
2

Mine Drainage: The Common Enemy

by George Vranesh, Attorney at Law,
Vranesh and Raisch, P.C.,
Boulder, Colorado, USA

I. INTRODUCTION

The problems related to mine drainage have been with us from the beginning of mining.

Until the 18th century water formed the limiting factor in the depth of mines. To the great devotion of this water problem we owe the invention of the steam engine. In 1705 Newcomer--no doubt inspired by Savery's unsuccessful attempt--invented his engine and installed the first one on a colliery at Wolverhampton in Staffordshire.(1)

Mining has enjoyed a preferred status as reflected by the Court's decision in an early Pennsylvania case:

The plaintiff's grievance is for a mere personal inconvenience, and we are of opinion that mere private personal inconvenience, arising in this way and under such circumstances, must yield to the necessities of a great public industry, which, although in the hands of a private corporation,

subverses a great public interest. To encourage the development of the great natural resources of a country, trifling inconveniences to particular persons must sometimes give way to the necessities of a great community. Nor do we say that a miner, in order that his mines may be made available, may enter upon his neighbor's lands or inflict upon him any other immediate or direct injury, but we do say that in the operation of mining in the ordinary and usual manner, he may, upon his own lands, lead the water which percolates into his mine into the streams which form the natural drainage of the basin in which the coal is situated, although the quantity as well as the quality of the water in the stream may thereby be affected.(2)

Not being content with this language the Court quoted part of the dissenting opinion from the prior case between these same parties:

The population, wealth, and improvements are the result of mining and that alone. The plaintiffs knew when they purchased their property that they were in a mining region. They were in a city born of mining operations and which had become rich and populous as a result thereof. They knew that all mountain streams in that section were affected by mine water, or were liable to be. Having enjoyed the advantages which coal mining confers, I see no great hardship nor any violence to equity in their also accepting the inconveniences necessarily resulting from the business.(3)

There is no doubt that mining has enjoyed a preferred status in this country. The entire westward expansion was accelerated by the search for minerals. Congress encouraged the westward expansion by allowing people to trespass on government lands, then recognizing the trespass and eventually passing appropriate legislation encompassing local laws, rules and regulations. Congress passed the 1866 and the 1872 Mining Laws which further encouraged development of unoccupied lands in the West through mining.

The early statutes were drawn to encourage any industrial activities, including mining. The laws of the Eastern states allowed virtually any means of disposal of industrial waste

to encourage such development. The Western states, however, had no specific rules as to waste disposal.

Recently there has been a change in the public's attitude toward the value of industrial growth and this attitude has affected mining. No one today argues that one can indiscriminately dump waste or tailings into the stream system. Nor can one leave the mined land scarred and unproductive. Miners throughout the world are more aware of the beauty of their surroundings. They are in fact outdoorsmen who enjoy all the fruits of an unspoiled countryside.

The shift in emphasis as to the value of mining has been gendered in part by those least effected by mining. Bureaucrats throughout the world are learning to say "no" in more and more ways.

Overregulation may in time inhibit needed mining, which in turn will cause us to come full circle. For now, the pendulum has swung against mining, resulting in overregulation of an industry that no doubt needed some regulation.

This paper is written as a general overview of what is required of a mine operator when mine water is discharged.

II. HISTORIC APPROACH

The early authority on drainage of mines was Curtis H. Lindley on Mines.(4) Lindley analyzed the laws of many of the states dealing with mine drainage. Historically, the problem was primarily one of getting rid of the water from the mine workings. The questions that had to be resolved concerned various rights of the affected parties.

In Massachusetts, Kentucky, Tennessee, Georgia and North Carolina(5) mining was considered a public use with a right of condemnation which could be lawfully exercised for mining purposes.

A number of state constitutions contained provisions authorizing the legislature to make rules and regulations as may be necessary for mine drainage.(6) In 1893 Pennsylvania enacted legislation pertaining to mine drainage being supervised by state officials.(7) The rules historically applied to mine drainage problems were few and simple, based upon common sense.(8)

Law of Natural Flow

Some of the earlier reported cases dealing with mine drainage were contests between mine owners who worked different levels of the same structure. This type of case was generally regarded as the basis for determination of the rights, obligations and duties of mine operators. Lord Tenterden(9) said that in conducting mining operations, water is a sort of common enemy against which each man must defend himself. He went on to further state that the defense must be exercised so as not to endanger the lives or property of others.

The rule defining the rights and liabilities of adjoining mine owners may be stated in this form: For damages resulting from natural causes or from lawful acts done in a proper manner, the law gives no redress; but where one of the two adjoining mine owners conducts water into his neighbor's mine which would not otherwise go there, or causes it to go there at different times and in larger quantities than it would go there naturally, he commits a wrong which the law will redress.(10)

This factual situation is not generally of concern to the miners of today, although the problem has not entirely disappeared.

Flooding by Waters Impounded

Although the owners of an upper mine can discharge natural waters onto a lower mine owner, the Courts have not allowed waters which are foreign to the mine to be so discharged. In Fletcher v. Rylands,(11) the leading case as to flooding resulting from contained water, the Court ruled that the doctrine of absolute liability controlled:

We think that the rule of law is, that the person who, for his own purposes, brings on his land and collects and keeps there anything likely to do mischief if it escapes, must keep it at his peril; and if he does not do so, is prima facie, answerable for all the damage which is the natural consequence of its escape. . . .

In Colorado, this pronouncement applies to reservoirs constructed for any use and is not limited to mining.(12)

The Courts have attempted to define and solve the recurring problem attributed to drainage of water. The geographic area has had some influence on the Court's attitude. The problems in the Eastern section of the country are different from those of the West. The rainfall, topography and type of mining all contribute to the factual solution.

The law applying to mine drainage was well developed throughout this country, but there was no uniformity. The Civil Law Rule(13) states that a person who interferes with the natural drainage is liable for injury to other landowners. There is, however, a recognition that the lower landowner is required to accept the natural drainage. This rule implies that neither party is allowed to disturb the natural drainage conditions and therefore very limited changes can be made to the natural drainage flow.

Since neither the Common Enemy Rule nor the Civil Law Rule resolved the problem of drainage, a compromise rule was required. The Reasonable Use Rule(14) was such a compromise. Under this rule, both the upper and lower landowners have equal rights to the drainage of waters. The rule speaks of correlative rights of the parties and allows each to reasonably alter the amount of drainage naturally occurring. This is the general rule as applied today to mine drainage, although water quality is not considered under this rule. Yet another body of law must be addressed regarding the discharge of pollutants.

Pollution from Mining

Much of our present day law regarding pollution from mining is drawn from the English rule. The common law rule, simply stated is that no one has the right to defile water.(15) But in "streaming" for tin in Cornwall, England, the rule could not be respected in its original form. The tin bounders, as they were called, conducted placer operations and in the process sent down the streams sand, stone and rubble dislodged in processing their workings. This custom was recognized, based on necessity.(16) The courts reasoned that sand, stone and rubble was not pollution as such, since all the materials were an inherent part of the stream system and in time would settle out with no lasting injury to others.(17)

In 1876, however, England recognized the problem of pollution of streams and enacted protective legislation.(18)

The Act prohibited miners from permitting to flow into streams any poisonous, noxious or polluting solids or liquid matter from any mine, unless the water released was in the same condition as that raised or drained from the mine.

The early cases in the Eastern states wrestled with the two conflicting doctrines and, in time, ruled that pollution per se was bad. In Sanderson v. Penn. Coal Co.(19) the coal company argued that it had a right to pollute the water because it was conducting a lawful business. The Sanderson case on fourth appeal stated:

Undoubtedly the defendants were engaged in a perfectly lawful business in which large expenditures had been made and with which widespread interests were connected; but however laudable an industry may be, its managers are still subject to the rule that their property cannot be so used as to inflict injury on the property of their neighbors.(20)

The common law rule regulating riparian rights was not recognized in the Western states. A parallel can be drawn between the conditions in Cornwall and the West where necessity of action and lack of immediate concern controlled. The right to mine and the right to divert water stood on equal footing--all as determined by miner's courts. The miner's courts determined that "first in time was first in right". Each person took the water as he found it. The first miner had absolute right to the extent of his needs and only then did the second appropriator obtain specific rights.(21)

In Esmond v. Chew(22) the California court expressed the general attitude of the day:

Each person mining in the same stream is entitled to use in a proper and reasonable manner both the channel of the stream and the water flowing therein, and where, from the situation of different claims, the working of the same will necessarily result in injury to others, if the injury be the natural and necessary consequence of the exercise of this right, it will be damnum absque injuria, and will furnish no cause of action to the party injured. The reasonableness of the use is a question for the jury, to be determined by them upon the facts and circumstances of each particular case.(23)

The Colorado courts, however, refused to accept this holding and in Suffolk Gold M. & M. Co. v. San Miguel Cons. M. & M. Co.(24) issued an injunction preventing an upstream mining company from discharging tailings into the stream. The lower user was a power company that required clean water to drive its Pelton water-wheel. The Court concluded that the mining company might, with little expense, impound the tailings and return the water to the stream in an acceptable condition. In contrast, the United States Supreme Court, in deciding the same general question in Atchinson v. Peterson,(25) held that the subsequent appropriator must construct his own reservoir, impound the water and flush out clear water as he may require.

