157 (1964).} prohibition of mining where acid drainage is likely to become a problem, and reclamation of abandoned lands that were inadequately reclaimed under earlier laws are the most urgent needs in Ohio. Better practices to ensure the minimization of erosion during operation are also important. The first step to improve Ohio’s reclamation law might be to compile statistical data for the state as a basis for such a program. Beyond basic information concerning the condition of the land, there is need for information concerning the long term relationship of reclamation expenditures to total public benefits. A very small tax on each ton of coal could provide for a major state research effort by the Agriculture Experiment Station.

Two bills to amend the Reclamation Act are before the 109th General Assembly (1970-1971). The Lancione Bill\footnote{H.B. 125, 109th Gen. Ass’y (1970-1971).} revises and strengthens much of the current Reclamation Act. This proposal would require segregation of topsoil and restoration of the land to its original use or to a more valuable use. Other changes include an increase in the license fee to $150; an increase in the bond to $500 or
$1,000 per acre with a minimum bond of $5,000; and provisions for the regulation of blasting near buildings, public highways, and streams.

The Paulo-Batchelder Bill would amend section 1513.16(C) of the Act to require the operator to fill the final cut and grade it to a gently rolling topography. If this bill is passed, the statute would no longer permit operators to impound water in the final cut.

How much should be spent to protect land of little value is not an easy question. The extent to which the land is protected may depend on how much the public is willing to bear through an increased price for coal. The expenditures necessary to prevent acid drainage, erosion, and siltation of land and waterways should be a minimum requirement. Ohio’s present law does not disregard these considerations, but there is room for improvement. And beyond these immediate goals is the long-term need to protect the state’s soil resources and to improve its fish and wildlife and recreation resources through better reclamation efforts.

VII. CONCLUSION

With proper reclamation, surface mining can be beneficial to the land. The soil is fragmented and made more porous, thus improving drainage and fertility. The water-retardation action of strip mine backfill can help control floods. The small ponds and lakes created by damming the final cut can provide pleasant topographical relief in flat land and be a source of fishing and other water-based recreation. New vegetation, providing food and cover, may increase wildlife resources. Trees, shrubs, grasses, legumes, and cultivated plants grow better in some cases on strip-mined areas than they grew before mining. In Virginia, for example, one reclamation effort resulted in hay production that was 50 percent greater after reclamation than before mining. And some of the fastest growing yellow pines in the nation are on land hydraulically mined in gold rush days in the Sierra Nevadas.

Reclamation success is not accomplished easily. Information

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358 See Cahn, Mining Ore With Minimal Damage to Natural Beauty, Christian Sci. Monitor, Jan. 16, 1970, at 3; Chase Manhattan Bank, Mining Companies Restore Land Into New Parks and Farm Acreage, ACTION REP., Fall 1968.
361 Thomas Gwynn, geologist of the Knife River Coal Mining Company, in dis-
releases of coal industry representatives such as the Ohio Reclamation Association would have you believe that successful reclamation is normal, but unfortunately, most reclamation efforts would not make good copy for information releases. Successfully reclaimed areas are used to screen mining scars. Near Cadiz, Ohio, for example, there are thousands of acres of poorly reclaimed land. But the industry points to a few patches of successfully reclaimed land in the county as evidence that surface mining is not a destroyer of natural resources. And although scattered reclamation efforts may provide recreation areas and wildlife habitats, surface mining in Ohio has adversely affected 67,920 acres and 1,200 miles of streams. In Meigs County in southeastern Ohio, for example, the destruction of 3,000 acres ended much of the excellent hunting for bobwhites, cottontails, deer, and grouse. The results of most reclamation efforts demonstrate that the industry spends as little as legally possible to reclaim mined land. In Ohio, an operator is legally required to replant surface-mined land twice. After two unsuccessful plantings, his obligation to reclaim is fulfilled. Thus many legally reclaimed areas are barren waste lands.

Statistics on the percentage of successfully reclaimed land are also misleading because what was once farmland and hardwood forest may be replanted with crown vetch or other hardy legumes and grasses. Because crown vetch is a perennial legume and thus a soil nitrogen fixer, it has a high rate of survival in areas where little else will grow. United States Senator Gaylord Nelson has said cussing his company's reclamation in North Dakota, said: "Difficult as our conditions are, we are fortunate in not having the severe problems of erosion, toxicity, groundwater pollution, and economics which are present in many of the mined areas of Kentucky, West Virginia, Pennsylvania, Ohio, Illinois, Indiana, and elsewhere." T. GWYN, KNIFE RIVER COAL MINING CO., RECLAIMING STRIP-MINED LAND BY ESTABLISHING GAME MANAGEMENT AREAS 1 (1966).

