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FACT PACK

ABANDONED MINE

RECLAMATION IN PENNSYLVANIA

The Abandoned Mine Reclamation Fund, Partnerships, and Future Challenges

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Overview of the Abandoned Mine Reclamation Fund

The Abandoned Mine Reclamation Fund (AMRF) is an interest-accruing account held by the United States Department of the Interior's Office of Surface Mining (OSM) to address the adverse impacts created by old coal mining operations. Title IV of the Federal Surface Mining Control and Reclamation Act of 1977 (SMCRA) established the Abandoned Mine Reclamation Fund to reclaim abandoned sites mined before the passage of the Act – before modern environmental standards requiring mine operators to reclaim surface mines to their pre-mining condition.

Income to the fund is generated by today's mine operators on every ton of coal they mine – 35 cents/ton for surfaced-mined coal, 15 cents/ton for deep mine coal, and 10 cents/ton for lignite coal. Money from this fund is funneled back to the coal mining states, including Pennsylvania, to support abandoned mine reclamation programs.

Congress determines the amount of money that will be appropriated from the fund. The Office of Surface Mining then delegates the money to state reclamation programs using a formula that takes into account each state's present and historic coal production. In Pennsylvania, the Department of Environmental Protection (DEP) uses this money to fund projects to reclaim abandoned mines and clean up watersheds polluted by abandoned mine drainage (AMD). Pennsylvania has been able to leverage this money with state and private funds and the work of dedicated volunteer groups to maximize the reclamation of abandoned mines, improve the environment, and make a positive impact in communities throughout the Commonwealth's coalfields. In addition, OSM uses money from the fund to complete emergency reclamation projects.

The fund is currently operating with a substantial balance. Average income for the AMRF ranges from $300-$350 million each year. The usual expenditures from the fund are about $150 million each year. Under-spending continues to leave a balance in the fund that grows at a rate of about $125-$150 million each year. As of March 31, 2001, the total unspent balance sitting in the fund was $1,376,671,498.

The total collected from its first collection date (January 30, 1978) until March 31, 2001 amounts to $6,385,249,759.

In addition, collection to the fund is set to expire on September 30, 2004. The discontinuation of this program would eliminate the Abandoned Mine Reclamation Fund, transferring any leftover money to general government revenue and severely hampering Pennsylvania's efforts to reclaim its abandoned mine legacy.

Pennsylvania receives about $25 million per year from the AMRF through OSM. According to OSM figures, Pennsylvania's unspent balance, as of March 31, 2001, was $51,623,569. It is estimated that, at the current rate, the balance in the federal fund could reach $3 billion by the year 2004. It is also estimated that Pennsylvania could receive nearly $1 billion over the life of the program.

History of Abandoned Mine Reclamation in Pennsylvania

Pennsylvania has been a leader in improving the quality of its environment after many years of mismanagement. In 1968, Pennsylvania passed the Land and Water Conservation and Reclamation Act, the first act to address abandoned mine reclamation. This act spurred Operation Scarlift, which was instituted to clean up the damage caused by abandoned mines. It used a total of $141,000,000 to complete 500 stream pollution abatement projects, extinguish 75 fires, remove 150 areas of subsidence, and prevent air pollution at 30 sites of burning refuse banks.

Other laws and initiatives were passed that improve abandoned mine reclamation efforts. The 1997 Appalachian Clean Streams Initiative provides additional funds to the Appalachian region to address AMD. Incentives for re-mining of abandoned mine sites are provided under the 1992 Amendment to the Pennsylvania Reclamation Act. The Good Samaritan Law was enacted in 1999 to protect landowners from the Pennsylvania Clean Streams Law. Under the Pennsylvania Clean Streams Law, DEP may require a landowner to clean up any pollution

resulting from the condition of their property, regardless of fault. The Good Samaritan Law reduces current-owner liability for damages caused by previous owners. It encourages individuals or groups to reclaim areas affected by abandoned mining operations by granting them liability relief.