The general confusion has not been cleared up except to say that today the dumping of tailings directly into the streams is not acceptable under any circumstances.(26) The balancing of equities where the protection sought is relatively small as compared to the benefit to the public in general gave way to the protection of individual property rights.(27) However, while litigation was going forward, the legislatures of many states were enacting laws, rules and regulations to attempt to clarify this very confusing situation.

III. EARLY LEGISLATION

While the courts were busy interpreting the common law, the State and Territorial legislators were also active. In the West, where mining was the primary industry, the state legislators looked upon mining activities in a more favorable light than is evident today.

Colorado, in its constitution, recognized the need for protection of mining activities. Article XVI, Section 3 states: "that the general assembly may make such regulations from time to time, as may be necessary for the proper and equitable drainage of mines." Water and mining took on equal importance.(28) The way was cleared for mining activities to continue.

Colorado first addressed the general problem of mine drainage in 1870(29) when it enacted legislation for a pro-rata assessment of costs for removing water having a common ingress from subterranean sources. Mining companies and

individuals were authorized to incorporate for the purpose of draining mines. In water-short areas such as Colorado the mine owner had the first right to use of the water hoisted from the mine, provided that he exercised appropriate dominion.(30) This is still the law as to nontributary waters.(31)

In 1911, the Colorado legislature, pursuant to the section in the Colorado Constitution(32) authorizing legislation on mine drainage, provided for the formation of Mine Drainage Districts(33). These quasi-governmental districts are authorized to levy taxes and conduct whatever other activities are necessary to drain specific mining districts for the benefit of all that may wish to mine the area. Wyoming has a constitutional provision(34) similar to that of Colorado, but the Wyoming legislature has not enacted general laws pertaining to mine drainage. The Arizona legislature passed a statute providing that adjacent or contiguous mines having a common ingress of subterranean water must dispose of their proportionate share of such water.(35) During much of this same period, the Eastern states, including Pennsylvania,(36) Kentucky,(37) North Carolina(38) and others(39), were enacting laws directly related to mine drainage.

The oldest known coal strip mine was reportedly started in 1815 in Pennsylvania.(40) The early cases from that state were not determinative of guidelines for mine drainage and incidental water pollution from coal mines.(41) The Purity of Waters Act(42) was the first attempt by Pennsylvania to regulate discharge into streams. It regulated discharge of sewage but specifically excluded coal mine drainage.(43) Subsequent legislation also excluded mine drainage,(44) giving credence to the overall importance of coal mining to the area.

Finally in 1937, the Clean Streams Law(45) declared it a public nuisance to discharge pollutants into the streams. The Act specifically excluded acid mine water because there was no known solution for this problem.(46)

Acid Mine Drainage and Silt.--The provisions of this article shall not apply to acid mine drainage and silt from coal mines until such time as, in the opinion of the Sanitary Water Board, practical means for the removal of polluting properties of such drainage shall become known.

In 1945 the Clean Streams Law was amended to address the problem of pollution from mine drainage.(47) The Act did not

prohibit pollution but only proscribed drainage into "clean waters" which were devoted to a public use. The most significant part of the Act was that it required the mine operator to submit a drainage plan to obtain a permit from the Sanitary Water Board. The permit would be granted allowing drainage into a stream not designated or not put to a public use.

In 1965, new amendments to the Pennsylvania Clean Streams Law were enacted(48) finally setting out terms and conditions and specific controls over mine drainage. Section 1 of this Act defined industrial waste to include mine drainage. The present Act provides for greater control, making it a nuisance to discharge waste without a permit. The statute defines "operations"(49) to include any activity that will disturb the status quo. The Act defines discharge to include water that continues to flow after mining operations have terminated.(50) The Act provides for civil or criminal penalties as well as injunctive relief against violators.(51) The State has taken an active role in assisting mine operators to achieve full compliance(52) and may undertake unilateral action to reduce pollution from abandoned mines.(53)

The foregoing discussion points out the realities of mine drainage. The early-day miners did pretty much as they pleased. The early-day legislators did very little to correct the problem. This was an indication of the strength and influence of mining. That era has long since come to an end. The present-day legislators are not so influenced by the importance of mining. This is reflected in the types of legislation regulating mine drainage. The pendulum has shifted away from encouraging mining to grave concern for the environment. Somewhere there must be a common ground for balancing the equities of all concerned.

Current activities in Colorado are characteristic of this new approach. In 1978, the Colorado Mined Land Reclamation Board enacted rules and regulations under the Colorado Mined Land Reclamation Act(54) to protect the hydrology and water quality(55) of the area to be mined. The Act provides that disturbances to the prevailing hydrology of affected and surrounding areas during and after mining will be kept to a minimum. A major difficulty is that in some areas it may be impossible to not drain an area, or lower the water table, and still conduct mining operations.

The purpose of this rule obviously was to protect vested water rights. In Colorado, as a matter of law, anything can

be done with water so long as vested rights of third parties are not adversely affected.(56) The Colorado legislature recognized this principle of law when it rejected a bill(57) that would allow the State Engineer of Colorado to issue orders as may be necessary to "prevent or remedy injury from present or proposed mining, milling, drilling or other operations to persons owning, or entitled to use water under water rights, including injury from drilling of test or prospective holes. . . ." Nonetheless, the state engineer claims to already have such authority.

The Colorado statute defines a "well" as follows:

"Well" means any excavation that is drilled, cored, bored, washed, driven, dug, jetted, or otherwise constructed, when the intended use of such excavation is for the location, diversion, artificial recharge, or acquisition of ground water, but such term does not include an excavation made for the purpose of obtaining or for prospecting for oil, natural gas, minerals, or products of mining or quarrying, or for inserting media to repressure oil or natural gas bearing formation or for storing petroleum, natural gas, or other products.(58)

The Colorado Ground Water Mangement Act(59) also includes the provisions used in permitting wells in Colorado and defines "well" more broadly:(60)

"Well" means any structure or device used for the purpose or with the effect of obtaining ground water for beneficial use from an aquifer.

Such broad definitions may or may not include mine dewatering operations.

Legal Dilemma

In dewatering mines, the right to mine one's property and the vested water rights of third parties may conflict. Under common law a person may make use of his property provided he does not deprive another of his lawful recognized use. This right applies to the removal of minerals as well.(61)

Water is almost universally encountered in mining operations. The earlier cases regarded this water as independent

of the stream system, but the present view in Colorado is that there is a prima facie presumption that all water is tributary to the stream system.(62)

Where there is a direct hydrologic connection, the mine operator may well face a court contest because he will be draining the ground water that others may depend upon for irrigation and domestic uses. This will be especially true in the arid West. The appropriation doctrine, i.e., "First in Time is First in Right," will turn full circle to the consternation of the miner, who initially developed this concept.

In the East, where water availability is not a problem, the contest may not materialize. Under riparian law of the Eastern states, reasonable use of the water may still be the test. In 1936, the Alabama court concluded that if the mining operations are conducted in an ordinary and careful way and drain the lands of a surface owner, no liability exists.(63)

The courts have made attempts to distinguish between drainage and water rights matters,(64) but regardless of the legal distinction the net effect is the same. The factual situation in each case, under the laws of the particular state will control, but the trend appears to be that the burden of proof is on the mining company to prove non-injury.(65) The question of injury resulting from drainage of mines is but one aspect of a very complicated set of problems. There may in fact be no real question over whether pumping of mine water deprives another of his vested rights. The larger question is whether such drainage causes any adverse effect on the stream system. The effects of mine drainage discharge are not limited to state boundaries, and, therefore, federal laws must be considered.

IV. FEDERAL LEGISLATION

Initially the federal government viewed mine drainage as a matter of local concern, and the disposal of mine water and tailings was left up to state regulation. Before the turn of the century Congress was more interested in opening up the Western lands to settlement and industry.(66) The first federal attempt to control water pollution was contained in the Rivers and Harbors Appropriations Act of 1899,(67) commonly referred to as the Refuse Act. This Act provides that it is

unlawful to discharge refuse into navigable waters or their tributaries. Although the Refuse Act conceivably could have applied to mine drainage or tailings disposal, the Act was not used for that purpose.

In 1948 the Federal Water Pollution Control Act (FWPCA) (68) was passed by Congress. The Act called for studies and investigations of water pollution, but still deferred to state regulation. Increasing concern about the deterioration of the quality of our nation's waters led to the 1965 amendments to FWPCA. These amendments provided for the establishment of water quality standards by the states. A water quality standard is a legal limit on the amount of pollutants in a defined water course. Thus, the focus is on the capacity of the receiving body of water to tolerate harmful substances. Yet, enforcement of the water quality standards was ineffective because of the difficulty in determining which pollution sources caused the standards to be violated.