See, e.g., NATIONAL COAL ASS'N, NEW VISTAS FOR MINED LAND (undated); OHIO POWER CO., SURFACE MINING, RECLAMATION, RECREATION (1965); Ohio Reclamation Ass'n Information Release, reprinted from 3 CONSOL. NEWS, No. 4, 1964.


The author had the opportunity to view the Cadiz area with L. Milton Ronsheim, then editor and publisher of the Cadiz Republic and a leader in the fight for stronger strip-mine laws. See also Bauer & East, Blight on the Land: Part 2, The Brighter Side, OUTDOOR LIFE, Jan. 1968, at 48.

SURFACE MINING, supra note 11, at 117.


See CODE § 1513.16(F) (Page Supp. 1970); text accompanying notes 295-96, supra.

Breeding, Ohio Reclamation Ass'n, Crown Vetch as an Aid to Strip Mine Rec-
that some reclamation "is really a kind of green lie. When you look closely it is crabgrass and quackgrass and brush . . . ." 369

Replanting with vegetation that existed prior to stripping or that is indigenous to the region may not always be necessary. But the law should insure that the land is returned to at least the same level of productivity and fertility as before mining. This goal may require provision for segregation of topsoil so that the land after mining will be capable of supporting a wider range of vegetation than legumes and weeds.

It is unlikely that the coal industry will voluntarily improve reclamation efforts. Investments and research are confined primarily to improving mining techniques. A $12 million dragline has been developed which removes 325 tons of overburden at one pass, 370 but developments in reclamation are limited to hydroseeders and an $18,000 tank truck that seeds and fertilizes at the same time. 371

Nor can the landowner be relied upon to protect his own land.

In acquiring these reserves the operator has no right of eminent domain. He must bid for them in competition with anyone else the landowner may wish to call in, and the landowner is the only one who cannot lose on the deal. His biggest problem is whether he can make more out of it by selling outright or by receiving royalty on each ton produced. In any case he may receive option payments for many years before the final deal is consumated and the mining begins. If he leases the mineral rights he can dictate, within the bounds of the economic sanity of the operator, the terms of the lease. Generally he begins by making extensive demands of the operator for the restoration of the land, but when he discovers that these demands are to be reflected in the amount of royalty he will receive, he usually forgets them and takes the highest royalty. 372

Because the cost of reclamation may exceed the value of the land for nonmining purposes 373 the landowner has little incentive to insist on reclamation at the cost of reduced lease values or royalties.

Thad adequate reclamation can only be achieved by legislation. State legislation has generally proved inadequate; and if this problem

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369 1968 Hearings, supra note 14, at 43.
370 NATIONAL COAL ASS'N, supra note 362, at 5; Bucyrus-Erie Co., What's Behind the World's Largest Dragline Bucket? (information release).
371 See NATIONAL COAL ASS'N, supra note 362, at 6.
372 Reclamation of Mined Over Areas, Address by L. Cook, Ohio Planning Conference Annual Meeting, Onesta Hotel, Canton, Ohio, March 5, 1962.
373 Coal lands, however, are not always submarginal agricultural lands. By holding land unproductively, a coal company can keep its taxes low and later use the so-called marginal value of the land as a basis for minimal reclamation efforts.
which transcends state borders is to be dealt with effectively, federal legislation seems mandatory. The passage of improved legislation will not be easy. The coal industry opposes federal legislation although the industry may support a weak federal act to reduce political pressure for strip-mine controls. Former United States Senator Frank Lausche speaking of his days as Governor of Ohio said:

[D]uring my administration as Governor of Ohio, after many unsuccessful attempts, there was finally enacted a strip mine reclamation law. . . . While the law has been helpful in land restoration, I have always felt that it should have required more strict conservation measures. Faced with almost insurmountable opposition, it was the best that I could get.

Ideally, federal legislation would delineate a new land ethic to protect our soil. Reclamation should be tailored to meet long-range societal goals, such as making land available for housing and industry, increasing recreation resources, and providing sites for solid waste disposal, airports, and other special purposes.

Coal production in the United States is expected to double in the next 30 years. Belmont County, Ohio, for example, has 200,000 of its 346,000 acres sold, leased, or optioned to coal strippers. That beautiful county, like scores of others, seems destined to become a wasteland of silted, acid waters, barren land, and patches of crown vetch, all legally reclaimed. Appalachia has already yielded 25 billion tons and with many of the richest and most accessible Appalachian seams depleted, reserves elsewhere must be mined. Without action to protect the environment, large areas of the West and Midwest could become as desecrated as much of Appalachia.

