Treatment or Abatement of Abandoned Mine Drainage (AMD) Using AML Pilot Program Funding in Pennsylvania

Eric Cavazza, PE
Director, PA-DEP-BAMR
The Abandoned Mine Land Reclamation Economic Development Pilot Program (AML Pilot Program) was initially authorized by Congress under the Consolidated Appropriations Act of 2016, Public Law 114-113, enacted on December 18, 2015.

The AML Pilot funds are to be used to accelerate the remediation of AML and AMD sites with economic and community development end uses.
AML Pilot Program Background

• Congress has since authorized AML Pilot Program funding for Pennsylvania for FY 2017, FY 2018 and FY 2019 in the amount of $25 million each year for reclamation of AML and/or AMD in conjunction with economic development and community revitalization.

• Pennsylvania has selected a wide variety of AML/AMD project types with a variety of anticipated economic and community development benefits for each of the first three AML Pilot Program years.
Language from the OSMRE’s guidance for the 2018 AML Pilot Program requires that State AML Programs, in consultation with state and local economic and community development authorities, must develop eligible projects that demonstrate a nexus with AML land and water reclamation, and economic and community development.
Seventeen (17) of PA’s 42 total AML Pilot Program proposed or approved projects include the treatment or abatement of AMD.

Nearly $36 million of the $80 million total of AML Pilot Program funding authorized to date by OSMRE for Pennsylvania has been committed to projects which include AMD treatment and/or abatement.
2016 AML Pilot Projects Involving AMD Treatment and/or Abatement

1. Pittsburgh Botanic Garden
2. Ehrenfeld Coal Refuse Pile Reclamation Project
3. Fran/Cooks Run Restoration
4. Potts Run Restoration
5. Wingfield Pines Passive Treatment System Rehabilitation Project
6. Cresson Acid Mine Drainage Treatment Plant
AML Pilot Projects Location Map

- Includes AMD Treatment or Abatement
Pittsburgh Botanic Garden
The AML Pilot funding, in combination with other funding, is being used to complete Phase 1 of the project consisting of remining & reclamation work. Additionally, the funding is being used to facilitate Phase 2 of the project consisting of abandoned mine reclamation work at the Pittsburgh Botanic Garden. Phase 1 involves daylighting old underground mine workings and reclaiming pre-act surface mine cuts on approximately 100 acres of the site while Phase 2 is addressing a dangerous highwall, mine subsidence, and AMD on 50 additional acres of the property.
Pittsburgh Botanic Garden Master Plan

Area of Reclaimed Mine Sites
Lotus Pond Passive AMD Treatment
Lotus Pond Passive AMD Treatment
The AML pilot funding, along with other funding sources, will be used to complete reclamation of the abandoned Ehrenfeld Coal Refuse Pile. The 3.2 million tons of coal refuse material will be excavated, hauled away, blended with alkaline material, and disposed of in accordance with an approved handling and placement plan authorized within the mining permit for an adjacent surface mining site operated by the Rosebud Mining Company.
 Cleanup to create 40 jobs

$13.4M project will return miners to work in Ehrenfeld

BY DAVID HURST

EHRENFIELD - There's a mountain of a waste coal pile above Ehrenfeld that serves as little more than a reminder of the old coal town's heyday.

Back then, Ehrenfeld's streets were busy and its air was dusty.

It all reminded Guy Galosi of days he spent sorting coal for the company that made the pile and nights he and his buddies would cram into cars to go see big band greats like Tommy Dorsey play Carrolltown's Sunset Ballroom.

"Those were good times," Galosi said. Soon, Ehrenfeld's 32 acre "boney" pile will be a memory, too.

After years of failed attempts, the state Department of Environmental Protection announced a $13.4 million project Monday to remove all 3.2 million tons of it and reclaim the site, a move state officials said will provide work for 40 recently laid off Rosebud Mining Company miners.

It's also a project that will eliminate acidic runoff flowing into an unnamed Little Conemaugh River tributary while developing a small recreational park on one portion of the site alongside the Path of the Flood Trail, DEP spokesman John Poister said.

"We can finally award a contract to reclaim this unsightly and hazardous abandoned coal refuse pile," DEP Secretary John Quigley said, adding that officials are "doubly happy" that the project will be a boost for the town, the environment and dozens of mine workers.

Rosebud's $13,455,319 bid was the lowest qualified one received for the project, Poister said. They'll haul the rocky refuse away by truck to a Rosebud property where it will be used as fill inside an old, shuttered coal mine.

Part of the pile is often smoldering, and Rosebud will be tasked with extinguishing it, he said.

