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ENVIRONMENTAL LAW—ACID MINE DRAINAGE

Drainage from coal mines has been described as the nation's most serious and complex water pollution problem and the most costly to remedy.¹ More than 3.5 million tons of acid mine water are discharged annually into the nation's streams and rivers.² The estimated annual damage from acid mine drainage in the Appalachian region is nearly ten million dollars, including loss of aquatic life,³ increased water treatment costs for industries and municipalities, corrosion of barges, boats, bridge piers, dams, and other structures, and diminished recreational value of affected rivers and streams.⁴ Of the 5,700 miles of streams in Appalachia continuously or intermittently affected by acid mine drainage, three-fourths are found in the Susquehanna, Allegheny, Potomac, and Delaware River basins in Pennsylvania, northern West Virginia, and Maryland.⁵ So, acid mine drainage is of particular concern in West Virginia.

I. THE NATURE OF THE PROBLEM

Mine drainage is surface or ground water which flows from a surface or underground mine or mining site.⁶ Drainage in underground mining occurs when water from various sources seeps into the newly formed cavity and is either pumped out to enable mining

¹The estimated cost of complete abatement of acid mine drainage under present technology is \$6.6 billion. ENVIRONMENTAL PROTECTION AGENCY, EVALUATION OF WASTE WATERS FROM PETROLEUM AND COAL PROCESSING 119 (1972) [hereinafter cited as EVALUATION OF WASTE].

²*Id.* at 121.

³In 1967, over one million fish were killed as a result of acid mine drainage, rendering that pollution the primary cause of the death of fish inhabiting inland waters. *Id.*

⁴A detailed examination of the damage caused by acid mine drainage appears in APPALACHIAN REGIONAL COMM'N, ACID MINE DRAINAGE IN APPALACHIA, H.R. DOC. NO. 180, 91st Cong., 1st Sess. 24 (1969) [hereinafter cited as APPALACHIAN REPORT]. Other estimates include loss of aesthetic value of water and property affected by acid mine drainage. Howard, *A Measurement of the External Diseconomies Associated with Bituminous Coal Surface Mining, Eastern Kentucky, 1962-1967*, 11 NAT. RES. J. 76, 77 (1971).

⁵APPALACHIAN REPORT, *supra* note 4, at 6 & Appendix C 1-42. Although 5700 miles represents only a fraction (8.5%) of the total river and stream mileage in the Appalachian region, the water quality of several major rivers, such as the Allegheny and Monongahela, is seriously impaired.

⁶APPALACHIAN REPORT, *supra* note 4, at 6.

to continue or flows naturally into underground streams. Rainwater produces a similar runoff in surface and auger mining.⁷ Mine drainage is classified as either acidic or alkaline; acid mine drainage is the most damaging.⁸ Acid formation occurs when pyrite and marcasite—sulphur bearing minerals associated with a coal seam—are exposed to oxygen and water. A series of physical, chemical, and biological reactions occurs producing concentrations of acids, sulfates, iron oxides, and such other water soluble minerals as aluminum, magnesium, manganese, calcium, and iron.⁹ The red-yellow iron oxide, or “yellow boy,” which is only slightly soluble in water, usually precipitates in the streambed and is primarily responsible for discoloration of the water. Although occurring normally in the natural weathering process, acid formation and iron oxide precipitation are greatly accelerated by coal extraction. The amount and degree of acidity produced varies with the availability of the reactive materials, the degree of alkalinity of the surrounding strata and receiving stream, and the type of mining conducted.¹⁰

⁷The type of mining conducted affects the amount of acid produced and determines the method of control employed. See note 10 *infra*. Augering is employed when the overburden is too steep to permit stripping of the coal. Augers are mammoth screws—often seven feet wide—which bore nearly two hundred feet into an exposed coal face to extract the coal. The various methods of mining coal are described in ENVIRONMENTAL PROTECTION AGENCY, LEGAL PROBLEMS OF COAL MINE RECLAMATION: A STUDY IN MARYLAND, OHIO, PENNSYLVANIA AND WEST VIRGINIA 20-24 (prepared by the University of Maryland School of Law, March, 1972) [hereinafter cited as LEGAL PROBLEMS OF RECLAMATION].

⁸Both acid and alkaline drainage are high in sulfates and contain significant amounts of manganese, calcium, and magnesium. Acid mine drainage contains significant amounts of aluminum and iron. R. HILL, MINE DRAINAGE TREATMENT: STATE OF THE ART AND RESEARCH NEEDS 5, 7 (1968) [hereinafter cited as RESEARCH NEEDS].