We must decide what kind of a nation we wish to present to future generations. And if we believe a future is possible, we must

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In addition to coal industry attacks on proposed federal legislation, the United Mine Workers have attacked the Hechler bill [H.R. 4556, 92d Cong., 1st Sess. (1971); see text accompanying notes 174-77 supra] as "so much grandstanding" and the administration bill [S. 1176, 92d Cong., 1st Sess. (1971)] as too weak. The United Mine Workers support federal standards with the federal government absorbing most of the reclamation costs. See King Coal, ENVIRONMENTAL ACTION, March 6, 1971, at 3.


877 For discussion of the possible uses by society of abandoned strip mines, see, e.g., An Abandoned Strip Mine Is to Fill, 2 ENVIRONMENTAL SCI. & TECH. 402 (1968); Bowden & Meier, Should We Design New "Badlands"?, 51 LANDSCAPE ARCHITECTURE 224 (1961).

878 Drapkin, King Coal's Legacy, Wall Street J., Apr. 22, 1970, at 1, col. 1.
end the managing of our Nation as though it were a corporation being run simply to liquidate its assets.\textsuperscript{379}

In deciding whether an area should be preserved from mining, or how much should be spent for reclamation, we must reject the system that automatically discounts the importance of future values and provides a mathematical method of justifying poor management of nonrenewable resources.\textsuperscript{380} Cheaply obtained coal benefits coal companies, electric consumers, and landowners in Appalachia who at this point in time have a property right to lands containing coal.

If we base reclamation requirements on annual accounting periods and the present value of money, we can afford to leave nothing for the next generation. Any present expenditure for providing for a viable environmental base for our Nation is probably unjustified if our national goal is greater profits for the coal industry and landowners. But this assumes that profits measured in that intangible called dollars are more important than soil and water.

Man is part of the environment and should live so that he leaves his land and nation to future generations in as good a condition as he received it. The decision to repeal biological laws is not a decision for a coal company or a temporary landowner to make. We need coal now. But we cannot leave the land barren and poisoned. A thousand years from now the inhabitants of North America, if there are any, will not be interested in coal company balance sheets \textit{circa} 1970.

\section*{APPENDIX A}

\textbf{REPRESENTATIVE SUMMARY OF STATE SURFACE-MINING STATUTES}


\textit{Minerals Covered}: All.

\textit{License or Permit Requirement}: "For an area of 10 acres or less to be affected during the permit year, a fee of $50 and an amount equal to the amount of $11.50 multiplied by the number of acres to


\textsuperscript{380} The proper measure of the cost to the Nation of not mining is the profit left over after deducting all expenses (including the competitive return on capital) from revenues. This figure is usually small because equivalent materials could usually be extracted elsewhere at very little additional cost. The harm to the environment can then be balanced against this profit. O. HERFINDAHL & A. KNEESE, \textit{QUALITY OF THE ENVIRONMENT} 71 (1965).
be affected between 2 and 10 acres, inclusive; for an area of more than 10 acres but not more than 50 acres to be affected during the permit year, a fee of $153.50 and an amount equal to the amount of $6.50 multiplied by the number of acres to be affected between 11 and 50 acres, inclusive; for an area of more than 50 acres, a fee of $413.50 and an amount equal to the amount of $5.50 multiplied by the number of acres to be affected in excess of 50 acres.”

**Bonding Requirement:** $1,000 plus $200 for each acre over five to be affected. For acres to be used for disposal of gob, which cannot be revegetated, $3,000 plus $600 for each acre over five.

**Reclamation Requirements:** Condition to make suitable for productive use including forestry, grazing, cropping, wildlife, recreation, and building sites, according to a plan. Strike off ridges to a minimum of 10 feet for forestry and 18 feet for pasture, and grade to allow use of farm machinery for cropland. Construct access roads in all areas to be reforested. Plant species to be used must be approved by the Department of Conservation. Cover acid-forming material with 4 feet of water or material capable of supporting plant life. Reclamation to be completed within 3 years after permit year except on toxic land.

**Refuse:** Confine slurry in depressions or by levees and screen with border plantings. Cover infertile gob by a minimum of 4 feet of productive material. Gob and slurry areas to be reclaimed within 1 year after active use.

