

Pennsylvania's Comprehensive Plan for Abandoned Mine Reclamation

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I. Introduction

Pennsylvania has a history of coal mining beginning in the 1800's. Coal from Pennsylvania fueled the industrial growth of the country and provided the energy to fight two world wars. But this legacy has left numerous scars on the Pennsylvania landscape. There are over 250,000 acres of abandoned surface mines with dangerous highwalls and water filled pits. About 2,400 miles of streams do not meet water quality standards because of drainage from abandoned mines. There are uncounted households without adequate water supply due to past mining practices. Mine fires and subsidence plague many Pennsylvania communities.

Pennsylvania long has been leader in reclaiming abandoned mine lands. In the mid 60's, a bond issue authorized \$200M to solve the problems of the past. Operation Scarlift, as it was known, completed over 500 stream pollution abatement projects to the tune of \$75,000,000. Seventy five underground mine fires were extinguished at a cost of \$24,000,000 and over 150 areas subjected to mine subsidence were stabilized at a cost of \$26,000,000. Air pollution at 30 burning refuse banks was controlled for a cost of \$16,000,000.

The reclamation of abandoned mine lands including the abatement of mine drainage is essential to improving the environment and the well-being of the citizens of Pennsylvania. In the past, the selection of reclamation projects was based largely on the requirements of the funding source and the consent of the landowner.

During the "Operation Scarlift" days, the bond issue legislation focused attention on restoring streams impacted by acid mine drainage, on extinguishing mine fires and on controlling mine subsidence. When federal funding became available from Title IV of the Surface Mining Control and Reclamation Act (SMCRA), OSM focused attention on Priority 1 and 2 health and safety problems rather than general welfare problems. Mine drainage abatement was not considered a priority 1 or 2 problem in most cases. Revisions to the federal policy now consider general welfare problems that are in proximity to populated areas or have adverse economic impacts as potential priority 2 problems. These changes to the federal law give more flexibility in expending the SMCRA funds.

More recently, grassroots organizations have expressed the need to improve the quality of streams polluted by acid mine drainage. While these organizations emphasize mine drainage treatment and abatement, they have taken an areal approach focusing on

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watershed cleanup. Rehabilitation plans are developed addressing the watershed as a whole. The Department, also, has begun to take an areal approach looking, for example, at water supplies impacted by mining on an areal basis.

The difficulty facing those engaged in abandoned mine reclamation is the magnitude of the problem (\$15 billion by some estimates) and the dearth of funds to address it. Decision makers have a difficult task in determining how to spend the limited resources. A decision to fund a project means another worthy project will not be funded. It is obligatory, therefore, for abandoned mine reclamation "practitioners" to effectively plan for abandoned mine reclamation so that measurable, significant benefits accrue from the money spent. A comprehensive approach to planning is needed to accomplish this goal.

II. Purpose of this Plan

The purpose of this Plan is to establish a frame-work for organizing reclamation efforts, for coordinating among those involved in reclamation activities, for prioritizing expenditures and for decision-making. The Plan is a guide; as such, it is not an absolute under which every decision is to be made and every action must fall. The Plan is intended to help those involved in reclamation activities focus on similar, achievable goals. The Plan is intended to be a Pennsylvania Plan, not the "property" of any one institution or group.

III. Guiding Principles

In developing and implementing a comprehensive plan for abandoned mine reclamation, the resources (both human and financial) of the participants must be coordinated to insure cost-effective results. In addition, resources are limited requiring priorities to be set. The following set of principles are intended to guide (nothing is absolute) decision making.

- Partnerships between the DEP, watershed associations, local governments, environmental groups, other state agencies, federal agencies and other groups organized to reclaim abandoned mine lands are essential to achieving reclamation and abating acid mine drainage in an efficient and effective manner.
- Partnerships between AML interests and active mine operators are important and essential in reclaiming abandoned mine lands.
- Preferential consideration for the development of AML reclamation or AMD abatement projects will be given to watersheds or areas for which there is an approved rehabilitation plan. (See Appendix B)
- Preferential consideration for the use of designated reclamation moneys will be given to projects that have obtained others sources or means to partially fund the project or to projects that need the funds to match other sources of funds.
- Preferential consideration for the use of available moneys from federal and other

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sources will be given to projects where there are institutional arrangements for any necessary long-term operation and maintenance costs.

- Preferential consideration for the use of available moneys from federal and other sources will be given to projects that have the greatest worth.
- Preferential consideration for the development of AML projects will be given to AML problems that impact people over those that impact property.
- No plan is an absolute; occasional deviations are to be expected.

IV. Goals

In addition to the principles that will be used to guide decision making, specific goals to be achieved by the comprehensive plan are set forth below. These goals are to be reviewed, modified, expanded or changed when necessary to insure the goals meet the needs of the time.