⁹The physical, chemical, and biological systems involved in the reaction are explained in WATER QUALITY OFFICE, ENVIRONMENTAL PROTECTION AGENCY, ACID MINE DRAINAGE FORMATION AND ABATEMENT 23-57 (1971) [hereinafter cited as DRAINAGE FORMATION].

¹⁰The amount of sulfur-bearing material varies among coal seams. APPALACHIAN REPORT, *supra* note 4, at Appendix C 11. The relative underground humidity in Appalachia is sufficiently high to provide the water vapor necessary to support the reaction. DRAINAGE FORMATION, *supra* note 9, at 58. Sealing a deep mine is ineffective to prevent oxygen entry; the difference between the barometric pressure inside and outside a mine causes air to seep in and out of the mine through cracks in the strata above or in rocks surrounding the seal. LEGAL PROBLEMS OF RECLAMATION, *supra* note 7, at 28-29. Where pyritic materials are shielded from exposure to oxygen by a layer of water or soil, oxidation will not take place or will occur at an insignificant rate. In surface mining, such a shield is supplied by covering exposed pyrites

Over twenty-four methods of eliminating or reducing the effects of acid mine drainage have been discovered.¹¹ The method utilized depends upon the type of mining conducted, the availability of financial resources, and the quality of water desired.¹² Treatment of the water to neutralize acid and remove harmful minerals is the most economical and commonly used method and is usually effective. Since neutralization does not abate the formation of acid, additional methods must be employed to avoid perpetual treatment. Abatement at the source is generally employed in surface mining where covering pyritic materials with a layer of earth effectively prevents their exposure to oxygen and water. Underground mining presents an entirely different situation. Elimination of the reactive elements is nearly impossible with present technology because of trapped air pockets, barometric pressure, underground streams, and fissures.¹³ While mine flooding may prove effective where leakage can be prevented, proposed technological means to abate acid formation in underground mines are largely untested.¹⁴

with earth. Flooding of an underground mine provides an effective shield. Where mining is conducted beneath the water table, a water shield will occur naturally. If the receiving stream is alkaline or the surrounding strata contains limestone, any acid produced may be effectively neutralized. The type of mining conducted also affects the amount and rate of acid formation. Methods which increase fissures in the rock and the probability of a roof collapse and consequent exposure of more pyrites to air are more likely to cause acid formation. *Id.*

¹¹APPALACHIAN REPORT, *supra* note 4, at 52-53. Hill discusses lime neutralization, iron removal, ion exchange, reverse osmosis, flash distillation, electro dialysis, crystallization, and biological treatment. RESEARCH NEEDS, *supra* note 8. Neutralization, usually coupled with aeration, is the most commonly used method of treatment and is effective to reduce acidity and iron content; it does not reduce the sulfate content. The other processes listed are used to produce pure water by removing minerals. *Id.* at 90.

¹²Total purification is not necessary for most uses of water, and partial treatment will reduce a substantial portion of the damage caused by acid mine drainage. The total annual savings to all industry from reductions in acid mine drainage in Appalachia have been estimated as follows:

Estimated Annual Savings

<u>Degree of Reduction</u>	<u>Reduction at Source</u>	<u>Lime Neutralization</u>
30 percent	\$ 530,000	\$370,000
60 percent	990,000	410,000
90 percent	1,230,000	490,000

APPALACHIAN REPORT, *supra* note 4, at 71.

¹³RESEARCH NEEDS, *supra* note 8, at 90.

¹⁴*Id.* See also DRAINAGE FORMATION, *supra* note 9, at 58-68.

II. COMMON LAW RESPONSE TO THE PROBLEM

The common law holds the owner or operator of a coal mine who allows acidulated mine water or debris to drain into a stream liable to other riparian owners when the pollution renders the water unfit for agricultural or domestic use or causes substantial injury to the riparian owner's land.¹⁵ The duty imposed on the coal operator is "*sic utere tuo ut alienum non laedas*."¹⁶ Each owner of land abutting a natural watercourse has a right to reasonable use of the surface water, subject to the same rights of other riparian owners.¹⁷ Interference with another's reasonable use of the water constitutes an actionable nuisance for which damages and injunctive relief will lie.¹⁸ The discharge of acid water from a coal mine is not a nuisance per se,¹⁹ and the claim of nuisance arises when mine drainage pollutes a public water supply or causes substantial damage to another's property.²⁰ Although a riparian owner has no right to discharge mine water into a stream, mine drainage has been allowed when the water is not diverted from its natural channel or does not substantially change the quality of the receiving stream.²¹ It is no defense that mine drainage is necessary to the

