



The Office of Surface Mining's Abandoned Mine Land Program

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Introduction

In the early 1970s, the mining industry held a symposium concerning the revegetation of surface mine land (West Virginia University, 1971). Ira Latimer, Jr. presented the keynote address at the conference, both asking and answering the simple question, "Why revegetation?" He noted that natural revegetation of a spoil site is a very slow process. In one instance, nearly 100 years had passed before spoil became as well aggregated as undisturbed soil. Mr. Latimer's response to this was that "nature perhaps cannot do all that we want by herself" (Bondurant, 1971). Latimer stated that the primary reason for vegetation of mined lands should be stabilization of the slope, thereby reducing erosion, acidity and sedimentation. He continued by explaining the potential uses of reclaimed land. Five broad categories were listed: agriculture, woodland (for timber), recreation, wildlife, and other multiple uses (Bondurant, 1971).

The surge of interest in land reclamation led to the creation of the Surface Mining Control and Reclamation Act (SMCRA) in 1977. Before that time, 25 states individually regulated surface coal mining. The SMCRA provides an umbrella that creates greater unity in the effort to reclaim America's abandoned mine lands.

The Abandoned Mine Land Program

Despite previous efforts by the states, numerous problems such as topsoil loss, landslides, and acid mine drainage were found at abandoned mine sites. Recognizing these problems, Congress established the Surface Mining Control and Reclamation Act on August 3, 1977. The Act created two major programs: 1) A regulatory program (Title V) that established standards and procedures for approving mining permits, and 2) The Abandoned Mine Land Program (Title IV) (OSM, 1992).

The Abandoned Mine Land (AML) program set up a funding mechanism for abandoned mine reclamation. A tax on coal production was established. Fees of 35 cents per ton of surface mined coal, 15 cents per ton of coal mined underground, and 10 cents per ton of lignite mined are collected by the Office of Surface Mining (OSM) on all active mining operations (OSM, 1997). Those funds are placed in an interest-bearing account specifically for the purpose of paying the reclamation costs of AML projects. At least 50 percent of the funds collected from each state or Native American tribe are returned to that state or tribe, "provided it has a federally-approved AML Program" (St. Aubin and Massie, 1987). Another 20 percent of the funds are allocated to states and tribes based on the amount of coal produced in each of those areas prior to August 4, 1977 (OSM, 1997)

In order to gain a federally approved AML program, a state or tribe must first establish a Title V regulatory program. Once the Title V program is approved, the path is cleared for a Title IV AML Program and its associated funds. Currently 23 states and three tribes have established their own programs and fully participate in the AML Program. Eleven other states and fourteen tribes do not maintain regulatory programs, but are still eligible for discretionary funds, typically in "emergency cases". Many of these non-program states/tribes no longer have an active coal mining industry, leaving no reason to establish a Title V regulatory program (St. Aubin and Massie, 1987). The vast majority of high priority sites are located in the Appalachian Mountains or the Ohio River Valley. A map of these high priority sites can be viewed on the OSM web page (<http://www.osmre.gov/zamlis.html>).

Objectives of the SMCRA and AML Programs

The adoption of an AML Program by a state or tribe fulfills the primary objective of SMCRA: to implement a reclamation program. Once implemented, "SMCRA provides authority to...reclaim and restore land and water resources adversely affected by past mining." In this case, "past mining" means prior to August 3, 1977. Due to the bureaucratic lag-time involved in setting up the program, some sites mined after the cut-off date have been enrolled (OSM, 1997).

Beyond the broad objectives set forth by SMCRA, each state and tribe typically develops goals to guide its AML Program. Most states have objectives quite similar to those found in the SMCRA. For instance the Oklahoma AML Reclamation Program states its mission to be "to protect the public from hazards left as a result of past coal mining practices" (Oklahoma Conservation Commission, 1998). Maryland has a much more specific goal: "to promote the reclamation of all abandoned mined areas...that have been left in an inadequately reclaimed condition and continue to endanger the health or safety of the public, degrade the quality of the environment or diminish the beneficial use of land and water resources" (Maryland Bureau of Mines, 1997). They follow up with a list of ten specific objectives of the AML Program, ranging in scope from economic considerations to greenspace uses of reclaimed lands.