**Substitution of Sites:** Permitted subject to approval of Department of Conservation.

**Penalties:** Forfeiture of that part of bond covering acres which have not been reclaimed. Criminal fine of $50 to $1,000 for failure to obtain license. Each day of violation is a separate offense.


**Minerals Covered:** Coal, clay, and shale.

**License or Permit Requirement:** $50 per year plus $15 per acre.

**Bonding Requirement:** $300 per acre with a minimum bond of $2,000.

**Reclamation Requirements:** Submit revegetation plan before mining. Grade to rolling topography to reduce erosion and permit best land use. Cover acid materials with water or earth. Construct access roads. Construct earth dams in final cut to impound water.
Plant trees, shrubs, and grasses within following planting season, except where affected area to be used for disposal of refuse.

*Refuse:* Remove or bury all metal, lumber, and other refuse resulting from operation.

*Substitution of Sites:* Permitted.

*Penalties:* Forfeiture of bond for failure to comply. Modification, suspension, or revocation of permit for failure to comply. Criminal fine of $1,000 to $5,000 for any violation.

**Iowa Code Ann. §§ 83A.1-29 (Supp. 1971).**

*Minerals Covered:* All.

*License or Permit Requirement:* $50. $10 annual renewal.

*Bonding Requirement:* Equal to the estimated cost of rehabilitating the site as determined by the Department of Mines and Minerals.

*Reclamation Requirements:* Avoid placing acid-forming material on spoil banks when feasible. Grade irregular spoil banks to gently rolling topography. Strike off tops of banks to at least 24 feet in width. Grade other spoil banks to regular slope with a maximum vertical rise of not more than 1 foot for 3 feet horizontal distance except when original slope was steeper. Control drainage. Cover acid-forming materials with 2 feet of earth. Reclamation to be completed within 25 months after completion of mining operations. Extensions may be granted where land is to be reaffected.

*Refuse:* No provision.

*Substitution of Sites:* No provision.

*Penalties:* Forfeiture of bond for any violation of Act. Criminal fine of $50 to $500, or imprisonment up to 30 days, or both for failure to register. Each day of violation is a separate offense. Suspension or revocation of license or refusal to renew license for any repeated or willful violation.
KY. REV. STAT. ANN. §§ 350.010-.990 (Baldwin 1969).

Minerals Covered: Coal.

License or Permit Requirement: $50 per year plus $25 per acre.

Bonding Requirement: $100 to $500 per acre with a minimum of $2,000.

Reclamation Requirements: In area stripping, backfill and completely eliminate highwalls. In contour stripping, backfill to reduce highwalls. Water impoundment permitted as alternative to backfilling. Cover floor of pit with at least 4 feet of fill. Plant suitable vegetative cover as defined by the Reclamation Commission. Reclamation to be completed within 12 months of expiration of permit. Division of Reclamation may authorize deferral of planting until land becomes suitable if land is toxic and unplantable.

Refuse: Remove or bury all metal, lumber, and other refuse resulting from operation. Depositing refuse or spoil material in streams, lakes, or subterranean waters, or on public roads or other public property prohibited.

Substitution of Sites: Allowed with respect to planting only, subject to approval of division if investigation shows that revegetation of original site may not be successful.

Penalties: Forfeiture of bond for any violation. Civil penalty of $100 to $1,000. Each day of violation is a separate offense. Suspension or revocation of permit for failure to comply.


Minerals Covered: Coal.

License or Permit Requirement: License fee of $100. $10 annual renewal. Permit also required.

Bonding Requirement: $200 per acre with a minimum of $1,600. Revegetation bond of $50 to $125 per acre.

Reclamation Requirements: Grade spoil to minimize erosion, depressions, and steep slopes. Grade overburden to cover final pit. Seal off all openings from underground mining. Impoundments of water must be approved by Department of Water Resources. Establish suitable vegetation. Complete reclamation 2 years after completion of the operation, except if area to be used for deep mining or other lawful use.

Refuse: No provision.

Substitution of Sites: No provision.
Penalties: Forfeiture of bond for failure to comply with reclamation requirements. Criminal penalty of $5,000 to $10,000, or imprisonment up to 6 months, or both for failure to obtain license. Criminal penalty of $500 to $5,000 for failure to obtain permit or post bond. Denial of further permits for failure to comply.