1. To focus expenditures for the reclamation abandoned mine lands on maximizing benefits.
2. To develop partnerships involving local citizens, local government and other groups that promote abandoned mine reclamation.
3. To develop long-term funding sources that would allow for long-term planning and long-term funding commitments.
4. To develop an areal approach to reclamation planning that will result in reclamation and rehabilitation of an entire geographical area.
5. To encourage the development and use of innovative technologies that reduce the cost of reclamation.
6. To coordinate the activities of the Abandoned Mine Land program with the Mine Regulatory program so that active mine operators are encouraged to remine and reclaim where possible.
7. To insure that property owners who allow the use of their lands for long-term treatment of abandoned mine drainage are not subject to personal or environmental liabilities because of the projects.

V. Plan Elements

A. Inventory of Abandoned Mine Land Problems

In order to develop a comprehensive reclamation plan, the size and scope of the abandoned mine problem must be understood. Over the years, many surveys have been

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done to inventory the problem and measure its impact. Operation Scarlift developed an inventory of AMD problems on selected watersheds. The Bureau of Abandoned Mine Reclamation maintains an "Abandoned Mine Land" inventory that was developed in the early 80's under SMCRA but has not been adequately updated over the entire state. This inventory contains an extensive list and assessment of abandoned mine lands problems and serves as the basis for OSM approval of Title IV grant expenditures. The inventory, while fairly comprehensive regarding health and safety problems, does not contain a complete list of acid mine drainage problems nor a complete assessment of water supply restoration needs.

The inventory is currently maintained on a mainframe computer but is not geographically based. So, information cannot be removed from the system in a user friendly manner. This inefficiency costs time and money and is a Bureau of Abandoned Mine Reclamation priority for enhancement.

Local groups including watershed associations, conservation districts and others have been collecting data on abandoned mine lands problems for many years. These data are extremely important in defining the scope of the problem and needs to become part of the statewide inventory.

To support comprehensive planning, a Geographical Information System is needed to store and retrieve information in an efficient, useful manner. Such a system should be available to all who are involved in addressing AML problems.

B. An Areal Approach to AML Reclamation

The reclamation and rehabilitation of abandoned mine lands needs to focus on geographical areas that contain abandoned mine land problems. These can be watersheds, political units, geologic units or other areal measures. The geographical focus will allow the restoration of an entire area rather than at scattered individual sites. Some common areas for this focus would include:

1. Watersheds

The use of a watershed as an areal boundary is appropriate when the major problem is the pollution of the watershed by drainage from abandoned mines. In determining if a watershed should be given attention, the following criteria should be considered:

- The potential for water quality improvement in the watershed
- The potential for a state / federal / local partnership
- The existence of funding from other sources
- The potential for re-mining in the watershed
- The potential uses for the watershed

Watersheds meeting the criteria would be ripe for the development of a watershed rehabilitation plan.

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2. Areas experiencing loss or contamination of domestic water supplies.

The use of water company service areas as an areal boundary is appropriate when many residents are experiencing water loss or contamination due to past mining. The following criteria will be used to select water supply development projects.

- The public health concerns where there is a lack of potable water
- The number of household involved
- The availability of an approved source of water
- An agreement by local government or public utility to assume operation and maintenance costs
- Lack of a feasible alternative
- Cost per household

3. Other areas for focus

The reclamation of surface mined lands should also be addressed on an areal basis. In determining if an area should be selected, the following should be considered.

- Areas that are adjacent to or support public recreational areas.
- Areas that protect or enhance public water supply sources..
- Areas where past mining activities create an immediate threat to public health or safety (mine fires, mine subsidence, mine wastes).
- Areas designated by other state or federal agencies where mine reclamation would contribute to overall improvements to the area.
- Areas adjacent to or part of other areas which are undergoing non-mine related environmental enhancements
- Areas adjacent to remining areas
- Groundwater recharge areas

An areal focus, however, cannot be an absolute. There will need to be some flexibility to address site specific, high profile problems as they arise.

C. Institutional Partnerships

As discussed earlier, the magnitude of the abandoned mine land problem in Pennsylvania is greater than any one institution can address in the foreseeable future. Therefore, partnerships among public and private institutions are essential to accomplishing the goals of this comprehensive plan.

Partnerships can develop at any phase in the planning process. The leadership role among the partners is the most important decision the partners must make. The earlier partners establish a leader and define their individual roles, the more effective they will be. For the most part, leadership should lie with a local organization where there is strong, local support and commitment to long-term solutions.

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There is no formula for developing partnerships. Most likely a single institution will become interested in an area and bring other institutions into a partnership as needs and interest arise.

D. The Rehabilitation Plan.

The Rehabilitation Plan is the foundation upon which reclamation projects are to be developed and approved. The focus of the Rehabilitation Plan will depend on the problems being addressed. When dealing with water pollution problems, the Rehabilitation Plan must identify all of the environmental problems within the area not just those related to mining. Alternative solutions to the mining related problems must be identified including a cost estimate for each alternative. For non-mining related problems, the status of clean-up efforts must be discussed and/or referrals made to the appropriate regulatory body.