Aside from two years serving in the Navy, Galosi said he's spent of all his 88 years in Ehrenfeld. That waste coal pile has been there that entire time, and then some, he said.
Ehrenfeld Construction
The AML pilot funding is being used in combination with other funding sources to construct the Cresson Acid Mine Drainage (AMD) Treatment Plant. The plant will pump water from 3 separate mine pools to eliminate 3 AMD discharges that impair tributaries in the Clearfield Creek and Sugar Run which are tributary to the Susquehanna River Watershed.
Treatment of AMD will eliminate 3 discharges from the Cresson No. 9, Gallitzin Shaft, and Argyle Stone Bridge Mine Pools.
Cresson AMD Treatment Plant/ SRBC Low-Flow Augmentation Project

- **21.5 Miles of Expected Stream Restoration**
  - 15 Miles of Clearfield Creek from Treatment Plant Effluent to Brubaker Run
  - 6.5 Miles of Sugar Run – Removing the largest source of AMD to Sugar Run

- **Mine Pool Management**
  - Lower the 3 Mine Pools to Eliminate Discharges
  - Maintain Mine Pool Operating Level
  - Provide 30 days of Emergency Storage
  - Maintain Mine Pool Capacity to supply water for SRBC

- **Supply supplemental treated water to the Susquehanna River during conditions of low flow.**
The treatment plant will consist of four (4) AMD extraction wells, a decarbonation unit, a hydrated lime silo, a high-density lime slurry mix tank, a 66-foot diameter solids contact clarifier, and a polishing wetland.

The plant will be capable of treating 4,400 gpm (~6.3 million gallons per day) but should average treatment of 2,200 gpm.

Polymer will be added to promote the flocculation and settling of solids.

Sludge will be disposed of in one (1) of three (3) injections wells.
Plant Construction
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Potts Run Restoration

- Potts Run Coal Refuse Pile
- Oak Twin Deep Mine Discharge
- Unreclaimed Contour Surface Mine
- Potts Run No. 3 Mine Discharge
- Unnamed Tributary to Potts Run

Potts Run Restoration Project
The AML pilot funding will construct a passive AMD treatment system that will treat 620 gpm of AMD emanating from the Potts Run No. 3 deep mine which closed in the mid to late 1950s. This deep mine drainage was identified as the major source of AMD pollution to Potts Run introducing high loadings of acid, aluminum and iron into the lower 0.4 mile of the Oak Ridge tributary which then enters and pollutes the final 2.7 miles of the Potts Run main stem. Twenty-five acres of abandoned surface mine will also be reclaimed including alkaline addition and reforested using the FRA.
Potts Run Restoration

Potts Run No.3 Deep Mine Discharge
500 gpm
Potts Run Restoration

Oak Twin Deep Mine Discharge
120 gpm
Fran Contracting Surface Mine Restoration Project (Rock and Camp Runs)
The AML pilot funding will be used to fund the reclamation of the Camp Run No. 2 AML site in Sproul State Forest to restore water quality in the Rock and Camp Run tributaries of Cooks Run. The site will be reclaimed by excavating and removing or treating the acid forming materials on site by mixing them with alkaline material to neutralize acidity. The reclaimed site will be reforested to bring the land & water back to pre-mining conditions.
Fran Contracting Surface Mine Restoration Project (Rock and Camp Runs)
The AML Pilot funding, is being used to reconstruct the mine water collection system and to restore the inflow to the Wingfield Pines passive treatment system. The current intake structure is a concrete man-hole, used to collect and direct the mine pool water to the treatment system inlet. The intake structure has become inoperable due to mine subsidence which occurred in Dec. 2017 and has ruptured the base, and exposed a portion of the deep mine. This subsidence allowed the mine water to circumvent the intake structure and surface flow into the final pond without treatment.
In December of 2017 a mine subsidence event occurred near the treatment system inflow structure. This subsidence allowed the water to circumvent the intake structure and surface flow into the final pond without treatment.
View looking at the concrete man-way, used as the old mine water collection system. The bottom and the area next to the man-way has subsided causing damage to the PTS collection system.
2017 AML Pilot Projects Involving AMD Treatment and/or Abatement

7. Gladden AMD Active Treatment Plant and Fishing Run Stream Sealing
8. Stineman Refuse Pile Reclamation – Path of the Flood Trail Extension
9. Quakake Tunnel AMD Treatment Plant and Weatherly Borough Trail
10. TASA Coal Refuse Piles - South Sandy Creek Restoration
2017 AML Pilot Projects Location Map

2017 AML Pilot Program Projects
- Includes AMD Treatment or Abatement

TASA Refuse Piles South
Sandy Creek Restoration

Gladden AMD Active Treatment Plant and Fishing Run Stream Sealing

Stineman Refuse Pile
Path of the Flood Trail

Black Dog Hollow
Fredrickstown Coal Refuse Pile

Dickson City Trail
Earth Conservancy Bliss Bank 3 Business Area

Can Do North Park Drive Business Park

Donaldson Culm Bank Stream Restoration Project

Lackawanna College Subsidence Abatement
Swoyersville Refuse Pile Community Athletic Area
Quakake Tunnel AMD Treatment Black Creek Trail