Minerals Covered: All.
License or Permit Requirement: $50 per year.
Bonding Requirement: $50 per acre or assessed value of land the previous year, whichever amount is lesser.
Reclamation Requirements: Grade to rolling topography. Strike off and grade tops of peaks to minimum of 15 feet in width. Construct earth dams in final cuts to impound water. Cover acid material with at least 2 feet of earth or spoil. Construct fire lanes in areas to be forested. Complete replanting within 3 years except where the land is toxic and unplantable or where it is to be reaffected.
Refuse: No provision.
Substitution of Sites: Permitted subject to approval of Department of Mines.
Penalties: Forfeiture of bond for any violation. Criminal fine of $50 to $1,000 for failure to obtain permit. Each day of violation is a separate offense.

Minerals Covered: Bituminous Coal and Anthracite Coal.
License or Permit Requirement: $300 per year. Permit required for each separate operation.
Bonding Requirement: $500 to $1,000 per acre with a minimum bond of $5,000.
Reclamation Requirements: Bituminous Coal — Backfill to original contour within 6 months of operation's completion. Backfill pits near roads and buildings completely. Prevent acid drainage and siltation of streams. Complete planting in accordance with a
plan prescribed by the Land Reclamation Board within 1 year after backfilling is completed, except where planting is not practicable or likely to succeed, where the area has been approved for another use, or where the operator pays to the Secretary of Mines and Mineral Industries $150 per acre in lieu of replanting.

Anthracite Coal — Backfill in accordance with requirements of Land Reclamation Board. Backfill completely all pits not more than 100 feet deep and all pits near public highways and buildings. Complete backfilling within 6 months of operation's completion. Provide drainage if required by Department of Mines and Mineral Industries. Planting to be completed within 1 year after operation is completed, except where planting is not practicable or likely to succeed, where the area has been approved for another use, or where the operator pays to the Secretary of Mines and Mineral Industries $150 per acre.

Refuse: No provision.

Substitution of Sites: No provision.

Penalties: Forfeiture of bond for noncompliance with Act. Criminal fine of $5,000 to $10,000, or imprisonment up to 6 months, or both for mining without a license. Criminal fine of $500 to $5,000, imprisonment up to 3 months, or both for failure to obtain a permit. Denial of license for previous failure to comply with Act.


Minerals Covered: All material of commercial value found in natural deposits or in the earth, except for limestone, marble, and dimension stone.

License or Permit Requirement: $250 per year plus $25 per acre. Supplemental fee for amendment of permit $25 plus $25 per acre. Acreage fee not to exceed $750.

Bonding Requirement: $100 to $200 per acre.

Reclamation Requirements: Coal — Grade to favorable conditions for revegetation. Strike off overburden piles to minimum width of 20 feet. Cover toxic materials and exposed auger holes. Control drainage to prevent acid drainage and soil erosion. Impoundment of water permitted. Preserve existing access roads and grade to permit construction of roads in areas where they do not exist. One planting required. If land restored to permit normal cultivation, no further rehabilitation, including replanting required.
Other minerals — Strike off crests of overburden piles to minimum width of 15 feet. One planting required. If land restored to permit normal cultivation, no further rehabilitation, including replanting, required. Total cost of replanting not to exceed $25 per acre. Impoundment of water permitted.

Refuse: Remove or cover all metal, lumber, and other refuse.

Substitution of Sites: No provision.

Penalties: Forfeiture of bond for failure to comply with statute. Fine of $100 to $5,000 for any violation. Fine of $100 to $500 for willfully falsifying any application or report. Each day of violation is separate offense. Denial of subsequent request for a permit.


Minerals Covered: Coal.

License or Permit Requirement: $6 per acre to be disturbed. Fee not to exceed $150.

Bonding Requirement: $100 per acre, with minimum bond of $2,500 except where 5 acres or less to be affected.

Reclamation Requirements: Grade to gently rolling topography. Grade to preserve existing access roads and to permit construction of new access roads at minimum cost. Plant trees, grasses, or shrubs where revegetation is practicable. Impoundment of water permitted.

Refuse: Remove metal, lumber, and other debris resulting from mining operations. Grade loose coal, refuse, and other debris on bottom of last cut.

Substitution of Sites: Permitted subject to approval by Department of Conservation and Economic Development.

Penalties: Forfeiture of bond for failure to reclaim. Criminal fine of up to $1,000, or imprisonment up to 1 year, or both for any violation.
W. VA. Statute, tit. 20, art. 6, §§ 1 et seq. (1971) (as yet uncodified).

Minerals Covered: Coal, clay, manganese, iron ore.

License or Permit Requirement: Prospecting permit — $500 per acre for area disturbed during prospecting. Permit to surface mine — $100. $50 annual renewal. Special reclamation fee — $30 per acre for land disturbed.