When dealing with water supply problems, the Rehabilitation Plan must identify all the water loss or contamination problems within the defined area. Alternatives for addressing those problems must be discussed. Similarly, for other areal designations, the reason for making the designation must be fully addressed.

The development of the rehabilitation plan should be done under the leadership of the institutional partners. Realistically, the plan will undergo several iterations as the partners bring their individual needs into the process. Over time, the plan will evolve into a comprehensive framework for addressing the abandoned mine land problem.

The implementation of the plan must be discussed in detail including the extent to which each of the partners will contribute to the implementation. A proposal for financing the plan and time schedule for implementation should be included. The outline for a Rehabilitation Plan is attached as Appendix A.

[Appendix A](#) - A Rehabilitation Plan for Abandoned Mine Reclamation, June 1997

[Appendix B](#) - Criteria for Assessing a Rehabilitation Plan, June 1997, revised June 1998

[Appendix C](#) - Criteria for Project Selection, June 1997, revised June 1998, updated August 2004

[Appendix D](#) - Transitioning to Pennsylvania's Comprehensive Plan for Abandoned Mine Reclamation, June 1997

[Appendix E](#) - Guideline to Award Abandoned Mine Reclamation Grants, June 1998

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A Rehabilitation Plan for Abandoned Mine Reclamation

Appendix A - June 1997

A Rehabilitation Plan for abandoned mine reclamation should contain certain key elements. These elements are important whether the concern is mine fire control, mine subsidence prevention, mine hazard removal or mine drainage abatement. The elements are inter-related with information from one element feeding the others.

The development of rehabilitation plans is an evolutionary process. Plans begin with a vision and move forward through the initiative, commitment and perseverance of the involved partners. It is not something that can be put together in a week or month. In the beginning, the content of the plan and each element in the plan may be more conceptual than real. As work is completed, the focus will become clearer and the plan will take on some substance.

A Rehabilitation Plan should include the following elements:

1. **A Manageable Area.** Whatever the mining problem being addressed, the selected area must be manageable from both the standpoint of implementation and of achieving the purpose of the plan. Each kind of mining problem will have different means for determining what is a manageable area. In general, a manageable area is one in which rehabilitation can occur within a reasonable time, at a reasonable cost and achieve defined goals

Acid Mine Drainage Abatement - For acid mine drainage abatement, the purpose is to restore the surface water quality and quantity to their pre-mining, natural condition. The degree of pollution, the resources available to develop a plan and the potential for restoring stream uses are important factors in selecting a manageable area. Large drainage basins may have to be divided into smaller units and addressed as separate areas to insure manageability.

Water Supply Replacement -- For water line replacement, the purpose is to restore safe drinking water to those whose water was contaminated or diminished due to mining. The number of people, the availability of a safe source, the distance between homes, the boundaries of public utility service areas are important.

Mine Hazards -- For mine hazards, the purpose is to remove a threat to human health or safety. The size of the hazard, the proximity to habitation, and the risk to people are important.

2. **Problem Definition.** The abandoned mine land problems within the "manageable area" should be identified and assessed as completely as possible.

Acid Mine Drainage Abatement -- For acid mine drainage abatement, all sources of pollution should be considered including mine related, sewage, agricultural, other point and non-point sources. Water quality and quantity data from the pollution sources and the

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stream should be used to identify, assess and prioritize the problem. Biological surveys of the streams would be needed for use of funds from the 10% set-aside program. Much of this information is available from the Department of Environmental Protection, the Pennsylvania Fish and Boat Commission and other state and federal agencies.

Water Supply Replacement -- For replacements, the number of people without water, their present means for obtaining water and the health risk of being without water should be determined.

Mine Hazards-- For hazards, the risk to people should be thoroughly described. Factors such as proximity of the problem to occupied dwellings, accessibility to the problem area by the public and the history of deaths or injury should be detailed.

3. **Goals.** Goals must be reasonable and achievable. There should be a deadline for achieving the established goals. The time schedule will be used to develop the financing plan. Goals can be short-term and/or long-term. The benefits to be gained by achieving the goals should be thoroughly discussed

Acid Mine Drainage Abatement -- In general, the goal for acid mine drainage abatement should be to restore the uses of the streams in the watershed. A goal to merely improve water quality may be achievable but not be reasonable if the improvement does not restore stream uses. Raising the pH of a stream from 3.0 to 5.0 may be achievable but if the stream uses are not restored has any benefit accrued in the area of concern? Similarly, a goal to restore stream uses may be reasonable but not be achievable because a source of pollution is too large to be abated or treated within a reasonable cost or reasonable time.

Water Supply Replacement -- The goal for water replacement should be to provide potable water to people whose supplies have been impacted by past mining activity.

Mine Hazards -- The goal for mine hazards is to eliminate a threat to public safety and health. The risk to the public as measured by the physical conditions at the site, the proximity of the site to people and the costs should be considered in establishing a goal.