The Refuse Act (69) was revived in order to control water pollution because of the difficulties in administering the water quality standards. The emphasis was on prohibiting any discharge of refuse material, which is in effect an effluent limitation. As contrasted with water quality standards, effluent standards describe the legal limit of pollutants that can be released from a specific source. In 1966 the Supreme Court ruled that refuse included almost all discharges that adversely affect water quality. (70) Impliedly this definition included mining activities. Pursuant to authority contained in the Refuse Act, the Corps of Engineers announced that industrial discharges into navigable waters would be subject to a strict permit program. (71) President Nixon acted to preempt this scheme, and by executive order substituted a federal permit program to enforce the Refuse Act. (72)

Congress responded to pressure exerted by interested groups by enacting legislation amending the Federal Water Pollution Control Act. A compromise bill was vetoed by President Nixon, but on October 18, 1972, Congress overrode the veto and the bill became law. (73) The 1972 amendments adopted the effluent limitation approach contained in the Refuse Act. Section 101 (74) states that it is a national goal to make the waters "swimmable" by 1983 and to eliminate discharge of pollutants into our rivers and lakes by 1985. To accomplish these goals, effluent standards are to be promulgated. By July 1, 1977, all point sources, other than

publicly owned treatment works, were to apply the best practicable control technology currently available" (BPT).(75) A July 1, 1983 deadline was set for application of "best available technology economically achievable" (BAT).(76)

Section 107 of FWPCA authorizes demonstration projects for the development of programs to control mine water pollution.(77) The major provisions of the Act which affect mine drainage matters are Sections 208, 301, 303 and 402.

Section 301--Point Source Regulation

The Act broadly defines pollutants(78) so that mine discharges are covered by the Act. A major source of controversy is whether mine operations are point sources, and therefore subject to the effluent standards of Section 301(b)(1)(A) best practicable technology and Section 301(b)(2)(A) best available technology. The Act describes point sources as follows:

The term "point source" means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged.(79)

Two federal district courts have ruled that mining operations are not a point source.(80) If these rulings are upheld, the primary mechanism for control of mine drainage will be under Section 208.

Section 208--Areawide Waste Treatment Management

Section 208(81) provides that the governor of each state identify areas within the state which have substantial water quality control problems. The boundaries of each area are to be designated, and a planning agency, including local officials, is formed.(82) Essentially this agency is to develop an area waste treatment management plan for that area. The development of the plan is to be financed by federal grants.(83)

Along with other purposes, the 208 plan is to establish a program to "regulate the location, modification, and construction of any facilities within such area which may

result in any discharge in such area,"(84) and to include "a process to (i) identify, if appropriate, mine-related sources of pollution including new, current, and abandoned surface and underground mine runoff, and (ii) set forth procedures and methods (including land use requirements) to control to the extent feasible such sources; . . ."(85) Thus, it is clear that the Section 208 planning agency must consider the abatement of mine discharges.

Mining operations will be controlled under Section 208 by the development of "best management practices" (BMP).(86) A BMP prescribes a treatment method which must be economically sound, for the Act states that control be "to the extent feasible".(87) In practice 208 planning activities have not significantly addressed mine drainage problems.(88) Municipal and industrial point source discharges have received the most attention, and the difficulties associated with implementing a program for nonpoint sources such as mine discharges has relegated control of mining operations to a low priority.

Section 303--Water Quality Standards

While the 1972 amendments to the Federal Water Pollution Control Act primarily established effluent standards, the amendments also incorporated the 1965 water quality standards approach in Section 303.(89) Section 303(a) provides that water quality standards previously adopted by the state are to remain in effect, unless the Administrator of EPA determines that such standards are inconsistent with the requirements of the Act prior to enactment of the 1972 amendments. If a state fails to submit water quality standards or the Administrator disapproves such standards, the Administrator is authorized to promulgate regulations setting forth water quality standards for the state.(90)

A state with approved standards is to identify those waters for which the effluent limitations required by Sections 301(b)(1)(A) and 301(b)(1)(B) are not stringent enough to implement the water quality standards applicable to such waters, and establish a priority ranking for these waters.(91) In addition, the state is to establish maximum daily loads of pollutants for the above-identified waters in order to meet the applicable water quality standards. Section 303(c)(92) requires that the state hold public hearings for the purpose of reviewing the water quality standards, and modifying them if necessary. Colorado is currently engaged

in this process, and is encountering the difficulties inherent in a system which requires that the individual characteristics of the receiving body of water be taken into account.

Section 303 water quality standards could apply to mine drainage. Given that most mine discharge will likely be seepage, it will be difficult to establish maximum daily loads for such a nonpoint source. It is likely that states will concentrate on point sources emitting municipal and industrial waste and defer consideration of the mine drainage problem under Section 303 until later.

Section 402--National Pollutant Discharge Elimination System

Section 402(93) establishes the National Pollutant Discharge Elimination System (NPDES). Under the NPDES program, a point source which discharges pollutants into navigable waters is required to obtain a discharge permit.

A state which is capable of administering the permit program and which insures the compliance with the requirements of the Act is allowed to issue such permits, except that the Administrator of the EPA is authorized to object to the issuance of a permit under this Section.

As shown above, the most likely mechanism for dealing with mine drainage is the Section 208 areawide waste treatment management plan. It is possible that the states will supplement enforcement by enacting stringent water quality standards which could apply to mine discharges. And if the drainage can be characterized as a point discharge, a 402 permit is required and the effluent limitations of Section 301 must be complied with. Yet it is more likely that coal mine drainage regulation will be accomplished through the Surface Mining Control and Reclamation Act of 1977.(94)

SURFACE MINING CONTROL AND RECLAMATION ACT OF 1977

The Surface Mining Control and Reclamation Act of 1977,(95) signed by President Carter on August 3, 1977, marked the end of a bitter struggle over federal legislation regulating surface coal mining. The Act is the result of numerous congressional hearings and reports, including seven different bills passed by either the House or the Senate and two Presidential vetoes.

The Surface Mining Control and Reclamation Act provides a comprehensive scheme for regulating surface mining. Since

the Act contains standards relating to mine drainage, a detailed discussion of those standards and the overall scheme of regulation is warranted.

Findings and Policy of the Act. The Act commences with a set of findings, the general tenor of which is represented by Section 101(d), which states that "the expansion of coal mining to meet the Nation's energy needs makes even more urgent the establishment of appropriate standards to minimize damage to the environment and to productivity of the soil and to protect the health and safety of the public." This finding should be read in conjunction with one purpose of the Act, which is to "assure that the coal supply essential to the Nation's energy requirements, and to its economic and social well-being is provided and strike a balance between protection of the environment and agricultural productivity and the Nation's need for coal as an essential source of energy; . . . (96) Thus, the purpose of the Act is to "strike a balance," between energy development and protection of the environment, and not to guard against any adverse environmental effects at any cost.

Also important is the finding that "because of the diversity in terrain, climate, biologic, chemical, and other physical conditions in areas subject to mining operations, the primary governmental responsibility for developing, authorizing, issuing, and enforcing regulations for surface mining and reclamation operations subject to this Act should rest with the States; . . ." (97) This finding is consistent with Section 102(g), which declares that it is the purpose of the Act to "assist the States in developing and implementing a program to achieve the purposes of this Act; . . ." (98) It is apparent that Congress intended that the states accept primary responsibility for implementation and regulation of the provisions of the Act.

Major Provisions of the Act.

A. Creation of the Office of Surface Mining. Section 201(99) establishes the Office of Surface Mining Reclamation and Enforcement, which is to be included in the Department of the Interior. A director for the office shall be appointed by the President. The Secretary of the Interior, through the office, shall administer programs required by the Act for controlling surface coal mining operations, review and approve or disapprove state programs for controlling surface coal mining operations and reclaiming abandoned mined lands, and publish and promulgate such rules and regulations

as may be necessary to carry out the purposes and provisions of the Act.

B. Abandoned Mine Reclamation Fund. Section 401(100) creates an Abandoned Mine Reclamation Fund. The Fund is established to reclaim and restore land and water resources adversely affected by past coal mining by providing that coal mining operations subject to the Act pay to the Secretary a reclamation fee of 35 cents per ton of coal produced by surface coal mining and 15 cents per ton of coal produced by underground mining or 10 per centum of the value of the coal at the mine, as determined by the Secretary, whichever is less.(101) The Act provides that fifty percent of the reclamation fees collected annually in any state be returned to that state if the Secretary has approved the state's abandoned mine reclamation program.(102) Programs established under this fund should substantially reduce the amount of presently unreclaimed land disturbed by surface coal mining, which as of January 1, 1974, totalled 621,887 acres.(103) Since much of the adverse impact of surface coal mining results from acid mine drainage and degradation of water quality, the fund allows much needed expenditures for drainage abatement.