¹⁵State v. Mitchell, 47 W. Va. 789, 35 S.E. 845 (1900). A riparian owner is "one who owns land on the bank of a river." Riparian rights relate to the water, its use, ownership of soil under the stream, accretions, etc. BLACK'S LAW DICTIONARY 1490 (4th ed. 1951). Common law and statutory responses to acid mine drainage are explored in Broughton, Koza, & Selway, *Acid Mine Drainage and the Pennsylvania Courts*, 11 DUQUESNE L. REV. 495 (1973), and LEGAL PROBLEMS OF RECLAMATION, *supra* note 7.

¹⁶"So use your own property that you do not injure another." Day v. Louisville Coal & Coke Co., 60 W. Va. 27, 29, 53 S.E. 776, 777 (1906).

¹⁷Jessup & Moore Paper Co. v. Zeitler, 180 Md. 395, 397, 24 A.2d 788, 790 (1942). The Maryland Supreme Court stated that the right of riparians to the enjoyment of a stream in its natural flow, quantity, and quality is a fundamental principle of law. Every riparian owner must use this right so as not to interfere with the enjoyment of it by others.

¹⁸Pennsylvania Ry. v. Sagamore Coal Co., 281 Pa. 233, 126 A. 386 (1924) (acid mine drainage enjoined as a public nuisance). Pennsylvania distinguishes public from private nuisances. Pennsylvania Coal Co. v. Sanderson, 113 Pa. 126, 6 A. 453 (1886). The absence of negligence or malice is immaterial. H. B. Bowling Co. v. Ruffer, 117 Tenn. 180, 100 S.W. 116 (1906).

¹⁹Bumbarger v. Walker, 393 Pa. 143, 142 A.2d 171 (1958) (operator of an open pit mine entitled to reasonable discharge of water into natural watercourse).

²⁰Auger & Simon Silk Dyeing Co. v. East Jersey Water Co., 88 N.J.L. 273, 96 A. 60 (1915); Pennsylvania Ry. v. Sagamore Coal Co., 281 Pa. 233, 126 A. 386 (1924).

²¹Lucas v. Ford, 363 Pa. 153, 69 A.2d 114 (1949).

mining operation,²² that the practice is customary within the industry,²³ that drainage is required by statute,²⁴ or that the coal industry will be harmed by such regulation.²⁵

In *Day v. Louisville Coal & Coke Co.*, the West Virginia Supreme Court of Appeals affirmed an award of three hundred dollars for trespass when the defendant, a mine owner-operator, discharged quantities of waste and refuse from its mine into a river flowing through the plaintiff's farm. As a result of the mine debris, the plaintiff's land was covered with refuse, eighty acres of crops were destroyed, and the water was rendered totally unfit for agricultural and domestic use. The court rejected the coal operator's contention that imposing liability for such damage would impede development of the State's coal industry and deprive the company of the value of its property. The court equated "*sic utere tuo ut alienum non laedas*" to the Golden Rule in importance and found liability to be "clear."²⁷

In *State v. Southern Coal Transportation Co.*,²⁸ the West Virginia court upheld, as a valid exercise of the State's police power, a statute prohibiting the discharge of any matter "deleterious to

²²In *State v. Southern Coal & Transp. Co.*, 71 W. Va. 470, 76 S.E. 970 (1912), the West Virginia Supreme Court of Appeals upheld a judgment against the defendant for violation of a statute prohibiting the discharge into a stream of any matter deleterious to the propagation of fish even though other methods of drainage were impracticable. Pennsylvania would relieve a coal operator from liability if "natural conditions make it impracticable to discharge the water in any other way or . . . the expense of so doing [will] substantially deprive the owner of the mine of the use of his property." *McCune v. Pittsburgh & Baltimore Coal Co.*, 238 Pa. 83, 85, 85 A. 1102, 1103 (1913).

²³*Columbus & H. Coal & Iron Co. v. Tucker*, 48 Ohio St. 41, 26 N.E. 630 (1891).