4. **Solutions.** Technical alternatives for addressing the problems, including the costs, must be considered. The alternatives should identify both conventional technologies and innovative technologies that reduce the cost of reclamation. The pros and cons of the alternatives should be discussed. The recommended solution should be the one that best achieves the goals at the least cost.
5. **Financing.** A plan for paying for the recommended solution is essential to showing that the goals are achievable. The financing plan should include all sources of funding such as grants, in-kind services, donations of material or equipment, available cash, etc.

The financing plan should identify the partners in the project, their contribution and any agreements that commit the partners to funding the project.

The financing plan should address each project within the plan, its schedule for completion, its capital costs and its annual operation and maintenance costs.

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6. **Implementation.** A strategy for implementing the rehabilitation plan is essential. It should identify who--will do what--by when. It should address all of the elements listed above and be as detailed as necessary to insure the work will get done. The implementation strategy need not be completed when work begins but it should address each element to some degree. It will evolve as work progresses so that at some point in time, it will be clear as to who-will do what-- by when.
7. **Measures of Success.** The rehabilitation plan should identify measures for determining if the plan has been successful. Have the goals been achieved? Are partnerships flourishing? Has the funding occurred as proposed? The measures should be monitored during the life of the plan and a periodic status report prepared.

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Criteria for Assessing a Rehabilitation Plan

Appendix B - June 1997 - Revised June 1998

The funds for abandoned mine reclamation and for implementing rehabilitation plans are limited. Both private and public sources expect sponsors of plans to show substantial benefits to justify expenditures. Agencies and organization with funds for reclamation must have objective, equitable means for selecting which plans and projects will be funded and which will have to wait for future funds. These agencies and organizations are faced with the difficult task of balancing the worth of competing rehabilitation plans.

The Department of Environmental Protection, Bureau of Abandoned Mine Reclamation (BAMR) is responsible for administering a grant from the federal Abandoned Mine Reclamation Trust Fund for the construction of abandoned mine land projects. This grant is the largest source of money for abandoned mine reclamation. The Bureau will use the following criteria to evaluate rehabilitation plans to select plans for funding. Plans assessed as Highly Effective will be considered for funding before those with a lower assessment. Other agencies with funds to distribute may want to consider these same criteria.

1. The Rehabilitation Plan Has Well-Defined Goals.

A Highly Effective Plan is one

- with well-defined goals that are very likely to be achieved
- that addresses all the identified problems.

A Moderately Effective Plan is one

- with well-defined goals that are probably achievable
- that addresses the significant identified problems.

An Effective Plan is one

- with well-defined goals that are potentially achievable
- that addresses most of the identified problems.

2. The Rehabilitation Plan Has A Well-Defined Implementation Plan.

A Highly Effective Plan is one with

- firm commitments from all partners,
- clearly defined roles for each partner,
- detailed work plan for all projects,
- a schedule that is very likely to be achieved.

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A Moderately Effective Plan is one with

- firm commitments from most partners,
- defined roles for each partner,
- a complete work plan for the significant projects,
- a schedule that can be achieved.

An Effective Plan is one with

- some level of commitment from all partners,
- defined roles for each partner,
- a work plan for most projects,
- a schedule that is achievable.

3. The Financing Plan Shows Funding From Several Sources

A Highly Cost Effective plan is one which shows a commitment of more than 50% of the costs of implementing the rehabilitation plan from sources other than the BAMR.

A Moderately Cost Effective plan is one which shows a commitment of more than 35% of the costs of implementing the rehabilitation plan from sources other than the BAMR.

An Effective plan is one which shows a commitment of less than 35% of the costs of implementing the rehabilitation plan from sources other than the BAMR.

4. Projects Proposed In The Rehabilitation Plan Have A High Level Of Worth

It is incumbent upon officials making spending decisions to insure a high level of worth for all projects approved for financing. This worth is some measure of the benefits verses the costs of projects within the plan. Appendix C -- Assessing the Worth of Projects -- should be used to determine the worth of projects proposed in the rehabilitation plan.

- A Highly Effective plan is one in which all projects have exceptional worth.
- A Moderately Effective plan is one in which several projects have exceptional worth and the others have high worth.
- An Effective plan is one in which most projects have high worth and one or two are moderate worth.

5. The Amount Of Money Sought By Project Sponsors Is Within The Department's Financial Ability To Participate.

When rehabilitation plans proposing to use money from the Abandoned Mine Reclamation Trust Fund are approved, the Department is making a commitment to encumber the money from several future federal grants. The Department cannot encumber more money than will become available. Therefore, choices must be made based on the amount of the request, the time frame for expenditure and projected trust

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fund allocations from Congress. The following will be used to assure the BAMR's ability to participate in implementing rehabilitation plans into the future.