C. Enforcement of the Act.

1. Interim Regulation. In order to gradually implement the provisions of the Act, Sections 501(104) and 502(105) provided for promulgation, by the Secretary, of interim regulations concerning performance standards. The interim regulations applied only to states which had existing regulatory authority controlling surface coal mining operations.(106) Any new surface coal mining operations were required to obtain a permit from the state before commencing the new project.(107) Surface coal mining operations which had been issued permits by the states after February 3, 1978 were to comply with the interim regulations immediately, while existing mines were required to come into compliance with the regulations by May 3, 1978.(108) Section 523(c) provided that states with cooperative agreements with the federal government existing on the date of enactment would continue to regulate federal lands if the cooperative agreements were modified to comply with the interim regulatory procedures outlined in Section 502.(109)

Along with the above provisions concerning states with existing regulatory authority, the Act mandated that the Secretary, within six months of enactment, commence a federal

enforcement program that would remain in effect until the state program had been approved or a federal program had been implemented. The enforcement program included warrantless inspections of the mining site without notice.(110) The regulations provided that an authorized representative of the Secretary could order cessation of operations if the inspections reveal conditions showing an imminent change to public health or causing a significant environmental harm.(111)

2. Permanent State and Federal Programs. The Act allows a state to assume exclusive jurisdiction over regulation of surface coal mining and reclamation operations on nonfederal lands by submitting to the Secretary a state program which demonstrates ability to carry out the provisions of the Act.(112) A state with an approval program may enter into a cooperative agreement with the Secretary to provide for state regulation of surface coal mining operations on federal lands within the state if the Secretary determines that the state can properly implement the cooperative agreement.(113) Even if the state does act to take responsibility for regulation of surface coal mining on both federal and nonfederal lands, the Act requires the Secretary to promulgate and implement a federal program.(114) If the federal lands are situated in a state with an approved program, the federal program, at a minimum, must incorporate the requirements of the state program, yet the Secretary retains his duties and responsibilities to oversee federal coal leases under the authority of the Federal Mineral Leasing Act. The requirements of the Act with the federal lands program or an approved state program must be included by reference in any federal mineral lease, permit or contract issued by the Secretary involving surface coal mining and reclamation operations. No later than two months after approval of a state program or implementation of a federal program all operators must submit an application for a permit to the regulatory authority.

If a state fails to submit a program or a program submitted is disapproved or not enforced by the state, the Secretary is to implement a federal program.(115) The Secretary thus has exclusive jurisdiction for the regulation and control of surface coal mining operations taking place on any lands within the state. Section 503(a)(116) of the Act provides that states are required to submit permanent program applications by February 3, 1979. However, under Section 504(a) the Secretary can extend the date for permit applications up to an additional six months, if submission of the

application requires an act of the state legislature. This extension has been granted to all states where coal is currently mined, thus states have until August 3, 1979 to submit programs to the Secretary for approval.(117) The Secretary is then given ten months (6 months for initial review and 4 months for resubmission and reconsideration) to approve or reject the state program. Therefore, by June 3, 1980, a state program must be approved or a federal program implemented.

The regulatory scheme provided by the Act is unwieldy and difficult to administer. The Secretary and the state (if a state program is approved) have concurrent jurisdiction over surface coal mining operations. The retention of federal control and the required monitoring by federal officials can be attributed to the involvement of federal lands. The federal government was not quite so sure that the states would not plunder the lands. Yet, as evidenced by the automatic six-month extension for submission of state programs, federal officials are looking to the states to implement the Act. Given the "diversity in terrain, climate, biologic, chemical, and other physical conditions in areas subject to mining operations," the states are the proper governmental authority to administer such programs. Still it seems that the federal government will take an active role in formulation of reclamation policy, especially when federal lands are involved.

D. Standards and Regulations Relating to Mine Drainage. The Secretary of the Interior recently promulgated permanent regulations concerning the provisions of the Surface Mining Control and Reclamation Act.(118) Special attention will be devoted to a discussion of the sections of the Act and those regulations that deal with mine drainage.

1. Application Requirements. First, an application for a permit pursuant to an approved state or federal program must contain, among other things, the name of the watershed and location of the surface stream or tributary into which surface and pit drainage will be discharged; along with

a determination of the probable hydrologic consequences of the mining and reclamation operations, both on and off the mine site, with respect to the hydrologic regime, quantity and quality of water in surface and ground water systems including the dissolved and suspended solids under seasonal flow conditions and the collection of sufficient data

for the mine site and surrounding areas so that an assessment can be made by the regulatory authority of the probable cumulative impacts of all anticipated mining in the area upon the hydrology of the area and particularly upon water availability: Provided, however, That this determination shall not be required until such time as hydrologic information on the general area prior to mining is made available from an appropriate Federal or State agency: Provided further, That the permit shall not be approved until such information is available and is incorporated into the application; . . .(119)

The application should also include cross-section maps prepared by a qualified registered engineer or professional geologist which show the location of subsurface water, if encountered, and its quality, the location of spoil, waste or refuse areas; constructed or natural drainways and the location of any discharges to any surface body of water on the area of land to be affected or adjacent thereto. A statement of the result of test borings or core samplings is also required.

The regulations which apply to permit applications require a description of the geology, hydrology, and water quality of all lands within the proposed mine plan area, the adjacent area and the general area.(120) The application must describe the ground water hydrology of the proposed mine plan area and adjacent area, including the depth below the surface, lithology, thickness, and recharge and discharge capacity of aquifers. The quality and quantity of ground water must also be described.

Regarding surface water information, the application must describe the watershed involved, the location of all surface water bodies, and the flow discharge rates of streams in the area. Water quality data is required, showing the total dissolved solids, total suspended solids, total and dissolved iron, total manganese, all in milligrams per liter. Also required is a showing of the acidity and pH levels. If the proposed mining activities may proximately result in contamination, diminution, or interruption of an underground or surface source of water, alternative sources of water supply that could be developed to replace the existing sources shall be identified.(121)

2. Reclamation Plan Requirements. Each application submitted must also contain a reclamation plan.(122) The reclamation plan must include a statement of the engineering techniques proposed to be used in mining and reclamation, including a plan for the control of surface water drainage and of water accumulation. Section 508(a)(13) declares that the application include a statement of:

a detailed description of the measures to be taken during the mining and reclamation process to assure the protection of:

(A) the quality of surface and ground water systems, both on- and off-site, from adverse effects of the mining and reclamation process;

(B) the rights of present users to such water; and

(C) the quantity of surface and ground water systems, both on- and off-site, from adverse effects of the mining and reclamation process or to provide alternative sources of water where such protection of quantity cannot be assured;(123)

The regulations require that each application include a general plan for each sedimentation pond, water impoundment, and coal processing waste bank dam, or embankment within the proposed mine plan area.(124) The general plan will additionally contain the hydrologic impact and the operation and maintenance requirements of the structure.

3. Permit Approval or Denial. Consistent with the above requirements, the Secretary cannot approve a permit application unless the assessment of the probable cumulative impact of all anticipated mining in the area of the hydrologic balance has been made.(125) The Secretary must find that the proposed operation "has been designed to prevent material damage to the hydrologic balance outside the permit area, . . ."(126)

4. Performance Standards--Surface Operations. Section 515(127) puts teeth in the Act. The purpose of reclamation is to restore the land affected to a "condition capable of supporting the uses which it was capable of supporting prior to any mining, or higher or better uses of which there is reasonable likelihood, . . ."(128) The Act provides that

operators backfill, grade and compact in order to provide adequate drainage. All acid-forming and toxic materials are to be covered, and spoil sites are to be stabilized to effectively control erosion and attendant water and air pollution. The section also allows creation of permanent water impoundments if such impoundments are stable and safe and will not result in the diminishment of water quality below the applicable state and federal standards. The performance standards also mandate that the operations:

minimize the disturbances to the prevailing hydrologic balance at the mine-site and in associated offsite areas and to the quality and quantity of water in surface and ground water systems both during and after surface coal mining operations and during reclamation by--

(A) avoiding acid or other toxic mine drainage by such measures as, but not limited to--

(i) preventing or removing water from contact with toxic producing deposits;

(ii) treating drainage to reduce toxic content which adversely affects downstream water upon being released to water courses;

(iii) casing, sealing, or otherwise managing boreholes, shafts, and wells and keep [keeping] acid or other toxic drainage from entering ground and surface waters; . . .(129)

In addition, the Act requires that mining operations be conducted using the best technology currently available, so as contributions of suspended solids to stream-flow or runoff outside the permit area. It is emphasized that these contributions are not to exceed state and federal water quality limits for such pollutants. In order to comply with this standard the regulations provide that all surface drainage from the disturbed area shall pass through a sedimentation pond before leaving the permit area.(130) The regulations also supply a table containing numerical effluent limitations for iron, manganese, and total suspended solids. A further provision regulates pH concentration.(131)

Established in the permanent regulations is the preference of changes in flow of drainage over the use of

treatment facilities. Thus acceptable practices to control and minimize pollution are: (i) stabilizing disturbed areas through land shaping, (ii) directing runoff, (iii) regulating channel velocity of water, (iv) diverting flow from perennial, intermittent and ephemeral streams, and (v) selectively placing and sending acid-forming and toxic-forming materials.(132) It is also important that pits, cuts, mine excavation and backfilling be designed and constructed so as to prevent discharge of acid or toxic materials into the groundwater system. The operator is also required to restore "the recharge capacity of the mined area to approximate premining conditions."(133) The regulations provide for monitoring of ground water quality and quantity, and the results of the tests are to be submitted to federal or state inspectors.