²⁴*West Ky. Coal Co. v. Rudd*, 328 S.W.2d 156 (Ky. 1959) (statute requiring drainage intended for mine safety and cannot be construed as permission to pollute). The West Virginia Bureau of Mines imposes a similar statutory duty to drain water from mining operations. W. VA. CODE ANN. § 22-2-8 (1973 Replacement Volume).

²⁵"However numerous may be the persons who engage in mining for coal and petroleum, however laudable may be their undertakings, these are but private enterprises instituted and conducted for private gain which may be acquired only with due regard to the rights of [downstream riparian owners]." *Straight v. Hover*, 79 Ohio St. 263, 265, 87 N.E. 174, 176 (1906). See also *Arminius Chem. Co. v. Landrum*, 113 Va. 7, 73 S.E. 459 (1912). *State v. Southern Coal & Transp. Co.*, 71 W. Va. 470, 76 S.E. 970 (1912).

²⁶70 W. Va. 27, 53 S.E. 776 (1906). The case was overruled on other grounds in *Farley v. Crystal Coal Co.*, 85 W. Va. 595, 102 S.E. 265 (1920).

²⁷60 W. Va. at 31, 53 S.E. at 777 (1906).

²⁸71 W. Va. 470, 76 S.E. 970 (1912).

the propagation of fish" into any stream or watercourse. The court was not persuaded by Southern Coal's contention that mine drainage is a product of nature and should be freely permitted as a process necessary to the operation of a coal mine for which no practical means of control then existed.²⁹

*International Shoe Co. v. Heatwole*³⁰ illustrates the effective limits of the common law remedy in West Virginia. Plaintiff, the owner of a summer home and camp on the Greenbrier River, brought an action for damages for devaluation of his property due to pollution of the river by a tanning company whose discharge of tannic acid, sediment, and sludge discolored the river and made its water unfit for human consumption. The plaintiff claimed that he and his family could no longer bathe, fish, or enjoy the stream in its "original beauty and pureness" because of the pollution.³¹ The court ruled that the plaintiff had no standing to sue unless he suffered an "injury different from that inflicted upon the public in general, not only in degree but in character."³² Plaintiff's interests in the water were purely recreational and aesthetic—values which the court, in 1944, was not ready to protect.

Common law private actions are only partially effective in dealing with the acid mine drainage problem since the defenses available to the coal operator make recovery uncertain. Coal companies are held only to a standard of reasonable use of the water, which was difficult to disprove at a time when acid drainage was accepted as a necessary by-product of coal mining. The lack of adequate control technology works to the operator's advantage. The Supreme Court of Pennsylvania has declared that it will not require compensation for damages caused by acid mine drainage if other means of drainage are impractical or the cost of treatment will substantially deprive the mine owner of the use of his property.³³

At least two states recognize that a prescriptive right to pol-

²⁹*Id.* at 473, 76 S.E. at 972.

³⁰126 W. Va. 888, 30 S.E.2d 537 (1944).

³¹*Id.* at 892, 30 S.E.2d at 540.

³²*Id.*

³³*McCune v. Pittsburgh & Baltimore Coal Co.*, 238 Pa. 83, 85 A. 1102, 1104 (1913). A recent Pennsylvania case found that a standard requiring total treatment was neither unduly oppressive nor a denial of the use of the coal companies' property, since mining was only made more expensive, not absolutely prohibited. *Commonwealth v. Harmar Coal Co.*, 452 Pa. 77, 306 A.2d 308 (1973).

lute can be acquired by continuous discharge for a specified length of time. Once acquired, the right to pollute is held superior to another's right to pure water.³⁴ Furthermore, multiple sources of pollution create almost insurmountable problems. To recover where a stream is polluted by drainage from several mines, the plaintiff must overcome the burden of apportioning the damage or proving the source which is the proximate cause of his injury. Joint liability will not attach if the damage is impossible to apportion.³⁵

Recovery at common law is also impeded where the damaging acid drainage flows from an abandoned mine. Frequently, the owner of the surface does not own the mineral rights, having leased or sold them to a coal operator who left the area upon abandonment of the mine.³⁶ At common law, the owner of the surface is not liable for an injury caused by another, which leaves injured property owners without a remedy.

