

History of AMD Treatment Systems, TAG Grant Received by Trout Unlimited and Recent Evaluation

Tribute to Bruno Najaka (March 3, 1930 - July 3, 2018) and Corey Richmond (February 14, 1971 - April 21, 2020)

Both Bruno and Corey were involved with Sullivan County Conservation District. Bruno's goal before his death was to reclaim the scars of Sullivan County's coal mining industry between Lopez and US Route 220 which impaired Loyalsock Creek's watershed. Corey became a watershed specialist for the conservation district in 1994. Both of these men worked as a team to eliminate mining scars and acid mine drainage (AMD) going into Loyalsock Creek.

Starting sometime around 1999 two treatment systems were installed on White Ash property. Water from mine shafts was collected, piped, and outflowed onto ground to descend to Loyalsock Creek. Tunnels A (AMD from Murray mines) and B (AMD from Connell mines) were the open ends of these pipes. Bruno, Corey and White Ash land owners, continued with planning and having treatment systems constructed at both tunnels.

Tunnel A's system has three underground cells, each with a liner wrapped around its treatment (drainage pipes top and bottom with a layer of limestone between them). Being underground kept oxygen out of this system because oxygen lessens limestone's ability to release its lime for neutralizing water's acid. An intake captured some of outflow from tunnel. Water from intake flowed into bottom layer of drainage pipes of each cell, percolated up through limestone to top layer of drainage pipes, flowed out of system and down to Loyalsock Creek. Various pipes to ground's surface were ways to open valves and periodically flush the system. Untreated water did not pass through a weir before flowing to Loyalsock Creek over a layer of limestone exposed to oxygen.

Tunnel B's system has an intake capturing all water from tunnel and piping some of it to a pond. Water not entering pipe to pond, flows over a weir and down a ditch lined with limestone to enter Loyalsock Creek. The pond has a liner with a system of a main drainage pipe with side pipes on the bottom. Above that is a layer of limestone covered with two feet of mushroom compost to remove oxygen from water so it can be buffered by limestone before draining into bottom layer of drainage pipes. Intake has a weir without a staff gauge to measure water bypassing treatment system. Water from treatment pond is directed into a lower pond to collect heavy metals. Then treated water is released to flow into Loyalsock Creek. However, this water passes through a wetland which acts like nature's sponge to purify water more before entering flow of Loyalsock Creek. This location is near where Tioga & Berwick Turnpike crossed Loyalsock Creek.

Robert Hedin (Hedin Environmental Consultants) reported to LCWA directors on Nov. 28, 2006 that tunnels A and B treatments were not treating entire mine outflow that they were capable of treating because certain valves have not been properly adjusted which requires a special wrench. We needed to have wrench and instruction/maintenance schedule for flushing these systems. Also a weir needed to be installed at tunnel A. Another problem at both A & B intakes was sunlight causing algae growth and leaves clogging intake and system of pipes in Tunnel A's underground cells and Tunnel B's pipe carrying water to pond.

On April 25, 2007 Mr. Korb from BAMR and his men came to work with LCWA directors at both tunnels, gave us the special wrench, showed us how to flush the system and maintenance advice. During July 2009 LCWA placed aluminum carports with fencing around four sides over intakes of both tunnels to prevent algae growth and leaves from entering treatment systems.

The last coal breaker was dismantled in 2005 thus leading the way toward using interest money from bonds that mining companies forfeited to the government because bond was not enough money to reclaim the land. Closing pit mining holes and grading land to its natural terrain, covering area with six to eight inches of treated biosolids from sewer treatment facilities and mixed with lime started taking place. Biosolids/lime were mixed into rocky surface soils and trees and grasses to attract wildlife were planted. All of this took place from 2010 to 2011.

During November 2017 Tunnel A's system had its three cells opened, pipes cleaned and limestone washed. Dead frogs, etc. from intake had prevented this system from working to its capacity. After all was restored, several changes took place. Old intake/carport was removed. Now a large volume of water bypasses this treatment system and no weir or staff gage to measure water bypassing treatment system was installed. Water flowing into the treatment cells enters into three pipes. Each pipe has a damper that needs adjusted due to rainy times. After the damper and as each pipe heads to its underground cell, there is a backflow pipe, four inches in diameter, that extends three feet above the ground's surface and has holes to release water that cannot pass through its cell. This untreated water flows over ground's surface and has formed a gully that leads to outflow ditch from treatment cells. There is no measurement for this untreated water. Then each pipe enters its cell to flow through top drainage pipes, percolate down through limestone layer and drain out bottom layer of drainage pipes to outlet of system. This project was funded by Southwestern Energy.