Two Pennsylvania resolutions have been organized to call for the continuation and proper appropriation of the Abandoned Mine Reclamation Fund. In 1997, a group of organizations from many backgrounds came together to address the inappropriate handling of the AMRF. They set aside their differences to show united support behind complete allocation of the AMRF. The signatories consisted of environmental and conservation groups, coal industry representatives, the United Mine Workers of America, government agencies, and community groups. The resolution was given to members of Congress in the spring of 1998. Due, in part, to this massive effort, the 2000 federal budget included a $10.5 million increase in funds for abandoned mine reclamation. Another resolution was drawn up in 2001, garnered over seventy organizational signatories, and was presented to Congress.

Abandoned Mine Land Issues in Pennsylvania

Abandoned mines from extensive, unregulated coal mining until the passage of SMCRA in 1977 resulted in a legacy environmental damage. Abandoned mine sites have left dangerous highwalls, open pits, coal refuse spoil piles, old mine openings, and more than 3,000 miles of streams polluted by abandoned mine drainage. Past coal mining practices have led to erosion, landslides, polluted water supplies, destruction of fish and wildlife habitat, and an overall reduction in natural beauty. Abandoned mines leak acidic, metal-contaminated waters into nearby waterways. See Appendices 1 and 2 for a list of outstanding problems in Pennsylvania.

- **At least 44 of the 67 counties** in Pennsylvania are affected by abandoned coal mines.
- As of March 2002, Pennsylvania had **5,172 documented abandoned mine sites**, encompassing **184,431 acres of abandoned mine lands**.
- AMD is the largest contributor to water quality impairment in Pennsylvania. According to the 2002 Pennsylvania Water Quality Assessment 303(d) Report, **3,129 miles of the Commonwealth's streams are impaired by AMD**.
- It was once estimated that it will cost **$15 billion** to clean up abandoned mine-damaged land and water.
- According to the National Coalition for Abandoned Mine Reclamation, there is a national price tag of ***$*6.5 billion for health and safety costs** and another **$30 billion for environmental and water quality issues**.
- At the current rate of funding, DEP expects that it will take **50 years** to eliminate all of the high-priority abandoned mine land hazardous sites.

Numerous projects with innovative solutions have been employed to solve the problems left behind by abandoned mines. Open shafts are closed, mine entrances are blocked off, subsidence areas are filled with concrete, highwalls and open pits are leveled out, and abandoned mine drainage is treated with active or passive treatment systems. Passive treatment utilizes natural chemical and biological processes to reduce AMD. Wetlands, open limestone channels, anoxic limestone drains, vertical flow systems, or diversion wells can be constructed according to the needs and conditions of the site. The materials used are not hazardous and, after construction, there are few costs, creating a cost-effective and efficient means of treating AMD. Active treatment uses chemicals and equipment to neutralize AMD. Unlike passive treatment systems, active treatments require constant and continuous operation and maintenance, making them a highly expensive means of treatment. Projects highlighting some of these solutions are included in Appendix 5.

Abandoned Mine Impacts

Abandoned mines create negative impacts to the economy, while abandoned mine reclamation boosts the economy. Abandoned mines and abandoned mine lands create negative impacts on local economies by destroying recreational opportunities; lowering land values; leaving desolate communities once the mines are exhausted; and ruining sites for further residential, commercial, forestry, or agricultural uses. Reclamation of abandoned mine sites can add to the economy by creating jobs, increasing community pride, increasing property values, decreasing stress-related costs through stream-based recreation, restoring the health of the environment, and providing future sites for commercial or industrial endeavors.

A monetary value can be placed on the lost recreational opportunities through fishing by examining the use rate (trips/mile/year) and the value per trip ($/trip). In 1995, John Arway from the Pennsylvania Fish and Boat Commission assessed 2,167.2 miles within Pennsylvania and estimated the loss in value per year to be $66,935,519. Other losses due to abandoned mines can be assessed through estimation of reduced property values, lost jobs, and decreased marketable opportunities.

