

Remediating the Audenreid Mine Tunnel Discharge A Passive Treatment System to be Constructed

Project Location

The Audenreid Mine Tunnel Discharge is located within the Catawissa Creek Watershed about two miles east of the town of Shepton, Schuylkill County, Pa. The discharge from the Audenreid Mine Tunnel, which is the largest abandoned mine drainage discharge in the watershed, is located in the headwaters of the Catawissa Creek and impacts the entire watershed.



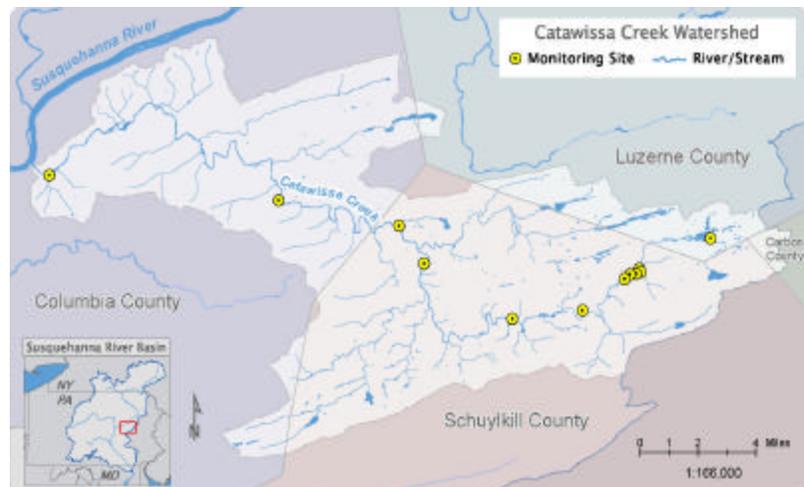
The Catawissa Creek Watershed covers a 152-square-mile area covering portions of four Pennsylvania counties: Carbon, Columbia, Luzerne, and Schuylkill. The mainstem Catawissa Creek originates in the anthracite coal region of Carbon and Luzerne Counties and flows 41 miles to its confluence with the Susquehanna River.

Many tributaries of the Catawissa Creek have native brook trout populations or recreational trout fisheries.

Why the Remediation Project Is Needed

A 1982 study, conducted for the Pennsylvania Department of Environmental Resources (now Environmental Protection – PADEP), reported that 84 percent of the acid load to the Catawissa Creek is from the Audenreid Mine Tunnel Discharge. The Catawissa Creek is listed on PADEP’s 303(d) list of impaired waters. The acid mine drainage (AMD) has left the creek and its largest tributary, Tomhickon Creek, essentially devoid of fish and other aquatic life.

Streamflow drainage patterns, surface runoff, and the landscape of the upper watershed have also been altered by past surface and underground coal mining activities. Vast coal refuse piles and numerous abandoned, open surface mining pits cover extensive areas of the upper watershed. The coal seams are steeply pitched and mine workings penetrate deep into the ridge tops, hillsides, and valleys. Five abandoned mine tunnels drilled during active coal mining have been discharging AMD, and severely degrading the water quality of Catawissa Creek since the 1930s. If the AMD from the tunnels can be abated, Catawissa and Tomhickon Creeks have the potential to become important recreational trout fisheries, boost tourism, and stimulate the local economy.



Goals of the Project

The primary goal of the project is to restore, to the greatest extent possible, the water quality and quantity of the Catawissa Creek Watershed to natural conditions by designing and installing a passive treatment system. The success of the project will be measured by increases in pH and alkalinity, reduction in dissolved aluminum in mainstem Catawissa Creek, and colonization by macro invertebrates.

Short-term goals are to:

- Continue monitoring water quality and quantity impacts.
- Continue encouraging watershed residents to be involved in volunteer environmental and educational activities.
- Continue educating the general public and school children on the impacts of nonpoint source pollution, abandoned mine reclamation, and passive treatment technologies.
- Continue seeking technical expertise and funding from all levels of government, the private sector, local groups, private landowners and consultants to effectively address pollution problems.
- Continue expanding broad-based partnerships and building the local coalitions needed to address other nonpoint pollution sources affecting the watershed.