Selection of Sites to be Reclaimed

When the OSM created the Abandoned Mine Land Program, it was with the knowledge that the funding process would not provide the necessary money to reclaim all eligible sites. Therefore, it became necessary for each state to develop some type of ranking process for selection of sites to be reclaimed. The State of Missouri has outlined in its AML Program description the process it follows in determining what sites should be selected for application of AML activities.

First and foremost, the AML Program in Missouri is required by law to address only those problems caused by coal mining. The Missouri AML Program does not deal with problems created by mining other commodities. However, States which have certified that all coal reclamation has been completed may then use their AML moneys for other reclamation projects

(OSM, 1997). Sites are selected according to a classification system that uses three levels of priority. Each priority level describes the intent of the reclamation activity (Missouri DNR, 1997):

Priority I: The protection of public health, safety and general welfare from extreme danger resulting from the adverse effects of past coal mining practices;

Priority II: The protection of public health, safety and general welfare from the adverse effects of past coal mining practices that do not constitute extreme danger; and,

Priority III: Restoration of land and water resources and the environment previously degraded by the adverse effects of past coal mining practices.

Examples of Priority I and II sites include dangerous mine spoil and refuse piles, highwalls, subsidence, and polluted water used for agricultural and human consumption. Priority III (or environmental) problems include bare acidic spoils and coal refuse that pollute water through soil erosion, sedimentation and acid mine drainage (Missouri DNR, 1997).

Description of Sites and Reclamation Methods

Mine Spoil and Refuse- Spoil consists of the soil and rock that is stripped to expose the coal during a surface mining operation. Refuse is created in the coal cleaning process and is commonly referred to as "gob" or "slurry" (St. Aubin and Massie, 1987). Prior to the SMCRA, both spoil and refuse were commonly deposited in large piles. The resultant steep slopes not only prevented growth of vegetation, but also generated a great deal of sediment runoff from the mining sites. The primary problem with these large piles is that they are often high in pyrites, which easily oxidize into an acid toxic to both plant and animal life. Runoff from the pile would mobilize the acids and contaminate the surrounding land and water.

Obviously the primary concern in a spoil and refuse site is to eliminate acid production and erosion. The first step toward that objective is to re-grade the site, establishing stable slopes and proper drainage. Limestone may then be added to neutralize acidity. The site is then fertilized and seeded. In extreme cases, up to an additional two feet of soil may be added to the site prior to seeding (St. Aubin and Massie, 1987).

Highwalls- If the operator has not backfilled into the opened area of a coal mine, a sheer wall of rock will be left behind. This sheer wall is known as the highwall and can be up to 150 feet high. The associated pit is sometimes water-filled. Weathering gradually destabilizes the highwall, creating a risk of collapse or smaller rockslides. These highwalls become an obvious safety hazard when located near populated areas or roads. Reclamation of such a site involves filling or partially filling the final cut area against the highwall, or the highwall itself is graded to a more stable slope. The worked area is then vegetated to insure slope stability (St. Aubin and Massie, 1987).

Subsidence- The less glamorous but equally problematic side of the AML Program deals with the prevention and reclamation of areas prone to subsidence. Subsidence is the shifting or settling of an underground mine and is identified by ground surface depressions or cracks. About 7 million acres of land in the United States are underlain by abandoned coal mines. Roughly 500,000 acres of that total is located within urban areas. Subsidence is a direct cause of property damage and therefore becomes a problem in urban areas where utilities such as gas and electric service and sewer lines are potentially affected. In cases where subsidence does occur in a highly developed area, the mine is accessed by drilling a hole directly into the mine void and then filled with material such as sand or flyash (OSM, 1992).

Monitoring and Inspections

A description of how monitoring of reclamation sites is to occur is provided in Title V of the SCMRA. Section 517 of the SMCRA states that "The Secretary (of the Interior) shall cause to be made such inspections of any surface coal mining and reclamation operations as are necessary to evaluate the administration of approved State programs." Furthermore, "The inspections by the regulatory authority shall occur on an irregular basis averaging not less than one partial inspection per month and one complete inspection per calendar quarter for the surface coal mining and reclamation operation covered by each permit" (OSM, 1997). No specific method of inspection is provided, except in cases where the hydrologic balance of the site is threatened. In those instances, there is an obvious emphasis on maintenance of proper hydrology for the site. Specific goals for other objectives such as slope stabilization and vegetative cover are not provided in the SMCRA.