- The total amount of money to be allocated by the Department for reclamation projects in a single rehabilitation area shall not exceed \$5 million. If the entire \$5 million is allocated, the time frame for making the allocation shall be at least 10 years.
- No rehabilitation plan shall be allocated more than \$500,000 in a single year.
- The Department shall not allocate more than 25% of its annual AMD grant to rehabilitation plans.

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Criteria For Project Selection

Appendix C - June 1997 - Revised June 1998 - Updated August 2004

The funds to undertake reclamation projects are limited and there will never be enough to address the entire abandoned mine reclamation problem. Therefore, it is obligatory for decision makers to implement projects that have the greatest benefit for the least cost -- the projects that have the most worth. Further, the evaluation of rehabilitation plans depend, to a large extent, on the worth of the projects in a plan. Plans with projects of exceptional worth will be more effective than plans with projects of low worth and should be given priority for funding. In order to decide which projects should be funded, the Bureau of Abandoned Mine Reclamation will use the following criteria.

1. Assessing the problem

Not all problems are equal. Even among the Priority 1 and Priority 2 classifications established in federal SMCRA, there are substantial differences among problems. Some dangerous highwalls are in close proximity to occupied dwellings and create a more serious risk than a dangerous highwall at a remote location. Similarly, people who have completely lost their water due to past mining are at greater risk than people whose water might be contaminated but can be used for sanitary purposes. Further, some mechanism is needed to objectively compare the seriousness of a dangerous highwall problem with the lack of drinking water in a community.

The following chart helps to provide that comparison by rating the seriousness of a problem from moderate to critical based on safety, health, water pollution, drinking water, property damage and land resource considerations. In order to use the chart effectively, some discussion of terms is necessary. The definitions below are not intended to be exclusive.

1. Safety Problems -- include dangerous highwalls, hazardous water bodies, dangerous piles and embankments and dangerous openings. The proximity of the site to places where people congregate, the ease of access and the history of deaths or injuries are factors to be considered in determining the seriousness of the problem.
2. Health Problems -- include mine fires, toxic and explosive gases and toxic waste materials. The proximity of the problem to occupied dwellings is the key factor to be considered in determining the seriousness of the problem.
3. Drinking Water Problems -- include domestic water supplies both private and public. The lack of a safe domestic water supply is the key factor to be considered in determining the seriousness of the problem.
4. Water Pollution Problems -- include streams and acid/alkaline mine discharges that do not meet water quality standards. The impact on the stream and the

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feasibility of recovering a byproduct are key factors to be considered in determining the seriousness of the problem and the priority to be assigned to it.

5. Land Resource Problems -- include offsite impacts such as sedimentation, stream diversions, habitat destruction, clogged streams and stream flooding. The offsite impacts are the key factors to be considered in determining the seriousness of the problem.
6. Property Impact Problems -- include subsidence that impacts occupied dwellings public buildings and commercial structures. The impacts on property are the key factors to be considered in determining the seriousness of the problem.

The Problem

	Health	Safety	Drinking Water
Moderate	Toxic gases present but not near to occupied structures and Hot spots >1000 ft. from structures	Little access or access difficult and Not close >5000 ft to homes, recreational areas	Diminished supply
Serious	Toxic gases within 500 ft. of structure and Hot spots >500 ft. from structures	Easy access; evidence that people visit site and Homes > 2000 ft. from site	Water contaminated, does not meet secondary drinking water standards and Can be reasonably treated
Very Serious	Toxic /explosive gases beneath structure or Hot spots <500 ft. from structures	Access not impeded; evidence of frequent visitation and Homes within 2000 ft.	Water contaminated, does not meet secondary drinking water standards and Cannot be reasonably treated
Critical	Toxic/explosive gases found in structures or Fire beneath structures	Free access, homes, public areas, schools w/in 1000 ft. or Site heavily used for recreation or Recorded deaths or serious injuries at site	No domestic water available. or Does not meet primary drinking water standards. and Cannot be reasonably treated

The Problem

	Water Pollution	Land Resources	Property
Moderate	Discharge pollutes < 1.0 miles of stream. and Discharge contributes <25% of the pollution load to the stream.	Minor off site impacts such as soil deposition from erosion and site is < 25 acres	Not close to structures
Serious	Discharge pollutes > 1.0 miles of stream. and Discharge contributes >25% of the pollution load to the stream.	Some off-site impacts including soil deposition, surface water diversions, or clogged streams and site > 25 acres	Area undermined, structures in danger of failure based on history in the general area.
Very Serious	Discharge pollutes > 1.5 miles of stream. and Discharge contributes >50% of the pollution load to the stream.	Significant off-site impacts including soil deposition, surface water diversions, habitat destruction, seasonal flooding or wetland destruction and	Area undermined, occupied dwellings in imminent danger of failure based on drilling or other scientific data.