One major difficulty with the Act is that it fails to address or acknowledge state water laws. Most states have an administrative or judicial authority which decides delicate issues regarding the "hydrologic balance". Section 717(a) states that "Nothing in the Act shall be construed as affecting in any way the right of any person to enforce or protect, under applicable law his interest in water resources affected by a surface coal mining operation."(134) Yet, under state law a mining company might own a decreed water right entitling it to alter or diminish the hydrologic balance, the exercise of which would seem to contravene the provisions of the Act. In fact, Section 717(b) provides that:

The operator of a surface coal mine shall replace the water supply of an owner of interest in real property who obtains all or part of his supply of water for domestic, agricultural, industrial, or other legitimate use from an underground or surface source where such supply has been affected by contamination, diminution, or interruption proximately resulting from such surface coal mine operation.(135)

The above section clearly ignores the existence of the appropriation doctrine, which, as stated previously, controls water distribution in the West. Under the "first in time, first in right" rule, it is easy to see that an owner of an interest in real property may not have a cause of action for diminution of an underground or surface water supply, where either the operator owns superior water rights or the complainant has no vested water rights.

5. Performance Standards--Underground Mines. The Act expressly covers the surface effects of underground coal mining operations.(136) A substantial portion of the standards and regulations applying to the underground mines deals with the hydrologic balance issue, and therefore the standards are virtually identical to the provisions concerning the regulation of surface coal mining in this area. A major difference in the two types of mining is the existence of more tunnels and shafts in underground mining, and Section 516 requires that operators "seal all portals, entryways, drifts, shafts, or other openings between the surface and underground mine working when no longer needed for the conduct of mining operations."(137) This section also provides that exploratory holes (the regulations include wells) which are no longer necessary for mining be filled or sealed to keep acid or other toxic drainage from entering ground or surface water. In addition, the operator is required to "locate openings for all new drift mines working acid producing or iron producing coal seams in such a manner as to prevent a gravity discharge of water from the mine."(138)

6. Alluvial Valley Floors. One of the more controversial provisions of the Act is the protection afforded alluvial valley floors. Section 515(b)(10) states that the prevailing hydrologic balance should be maintained by "preserving throughout the mining and reclamation process the essential hydrologic functions of alluvial valley floors in the arid and semiarid areas of the country."(139) Alluvial valley floors are defined as:

[U]nconsolidated stream-land deposits holding streams with water availability sufficient for subirrigation or flood irrigation agricultural activities but does not include upland areas which are generally overlain by a thin veneer of colluvial deposits composed chiefly of debris from sheet erosion, deposits formed by unconcentrated runoff or slope wash, together with talus, or other mass-movement accumulations, and wind blown deposits.(140)

The Act provides that a permit will not be granted, if the operation is located west of the one hundredth meridian west longitude, and it would "interrupt, discontinue, or preclude farming on alluvial valley floors that are irrigated or subirrigated, . . . or materially damage the quantity or quality of water in the surface or underground water systems

that supply these valley floors."(141) Underdeveloped range lands and small acreage plots are excluded because of their negligible impact on the farm's agricultural production. Additionally, a grandfather clause excludes surface coal mining operations which in the year preceding enactment had produced coal in commercial quantities and were located in or adjacent to alluvial valley floors. Also excluded are operators who had obtained a permit from the state regulatory authority to mine within the alluvial valley floor.

One problem in administering the alluvial valley floors provision is the difficulty in determining what is an alluvial valley floor. Factors included are geology, hydrology and biology, yet the determination is apt to be almost sheer guesswork. The regulations put the burden on the applicant to prove that it is not an alluvial valley floor, and an extensive array of maps and studies concerning surface water, ground water, vegetation and land characteristics is required. And there is bound to be some disagreement as to whether the mining operations necessarily "interrupt, discontinue or preclude" farming in areas defined as an alluvial valley floor.

The Surface Mining Control and Reclamation Act is a difficult act that applies to a difficult problem. While the federal government does have a stake in the matter because the coal is primarily situated on federal lands, the state is a better mechanism to adapt to the local factors which each reclamation project faces. The inherent ambiguities and difficulties in defining phrases like "hydrological balance" and "alluvial valley floor" will prompt litigation over the proper application of such terms. The interim regulations themselves spawned an enormous amount of litigation.¹⁴² Despite its shortcomings, the Act can be a step in the right direction if it does "strike a balance" between coal development and environmental and agricultural protection.

However this Act is enforced, the effects are obvious to mining operations. Mine drainage problems historically were of concern only to "wet" mines. Today there is very little distinction among mines, and the problem of compliance exists for every coal mine.

V. THE CANADIAN EXPERIENCE

Much like the American system, in which the federal government and the states have concurrent jurisdiction over and

responsibility for mine drainage, the Canadian scheme involves the cooperation of the provinces and the Dominion. While Canada does not have a statute similar to the Surface Mining Control and Reclamation Act of 1977 which extensively deals with land reclamation and mine drainage, there are provincial and federal statutes which apply to mine pollution control and surface reclamation.

Federal Powers

The most significant federal legislation providing for the management of the water resources of Canada is the Canada Water Act of 1970.(143) The Act calls for the cooperation of provincial governments and federal officials to set nationwide standards of environmental quality. The Minister of Energy, Mines and Resources is to undertake water resource management programs where federal waters are involved, or in connection with interjurisdictional waters and any international waters where there is a significant national interest.(144) In addition, the Minister may make agreements with provincial governments to implement programs for any waters in which water quality management has become a matter of urgent national concern.(145) The Act mandates that no person shall deposit waste of any type in these water quality management areas or federal waters except in quantities and under conditions prescribed by the officials administering the Act.(146) An interesting provision is the authorization to require the payment of effluent discharge fees.(147) The Act also allows the Governor in Council to make regulations prescribing quantities or concentrations of substances that can be deposited in the waters, along with the proper treatment processes to be used.(148)

Another piece of federal legislation enacted in the same year as the Canada Water Act was the Northern Inland Water Act.(149) This Act applies to inland water resources in the Yukon Territory and Northwest Territories. The Northern Inland Water Act is very similar to the Canada Water Act, for it provides for the establishment of water quality management areas and prohibits the discharge of wastes into such waters without a license from the appropriate board.(150) A noteworthy provision of the Act is Section 11, which requires an applicant for a license to provide "information and studies concerning the use of waters proposed by the applicant as will enable it (the board) to evaluate any qualitative and quantitative effects of the proposed use on the water management area in which the applicant proposes to use such

water."(151) This requirement of information and studies seems comparable to the environmental impact statement mandated by NEPA.(152)

The pollution from mine drainage may also be regulated by the Fisheries Act.(153) The Act prohibits a person from depositing "deleterious substances" in any water frequented by fish.(154) Violations of the provisions of the Act can result in fines and/or cessation orders.(155) The Fisheries Act can be an important tool for water quality management because of the heavy fish populations throughout Canadian waters.

The British North America Act, Canada's Constitution, provides that the Parliament of Canada can make laws for the "Peace, Order, and Good Government of Canada."(156) Conceivably Parliament could pass legislation pertaining to pollution control and mine drainage based on the above authority. The Supreme Court of Canada has recently ruled that pollution offenses are a violation of public welfare.(157) Therefore, it seems that Parliament has the constitutional power to regulate mine drainage based on its relationship to the public welfare and good government of Canada, even though such a statute has not been enacted.

Provincial Governments

The provinces play a major role in the area of pollution control and mining regulation. The British North America Act granted exclusive jurisdiction to the provincial legislatures over matters concerning:

5. The Management and Sale of the Public Lands belonging to the Province and of the Timber and Wood thereon. . . .
10. Local Works and Undertakings
13. Property and Civil Rights in the Province.
16. Generally all Matters of a Merely Local or Private Nature in the Province.(158)

In addition, Section 109 provides that the provinces have the proprietary interest of the Crown in any natural resources.

Thus, because of its ownership of natural resources, such as water and minerals, and its ability to regulate local

works the provincial legislature has been a significant force in land reclamation and water pollution.

All the provinces have statutes that deal with environmental control or water quality.(159) Alberta is a good example, and the statutes that would affect a mine drainage controversy are numerous.(160) Similar to the Canada Water Act, most of the provincial water quality statutes prohibit discharge of harmful substances into the water courses without a license or permit. Also, the clean environment acts and land reclamation statutes often require that a plan for minimization of land disturbance and subsequent reclamation be approved before commencement of the project.(161)

One peculiarity of Canadian law that affects mine drainage is the English rule of capture regarding groundwater, a rule adopted in several provinces.(162) The retention of this doctrine is probably due to the fact that in some provinces, such as British Columbia, there are groundwater sources that have yet to be tapped. According to the rule of capture, a land owner could drain his mine without incurring liability for impairing the hydrological balance of the land around him. In contrast, Alberta has a statute which prohibits the drilling and pumping of groundwater without a permit.(163) The Act applies to wells and shafts that accumulate groundwater.