During 2015 a treatment system for AMD at Gunton mines on Dwight Lewis Lumber Co. property was installed. This system was a pond, as described for Tunnel B, which collected mine water from a major AMD seep. Later, this system was rehabilitated and a smaller pond near Old Bernice Road was made to collect heavy metals before treated water entered Birch Creek.

Has any need been found to treat AMD from Bernice mines west of the old Tioga/Berwick Turnpike? Tunnels A & B are east of Tioga & Berwick Turnpike and Gunton mine treatment is closer to US Rt. 220.

Streams with acidity problems due to wetlands in their headwaters have been treated with limestone sand piles deposited near these streams and before their mouth into Loyalsock Creek. Rainfall on these piles allows limestone to buffer stream's water. However, sand from these limestone quarries at source of Antes Creek in Lycoming County have coated bottom of this stream and has caused a fishery decline in this once famous trout fishing stream.

Plan to Evaluate and Improve Function of Treatment of Acid Mine Drainage

Local chapter of Trout Unlimited received a Technical Assistance Grant (TAG) from National Trout Unlimited, office in Lock Haven, PA to evaluate existing AMD drainage treatments in upper Loyalsock Creek watershed and ways to improve them. According to DEP standards, Loyalsock Creek is impaired two miles below Lopez. Steve Szoke, Walt Nicholson and Charles Knowlden of local Trout Unlimited, Dr. Shawn Rummel of National Trout Unlimited and Robert Smith of Lycoming College visited both AMD sites on White Ash property during June 4, 2020 and found they were not treating acid mine drainage to their capacity.

They noticed that middle cell of Tunnel A did not have water coming out of it's backflow pipe and was probably treating its inflow. Its outflow was about three fourths. The outer two cell's backflow pipes were releasing untreated water and their outflow was about one fourth. At Tunnel B there was less water flowing in pipe from intake to pond, which may be broken or clogged. Even the pond was below its normal level. Carport with fence is still over B's intake. This intake has a weir but no staff gauge to measure amount of untreated water bypassing treatment system. Both systems showed a lack of maintenance due to no Bruno and Corey to do what they did before their illnesses and deaths. Also a watershed specialist and conservation director, both new at Sullivan Co. Conservation office, may not know what to do with these treatment systems.

Dr. Shawn Rummel, who has gathered information concerning water quality data available from different agencies, contractors, Dr. Niles studies, SRBC, PA Fish & Boat Com. USGS, plans to work with Robert Hedin (Hedin Environmental Consultants) and Robert Hughes director at EPCAMR (Eastern PA Coalition of Abandoned Mine Reclamations). This fall they plan to collect water samples and do macroinvertebrate studies above and below where treated and untreated water from Tunnels A and B enter Loyalsock Creek. They plan to study geology of mine shafts and tunnels and see if there is a way to divert water away from entering mine shafts where it meets minerals causing acidity of this water and what will be the best and most feasible way to fix these treatment problems. This study will include finding an ongoing sustainable partnership to maintain these treatment systems.

We need the best treatment with the least maintenance that continues to work. There is a different system for Babb Creek near Arnot in Tioga County for treating AMD. It has a computerized sensor that adjusts limestone dispersion into its treatment system and can add lime as needed. Sullivan County's AMD systems have a fixed amount of limestone.

"Existing Use" as Exceptional Value (EV) for Loyalsock Creek from Rock Run Road (Iron Bridge) to Mouth (Montoursville, PA)

We need to maintain/improve the AMD treatment systems in upper Loyalsock Creek Watershed. Since July 2008 the Loyalsock Creek received "Existing Use" as Exceptional Value (EV) classification. Fishermen of Trout Unlimited and Whistle Pigs Fishing Club have been catching native brook trout in Loyalsock Creek at junctions with tributary streams from Pier 87 restaurant upstream to Rock Run Road (Iron Bridge). Studies by Shannon White indicate that native brook trout use the mainstem in winter. When summer's heat warms Loyalsock Creek, they migrate up cool tributary streams and remain until after spawning in autumn. This movement in the mainstem and spawning in various tributaries has diversified the spread of genes based on her genetic research of fin clips. Dr. Niles and his interns have been studying native trout populations in named and unnamed tributary streams and having pre and post flood data of some of these streams has helped to show post flood recovery of these native trout. Other studies with Clean Water Institute and migration studies on Little Bear Creek and other research in Loyalsock Creek watershed has proven the value of the Loyalsock Creel Watershed Association and those helping to preserve and improve Loyalsock Creek and its tributaries flowing from Wyoming County, through Sullivan County and into Lycoming County. This includes Loyalsock State Forest, Worlds End State Park and PA State Game Lands open for public recreation.