State and federal acid mine drainage legislation increases the duty of the coal operator, but it does not diminish the importance of the common law remedy.³⁷ The common law remains the sole source of relief for private individuals injured by acid mine drainage. It does not necessarily follow, however, that the role of the individual is limited to the redress of personal injury alone. Administrative regulation has expanded the individual's opportunity to participate in environmental matters.³⁸ Fearing industry domination and control of the regulatory bodies, environmentalists oppose vesting total responsibility for pollution abatement in administrative agencies.³⁹ Citizens' class actions for environmental pro-

³⁴*Western Ky. Coal Co. v. Rudd*, 328 S.W.2d 156 (Ky. 1959); *Alabama Consol. Coal & Iron Co. v. Turner*, 145 Ala. 639, 39 So. 603 (1906). Pennsylvania and West Virginia expressly reject a prescriptive right to pollute. W. VA. CODE ANN. § 20-5A-14 (1973 Replacement Volume); *Pennsylvania Ry. v. Sagamore Coal Co.*, 281 Pa. 233, 126 A. 386 (1924).

³⁵*Farley v. Crystal Coal & Coke Co.*, 85 W. Va. 595, 102 S.E. 265 (1920).

³⁶Severence of ownership of surface and mineral rights is possible in West Virginia. See R. DONLEY, *THE LAW OF COAL, OIL AND GAS IN WEST VIRGINIA AND VIRGINIA* §§ 1-3, 27-33 (1951).

³⁷W. VA. CODE ANN. § 20-5A-22 (1973 Replacement Volume). The West Virginia Water Pollution Control Act preserves common law rights and remedies.

³⁸One method of individual participation is the use of mandamus to compel the Director of the Department of Natural Resources to discharge a mandatory duty imposed upon him by the Code. W. VA. CODE ANN. § 20-6-11 (1973 Replacement Volume).

³⁹"Public agencies also have their inadequacies, they also need their system of checks and balances. Some are given inconsistent functions . . . some become

tection have been proposed for congressional approval.⁴⁰ The federal courts have recently upheld public challenges of federal administrative agency action.⁴¹ Whether state courts will be as receptive to citizens' environmental actions is uncertain.⁴²

The "public trust doctrine" provides an additional cause of action arising in the public by virtue of citizenship.⁴³ The concept of the doctrine is that title to all natural resources is held by the state in trust for its citizens. When the state, through its regulatory agency fails to preserve the quality of property in its trust, citizens can require performance of the duty. "The public trust doctrine" is now embodied in the Pennsylvania constitution.⁴⁴

captive of the industry they are supposed to regulate, some are lazy, some are ignorant, some are victims of Parkinson's Law. Their interests are not always synonymous with the public interest." *Testimony of Richard D. Lamm on S. 3575 Before Senate Subcomm. on Energy, Natural Resources and Environment*, 91st Cong., 2d Sess. (1970). See also Lamm & Davison, *Environmental Class Actions Seeking Damages* 16 ROCKY MT. MINERAL L. INST. 59 (1971).

⁴⁰Lamm & Davison, *supra* note 39, at 59.

⁴¹*United Church of Christ v. FCC*, 359 F.2d 994 (D.C. Cir. 1966); *Crawther v. Seaborg*, 312 F. Supp. 1205 (D. Colo. 1970).

⁴²Recently, a group of West Virginia residents unsuccessfully opposed the issuance of a West Virginia Department of Natural Resources drainage permit when it was shown that substantial acid mine drainage into a recreational lake was certain to result from mining. *Valley Mining, Inc.*, Case No. 241, Appeal No. 50 (W. Va. Water Resources Board 1973). The Department's order denying a permit was reversed upon appeal by the mining company to the Water Resources Board. Citizens' groups contested both the proposed issuance of the permit and the appeal. Review of decisions of the Water Resources Board may be sought in the Circuit Court of Kanawha County. W. VA. CODE ANN. § 20-5A-16 (1973 Replacement Volume).

⁴³Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 473 (1970). The public trust doctrine is discussed in Note, *Environmental Law—Air Pollution Abatement—A Supplemental Damage Remedy Under the Clean Air Act*, 75 W. VA. L. REV. 266, 275 (1973). The theory of a public trust was first applied in *Illinois Cent. R.R. v. Illinois*, 146 U.S. 387 (1892).

⁴⁴PA. CONST. art. I, § 27:

The people have a right to clear air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all people, including generations yet to come. As trustees of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people.

By statute in West Virginia, it is the responsibility of the state "to maintain, preserve, protect, conserve and in all instances possible to improve the purity and quality of water within the State . . ." W. VA. CODE ANN. § 20-5C-2 (1973 Replacement Volume).