Hollars Hill South AML Cranberry Creek Gateway Project
The Porter Floodplain Restoration Project

2017 Realization Project Sites
- Bistramin
- Anthracite
The AML pilot funding in combination with other funding will be used to construct an AMD treatment facility to treat the Gladden AMD Discharge and to seal several stream channels to prevent the loss of stream flow into the underlying abandoned mine workings. The treatment plant will restore four (4) miles of Millers Run and be instrumental in restoring over four (4) miles of Chartiers Creek to its confluence with Robinson Run.
Gladden Discharge
Confluence of Millers Run and Chartiers Creek
Millers Run Below the Gladden Discharge
Aerial View of the Confluence of Millers Run and Chartiers Creek
Stineman Refuse Pile Reclamation – Path of the Flood Trail Extension
The AML pilot funding will be used to remove coal refuse with fuel value for use in electricity generation at a cogeneration facility and to regrade any remaining refuse material onsite. Alkaline material will be added to neutralize acidity, and the site will be revegetated resulting in improved water quality in the South Fork Little Conemaugh River. The project will also facilitate a 3 mile extension of the Path of the Flood Trail to connect the existing trail in Ehrenfeld Borough to the Johnstown Flood National Memorial.
Quakake Tunnel & Weatherly Borough Trail
The AML Pilot funding, in combination with other funding, will be used to design and construct an active treatment system to treat the Quakake Tunnel discharge. Approximately 8 miles of wild trout stream (Quakake and Black Creeks) will be restored upon the completion and initiation of operation of the treatment system. Funding will also be used to create approximately 5 miles of new trail beginning at the existing Weatherly Borough building and extending into the Lehigh Gorge State Park. The new trail will traverse in close proximity to the restored stream.
Quakake Tunnel & Weatherly Borough Trail

Typical flow: 13 CFS (6,000 GPM)
Low pH and Elevated Metals
– Primarily Aluminum
Black Creek Downstream of Weatherly Borough
Quakake Tunnel & Weatherly Borough Trail
The AML Pilot funding will be used for a pass-through grant to South Sandy Creek Watershed Association to excavate 200,000 tons of acid forming material consisting of coal refuse & coal fines. The excavated material will be transported to Scrubgrass Generating Plant, an 85-megawatt generating facility fueled by bituminous waste coal. A portion of the resulting alkaline flyash byproduct will be returned to the site, blended with existing on-site soil & used to remediate the site.
A major source of AMD pollution to unnamed tributaries to South Sandy Creek & Williams Run will be eliminated, resulting in approximately 13 miles of stream improvement.

Long-term improvement of the regional groundwater table will improve the water chemistry for two residential drinking water wells.
2018 Proposed AML Pilot Projects Involving AMD Treatment and/or Abatement

11. Presto-Sygan AMD Remediation at Newbury Market
12. Slippery Rock Watershed Project
13. Six Mile, Longs Run/Sandy Run Watersheds
14. Crowley Hollow Diversion Channel
15. Huling Branch East
16. Stonycreek and Little Conemaugh River Improvement and Reinvestment Project
17. Morris Run AMD Treatment Plant
Presto-Sygan AMD Remediation at Newbury Market
The AML Pilot funding, in combination with other funding, will be used to complete the Presto-Sygan Passive Treatment System (PTS).

The Presto-Sygan discharge is one of the most pollutive discharges in the Chartiers Creek Watershed which discharges to the Ohio River just downstream of the Point in downtown Pittsburgh.

The PTS includes two 8,500 ton auto-flushing limestone only vertical flow ponds (VFP’s), a settling pong, and a large aerobic wetland.
Presto-Sygan Discharge: 650 gpm, 5.5 field pH, 38 mg/L Total Fe, 13 mg/L Total Al
Six Mile Run, Longs Run & Sandy Run Watersheds
The AML Pilot Funding, in combination with Match Money, will be used to perform crucial maintenance on 35 existing passive treatment systems located in Broad Top Township, Bedford County. Combined, the existing passive treatment systems remove 222 lbs./day of iron, 207 lbs./day of aluminum, and 2,145 lbs./day of acidity. They have restored 14.5 miles of stream to warm water fisheries – migratory fishes with young of the year trout now present in Six Mile Run. The project will sustain three full-time employee positions.
Passive Treatment System SX 10D2
The AML Pilot Funding, in combination with Growing Greener and Match Money, will be used to perform crucial maintenance on five existing passive treatment systems located in Brady and Washington Townships, Butler County. Additionally, the project will enhance educational, recreational, and tourism activities by restoring the Foltz Schoolhouse (part of the Jennings Environmental Educational Center) and provide significant repairs to bridges and trails on the North Country National Scenic Trail System.
Barkley Road Passive Treatment Rehab