Long-term goals are to:

- Remove the Catawissa Creek Watershed from the 303(d) List of Impaired Waters.
- Construct appropriate passive treatment technology systems on the tunnel discharges.
- Restore stream channels destroyed by mining activities.
- Reclaim and restore land surfaces impacted by mining and remove culm banks to reduce sedimentation and erosion and improve water quality and quantity.
- Restore coldwater fishery status and high quality designations to tributaries currently impacted by AMD.
- Restore viable fisheries in impacted streams and allow for the passage of nonpoint source impairment impacts.
- Maintain and update the watershed plan to effectively evaluate, assess, and implement projects to protect and restore water resources.
- Serve as a model for other groups addressing AMD impacts and comprehensive watershed restoration planning and implementation.

Project Partners

Catawissa Creek Restoration Association will assist with grant administration and oversight, water quality monitoring and educational and outreach activities.

Eastern Pennsylvania Coalition for Abandoned Mine Reclamation is responsible for implementing the watershed plan, and will assist with grant administration and oversight, and educational and outreach activities.

Pennsylvania Fish & Boat Commission will assist with water quality monitoring, and educational and outreach activities.

Schuylkill Conservation District is responsible for project administration, grant oversight, educational and outreach activities.

Susquehanna River Basin Commission will assist with water quality monitoring, and educational and outreach activities.

Additional project partners are: Blue Knob Rod & Gun Club, Butler Enterprises, Columbia County Board of Commissioners, Columbia County Conservation District, East Union Township, Hedin Environmental, Natural Resources Conservation Service, Office of Surface Mining, Paragon Adventure Park, Pennsylvania Association of Conservation Districts, PADEP, RETTEW and Schuylkill County Board of Commissioners.

Project Implementation

For the proposed treatment of the Audenreid Mine Tunnel discharge, the project sponsors decided to install the same passive treatment system that was used at another AMD discharge site (Oneida #1) given similar water quality conditions. The system for the Audenreid Mine Tunnel discharge, which was designed using funds from the PADEP's Growing Greener Technical Assistance Grant, was further modified to raise the pH level and precipitate the aluminum through the addition of limestone. This modified limestone drain passive treatment system has proven successful at other discharge sites in the anthracite region.

The Audenreid Mine Tunnel discharge required innovations to a conventional passive treatment system because of the high-volume discharge and the presence of aluminum. A conventional system would have been cost-prohibitive. The innovative passive treatment will involve:

- Diverting the discharge into a series of concrete treatment cells filled with limestone into a large settling pond to receive the aluminum precipitate.

- Using wetlands to provide final polishing before the water is returned to the creek.

Given the likelihood that the accumulation of aluminum hydroxide could plug the treatment system, several flushing options were evaluated for this innovative system to keep the treatment capacity of the concrete treatment cells at an optimal level, including:

- Keeping the limestone retention time down to 1-2 hours (instead of the 12-48 hours used in bituminous coal field treatment systems).
- Using unique treatment system concrete tank components instead of earthen ponds.
- Flushing the system extensively and frequently to manage the aluminum solids and keep them out of the stream.

These innovative features will make it possible to study and evaluate the effectiveness of the treatment system.

Project Schedule

The Catawissa Creek macroinvertebrate sampling took place in June 2004. The restoration (construction) activities will begin in March

2005 and are scheduled for completion in December 2005.

Project Funding

The funding for the watershed restoration and environmental education efforts in the Catawissa Creek Watershed has been provided by the U.S. Environmental Protection Agency's Environmental Education, Brownfields Initiative, and Section 319 programs; Office of Surface Mining Appalachian Clean Streams Initiative, Summer Internship, and Title IV AML Programs; Pennsylvania Growing Greener Environmental Stewardship/Watershed Protection and Technical Assistance Grant Programs; the EPCAMR Regional Watershed Support Initiative; and Schuylkill and Columbia County Commissioners.

Information Contact

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