When visitors come to clean or even semi-clean streams for recreation, they directly impact the economy by spending their money at grocery stores, sporting goods stores, restaurants, campgrounds, lodging facilities, gas stations, roadside stands, vacation homes, and other merchants. The money spent indirectly affects the economy when the stores purchase new products and materials and pay the providers of those goods and services: delivery companies, sign-makers, brochure publishers, media for advertisements, accountants, bank interest and fees, telephone and electric bills, and taxes. When this money bounces around in a local economy, it causes a multiplier effect. The multiplier effect due to a recreating visitor can create an economic impact of 1.5-3.0 times the actual amount of money spent. This increased impact trickles throughout the local economy, uplifting the community.

Reclamation has other valuable benefits. A reclaimed area gives residents a new pride for their home and increases their sense of

stewardship. Clean water means less money spent by water supply facilities on finding new water sources or treatment and purification processes for current supplies. Grants are given to grassroots groups who hire local contractors and workers. For every $1 million spent on construction for reclamation, 25-50 jobs are created. Over $5 billion has already been spent in Pennsylvania, infusing new money into the economy.

AMRF and Other Funding Sources in Pennsylvania

The AMRF has been used extensively in Pennsylvania to complete beneficial projects. Past projects have utilized almost 90% of the $400 million that has been appropriated thus far. Pennsylvania receives an average of $25 million each year from the fund.

Appendices 3 and 4 outline the results of abandoned mine reclamation in Pennsylvania.

The Commonwealth has turned to a variety of other sources for funding reclamation projects. DEP estimates that $950 million in federal

and state money has been spent in Pennsylvania to deal with abandoned mine problems. Less than half of this has come from the Federal AMRF. Pennsylvania has implemented a Comprehensive Plan for Abandoned Mine Reclamation (CPAMR) to increase efficiency in the reclamation process. Under DEP's Reclaim PA initiative, abandoned mine reclamation has become a priority with new programs and funding opportunities. Growing Greener grants, government-funded construction contracts (GFCC), the Regional Watershed Support Initiative (which helps to establish and continue grassroots watershed groups dedicated to eliminating abandoned mine drainage), Best Management Practice (BMP) permits (which encourage remining by industry), and cost-sharing programs are provided and encouraged by Pennsylvania and include their own incentives. The mining industry itself reclaims thousands of acres annually – at no cost to the Commonwealth.

Growing Greener has provided funds to local watershed groups and other organizations for abandoned mine reclamation, AMD treatment, and watershed assessment and will result in over 4,200 acres of abandoned mine reclamation and over 370 miles of AMD-impacted stream improvements.

Appendix 1

Documented Unreclaimed Abandoned Mine Land (AML) Sites, Features, and Acres in Pennsylvania, by County

Source: Pennsylvania Department of Environmental Protection; March 20, 2002

County Name	Number of AML Sites	Number of unreclaimed AML Features	Acres
Allegheny	263	763	4,514
Armstrong	313	1,548	17,772
Beaver	72	323	2,810
Bedford	39	167	1,128
Blair	12	72	766
Bradford	2	3	—
Butler	275	1,401	8,724
Cambria	265	1,374	4,973
Cameron	9	40	361
Carbon	30	270	2,827
Centre	121	709	5,866
Chester	1	2	—
Clarion	393	2,135	15,227
Clearfield	588	3,374	23,715
Clinton	49	233	1,441
Columbia	20	244	2,158
Crawford	1	5	28
Dauphin	10	86	410
Elk	101	619	4,053
Fayette	226	1,058	5,482
Fulton	5	14	244
Greene	34	130	511
Huntingdon	32	143	1,169
Indiana	278	1,555	8,400

County Name	Number of AML Sites	Number of unreclaimed AML Features	Acres
Jefferson	319	1,817	10,441
Lackawanna	143	732	5,481
Lawrence	101	418	4,996
Lebanon	3	9	—
Luzerne	211	1,169	10,466
Lycoming	9	65	239
McKean	27	93	862
Mercer	74	284	2,237
Northumberland	97	951	6,331
Schuylkill	316	2,639	16,355
Somerset	185	923	3,152
Sullivan	8	32	52
Susquehanna	3	17	73
Tioga	46	209	925
Venango	67	279	1,956
Warren	2	3	16
Washington	184	547	3,315
Wayne	8	30	94
Westmoreland	228	887	4,862
Wyoming	2	4	—
TOTAL	5,172	27,376	184,431

Each site consists of one or more documented abandoned mine land sites. The features include abandoned strip mines (dry or flooded); spoil piles; mine entries (drift, tunnel, or country bank); mine shafts; crop falls; subsidence openings; abandoned refuse piles (burning and not burning); underground mine fires; subsidence-prone areas; abandoned structures or equipment; abandoned coal processing settling basins; deep mine discharges; and surface mine seeps or discharges.