Also, it should be noted that Canada recognizes the common law remedies of nuisance, strict liability, trespass and negligence.(164) While these theories can be applied to mine drainage issues, they are not usually successful because of the high burden of proof and other difficulties.

Conclusion

While the Canadian Parliament has enacted legislation dealing with pollution control, the provincial statutes are the primary mechanisms for environmental regulation. Because the statutes and governing authorities differ from province to province, an overall assessment of the acts that apply to mine drainage is difficult, if not impossible. Still it is not hard to conclude that governmental regulation of mining, whether it be the province or Parliament, will continue to increase.

VI. AUSTRALIAN EXPERIENCE(165)

The abatement of water pollution in Australia is similar to the Canadian regulatory framework. While the Australian Constitution grants many specific legislative powers to the Commonwealth, none of these powers expressly provide for environmental control. Therefore, much of the regulation is done by the state. However, in 1974 the Environment Protection (Impact of Proposals) Act(166) was passed, in which the Department of Environment, Housing and Community Development was given the authority to oversee environmental concerns. While the Act does not impose specific obligations on industries such as mining, the Minister for the Environment has the power to request that other Ministers block necessary ministerial approval for a new project if the project does not meet the required environmental standards.(167) Therefore, the Department of the Environment is to insure compliance with the previous more specialized acts relating to the environment.

Comparable to the Canadian system where the provinces control discharges of pollutants into the water courses, in Australia the states have primary responsibility for water pollution. In Western Australia, environmental regulation stems from the State Environmental Protection Act.(168) The general object of the Act is "the prevention and control of environmental pollution and protection and enhancement of the environment." The Act sets up three bodies for administering the Act: (1) Environmental Protection Authority (EPA), (2) Conservation and Environment Council (CEC), and (3) Department of Conservation and Environment (DCE). The EPA is the body that deals with the public and industry, while the CEC is an advisory committee and the DCE is the ministerial administrative section of the EPA.

The State Environmental Protection Act in essence creates an administrative agency to oversee compliance with the various acts protecting the natural environment. For example, in the state of Victoria the Fisheries Act of 1958,(169) the Harbor Boards Act of 1958(170) and the Groundwater Act of 1969(171) all control the discharge of harmful substances into the water system. In addition, acts concerning metropolitan water supplies and irrigation affect the discharge of industrial wastes. Large projects, such as mining operations, often come under an agreement act in which it is becoming accepted practice to include specific environmental safeguards and make provisions for an environmental review and management program (ERMP) within the agreement.

Like many other common law countries, Australia has substituted specific statutory regulations relating to pollution for the common law remedies of nuisance, negligence and strict liability. All over the world the modern day miner faces a complex set of local, state and federal regulations relating to pollution control.

VII. THE BRITISH EXPERIENCE(172)

The early common law principles that have been relied upon by the English speaking countries have given way to statutory laws, rules and regulations. The Town and Country Planning Act(173) governs all land projects in England and Wales. This Act applies to all phases of land use, including mining and mine drainage.

The Act is a one-step procedure wherein all aspects of a project are reviewed at the local level. The Act has gone through an evolutionary process. The first Town and Country Act was enacted in 1932(174) but was no more than what we now consider as zoning matters. During World War II there was a recognition for more comprehensive planning resulting in the Acts of 1944(175) but the Act of 1947(176) provided the general framework for the present planning process. The post-war Act recognized the need for regional planning. A reduction in the number of local planning authorities was made. The present Act of 1971(177) governs all mining activities. The local plan process is open to all types of concerns. The local authority drafts the appropriate plan and holds hearings. A final report is prepared by an "Inspector" who heads up the local agency. This plan is presented to the Secretary of State for the Environment for approval, change or rejection. Generally the Secretary approves the Inspector's report and thereafter the proposed project may commence.

One unique feature of the permitting process is that in England most of the coal mining is done through the National Coal Board.(178) Surface coal mining is exempt from the Town and Country Act, but are regulated under the Opencast Coal Act of 1958,(179) which has similar provisions. The combination of owner, mining operator and grantor of permission to operate, all in one entity, makes for interesting speculation of conflict of interests. However, the safeguards built into the Acts allowing full public participation seem to overcome the possible conflicts.

Unlike the American plan under the Environmental Protection Agency, Britian has no set rules as to mine drainage and reclamation. The permit is considered and awarded according to the specific local concerns and problems. Mining is not considered bad by the majority of those involved in the permitting process and as a result, an evenhanded balance of equities is easier to attain.

The permits granted are subject to limited judicial review(180) to determine whether the Secretary's order was within the powers of the Act. Injunctive relief and enforcement of the order is provided for in the Act.(181)

It appears that the British system of permitting mining offers a quicker, more realistic approach. There are problems, not unlike those in America, where the staff making the decisions is not technically competent to undertake the burden of analyzing the effects of mining. But, overall, the method, when compared, is more efficient and certainly less time-consuming than that required in the United States.

VIII. THE GERMAN EXPERIENCE(182)

It may be somewhat unfair to make direct comparisons between European and American mining. There are geographical differences since land values are different. But preservation of water quality is a primary goal regardless of other differences.

Generally, West Germany has attained a higher standard of mine reclamation than has America. Europe has long been concerned with external social costs and results from coal mining(183) and has regulated mining activities accordingly. In Germany, both surface and underground coal operations are closely regulated. Water pollution from mining is but one aspect of a bigger overall concern. Pollution measures are generally controlled on-site, supplemented by treatment plants that may process whole rivers to tertiary treatment standards.(184)

Mining operations in West Germany are subject to ongoing review by the State Mining Office as well as other agencies, such as the State Ministries of Economics and Agriculture and state and local water authorities.(185) Mining projects undergo two distinct stages--the initial permit and annual permit review. There are no set standards to guide the

permit applicants. Instead, the problems are resolved on an ad hoc basis addressing the specific environmental concerns of the area. The meetings are closed to the public and no citizen participation is permitted, but the concerns of the local citizens are met by the various participating agencies that are obligated to address specific environmental concerns.

Since the entire permit and review process is staged with typical German bureaucratic multiple layer investigations and agency cross-reference reviews, the procedure would not favorably lend itself to American mining. Two main considerations, however, are evident. The first is that Germany realizes the need for coal and mineral development. There is not a polarization of positions as is evident in this country. The general theme is to allow mining with proper protection of the environment. The second consideration is that one agency has the ultimate authority to grant or deny the right to mine, as contrasted in this country where a dozen or more agencies issue separate permits before mining can commence. Additionally in this country, each agency wants to be the last one to issue the permit, thereby causing delays that go on for years instead of months. The delay has very little to do with actual concern of the subject matter before that agency.

The concerns of pollution from mine drainage are of significant importance in Europe as well as in America. Germany started much earlier in attempting to solve the problem, but the problem is being properly addressed in both countries.

IX. CONCLUSION

The problems related to mine drainage are changing throughout the world. Several time periods have evolved. The first set of laws, rules and regulations were concerned with the physical discharge of the mine waters. The question was whether or not a mine operator could release water upon a lower landowner without recourse. Although this may yet be an unresolved issue in some parts of the world, that question has been pushed aside to address more pressing issues.

The next phase in the law was a concern and determination of the amount of pollution a mine operator could cause without incurring legal liability and related obligations. This issue, too, took a secondary position after the courts determined the extent of such permissive activity.

Subsequently, with new awareness and concern, the issue did not focus upon whether one can discharge water into the stream system. That issue, for the most part, is resolved. Such discharge, if pollution results, cannot be permitted.

The present issue is the quality of water discharged to the stream system. Under today's strict standards there will be increasing demands placed upon the mine operator to discharge mine water only if pollution to the stream system does not happen.

The problem is no longer a local issue but is being or will be enforced to some degree throughout the world, wherever mining takes place. The original concern of miners was the common enemy of unneeded water in the mine. Today the common enemy still exists, but within a much larger area of concern. Lord Tenderden's statement that in conducting mining operations water is a sort of common enemy against which each man must defend himself is as true today as when first made in 1828.

REFERENCES

- (1) Agricola, De Re Metallica Libri XVI (Hover, L. and H. trans.)
- (2) Penn. Coal Co. v. Sanderson, 113 Pa. 126, 57 Am. Rep. 445, 6 A. 453, 459 (1886).
- (3) Sanderson v. Penn. Coal Co., 102 Pa. 370 (1883).
- (4) Lindley, Mines and Mineral Lands (3d ed. 1914).
- (5) Lindley, Mines § 806, at 1983 (3d ed. 1914).
- (6) See Colo. Const. art. XVI, § 3.
- (7) Pa. Laws 1893, p. 52, art. 14, § 3.
- (8) Lindley, Mines § 806, at 1984 (3d ed. 1914).
- (9) See Rex v. Pagham Commrs. of Sewers, 8 Barn. & C. 355, 108 Eng. Reprint, 1075 (1828).
- (10) Lord v. Carbon Iron Mfg. Co., 38 N.J. Eq. 452 (1884).