Bonding Requirement: $600 to $1,000 per acre, with minimum bond of $3,000. Rate per acre to be set by Director of Department of Natural Resources.

Reclamation Requirements: Preplanning by professional engineers. Complete drainage system before mining. Cover face of coal seam. Bury all toxic material and acid-producing material. Seal off any breakthrough of acid water caused by operator. Impound, drain, or treat all runoff water. Plant species adapted to site as prescribed in a planting plan within 1 year after mining is finished unless the planting is deferred by the Director of the Department of Natural Resources. Mulch required on all slopes exceeding 20 degrees.

Refuse: Remove or bury all metal, lumber, equipment, and other refuse resulting from the operation.

Substitution of Sites: No provision.

Penalties: No provision.

APPENDIX B

RECOMMENDATIONS OF THE DEPARTMENT
OF THE INTERIOR

U.S. DEP’T OF THE INTERIOR, SURFACE MINING AND OUR ENVIRONMENT 105-08 (1967):

Prevention of Future Damage

We recommend that:

a. The Federal Government establish standards and reclamation requirements for the reclamation and conservation of surface-mined areas regardless of ownership, in cooperation with industry, conservation, governmental (Federal and non-Federal) and other interests. Because the prevention of future damage is of high priority, consultation and active development of appropriate standards and requirements should be initiated as soon as possible. Such activities should take into account other Federal, State or local plans,
programs and regulations which relate to surface mining and the reclamation and rehabilitation of mined lands.

b. It should be recognized as an obligation of the State governments to enact and enforce regulations on non-Federal Lands, adequate to assure that the costs of reclaiming lands mined from now on will not become a public responsibility. Regulation and enforcement should be explicit responsibilities of the State; however, their effectiveness should be subject to continuing review by the Federal Government to prevent the continued build-up of derelict lands. The annual Federal/State cost to assure adequate reclamation as an integrated part of the mining cycle would be only one-tenth as much as the cost of reclaiming the derelict land which would accrue in the absence of such a program.

c. In the absence of satisfactory State regulation to control current and future surface-mining operations, or a failure of enforcement, Federal standards and reclamation requirements upon the surface mining industry should be imposed until such time as the State is prepared to assume its responsibilities.

d. All agencies of the Federal Government should apply effective, coordinated controls to surface-damaging exploration and surface mining activities conducted on lands under their jurisdiction.

e. Federal standards and requirements, both for guidance of Federal land-managing agencies, and for the States in adopting regulations, should include but not be limited to

1. Measures to control or alleviate effects of surface-mining operations that have a harmful impact upon the environment both during and following mining;

2. Provisions which relate specifically to: (a) Control or elimination of water pollution, (b) control of soil erosion, (c) elimination of health and safety hazards, (d) conservation of natural resources, and (e) preservation and restoration of natural beauty;

3. Issuance of a permit, or license, to surface mine contingent upon the submission by the operator of an acceptable mining and reclamation plan, with time limits imposed for the completion of reclamation;

4. Penalties for surface mining without a license, or permit, and for willful refusal to comply with Federal or State regulations;

5. Performance bonds sufficient to cover anticipated cost of reclamation, the forfeiture of which may involve the denial of future permits and licenses;
funding to insure an adequate inspection and enforcement staff;
periodic reports from operators on reclamation progress;
requirements and procedures reasonably consistent with those of adjacent States, or similar ecological areas; and
sufficient administrative flexibility to apply the regulations and reclamation standards in a manner that will reflect variations in local conditions, and prohibit mining in areas where reclamation is determined to be physically or economically unfeasible.

The Federal Government should encourage cooperative mined-land conservation activities by the States and other interested parties, such as:

1. The enactment of State reclamation laws that are compatible with those of contiguous States; and
2. the establishment of effective legal agreements or compacts relating to the regulation of surface mining.

Repair of Past Damage

We also recommend:

a. Federal participation with States, and private landowners, in a program of remedial, or basic, reclamation and a supplementary program of rehabilitation, or land development, should be authorized. Total program completion could be accomplished within 20 years, although the program could be longer or shorter depending upon availability of funds. Flexibility in scheduling would permit necessary budgetary adjustment. The Federal Government has a major interest in basic reclamation and must assume a major share of the cost if the program is to be accomplished. The Federal share in rehabilitation generally should be less than for basic reclamation.