III. STATUTORY RESPONSE TO THE PROBLEM

The inability of courts at common law to control acid mine drainage and other forms of pollution has prompted state and federal legislative intervention. Acid mine drainage legislation typically authorizes government expenditures for research and places the cost of employing current and reasonably practical treatment methods upon the coal industry.

Early West Virginia statutes prohibiting the discharge into streams of sawdust or other materials deleterious to the propagation of fish were construed to prohibit acid mine drainage.⁴⁶ The formation of the State Water Commission was the first legislative attempt at concerted, centralized control of water quality.⁴⁷ It was abolished in 1961 and replaced by the Department of Natural Resources, Division of Water Resources, which administers the presently operative Water Pollution Control Act.⁴⁸

The policy of the WPCA is both to protect the environment and to promote industrial development.⁴⁹ The Act encompasses acid mine drainage in its definition of pollution,⁵⁰ which also includes any discharge likely to reduce the quality of the water below the standards set out by the Water Resources Board.⁵¹

The WPCA requires that a permit be obtained from the State Department of Natural Resources before any person may "allow"

⁴⁶The most significant contribution of federal water pollution control legislation to the acid mine drainage problem is funding for research and development of control technology. Federal Water Pollution Control Act, 33 U.S.C. §§ 1251-1376 (Supp. II, 1973) authorizes federal contributions of up to 75% (not to exceed \$30 million) for acid mine drainage control demonstration projects conducted by state or interstate agencies. *Id.* §§ 1255-57. State legislative adoption of water quality standards applicable to intrastate waters is required by the federal act. *Id.* § 1313. The administrator of the Federal Water Pollution Control Act may require a permit to discharge mine drainage into navigable waters. *Id.* § 1342. See generally Casto, *The Use of the Corps of Engineers Permit Authority as a Tool for Defending the Environment*, 11 NAT. RESOURCES J. 1 (1971). For further discussion of the Water Pollution Control Act, see McThenia, *An Examination of the Federal Water Pollution Control Act of 1972*, 30 WASH. & LEE L. REV. 195 (1973).

⁴⁶State v. Southern Coal & Transp. Co., 71 W. Va. 470, 76 S.E. 970 (1912).

⁴⁷Acts of the W. Va. Leg. ch. 6, Reg. Sess. (1933), repealed and superseded by Acts of the W. Va. Leg. ch. 133, Reg. Sess. (1961).

⁴⁸W. VA. CODE ANN. § 20-5A-1 to -16 (1973 Replacement Volume) [hereinafter referred to as WPCA].

⁴⁹*Id.* § 1.

⁵⁰*Id.* § 2 (f), (h).

⁵¹*Id.* § 2(f).

the discharge of industrial wastes into the waters of the State.⁵² "Allow" is arguably broad enough to impose liability under the Act upon a surface owner who permits drainage to flow from beneath his land, from a coal mine which he neither owns nor operates, into a natural water course.⁵³

A permit is also required to "open, re-open, operate or abandon any mine . . . or dispose of any refuse . . . from any such mine . . . [if] the aforementioned activities cause . . . or might reasonably be expected to cause a discharge into or pollution of waters of the State"⁵⁴ Since a permit may be issued upon reasonable terms and conditions,⁵⁵ the Department can require the treatment of acid mine drainage as a condition to open or abandon a mine. The statute is broad enough to sanction the Department's requirement that a coal company continue treatment for many years after mining has ceased, provided that the reasonableness test is met. The Department Chief is authorized to inspect mine operations, compel compliance with conditions of the permit,⁵⁶ and order the mine drainage stopped when a clear and present danger to public health exists.⁵⁷ Injunctive relief is available for noncompliance with the conditions of a permit, orders of the Chief or the Board, or any violation of the provisions of the Act.⁵⁸ Failure to comply with WPCA provisions or orders of the Board or Chief and refusal to apply for and obtain a permit are misdemeanors carrying a one hundred to one thousand dollar fine, imprisonment, or both.⁵⁹ For willful violations, the fine is one thousand to ten thousand dollars, and each day the violation continues constitutes a separate offense.⁶⁰ Civil liability is imposed where loss of gamefish or other aquatic life has resulted from any violation of the Act.⁶¹ An amount equal to the cost of replacement of the gamefish or

⁵²*Id.* § 5(a)(1).

⁵³Although § 5(a)(1) arguably imposes liability upon surface owners who allow acidulated mine water from underground mines to drain through their property, severed ownership at common law prevents the attachment of such liability.