- (11) L.R. 1 Ex. 265 (1866).
- (12) Colo. Rev. Stat. § 37-87-104 (1973).
- (13) See Orleans Navigation Co. v. New Orleans, 2 Mart. 214 (La. 1812).
- (14) See Bassett v. Salisbury Mfg. Co., 43 N.H. 569 (1862).
- (15) MacSwinney on Mines, p. 396 (1884).
- (16) See generally, Carlyn v. Lovering, 1 Hurl. & N. 784, 26 L.J. Ex. 251 (1857). Under the laws of the stannaries, they must not, however, in exercising the right, injure rivers or lands adjoining rivers. If, as a consequence of its exercise, lands become overflowed by a river, they are bound within two days after receiving notice from any person thereby injured to clear the river, and in default are liable to damage and a fine; and for the protection of havens and ports in Cornwall, persons who stream for tin near any waters or rivers flowing into such havens or ports are under a statutory obligation to prevent the dislodged sand, stones, gravel, and rubble from being conveyed into such havens or ports.
- (17) In Red River Roller Mills v. Wright, 30 Minn. 249, 15 N.W. 167, 169 (1883), the court considered necessity and economic impact in denying injunctive relief from the sawdust and refuse that spilled into the water from defendant's pulp mill.
- (18) The Rivers Pollution Prevention Act, 39 & 40 Vict. c. 75 (1876).
- (19) Sanderson v. Penn. Coal Co., 86 Pa. 401, 27 Am. Rep. 711 (1878).
- (20) Penn. Coal Co. v. Sanderson, 113 Pa. 126, 6 A. 453 (1886).
- (21) See Irvin v. Phillips, 5 Cal. 140, 63 Am. Dec. 113 (1855), where the issue was first decided.
- (22) 15 Cal. 137 (1860).
- (23) Id. at p. 143.
- (24) 9 Colo. App. 407, 48 P. 828 (1897).

- (25) 87 U.S. 507 (1874).
- (26) *Wilmore v. Chain O'Mines*, 96 Colo. 319, 44 P.2d 1024 (1934); *Slide Mines v. Left Hand Ditch Co.*, 102 Colo. 69, 77 P.2d 125 (1938).
- (27) *McCleery v. Highland Boy Gold Mining Co.*, 140 Fed. 951 (1904).
- (28) Colo. Const. art. XVI, § 5, 6 and 7.
- (29) 1870 Colo. L. P. § 2, § 1, now codified at Colo. Rev. Stat. §§ 34-50-101 to 106 (1973).
- (30) Colo. Rev. Stat. § 34-50-106 (1973).
- (31) *Riley v. Park Central Land & Water Co.*, 40 Colo. 129, 90 P. 75 (1907).
- (32) Colo. Const. art. XVI, § 3.
- (33) Colo. Rev. Stat. §§ 34-51-101 to 124 (1973).
- (34) Wyo. Const. art. 9, § 2.
- (35) Ariz. Rev. Stat. 1887, §§ 2352-2357; Ariz. Rev. Stat. 1901, §§ 3252, 3257, now codified at Ariz. Rev. Stat. § 27-361 (1976).
- (36) Pa. Law 1893, Art. 14, § 3.
- (37) Ga. Code 1882, Art. 7, § 742.
- (38) N. C. Code 1883, § 3293.
- (39) Va., Act of February 29, 1892, p. 759.
- (40) See F. Graham, Disaster by Default: Politics and Water Pollution 161 (1966).
- (41) See generally, the Sanderson cases: 86 Pa. 401 (1878), 102 Pa. 370 (1883) and 113 Pa. 126 (1886).
- (42) Act of April 22, 1905, Pa. P.L. 260 (repealed 1937).
- (43) Id. Section 4 of the act so specifies.

- (44) Act of June 14, 1923, Pa. P.L. 793, section 1 (repealed 1937).
- (45) Act of June 22, 1937, Pa. P.L. 1987, as amended.
- (46) Act of June 22, 1937, § 310 Pa. P.L. 1998 (repealed 1965).
- (47) Act of May 8, 1945, Pa. P.L. 435.
- (48) Act of Aug. 23, 1965, Pa. P.L. 372, now codified at Pa. Stat. Ann. tit. 35, §§ 691 et seq. (1977).
- (49) Id. § 691.315(a).
- (50) Id.
- (51) Id. § 691.601.
- (52) Id. § 691.8.
- (53) Id. § 691.316.
- (54) The Colorado Mined Land Reclamation Act, Colo. Rev. Stat. §§ 34-32-101 et seq. (1973), as amended by 1976 Colo. Sess. Laws, chap. 149, p. 724.
- (55) Id. § 34-32-116(h).
- (56) Sieber v. Frink, 7 Colo. 148, 2 P. 901 (1884); Fuller v. Swan River Placer Min. Co., 12 Colo. 12, 19 P. 836 (1888); Strickler v. City of Colorado Springs, 16 Colo. 61, 26 P. 313 (1891).
- (57) H.B. 1123, 1979 Session.
- (58) Colo. Rev. Stat. § 37-91-102 (1973).
- (59) Colo. Rev. Stat. §§ 37-90-101 et seq. (1973).
- (60) Colo. Rev. Stat. § 37-90-103(21) (1973).
- (61) Annot. 56 A.L.R. 303 (1928).
- (62) See Herriman Irr. Co. v. Butterfield Mining and Milling Co., 19 Utah 453, 55 P. 537 (1899), where the court took judicial notice that tunnels intercept surface waters, and Safranek v. Town of Limon, 123 Colo. 330, 228 P.2d 975 (1951).

- (63) *Sloss-Sheffield Steel & Iron Co. v. Wilkes*, 231 Ala. 511, 165 So. 764 (1936).
- (64) *Stubbs v. Ereanbrack*, 13 Utah 2d 45, 368 P.2d 461 (1962).
- (65) See *Commonwealth v. Barnes and Tucker Co.*, 477 Pa. 115, 371 A.2d 461 (1977). In Colorado the primary burden is upon the person claiming injury, but once this burden is met, the other party must provide a method showing how this injury can be overcome. Only then can he continue his activities. See *Farmers Highline Canal and Reservoir Co. v. Golden*, 129 Colo. 575, 272 P.2d 629 (1954).
- (66) This is evidenced by the 1866 and 1872 mining laws; the early Homestead Acts; Act of July 4, 1866, 14 Stat. 86, 30 U.S.C. § 21 (1976); Act of May 10, 1872, 17 Stat. 91, 30 U.S.C. § 22 (1976); Homestead Act of March 3, 1891, 26 Stat. 1097, 43 U.S.C. § 161 (1976), repealed by Pub. L. No. 94-579 (1976).
- (67) 30 Stat. 1151, 33 U.S.C. 401 (1976).
- (68) Act of June 30, 1948, Pub. L. No. 80-845; ch. 750, 62 Stat. 1155.
- (69) See note 64, supra.
- (70) *United States v. Standard Oil Co.*, 384 U.S. 224 (1966).
- (71) Corps of Engineers Requirements for Permits for Industrial Discharges into Navigable Waters, U.S. Army Corps of Engineers, News Release, Seattle District, Aug. 4, 1970.
- (72) Exec. Order No. 11574, 3 C.F.R. 188 (1970).
- (73) Federal Water Pollution Control Act Amendments of 1972; Pub. L. 92-500 (1976). 86 Stat. 816 (1972) codified at 33 U.S.C. §§ 1251 et seq.
- (74) 33 U.S.C. § 1251.
- (75) 33 U.S.C. § 1311(b)(1)(A) (1976).
- (76) 33 U.S.C. § 1311(b)(2)(A) (1976). This deadline was altered by the 1977 amendments to FWPCA, Pub. L. No. 95-217, 33 U.S.C. §§ 1251 et seq. The deadline for compliance for

BAT is not later than three years after the date effluent limitations are established, or not later than July 1, 1984, whichever is later, but in no case later than July 1, 1987. 33 U.S.C. § 1311(b)(2)(F) (1978 Supp.).

(77) 33 U.S.C. § 1257(a) (1976).

(78) 33 U.S.C. § 1362(6) (1976).

(79) 33 U.S.C. § 1362(16) (1976).

(80) United States v. Earth Sciences, Inc. (D.C. Colo. 1977); Sierra Club v. Abston Const. Co., 10 E.R.C. 1416 (N.D. Ala. 1977).

(81) 33 U.S.C. § 1288 (1976).

(82) 33 U.S.C. § 1288(a)(2) (1976).

(83) 33 U.S.C. § 1288(f) (1976).

(84) 33 U.S.C. § 1288(b)(2)(C)(ii) (1976).

(85) 33 U.S.C. § 1288(b)(2)(G) (1976).

(86) 40 C.F.R. § 130.2(q) (1976).

(87) EPA Guidelines, Chapter 6, p. 20.