Federal assistance to programs of reclamation and rehabilitation of surface-mined lands should not be available where: (1) A non-Federal legal obligation to reclaim the lands exists but has not been performed; or (2) where current mining may impair the reclamation undertaken. Further, Federal assistance to programs of rehabilitation should not be available where the State has not developed an acceptable regulatory plan.

b. The Federal Government should be authorized to acquire privately-owned surface-mined lands and contiguous lands where the public interest requires such action for the furtherance of an effective mined-land conservation program. Following successful reclamation, the acquired lands should be placed under the manage-
ment of an appropriate Federal agency; in many instances it would be appropriate to place such lands within the National Park, National Wildlife Refuge or National Forest systems. Provision also should be made for transfer to appropriate State or local agencies, or public sale. In the latter case, proceeds of the sale could be placed in a revolving fund to acquire additional mined lands or otherwise to advance the minded-land conservation program.

c. Financial, technical and other appropriate assistance should be provided to States and their subdivisions for developing plans for reclamation of lands affected by surface mining. Such plans should be on a watershed, or other suitable basis, and should include but not be limited to:

(1) Legal authority to engage in cooperative reclamation efforts and necessary maintenance;

(2) an inventory of damage resulting from surface mining, to be conducted in cooperation with appropriate Federal agencies;

(3) determination of private and public responsibilities for reclamation and rehabilitation including the extent to which full utilization has been, or will be made, of other legal remedies available for accomplishment of surface-mine reclamation objectives;

(4) remedial actions to be undertaken, including land treatment and structure measures;

(5) financial and other arrangements for installation and maintenance of the treatment program; and

(6) an analysis of alternatives considered to attain the imperative objectives including the possibility of legal enforcement actions to alleviate damage to property and impairment of water quality, together with a schedule of Federal and non-Federal contributions and benefits.

d. Primary responsibility for reclamation of past surface-mined areas on Federally-owned or -managed lands should rest with the agency with jurisdiction over the land.

e. It should be the responsibility of the operator or landowner to reclaim lands surface-mined in the future. Federal funds should not be used to reclaim or rehabilitate lands that are mined after adoption of appropriate Federal regulations.

Research and Investigation

A long-range, coordinated research and demonstration effort is required to provide the scientific and engineering foundation needed to insure technological progress in mined-land reclamation
and conservation. To achieve these purposes, both as to past and future surface mining, the following measures are recommended:

**Fundamental research** efforts should be expanded to provide a better understanding of acid formation, nutrient deficiency, effects of bacterial action, ground water hydrology, and classification of waste or spoil bank materials in surface-mined areas. **Applied research** is recommended to improve mining equipment, procedures, slope stabilization, erosion control, and to prevent acid water production. Demonstration sites should be provided to explore research possibilities and to educate personnel in effective mined-land conservation techniques.

The Federal Government, in cooperation with State agencies, should prepare and maintain an inventory of existing surface-mined acreage, showing locations with respect to watersheds and other geographic features, travel corridors, and population centers. The inventory also should describe environmental factors, including soils, vegetation, climate, terrain, and air and water conditions in the mined area. A list of active surface mining operations should be prepared and maintained to provide similar information for each area, or district, in which mining is being conducted.

The specialized knowledge of Federal and State agencies should be utilized both in compiling and interpreting the above data. It is suggested that existing programs be expanded to provide the desired information on a continuing basis. For example, the U.S. Bureau of Mines should obtain information on the type and extent of disturbed and reclaimed acreage in connection with its annual collection of mine production data; specialists of the Soil Conservation Service of the U.S. Department of Agriculture should obtain data on soils and vegetation; specialists in other Federal and State agencies should provide basic information on water quality, aquatic and wildlife habitat, and economic factors.

An expanded program of land reclamation will require a corresponding increase in research facilities, personnel, and financial resources. Grants and technical advisory assistance to States, local agencies, universities, and others will be necessary to provide assistance for programs of research and development.

**Administration**

A comprehensive national surface-mined conservation program should provide for:
a. Coordinated Federal activities relevant to the reclamation and rehabilitation of surface-mined land;
b. Federal standards and requirements for the reclamation of past, present and future surface-mined areas;
c. cooperation among State and Federal agencies in the development of land-use programs and criteria for past and future surface-mined areas;
d. cooperative agreements among Federal, State, and other governmental agencies, associations, and private landowners for the reclamation and conservation of past surface-mined areas;
e. acquiring, reclaiming, and conserving mined-land areas where the public interest requires such action;
f. technical and financial assistance to States, local agencies, universities, and others to promote research and development;
g. demonstration projects either separately or in cooperation with other interested parties and governmental agencies;
h. priorities and criteria for selection of programs and projects; and
i. promulgation of regulations necessary for effective administration of the program.
## APPENDIX C