Appendix 2

This table contains high-priority, abandoned mine-related problems to be addressed in Pennsylvania. Associated with each problem are the number of units and the estimated costs of the solution or clean-up. This list is not all-inclusive and does not include future, unforeseeable costs. (Prepared using material from the OSM Abandoned Mine Land Inventory System, September 24, 2001.)

Problem	Unit	Number	Cost ($)
Clogged Streams	Miles	35.9	6,598,848
Clogged Stream Lands	Acres	668.9	9,693,601
Dangerous Impoundments	Count	4.0	82,500
Highwalls (Priority 1 and 2)	Feet	964,741.0	121,990,964
Dangerous piles and embankments	Acres	2,025.7	157,595,721
Hazardous Equipment and Facilities	Count	380.0	6,297,877
Hazardous Water Body	Count	164.0	26,753,160
Industrial/Residential Waste	Acres	124.9	8,415,923
Portals	Count	306.0	1,558,611
Subsidence	Acres	545.7	29,347,100
Surface Burning	Acres	76.5	6,366,203
Underground Mine Fire	Acres	1,276.1	594,691,999
Vertical Opening	Count	562.0	3,485,046
Gobs	Acres	1,103.5	11,741,810
Highwall (Priority 3)	Feet	341,994.0	107,649,851
Haul Road	Acres	2.0	2,011,666
Mine Opening	Count	54.0	4,190,567
Pits	Acres	927.7	22,126,778
Spoil Area	Acres	3,133.4	23,666,397
Slurry	Acres	118.0	1,873,316
Slump	Acres	274.1	5,827,669
Water Problems	Gal/Min	36,182.3	58,158,933
Polluted Water for Human Consumption	Count	155.0	3,607,464,901
Total Cost of Completed Projects			4,817,589,441

Appendix 3

This table gives a brief synopsis of what has been accomplished recently in Pennsylvania with Abandoned Mine Reclamation Fund monies.

	Expected Results		Projected
Year	**Acres reclaimed**	**Miles of Stream Improvements**	**Value ($)**
1997	670	26	14,244,000
1998	1240	42	11,427,000
1999	670	18	16,128,000
2000	739	36	**9,336,514
Total to date*	20,707	92.5	324,427,353

- * The total to date represents reclamation from 1997 through December 4, 2001.
- ** Includes matching funds from Growing Greener.

Appendix 4

This table contains a list of the results of projects completed in Pennsylvania. Associated with each problem are the number of units and the estimated costs of the solution or clean-up. There were other problem types and costs not included in this table. (Prepared using material from the OSM Abandoned Mine Land Inventory System, September 24, 2001.)

Problem	Unit	Number	Cost ($)
Clogged Streams	Miles	92.5	7,762,132
Clogged Stream Lands	Acres	140.2	3,739,625
Dangerous Impoundments	Count	44.2	911,882
Highwalls (Priority 1 and 2)	Feet	654,825.5	111,571,272
Dangerous piles and embankments	Acres	556.4	10,164,425
Hazardous Equipment and Facilities	Count	305.5	2,730,209
Hazardous Water Body	Count	115.0	11,318,651
Industrial/Residential Waste	Acres	17.0	330,442
Portals	Count	249.6	1,858,635
Subsidence	Acres	2,395.5	70,699,968
Surface Burning	Acres	121.9	1,625,345
Underground Mine Fire	Acres	915.0	65,455,168
Vertical Opening	Count	468.6	4,937,752
Gobs	Acres	51.7	578,188
Highwall (Priority 3)	Feet	13,328.0	2,322,495
Mine Opening	Count	19.0	22,671
Pits	Acres	77.9	524,498
Spoil Area	Acres	2,155.3	1,968,213
Slurry	Acres	1.0	10,000
Slump	Acres	25.6	525,286
Water Problems	Gal/Min	90,332.0	577,755
Polluted Water for Human Consumption	Count	31.0	4,037,949
Total Cost of Completed Projects			303,672,561

Appendix 5

The following project descriptions represent just a sample of hundreds of current and potential abandoned mine projects throughout Pennsylvania. In some cases, the partners and funding sources listed might not reflect the actual scope of involvement in each project. Again, this is just a sample.