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Critical	Discharge pollutes > 3.0 miles of stream. and Discharge contributes >75% of the pollution load to the stream.	Significant off-site impacts such as frequent flooding, destruction of property, etc. which have adversely affected people and site >75 acres	Area undermined, damage has occurred to adjacent structures, or surface fractures exist near structures, conditions expect to continue or Emergency event occurred in nearby area.
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2. Assessing the benefits to be derived from a project

The benefits to be derived from a project need to be quantified so that projects can be compared. The number of people made safe from the elimination of a health and safety problem is a measure of benefits. The number of people supplied with potable water is a measurable benefit. The number of miles of streams returned to designated uses and the acres of land returned to productive use are measures of benefits. The correction of an environmental problem in conjunction with support for an economic development project is a measurable benefit.

The following chart uses the problem assessment step to quantify the benefits that would accrue should the problem be addressed.

Benefits

Moderate	A serious problem will be substantially reduced; >75%; or A moderate problem will be eliminated.
Important	A very serious problem will be substantially reduced; >75% or a serious problem will be eliminated; or a serious problem will be substantially reduced > 75% and a technically and economically feasible resource recovery initiative – based on existing water chemistry and treatment technologies – will be established.
Very Important	A critical problem will be substantially reduced; >75% or a very serious problem will be eliminated; or a very serious problem will be substantially reduced; >75% and a technically and economically feasible resource recovery initiative – based on existing water chemistry and treatment technologies – will be established.
Significant	A critical problem will be eliminated; or A very serious problem will be eliminated and a significant functional wildlife habitat will be created or A moderate, serious, very serious or critical problem will be substantially reduced or eliminated and the reclamation will contribute to site preparation for a confirmed economic development project or a very serious problem will be eliminated and a technically and economically feasible resource recovery initiative – based on existing water chemistry and treatment technologies – will be established.

3. Assessing the costs of a project

Cost is an important element in deciding to implement a project. A project may have significant benefits but may cost too much to implement. Some mine fires and some acid mine discharges could use all of the AML grant money for an entire grant period. Such projects must be measured against other projects so that the most good is accomplished. Further, where appropriate, project costs should include the Present Worth of the annual

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For the purpose of this discussion, costs will be assigned as follows:

Problem/Costs	High Costs	Moderate Costs	Low Costs
Health	> \$2.0 million	< \$2 > \$1. million	< \$1. million
Property	>\$3.0 million or \$35,000 per home	< \$3 > \$1 million or <\$35,000 > \$10,000	< \$1 million < \$10,000 per home
Water Replacement	>\$2.0 million or \$35,000 per home	< \$2 > \$ 0.5 million <\$35,000 > \$10,000	< \$ 0.5 million or < \$10,000 per home
Water Pollution Control	> \$0.8 million	<\$0.8 > \$0.25million	< \$0.25 million
Safety	>\$1.0 million	< \$1 > \$ 0.5 million	< \$ 0.5 million
Land Resource	> \$0.5 million	< \$0.5 >\$.25 million	< \$0.25 million

In the guiding principles to this Plan, preferential consideration is given to projects where the cost is shared among several funding sources. Preferential consideration is also given to projects with an economic development focus that could result in reduced costs for development, design or construction supervision. In applying this principle, the amount of funding sought from the AML grant should be used in the above chart rather than the total project costs.

4. Determining the worth of a project.

The worth of a project must compare the benefits to be achieved by completing it with the cost of the project. Placing a specific dollar value on benefits is problematic at best and takes time, incurs a cost and requires a certain level of expertise. A subjective comparison can serve the need to make choices among projects. The following will aid in assessing the worth of a project.

Benefits vs. Costs

Costs	Benefits			
	Moderate	Important	Very Important	Significant
Low	Moderate Worth	Moderate Worth	High Worth	Exceptional Worth
Moderate	Low Worth	Moderate Worth	High Worth	Exceptional Worth
High	Low Worth	Low Worth	Moderate Worth	High Worth

The guiding principles to this Plan encourage partnerships, multi-source funding and watershed rehabilitation planning. Further, the Rehabilitation Plan described in Appendix A asks that partnerships be identified and a financing plan be developed identifying the sources of funding. Sometimes, funding from the AML grant is identified in the rehabilitation plan as matching fund for other sources. In such cases, the worth of a project proposed for AML funding can be raised one level to show the preference given to comprehensive planning. For example; a rehabilitation plan has an exceptional worth, two high worth and a moderate worth project identified as being needed to return a stream to

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water quality standards. Others have committed to fund the exceptional and high worth projects but the sponsor needs matching money for these projects. He has identified the AML grant as the source of funding for the moderate worth project which will provide the needed match. In this example, the moderate worth project can be increased in value to a high worth project.

5. Summary

The selection of a project begins with an assessment of the problem from moderate to critical. The benefits to be derived by solving the identified problems are defined and the costs are measured. The worth of the project is then established by comparing the costs with the benefits.