⁵⁴*Id.* § 5(a)(6).

⁵⁵*Id.* § 7(c).

⁵⁶*Id.* § 8.

⁵⁷*Id.* § 122.

⁵⁸*Id.* § 17.

⁵⁹*Id.* § 19. The Act further provides for exemptions to criminal liability when the violation is the result of "accident . . . act of God, war, strike, riot or other catastrophe" *Id.* § 20.

⁶⁰*Id.* § 19.

⁶¹*Id.* § 192.

wildlife is recoverable by the State for use in stocking its natural waters.⁶²

The administrative regulations promulgated by the Water Resources Board under authority of the WPCA set forth general and specific water quality standards.⁶³ The general standard prohibits entry into State waters of any waste producing (1) objectionable odor, color, taste, or deposits on the bottom or bank; (2) concentrations of materials poisonous to man, animal or fish life; (3) inadequate oxygen concentration; (4) distinctly visible solids, foams, scum, or oil slicks; or (5) water quality which requires an unreasonable degree of treatment.⁶⁴

Specific water quality standards are regionally prescribed according to present and anticipated uses of the water. These standards specify allowable water content ranges of dissolved oxygen, pH, temperature, threshold odor, toxic substances, bacteria, radioactivity, and concentrations of metals and other compounds.⁶⁵ The Board has discretionary authority to raise and lower the prescribed standards in an individual case.⁶⁶

The regulations also prescribe general acid mine drainage control measures: (1) Mine water, refuse, and acid-producing materials must, where practicable, be handled and disposed of in a manner which will prevent or minimize acid production;⁶⁷ (2) the amount of discharge must be regulated to equalize the daily flow into streams;⁶⁸ (3) chemical treatment of acid drainage is required "under appropriate circumstances" to "mitigate its polluttional properties";⁶⁹ and (4) mine sealing methods upon abandonment must be designed both to promote safety and to minimize the formation and discharge of acid mine drainage.⁷⁰

⁶²*Id.*

⁶³The regulations defer to practical limitations on pollution control and recognize the right to use a watercourse to dilute wastes as long as minimum stream quality is maintained. W. Va. State Water Resources Board, Regs. ser. 1 (1965). In addition to promulgating regulations, the Water Resources Board serves as the appellate agency for orders issued by the Chief of the Division of Water Resources.

⁶⁴*Id.* § 3.01.

⁶⁵*Id.* §§ 6-13 (1967).

⁶⁶*Id.* §§ 3.02, 7.01(e).

⁶⁷*Id.* § 5.02(b).

⁶⁸*Id.* § 5.02(c).

⁶⁹*Id.* § 5.02(e).

⁷⁰*Id.* § 5.02(d). Sealing requirements of the Bureau of Mines do not include prevention of acid formation. W. VA. CODE ANN. § 22-2-64 (1966).

The West Virginia Water Development Authority has the power to finance and construct⁷¹ water treatment facilities and to make their use commercially available to other persons or industries.⁷² The legislation creating the Authority declares that it is the public policy and responsibility of the State "to maintain, preserve, protect, conserve and in all instances possible to improve the purity and quality of water" in the State.⁷³ This provision authorizes significant State action in the treatment of waters polluted by acid mine drainage; if utilized it will make treatment methods available to mine operations for a fraction of the cost of constructing independent treatment facilities.

Pennsylvania takes public abatement a step further than West Virginia. The duty of the State of Pennsylvania to conserve and maintain the purity of its natural resources is constitutionally mandated. In addition to granting the authority to finance, construct, and maintain water treatment plants, the Pennsylvania Legislature authorized a \$500 million bond issue allocating the majority of the revenue to treatment and abatement of mine drainage from inactive and abandoned mines.⁷⁵ Under Pennsylvania law, an operator holding a permit can be required to post bond to insure compliance with administrative regulations and the conditions of the permit. The amount of the bond is discretionary with the Department of Health, and liability under it continues "until such time as the department determines that there is no further significant risk of a polluttional discharge."⁷⁶ The advantage of such a provision is that the amount of the bond can be set in relation to the potential hazard, and treatment after operations have ceased can be assured.

The State of Pennsylvania assumes the responsibility for maintenance of mine seals and is authorized to expend State Funds for this purpose.⁷⁷ A coal operator must treat all water pumped from his mine even if it flowed from an adjacent aban-

⁷¹W. VA. CODE ANN. § 20-5C-6(6) (1973 Replacement volume).