CUCUMBER RUN

Location:
Fayette County, Ohiopyle State Park

Description of Problem:
Acid mine drainage negatively impacted the North Branch and main branch of Cucumber Run. There were high levels of acid, iron, and aluminum that caused discoloration, as well as negative impacts to the aquatic ecosystem.

Solution:
The Pennsylvania Bureau of Abandoned Mine Reclamation (BAMR) selected this project for construction under the 10% Set Aside AMD Abatement Program. Casselman Enterprises was hired, using the Commonwealth's competitive bidding process, to install two anoxic limestone drains (ALD) that discharge into an existing wetland treatment system, which was left over from Operation Scarlift. The system was in operation by 1997.

Results:
Acidity levels in the wetland effluent have been almost completely eliminated. Both iron and aluminum concentrations have been significantly reduced. Visual aesthetics at the popular Cucumber Falls in the Ohiopyle State Park have been greatly improved. Monitoring of the effectiveness of the treatment is underway by the Cambria Office of BAMR.

Partners:
BAMR, Casselman Enterprises, Greensburg District Mining Office.

Funds:
The $166,060 needed to complete the project came from the OSM AMD set-aside program: AMD 26(2768) 101.1.

Continuing Needs:
Part of the North Branch is still iron-stained from a discharge that could not be directed into the treatment system (the goal of the project was to address AMD impacts to the main branch of Cucumber Run). Operation and maintenance costs of the monitoring system will continue into the future.

GOFF STATION

Location:
Venango Township, Butler County

Description of Problem:
Underground and surface mining activities, long since abandoned, left hundreds of gallons per minute of severely degraded mine drainage, acres of open pits, and tens of thousands of cubic yards of barren acidic coal refuse. This legacy of past mining added to the pollution of Murrin Run, a tributary of Seaton Creek that eventually joins the Slippery Rock Creek. Murrin Run was often "milky" colored due to the precipitation of aluminum hydroxide from the acidic, metal-laden discharges degrading the stream. In addition to the acid and metal pollution, the coal refuse piles which bordered the stream lay barren and eroding creating an on-going sediment pollution problem.

Solution:
A public-private partnership effort was initiated that pooled the resources of local industry; federal, state, and local government programs; local colleges and universities; and numerous non-profit and volunteer organizations to implement both effective reclamation activities and extensive public outreach and education programs.

Passive treatment systems were installed to abate the acid mine drainage and to provide additional alkalinity to Murrin Run. Four vertical flow ponds have been built, as well as four acres of naturally-functioning aerobic wetlands in which bear, fox, deer, reptiles, and fish have been

documented. These passive systems function to neutralize acidity and remove iron and aluminum from the water. Major reclamation construction was completed in the spring of 2001.

Also at the site, 78,000 cubic yards of waste coal was removed and used to reclaim an abandoned surface mine. Plus, the project boasts the creation of the Commonwealth's first bat hibernaculum.

Results:
The treatment system neutralizes about 84,000 lbs/year of acidity and retains about 13,200 lbs/year of metals in the settling ponds. It increases alkalinity and decreases metal concentration in the discharged water. In addition to the direct environmental benefits, numerous volunteer groups have toured the site and provided labor to plant the numerous constructed wetlands. Both activities help to raise public awareness of the abandoned mine legacy in the region and what can and is being done to address the problems associated with it.