Problem Assessment	Benefits Assessment	Cost Assessment	Project Worth
Moderate	Moderate	High	Low Worth
Serious	Important	Moderate	Moderate Worth
Very Serious	Very Important	Low	High Worth
Critical	Significant		Exceptional Worth

For the most part, projects that have a high or exceptional worth will be considered for funding. Moderate worth projects may be considered if the project is part of a Rehabilitation Plan that has several other projects of exceptional or high worth and the moderate worth project is necessary to the completion of the plan. In such cases, the exceptional and high worth projects should be completed or scheduled for completion first.

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Transitioning To Pennsylvania's Comprehensive Abandoned Mine Reclamation Plan

Appendix D

The Pennsylvania Comprehensive Abandoned Mine Reclamation Plan (Plan) establishes a frame-work for organizing reclamation efforts, for coordinating among those involved in reclamation activities, for prioritizing expenditures and for decision-making. As such, it refocuses the efforts of all those who have been reclaiming abandoned mine lands. Implementation of the plan, however, must recognize that reclamation efforts by many groups and agencies have been on-going for many years and there are projects under various phases of development. In many cases, project design work is almost complete and firm commitments have been made to property owners and others. Certainly, some projects should continue under the present scheme while others should be suspended pending application of the comprehensive plan. This may cause some consternation but the objective is to undertake projects that have the most worth to the citizens of the Commonwealth. Such decisions are not easy because seldom are there totally objective criteria. Nevertheless, moving to a comprehensive plan is important to insure that the citizens get the most bang for the buck. The following guidelines will help the program transition to the comprehensive approach.

1. Projects in development or design that involve primacy forfeitures are to be completed. New primacy forfeitures are to be given priority for development design and construction.
2. Projects in design that involve pre-primacy forfeitures that are also classified as priority 1 or 2 are to be completed.
3. Projects in design that are in accord with the guiding principles set forth in Section III of the Comprehensive Plan should continue to be developed, designed and constructed.
4. Projects in design where easements have been fully secured should be completed.
5. Projects where design has been completed and could be sent to bid except for easements should be completed unless the easements will take too much time.
6. Projects in design that can be completed by In-House construction crews should be completed.
7. Projects in design where a firm commitment has been made to a property owner or group should be completed.
8. Projects in design that have a exceptional or high worth as defined in Appendix C

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should be completed.

9. Projects in development should be evaluated to determine their relative worth and moved to design only if the worth is high or exceptional as defined in Appendix C.

10. All other projects should be evaluated in accordance with the Comprehensive plan

If the above guidelines are not met, projects should be suspended or canceled. Obviously, the guidelines cannot and do not address all situations where projects should be continued. In a situation where a staff member feels a project should be completed, the staff person should submit a request to complete the project to the District Manager through his/her supervisor. The Manager will decide whether the project should be completed.

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Guidelines To Award Abandoned Mine Reclamation Grants

Appendix E - June 1998

Introduction

The principles which guide this Comprehensive Plan for Abandoned Mine Reclamation encourage partnerships and multi-source funding. In applying these principles, DEP will make available grants to local institutions for developing and constructing reclamation projects from the State AML Grant or other reclamation funds. In order to respond fairly and consistently to requests for such grants, this guidance is to be used. Grants are contingent upon availability of funds and the worth of the project as defined in this Plan.

Applicants for funds need to be aware that all projects using the AML grant must receive OSM funding approval prior to the awarding of a grant. Certain federal guidelines must be met to receive funding approval for projects involving health, general welfare, and safety issues. Additional federal guidelines must be met for AMD abatement projects. The following submission and approval requirements are necessary to provide the Department with the information needed to obtain funding. Also, applicants should be aware that all applicable state and federal laws must be met, including those dealing with contracting.

To Qualify for a Grant:

1. The proposed site must be located in a watershed or geographic area with an approved rehabilitation plan and, for AMD projects funded under the Ten Percent Set Aside program, an approved Hydrologic Unit Plan.

Since the preparation of a comprehensive rehabilitation plan could take a year or so, the Department does not expect plans to be available until the FY 1999 grant year (March 1999). Therefore, for 1998 grant funds, consideration will be given to sites without approved rehabilitation plans. Further, the Hydrologic Unit Plans required by OSM need not be available at the time of the grant request but would be needed and approved by OSM before a grant award can be made.

For grant years after 1998, both rehabilitation plans and Hydrologic Unit Plans must be submitted with the grant request. Project approval will be contingent upon OSM approval of the Hydrologic Unit Plan.

2. Applicant must be a municipality, a municipal authority or an incorporated nonprofit organization.
3. Funds provided to the applicant must be used for project development, design, construction, and directly related expenses only. No administrative costs will be covered.

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4. Because of the limited money available for abandoned mine reclamation, the Department will only fund projects that have high or exceptional worth. See Appendix C of this plan for project selection criteria.