Accomplishments and Problems of the AML Program

Fifteen years after the Abandoned Mine Lands Program began, almost 10,000 sites containing abandoned mine land problems had been documented in the OSM's national inventory. Approximately 4,000 of those sites had been partially or completely reclaimed (OSM, 1992). As of March 31, 1997, "States and Indian Tribes using federal AML grant funds (and supported by OSM) have reclaimed \$1,053 million worth of public health & safety coal related problems (priority 1 & 2) and \$ 165 million worth of environmental coal related problems" (priority 3) (OSM, 1997). Total acres of reclaimed land has not been quantified due to the varying measures used (e.g. feet, acres, count). Because the program is so large, it is difficult to point to specific accomplishments other than those of sites reclaimed and the millions of dollars spent. Other general accomplishments described in specific examples of restored sites include eliminating "sediment sources" and "threats to the public water supply" (St. Aubin and Massie, 1987). Several other benefits, most of which are indirect (e.g. wildlife habitat) are also mentioned.

While the Department of the Interior and the OSM are quick to point out the successes of their AML Program, credit should also be given for their observation of the program's remaining problems. They note that "Of the \$3.6 billion of high priority (priority 1 & 2) coal related AML

problems in the AML inventory, \$2.5 billion, 69%, have yet to be reclaimed. New problems are constantly added to the inventory as conditions worsen at old mine sites and as development expands into old mining areas" (OSM, 1997). Only ten percent of all "environmental problems" (priority 3 sites) have been reclaimed, which means approximately \$1.7 billion worth of problems still exist on those lands. The total dollar amount is likely to be higher due to the fact that no systematic method of inventorying priority 3 sites exists at this time (OSM, 1997).

McElfish and Beier (1990) detected a cash-flow problem in a monograph for the Environmental Law Institute that reviewed the SMCRA. In the report, they stated that reclamation of all inventoried (priority 1 & 2) sites "will cost approximately \$5.47 billion. Reclamation of sites with environmental damages could cost an additional \$30 billion." As you can see, McElfish and Beier estimate a much larger amount of costs due to environmental problems than does the OSM. McElfish and Beier (1990) go on to criticize the AML fund, stating that "as currently structured, (the fund) is grossly inadequate to reclaim identified abandoned mine sites."

Assessment of the Abandoned Mine Land Program

If the figures from McElfish and Beier are correct, it is quite apparent that every AML site may not be reclaimed by the year 2004, the year federal authorization of the program ends. Although the program was re-authorized once in 1992, reauthorization is likely. Undeniable funding problems exist if the goal is to eliminate hazards to human health as rapidly as possible. I believe one way to possibly improve the situation is to increase the tax on each ton of coal mined in the United States. The current fee structure of 35 cents per ton of surface mined coal, 15 cents per ton of coal mined underground, and 10 cents per ton of lignite mined has not changed since the program's adoption in 1977. A raise of just one-nickel on each ton would not only be a tremendous boost to the AML fund, but is also easily justified by inflation. Of course, other economic considerations must be made according to historic changes in the price of coal as well as government subsidies to the industry. Nonetheless, a tax hike does appear to be overdue.

It is understandable for some aspects of the program to be emphasized more than others given the fact that the AML Program is desperately short of money. This is the case in the determining a priority level for each abandoned site. In order for a site to be considered "high priority", some danger to human health or safety must exist. This simple methodology makes perfect sense for a government designed to please its citizens in the short run. However, if truly long-term benefits are to be achieved by the AML Program, a better consideration of what they call environmental problems will be necessary. Millions of acres of land are eligible for AML projects. The residue of abandoned mines potentially affects any number of endangered plant and animal species. Those species must systematically be given a higher priority than indicated by the current methods. In general, the OSM should attempt to view wildlife benefits as more than a pleasant side effect of the reclamation performed in their program.

A solution to this problem may be found in better development of reclamation monitoring and inspection methods. Perhaps more specific goals relative to vegetation and wildlife habitat could be added to the SMCRA. By no means should these new additions to the law be so restrictive

that states are deterred from reclamation efforts. These new objectives should instead be viewed as an incentive to perform abandoned mine reclamation projects in a more comprehensive manner.

Summary

Overall the Abandoned Mine Land Program appears to have been a success. In the first 15 years alone, nearly 4,000 sites were progressing toward or were completely reclaimed. These reclaimed lands have undoubtedly improved the living environment of thousands if not millions of Americans, the stated purpose of the program. With that much achieved however, it is time to move into the next century with broader goals. These goals should aim to improve the condition of the environment with fewer human strings attached.

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