Partners:
DEP Knox District Mining Office; Grove City College; Slippery Rock Watershed Coalition volunteers; Girl Scouts; Quality Aggregates, Inc.; BioMost, Inc.; Private landowners; PA Game Commission; Jack Chamberlain Surveying; Stream Restoration, Inc.; Venango Township Supervisors; Scrubgrass Generating Plant; Aquascape; BAMR; PA Department of Conservation and Natural Resources, Jennings Environmental Education Center; Butler County Commissioners; WOPEC; Urban Wetlands Institute; Western Pennsylvania Watershed Protection Program.

Funds:
This project was completed through the combined efforts of public and private organizations. Stream Restoration, Inc. received $815,751 in funding through Pennsylvania's Growing Greener program as well as in-kind contributions from the project partners exceeding $400,000.

Continuing Needs:
The DEP Knox District Mining Office, in cooperation with Grove City College, will continue to monitor water quality at the site.

JEDDO MINE DRAINAGE TUNNEL

Location:
Butler Township, Luzerne County

Description of Problem:
The Jeddo Mine Drainage Tunnel was once an engineering marvel of its time. The 15,300-foot long tunnel with dimensions of seven feet by nine feet was constructed between 1891 and 1934. The tunnel was meant to utilize the force of gravity to drain water out of the mines, allowing coal extraction to progress without interruption. Gravity is still working to deliver abandoned mine drainage from the mines directly into the Little Nescopeck Creek. The tunnel drains four major coal basins covering over 30 square miles and discharges at a rate of approximately 80 cubic feet per second.

Solution:
This drainage tunnel is serving an active mining area. The size of the discharge is too large to consider a passive treatment system. The Wildlands Conservancy, in conjunction with the Susquehanna River Basin Commission, recently completed a study to identify sites where surface water was infiltrating into the underground mine workings and eventually exiting from the Jeddo Tunnel.

The Wilkes-Barre Office of the Bureau of Abandoned Reclamation has completed several abandoned mine reclamation projects within the drainage basin area of the Jeddo Tunnel which not only eliminated public health and safety hazards but also will prevent the loss of surface water into the underground mine workings. These projects include

1. OSM 40 (3218) Pardeesville
2. OSM 40 (0263) Humboldt North

BAMR also has two projects in design within the Jeddo Tunnel drainage area:

1. OSM 40 (2117) Heart of Hazleton
2. OSM 40 (3213) Cranberry Ridge

In addition, BAMR has projects in development within this area and anticipates that these projects will proceed to design since they have

property owner cooperation in all of them. These projects include

1. OSM 40 (0263) Humboldt North, Phase 2
2. OSM 40 (1365) Hazleton S.C. West
3. OSM 40 (2057) Humboldt East
4. OSM 40 (3725) Hollars Hill
5. OSM 40 (1381) Freeland South
6. OSM 40 (3217) Drifton

KELAYRES STRIP MINE RECLAMATION PROJECT

Location:
Kline Township, Schuylkill County

Description of Problem:
The abandoned mine left 265 acres of strip mine lands. There were dangerous, nearly vertical highwalls surrounding the strip pit with an average depth of 250 feet. The reclamation was conducted to eliminate the hazardous risk from this area to nearby citizens of Kelayres and McAdoo. One death occurred in 1978 when a young boy fell from the top of the highwall. Construction began on September 29, 1989, and was completed on October 1, 1992.

Solution:
The 265 acres of abandoned mine lands were back-filled with nearly 12 million cubic yards of material. The elevation change of the land was reduced to 120 feet, and the grade of the slopes was decreased from nearly vertical to 30-40 percent.

Results:
About 25 acres of wetlands have begun to fill the bottom of the newly designed pit. The wetlands have helped to decrease AMD flows. Geese and ducks have been seen utilizing the area frequently.

Partners:
In addition to BAMR, local volunteers helped to plant native species of grasses within the reclaimed land.

Funds:
The OSM Abandoned Mine Reclamation Fund paid the final construc-

tion cost of $9,961,000.

Continuing Needs:
Monitoring of this site should continue to take place in order to evaluate its stability and effectiveness for reducing AMD discharges.