### Ohio Department of Natural Resources Division of Forestry & Reclamation Coal Strip Mining Statistical Report — By Counties to January 1, 1970

<table>
<thead>
<tr>
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<td>County</td>
<td>Total Land Area (Acres)</td>
<td>Affected 1914 to 1-1-70</td>
<td>Percent of Strip Mined Land</td>
<td>Affected 1914 to 47 (Pre-Law)</td>
<td>Affected 1948 to 70 (Under Law)</td>
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<td><strong>TOTAL</strong></td>
<td><strong>8,362,000</strong></td>
<td><strong>269,513</strong></td>
<td><strong>3.22</strong></td>
<td><strong>45,213</strong></td>
<td><strong>224,300</strong></td>
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Figures in Column #4 (Affected 1914 to 1947) were obtained from a survey made by the Central States Forest Experiment Station completed in 1946, which indicated that 36,213 acres were affected from 1914 to 1946, and the prorating of an estimated 9,000 acres affected from 1946 to December 31, 1947.

It should be noted that this report makes no allowance for land which has been reaffected, and therefore, the acreage shown as affected in some counties is more than the actual land measure. Harrison County has a particularly distorted figure as the type of equipment used and the nature of the mining operations have caused some areas affected in the county to be reported two and even three times as affected area. The reporting of acreage affected for each license year in accordance with the strip mine law brings about this distortion.

RELEASE DATE: March 1, 1971
## Statistical Reclamation Report

**Licenses Issued, Acres Affected, Acres Reclaimed**

Ohio Department of Natural Resources — Division of Forestry & Reclamation

<table>
<thead>
<tr>
<th>Year (1)</th>
<th>Number of Licenses</th>
<th>Acres Affected</th>
<th>Trees</th>
<th>Forage</th>
<th>Other (2)</th>
<th>Acres Reclaimed 1970</th>
<th>Total (4) Reclaimed</th>
<th>Percent Reclaimed</th>
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<td>1948</td>
<td>272</td>
<td>6,882</td>
<td>3,432</td>
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<td>526</td>
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<td>1950</td>
<td>355</td>
<td>10,087</td>
<td>4,375</td>
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<td>Year</td>
<td>Number of Licenses</td>
<td>Acres Affected</td>
<td>Trees</td>
<td>Forage</td>
<td>Other (2)</td>
<td>Acres Reclaimed 1970</td>
<td>Total (4) Reclaimed</td>
<td>Percent Reclaimed</td>
</tr>
<tr>
<td>-------</td>
<td>--------------------</td>
<td>----------------</td>
<td>-------</td>
<td>--------</td>
<td>-----------</td>
<td>----------------------</td>
<td>-------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>1966</td>
<td>195</td>
<td>10,599*</td>
<td>3,781</td>
<td>839</td>
<td>75</td>
<td>1,857</td>
<td>4,695</td>
<td>44.3%</td>
</tr>
<tr>
<td>1967</td>
<td>190</td>
<td>11,353*</td>
<td>2,426</td>
<td>598</td>
<td>54</td>
<td>2,523</td>
<td>3,078</td>
<td>27.1%</td>
</tr>
<tr>
<td>1968</td>
<td>167</td>
<td>10,647*</td>
<td>116</td>
<td>47</td>
<td>7</td>
<td>170</td>
<td>170</td>
<td>1.6%</td>
</tr>
<tr>
<td>1969</td>
<td>157</td>
<td>12,041*</td>
<td>(No completed reclamation yet reported for this license year)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL STATE LICENSES**
5,772 | 224,300 | 115,359 | 61,896 | 7,580 | 6,162 | 184,835 | 82.4%  

**FEDERAL PERMITS (5)**
--------------------|--------|--------|
| 4,530 | 3,719 |

**OHIO TOTAL**
5,772 | 228,830 | 119,078 | 61,896 | 7,580 | 6,320 | 188,554 | 82.4%  

(1) Calendar year during which the strip mine licenses effective.
(2) Ponds, stockpiles, airstrips, and areas re-affected and reclaimed by a subsequent operator; or toxic (unplantable).
(3) Strip mine law effective October 13, 1955, permitted amendments of existing strip mine licenses reducing the number of licenses issued.
(4) Grading of the area affected has not been included in these totals.
* This figure is incomplete in that all of the actual acreage affected has not yet been reported. These acreages encompass forfeitures and findings to be made by the Division.

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