(88) See Ipsen, Water Quality Management Plans and Their Impact on Mining Operations, 23 Rocky Mtn. Min. L. Inst. 551 (1977).

(89) 33 U.S.C. § 1313 (1976).

(90) 33 U.S.C. § 1313(a)(3) (1976).

(91) 33 U.S.C. § 1313(d) (1976).

(92) 33 U.S.C. § 1313(c) (1976).

(93) 33 U.S.C. § 1342 (1976).

(94) For a complete analysis of Pub. L. 92-500, see Keppler, Mining and the Federal Water Pollution Control Act Amendments of 1972, 20 Rocky Mtn. Min. L. Inst. 501 (1975).

- (95) 30 U.S.C. §§1201-1328, Pub. L. No. 95-87, 91 Stat. 445 (1977).
- (96) 30 U.S.C. § 1202(f).
- (97) 30 U.S.C. § 1201(f).
- (98) 30 U.S.C. § 1202(g).
- (99) 30 U.S.C. § 1211.
- (100) 30 U.S.C. § 1231.
- (101) An exception for lignite coal is made, and such coal shall be charged at a rate of 2 per centum of the value of the coal at the mine, or 10 cents per ton, whichever is less. 30 U.S.C. § 1232.
- (102) 30 U.S.C. § 1232(g)(2).
- (103) H.R. Rep. No. 218, 95th Cong., 1st Sess. 76 (1977).
- (104) 30 U.S.C. § 1251.
- (105) 30 U.S.C. § 1252.
- (106) See 30 U.S.C. §§ 1252(a), (b), (c).
- (107) 30 U.S.C. § 1252(a).
- (108) 30 U.S.C. § 1252.
- (109) 30 U.S.C. § 1273.
- (110) 30 U.S.C. § 1252(e)(1).
- (111) 30 C.F.R. § 722.11 (1977).
- (112) 30 U.S.C. § 1253(a).
- (113) 30 U.S.C. § 1273(c).
- (114) 30 U.S.C. § 1273(a).
- (115) 30 U.S.C. § 1254.
- (116) 30 U.S.C. § 1253.

(117) 44 Fed. Reg. 14907 (1979).

(118) See 30 C.F.R. §§ 700-890.

(119) 30 U.S.C. § 1257.

(120) 30 C.F.R. § 779.13.

(121) 30 C.F.R. § 779.17 (1979).

(122) 30 U.S.C. § 1258.

(123) 30 U.S.C. § 1258(a)(13).

(124) 30 C.F.R. § 780.25 (1979).

(125) Hydrologic balance is defined as "the relationship between the quality and quantity of water inflow to, water outflow from, and water storage in a hydrologic unit such as a drainage basin, aquifer, soil zone, lake, or reservoir. It encompasses the dynamic relationship among precipitation, runoff, evaporation, and changes in ground and surface water storage." 30 C.F.R. § 701.5 (1979).

(126) 30 U.S.C. § 1260.

(127) 30 U.S.C. § 1265.

(128) 30 U.S.C. § 1265(b)(2).

(129) 30 U.S.C. § 1265(b)(10).

(130) 30 C.F.R. § 816.42 (1979).

(131) Id.

(132) 30 C.F.R. §§ 816.41-.45 (1979). Stream diversion will be approved only under specific guidelines. The preferred action is to create a 100-foot buffer zone around the stream in which surface mining activities are prohibited. See 30 C.F.R. § 816.57 (1979).

(133) 30 U.S.C. § 1265(b)(10(D)).

(134) 30 U.S.C. § 1307(a).

(135) 30 U.S.C. § 1307(b).

- (136) 30 U.S.C. § 1266.
- (137) 30 U.S.C. § 1266(b)(2).
- (138) 30 U.S.C. § 1266(b)(12).
- (139) 30 U.S.C. § 1265(b)(10)(F).
- (140) 30 C.F.R. § 701.5 (1979).
- (141) 30 U.S.C. § 1260(b)(5).
- (142) See In re Surface Mining Regulation Litigation, 456 F. Supp. (1978).
- (143) Canada Water Act, R.S.C. 1970, c. 5 (1st Supp.).
- (144) Id. S. 9.
- (145) Id.
- (146) Id. at S. 8.
- (147) Id.
- (148) Id. at S. 16.
- (149) Northern Inland Waters Act, R.S.C. 1970, c. 28 (1st Supp.).
- (150) Id. at S. 6.
- (151) Id. at S. 11.
- (152) National Environmental Policy Act of 1969, 42 U.S.C. 84321 et seq. (1970).
- (153) Fisheries Act, R.S.C. 1970, c. F-14, as amended by R.S.C. 1970, c. 17 (1st Supp.).
- (154) Id. at S. 33.
- (155) Id.
- (156) British North America Act of 1867, 30 and 31 Victoria, c. 3, S. 91. There are some important amendments to the B.N.A. Act of 1867, such as the creation of new provinces and the return of natural resources to the western provinces.

- (157) R. V. Sault Ste. Marie (1978), 3 C.R.(3d) 30.
- (158) British North America Act of 1867, S. 92.
- (159) British Columbia
 Environment and Land Use Act, S.B. c. 1971, c. 17
 Pollution Control Act, S.B. c. 1967, c. 34
 Manitoba
 Clean Environment Act, S.M. 1972, c. 76
 New Brunswick
 Clean Environment Act, R.S.N.B. 1973, c. C-6
 Newfoundland
 Newfoundland and Labrador Water Authority, R.S.N.
 1970, c. 44
 Waters Protection Act, R.S.N. 1970, c. 394
 Nova Scotia
 Water Act, R.S.N.S. 1967, c. 335
 Ontario
 Ontario Water Resources Commission Act, O.R.S.
 1970, c. 332
 Quebec
 Water Board Act, R.S.Q. 1964, c. 183
 Saskatchewan
 Department of Environment Act, S. 8, 1972, c. 31
 Water Resources Management Act, S. 8, 1972, c. 146

In addition to the above environmental acts, all provinces have statutes regulating mining, some of which deal generally with mine drainage.

- (160) Clean Water Act, S.A. 1971, c. 17
 Department of Environment Act, S.A. 1971, c. 24
 Groundwater Control Act, R.S.A. 1970, c. 162
 Land Surface Conservation and Reclamation Act, S.A.
 1973, c. 34
 Water Resources Act, R.S.A. 1970, c. 388
 Energy Resources Conservation Act, S.A. 1971, c. 30
 Coal Mines Regulation Act, R.S.A. 1970, c. 52
- (161) See Alberta's Land Surface Conservation and Reclamation Act, S.A. 1973, c. 34.
- (162) Comment: Aquaculture: Problems of Implementation Under Existing Law, 10 U.B.C.L. Rev. 301 (1975-76).
- (163) Groundwater Control Act, R.S.A. 1970, c. 162.

- (164) See Suzuki v. The Ionian Leader [1950] 3 D.L.R. 790 (Ex. Ct.).
- (165) For a more complete picture of pollution control in Australia, see Lanter, The Legislative Control of Air and Water Pollution in Australia (1970).
- (166) Environment Protection Act of 1974, as amended by the Environment Protection Act of 1975, No. 36.
- (167) This is accomplished by denying ministerial approval of an export license or withholding reserve bank approval for foreign loans.
- (168) State Environmental Protection Act of 1971.
- (169) Fisheries Act of 1958, § 48.
- (170) Harbour Boards Act of 1958, § 63(1).
- (171) Groundwater Act of 1969, §§ 2, 47, 77 (1969).
- (172) For a more detailed analysis of British Land Use Planning, see Dempsey & Fields: Mineral Development in the United Kingdom, 14 Land and Water L.R. 75 (1979).
- (173) Town and Country Planning Act of 1971.
- (174) Town and Planning Act of 1932, 22 & 23 Geo. V, c. 48.
- (175) Town and County Act of 1944, 7 & 8 Geo. V, c. 47.
- (176) Town and Country Act of 1947, 10 & 11 Geo. V, c. 51.
- (177) Town and Country Planning Act of 1971, 19 & 20 Eliz. 11, c. 78.
- (178) The Coal Act of 1938, 1 & 2 Geo. VI, c. 52: Title to all coal is vested in the government's Coal Committee.
- (179) Opencast Coal Act of 1958, 6 & 7 Eliz. 2, c. 69.
- (180) Town and Country Planning Act of 1971, c. 78, § 245.
- (181) Town and Country Planning Act of 1971, c. 78, § 87.

(182) For a more detailed analysis of the German experience, see Plater, Coal Law From the Old World, 64 Ky. L.J. 473 (1976).

(183) The Prussian Mining Law of 1865, as amended still serves as a model for mining permits today. See ALLEGEMEINES BERGGESETZ, 24 June 1865.

(184) See generally, E. Knop and H. W. Koenig, The Solution of Difficult Water Engineering Problems by Water Associations (1970).

(185) See generally, Knop and Koenig, Water Supply Associations in the Rhine-Ruhr Industrial Region, in SUR RUHRGEBIET PLANE, PROGRAMME, PROJEKTE 29 (1973).