PLUM BOROUGH MINE SUBSIDENCE CONTROL PROJECT

Location:
Plum Borough (Regency Park Southwest), Allegheny County

Description of Problem:
This project will reduce the risk of subsidence damage to 193 homes in Plum Borough on several streets: Saltsburg Road, Kathy Lynn Drive, Willow Village Drive, Regency Drive, Vale Drive, Aspen Drive, Mower Drive, Crestview Drive, and South Court. Prior to World War II, the Pittsburgh Coal Company mined the area using the room-and-pillar method. Buildings over these areas may experience structural damage if preventative action is not taken.

Solution:
BAMR has undertaken a project to address the situation. Construction has already begun and is scheduled for completion by June 2002 (the contract gives the contractor $2^1/_2$ years from November 2001; the project will likely be done before that but could possibly last that long). Grout will be injected through numerous boreholes directly into the mine. The grout will act as a weak concrete to stabilize the mine roofs and prevent subsidence and resulting damage to existing homes. Any property damage incurred will be repaired.

Results:
The project should result in safer, more stable homes.

Partners:
BAMR; Plum Borough

Funds:
The OSM Abandoned Mine Reclamation Fund will pay the projected cost of $4,444,689 million.

Continuing Needs:
There is still a great need for subsidence control in Allegheny County, as homes remain in jeopardy. It has taken 25 years to achieve the level of protection now in place, and it will probably take another 25 years to fulfill all of the subsidence control needs in Allegheny County.

UPPER LEHIGH

Location:
Foster Township, Luzerne County

Description of Problem:
The site was an abandoned deep-mined and surface-mined operation. The Upper Lehigh Coal Company completely abandoned the mine in 1964. Residents of Freeland Borough lived within 600 feet of hazardous mine land features. There were 3,015 feet of dangerous highwalls, three large spoil piles, and seven hazardous bodies of water, one of which resulted in the drowning of a young boy looking for fish. The project began on May 30, 1996, and was completed on March 10,1997. Reclamation of the site earned it the National Abandoned Mine Land Reclamation Award in 1997.

Solution:
The project reclaimed 64 acres through leveling and vegetating the area. Grading took place on 603,808 cubic yards of land. 25 acres of wetlands were created for stormwater retention and also provided safe wildlife habitat and recreation.

Results:
It eliminated 12 abandoned strip pits, sealed one entry to the mines, and reclaimed the three large spoil piles. The water quality (pH and metals concentration) at the site was greatly improved. The pH was raised from 4.1 to 6.2. The project prevents run-off water from entering the mines and becoming contaminated. The area has become a pleasant place for nearby residents, geese, and ducks to visit.

Partners:
Wilkes-Barre District Office; BAMR; Falls Creek Energy Co., Inc.; Maud Mining Company; Pennsylvania Department of Transportation

(PennDOT); Pagnotti Enterprises (landowner).

Funds:
The Office of Surface Mining through the Abandoned Mine Reclamation Fund provided the $660,000 needed to complete the project.

Continuing Needs:
There are numerous locations in Luzerne County similar to this one that need attention.

Photographs Available: www.dep.state.pa.us/dep/DEPUTATE/MINRES/BAMR/AMLAward/photodesc2.htm

VINTONDALE SITE

Location:
Vintondale

Description of Problem:
The Vintondale site was an abandoned mine land covering 35 acres. The site once housed a washery, power plant, tipple, and 152 coke ovens and was bordered by railroad tracks.

Solution:
Wetlands serving as a passive treatment system will be created to eliminate metals in the water and raise the pH to a healthy level. Plants, shrubs, trees, benches, public art, and historical features will complete the reclaimed site.

Results:
Reclamation of the site will result in AMD abatement and the creation of a new community park. The nearby railroad has already been turned into the Ghost Town Rail Trail and is traveled by 70,000 visitors each year.

Partners:
A number of groups cooperated to achieve success: AMD&ART, PennDOT, public agencies, private industry, the Western Pennsylvania Watershed Protection Program, and volunteers from the community.

Funding:
AMD&ART received funding from federal, state, and local environmental agencies as well as arts and humanities groups. PennDOT also contributed by purchasing the newly created wetlands. A fuel procurement company has agreed to a government-financed construction contract to remove a layer of coal from the site and take it to a co-generation processing facility.