Submission and Approval Requirements:

It is strongly recommended that those interested obtaining a grant meet the Bureau of Abandoned Mine Reclamation (BAMR) before too much effort is spent on developing a project. BAMR will be able to discuss application requirements in great detail and will provide guidance and assistance as needed. BAMR may also know where needed data is available and what other resources may be available to the applicant. The applicant will also receive an indication of the likelihood of approval of a project, based on the information provided at the time. This meeting is very important, since it will decrease the likelihood of the applicant spending time and money developing a project that is not fundable.

1. The following information must be provided to BAMR to evaluate the proposed project:
 - a. The name, address, phone number and contact person for the applicant
 - b. Background water quality data of all AMD discharges in the identified hydrologic unit for AMD related projects - at least 6 months of flow and water quality data will be needed for the discharge(s) being addressed, including data collection during high flow and low flow conditions;
 - c. Stream water quality data under high and low flow conditions and the results of a biological survey for AMD related projects (at a minimum, a qualitative macroinvertebrate survey identified down to genus will be required; a survey that follows an EPA approved bioassessment procedure is preferred);
 - d. A detailed description of the health, safety, or general welfare problem, if the project is not proposed as a Set Aside funded project;
 - e. A conceptual solution to correct the existing problem, including a discussion of treatment methodology for AMD treatment projects (please note, OSM will not authorize funding for AMD treatment research projects; only established technologies can be funded);
 - f. The name, address, and telephone number of the landowner(s) involved, and a statement of their concurrence with the proposed project;
 - g. A topographic map showing the location of the proposed project, and for AMD projects, the location of all AMD discharges within the identified hydrologic unit;

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- h. A discussion of proposed beneficial impacts of the project (potential beneficial stream impacts, number of miles of stream impacted by the site, health, safety and welfare benefits to the local population, etc.);
- i. Mining information for the site, including type of mining, name of operator, date of last mining, whether the current landowner participated in the mining operation, and the source of this information;
- j. Identification of key personnel to be involved in development, design, and construction inspection, and their education and experience in mine reclamation and AMD abatement;
- k. A discussion of other funding and technical sources involved, including local financial or "in kind" matches;
- l. A proposed budget to develop, design, and construct the project, and a financial cost accounting plan to show how records will be maintained;
- m. A work plan with proposed timetables;
- n. A plan or commitment that addresses future maintenance concerns for AMD treatment systems;
- o. A post construction monitoring plan that will determine the effectiveness of the treatment system and the impacts to the receiving stream for AMD treatment systems;

If a Hydrologic Unit Plan has already been developed for a watershed by BAMR staff, much of this information will already be available and will not need to be provided by the applicant.

- 2. Once the above information is submitted, a preliminary decision will be made by BAMR staff concerning whether to award a grant based on the following: the soundness of the proposed solution, the potential for partnering with other funding sources, the qualifications of the personnel involved, the project "worth" based on criteria described in Appendix C of this plan and whether the proposed project meets all funding requirements.
- 3. If a decision is made not to fund the project based on the initial submission, a letter will be sent to the applicant explaining the reasons for denial of funding. If the applicant wishes to address the reasons for denial and resubmit the proposal, the new submission will be considered.
- 4. Once a preliminary decision is made to award a grant, the documents needed for OSM funding authorization must be developed by the applicant with assistance from BAMR staff. For AMD Set Aside funded projects, a Hydrologic Unit Plan

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- will have to be developed in accordance with Section (7) (B) of SMCRA. In addition, an Environmental Assessment (EA) must be developed in accordance with the National Environmental Policy Act (NEPA). Compliance with NEPA requirements will necessitate receiving project clearances from the United States Fish and Wildlife Service and the Pennsylvania Historic and Museum Commission, as well as PNDI review through the PA Department of Conservation and Natural Resources. BAMR will assist in preparing these documents.
5. Once authorization to proceed is received from OSM for a project accepted by BAMR, the applicant will be notified. A grant contract will then be executed between the Department and the grantee that states the conditions under which the Department will release grant funds for completion of development, design, and construction of the project. Payments will be made to the grantee on a quarterly basis for reimbursement of costs incurred upon presentation of documentation in a format acceptable to the Department. Progress reports will be expected prior to payment.
 6. The applicant or its approved designee will then be responsible for designing the project. The completed design contracting documents, technical specifications, landowner consents for right of entry, and all necessary permits and/or waivers must be submitted upon completion to BAMR for review. Once BAMR has accepted these documents as complete and technically sound, written approval will be given to proceed with construction of the project.
 7. The grantee will be responsible for bidding and constructing the project in accordance with applicable laws. Contract management and construction inspection will be the responsibility of the grantee unless BAMR has previously agreed to provide this service.
 8. Ten percent of the grant amount will be held until completion of construction and a final review of the site by BAMR staff. To receive complete reimbursement, construction must be completed and all costs submitted within 2 years of contract execution. Payment will not exceed costs agreed to in the grant contract.
 9. At times, the Department may have reclamation funds available from non-federal sources. In such cases, the grant applications need not follow all of the procedures and requirements specified above. But awarding such grants will follow the selection criteria in Appendix C.