⁷²*Id.* 20-5C-6(7) (1973 Replacement Volume).

⁷³*Id.* § 20-5C-2 (1973 Replacement Volume).

⁷⁴PA. CONST. art I, § 27. The relevant portion of the constitution is found in note 44.

⁷⁵PA. STAT. ANN. tit. 32, § 5101 (Supp. 1971). In 1970, the Maryland Legislature authorized a five million dollar bond issue to fund the treatment of drainage from abandoned mines. MD. ANN. CODE art. 66C, § 674A *et seq.* (1970).

⁷⁶PA. STAT. ANN. tit. 35, § 691.315(b) (Supp. 1973).

⁷⁷PA. STAT. ANN. tit. 52, § 28.5 (1966).

doned mine.⁷⁸ Pennsylvania legislation also addresses the problem of severed ownership in determining the party responsible for treatment of acid mine drainage, requiring either the surface or mineral owner or the occupier of the land to treat drainage.⁷⁹ West Virginia statutes do not preclude holding the surface owner responsible for treatment of such drainage, although such liability can only be inferred.⁸⁰

IV. CONCLUSION

The present law in West Virginia can effect only a partial solution to the acid mine drainage problem. Although arguably supplanted by statutory regulation, common law actions to enjoin acid mine drainage on a nuisance or riparian rights theory can still be effective to stop mining where substantial damage is incurred by riparian owners or where a public water supply is polluted. No case was found, however, in which the polluter was required to pay the cost of water treatment and purification or the expense of replacing the fish killed by the spoiled water.⁸¹ The courts should consider these additional elements of damages, particularly in citizens' suits. Additionally, the effectiveness of statutory regulation of active mining operations can be improved by construction of public water treatment facilities whose use can be made commercially available to coal operators and industrial and municipal water users alike.

Because the hazard of acid mine drainage lingers long after active mining operations have ceased,⁸² West Virginia must look beyond the treatment of drainage from active operations alone. Approximately seventy-eight per cent of all acid mine drainage in Appalachia has been estimated to flow from abandoned or inactive mines.⁸³ Any solution of the overall problem must address this

⁷⁸Commonwealth v. Harmar Coal Co., 452 Pa. 77, 306 A.2d 308 (1973).

⁷⁹PA. STAT. ANN. tit. 35, sec. 691.316 (Supp. 1971).

⁸⁰Liability can be inferred from W. VA. CODE ANN. § 20-5A-5 (1973 Replacement Volume), which makes it unlawful for one to "allow" polluted waters to flow into the waters of the State without a permit.

⁸¹*Contra*, Standard Hocking Coal Co. v. Koontz, 5 Ohio App. 84 (1915), where the polluting coal operator was charged by the Ohio court with paying either permanent damage to the land or the cost of installing another sufficient water supply.

⁸²The oldest known strip mine in Pennsylvania dates back to 1815 and is still discharging acid. F. GRAHAM, DISASTER BY DEFAULT: POLITICS AND WATER POLLUTION 161 (1966).

⁸³BITUMINOUS COAL RESEARCH, INC., STUDIES ON LIMESTONE TREATMENT OF ACID MINE DRAINAGE, OPTIMIZATION AND DEVELOPMENT OF IMPROVED CHEMICAL TECHNIQUES

source of mine drainage. The West Virginia Legislature should adopt a bonding requirement similar to that of Pennsylvania to insure proper and continuous treatment of mine drainage even after abandonment. By continuing liability under the bond until danger from future pollution is removed, the Legislature can make total abatement, where practicable, an expense of coal operation. Imposing liability upon both the surface and subsurface owners of the land for treatment of acid mine drainage should also be considered, although constitutional questions are necessarily involved.⁸⁴ The cost of total abatement, however, cannot be borne by the coal industry or the surface owner over an abandoned mine. Public abatement plans should be strenuously pursued in light of their costs and anticipated benefits.

Katherine P. Kenna

FOR THE TREATMENT OF COAL MINE DRAINAGE 3 (1970).

⁸⁴See the discussion of retroactivity and the taking of property without compensation in LEGAL PROBLEMS OF RECLAMATION, *supra* note 7, and Broughton, Koza, & Selway, *Acid Mine Drainage and the Pennsylvania Courts*, 11 DUQUESNE L. REV. 495 (1973).