Catawissa Creek Oneida #1 Mine Discharge Passive Treatment System

RESTORING THE CATAWISSA CREEK WATERSHED ONE MINE TUNNEL AT A TIME

The Schuylkill County Conservation District, the Eastern Pennsylvania Coalition for Abandoned Mine Reclamation (EPCAMR), and the Catawissa Creek Restoration Association (CCRA) have jump-started the efforts to improve the water quality and restore fish to the Catawissa Creek Watershed with the construction of a passive treatment system for the Oneida #1 Mine Tunnel discharge. The Oneida #1, the second largest abandoned mine tunnel in the watershed and the only one in the upper Sugarloaf Creek Watershed, is located in the Eagle Rock Resort subdivision in both Luzerne and Schuylkill Counties. The discharge flows out of a rock tunnel drilled many years ago to drain water by gravity out of a large mine pool complex known as the Jeansville Basin while coal was being mined. The Oneida #1 degrades 5.5 miles of Sugarloaf Creek and contributes to the degradation of 10.6 miles of Tomhickon Creek, downstream of the mouth of Sugarloaf Creek. Comprehensive watershed planning efforts to address the AMD problems in the Catawissa Creek Watershed began in 1997 with the formation of the Catawissa Creek Restoration Association, guided by the technical assistance and support provided by the Schuylkill and Columbia County Conservation Districts and EPCAMR.

The series of oxic limestone drains (OLDs) passive treatment system showed significant improvements soon after construction was completed in August of 2001. The Eagle Rock Homeowners Association, some of which are active members of CCRA, were delighted to discover that not only has the water quality improved dramatically in such a short period of time, but their once-dead, totally acidified Lake Choctaw now

supports a stocked fish population donated by the Zion Grove Fish Hatchery. The Oneida #1, prior to entering the OLD, has pH ranging from 3.6 to 4.2, acidity from 40 to 52 mg/l, and aluminum of 1.4 to 4.9 mg/l, with flows ranging from 560 to 3,000 gpm. The treatment system discharges water with near neutral pH, alkalinity of 25-50 mg/l, and a negligible amount of aluminum. Lake Choctaw and Sugarloaf Creek are now alkaline instead of acidic. Water quality has improved for a total of 16 miles between the Sugarloaf Creek and the Tomhickon Creek.

The Oneida #1 OLD consists of 6 buried beds of limestone aggregate wrapped in a geotextile liner, two concrete retaining walls constructed underneath the ground to retain the water in the parallel drains, gate valves to control the flow, and corrugated perforated pipes to allow for flushing of the aluminum precipitate that tends to accumulate at the bottom of the drains. All of the components allow for the OLD to add alkalinity to the water, increase the pH, and dissolve the metals that are in solution, via three rock outlet channels that lead to the final sedimentation pond for retention of the aluminum floc. The total cost of the treatment system was $375,000, including nearly $75,000 in local, volunteer, in-kind matching funds. Funding sources obtained by the Schuylkill County Conservation District, EPCAMR, and the CCRA included grants from the U.S. EPA Section 319; PA DEP Growing Greener; NRCS Rural Abandoned Mine Program; the EPCAMR Regional Watershed Support Initiative, funded by the DEP Bureau of Mineral Resources Management; and the Office of Surface Mining Appalachian Clean Streams Initiative. Other partners included the Wilkes-Barre Office of BAMR, Luzerne and Columbia County Conservation Districts, Schuylkill County Commissioners, DEP Bureau of Watershed Management, the Eagle Rock Homeowners Association, and the Double Diamond Development Corporation.

Photo Credits

Cover Laura Spencer, Aquascape

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p. 5 Pam Shea, Mountain Watershed Association

p. 7 Gil Hirschel, Susquehanna River Basin Commission

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Useful Websites

Abandoned Mine Reclamation Clearinghouse:
www.amrclearinghouse.org

National Mine Land Reclamation Center:
http://www.nrcce.wvu.edu/nmlrc/

Pennsylvania Department of Environmental Protection
Bureau of Mining and Reclamation:
http://www.dep.state.pa.us/dep/deputate/minres/bmr/bmrhome.htm

United States Department of the Interior Office of Surface Mining:
www.osm.gov

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