Project Maps, Plans, and/or Photos
Crowley Hollow Diversion Channel
• The AML Pilot funding will be used to complete the Crowley Hollow Diversion Channel.
• An approximately 5,000 foot channel will be constructed to divert Crowley Hollow into Milligan Run.
• Cooks Run is designated as a High Quality Cold Water Fishery above the confluence with Crowley Hollow.
• Crowley Hollow is severely degraded by AMD.
• Below the confluence of Crowley Hollow and Cooks Run, Cooks Run is severely impacted and virtually void of aquatic life.
• Above the confluence, Cooks Run has a population of Native Brook Trout and Wild Brown Trout as well as a variety of aquatic invertebrates.
View of the confluence of Cooks Run (left) and Crowley Hollow (right)
Milligan Run discharges directly into the West Branch of the Susquehanna River and is severely degraded by AMD. The proposed project will divert Crowley Hollow away from Cooks Run and into Milligan Run, eliminating the AMD pollution entering Cooks Run. 1,230 lbs. of acid, 70 lbs. of Al, 120 lbs. of Fe, and 30 lbs. of Mn per day will be eliminated from Cooks Run. The project is located within the Sproul State Forest and is open to the public. The project will help bring back the land and water to its natural state to be enjoyed by all the citizens that enjoy hunting, fishing, hiking, camping, ATV riding, and sightseeing, which will attract increased tourism to the area.
The AML Pilot Funding, in combination with other funding, will be used to complete the Huling Branch East project and will create 5,000 linear feet of ATV trails within Sproul State Forest. Huling Branch will reclaim 3,000’ of dangerous highwalls. A 10-acre dangerous pile and embankment will be regraded onsite to form a parking area for visitors and a flat area for emergency evacuations. A 0.5-acre slurry pond will be reclaimed with gob material. Alkaline addition will be added to neutralize soil acidity and improve watershed quality.
AMLF No. 1123-05(DH) is often referred to as “The Pit” where ATVs attempt to climb the 80-foot dangerous highwall. There have been many failed hill-climb attempts which result in life-flight evacuations.
Stonycreek and Little Conemaugh River Improvement and Reinvestment Project
AML Pilot Funding, in combination with other funding sources, will be used to complete multiple projects within the adjoining Stonycreek and Little Conemaugh River Watersheds. This includes design, redesign and maintenance work on existing Passive Treatment Systems (EcoIslands/Mineral Point/Oven Run Site B), work to improve the thermal component of Quemahoning Creek, and enhancement of bike trails, (Quemahoning and Incline Plane) and the tailwater fishery below the Quemahoning Reservoir. These projects leverage upon the stream improvements realized to-date and those anticipated and will sustain and build upon the economic and community development benefits realized as a result of this on-going work.
Stonycreek and Little Conemaugh River Improvement and Reinvestment Project
Stonycreek and Little Conemaugh River Improvement and Reinvestment Project

• Completion of needed maintenance on several passive mine drainage treatment systems in both the little Conemaugh and Stonycreek Watersheds

• Protection and further enhancement of water quality in 15 miles of the Stonycreek River

• AMD Projects around Saltlick Reservoir
  – Improved water service to Greater Johnstown Water Authority residential and industrial customers with ability to expand
Morris Run AMD Treatment Plant

Tioga River at Blossburg, PA – Photo shows severe impact from acid mine drainage. There is little to no aquatic life in the river.
AML Pilot funding will be used to design and construct an active AMD treatment system with the intent of restoring the Tioga River. The Tioga River is impaired due to low pH and high concentrations of metals. AMD will be collected from discharges along Morris Run, Coal Creek and adjacent mine pools via directional-drilled pipes, then conveyed to a centralized treatment plant near Morris Run.
AMD discharge from the Lake Mine Complex. Average flow is 1,300 GPM. Average water chemistry values: pH=3.2, Al=20 mg/l, Fe=8 mg/l, Mn=25 mg/l, acidity=230 mg/l, alkalinity=0 mg/l.
The Coal Creek Discharge is the largest volume discharge within the Tioga River Watershed and is responsible for 45% of the total acidity load to the Tioga River.
Significant Benefits

• Restore a total of twenty (20) miles of streams back to a natural state as a wild trout and stocked trout fishery
• Improve water quality within 500-acre Tioga Lake and ultimately the entire 1,200-acre Tioga/Hammond Dam Complex; only half of the complex is good water quality
• Produce positive economic benefits to the Tioga/ Hammond Dam Complex recreation area
Questions?

Contact Information:
ecavazza@pa.gov
814-472-1800

Tom Wolf, Governor
Patrick McDonnell, Secretary