

SLIPPERY ROCK WATERSHED COALITION
DE SALE PHASE I RESTORATION PROJECT

Venango Township, northern Butler County, PA
“A Public-Private Partnership Effort”

PROJECT PARTICIPANTS:

PA DEP Knox District Mining Office	Amerikohl Mining, Inc.
Grove City College	Stream Restoration Inc.
BioMost, Inc.	Slippery Rock University
Private Landowners	WOPEC
Quality Aggregates Inc.	Scrubgrass Generating Plant
Aquascape	SRWC Volunteers

SITE HISTORY:

Pre-act mining on the Middle Kittanning coalbed left a barren landscape with severely degraded acid mine drainage issuing from the toe of spoil. The discharge emanating from this site impacts approximately 3 miles of Seaton Creek, the major tributary most heavily impacted by abandoned mine drainage within the Slippery Rock Creek Watershed headwaters.

LAND RESTORATION:

About 8 acres of barren spoil were reclaimed using 35,058 tons of alkaline, circulating, fluidized-bed, coal ash. (12/99 to 5/00)

DRAINAGE ABATEMENT:

Passive treatment system installed in six weeks (3/29/00 to 5/10/00) included four components: Anoxic Collection System with Inlet Control Structure, two Vertical Flow Ponds(operating in parallel), Settling Pond/Wetland Complex, and Horizontal Flow Limestone Bed.

Water is collected using a french drain-type subsurface collection system. The water is directed into the top of two Vertical Flow Ponds operating in parallel. The water flows vertically (top to bottom) through a 6" layer of spent mushroom compost and a 4' layer of limestone (1500 tons per pond, AASHTO #1limestone aggregate, 90% CCE). The treatment media generates alkalinity.

Two tiers of perforated plastic pipe installed in the aggregate collect the water flowing through the Vertical Flow Ponds. The treated water discharges through the outlet control structures into a 3/4-acre settling pond/wetland. This settling pond allows periodic flushing of the Vertical Flow Ponds in order to remove accumulated metal precipitates (mainly iron and aluminum). The wetland facilitates additional iron oxidization and settling of iron and aluminum precipitates. Finally, the water passes through a Horizontal Flow Limestone Bed, adding alkalinity and removing a large portion of the manganese, which then discharges through an 8" perforated underdrain.

WATER QUALITY (representative):

	pH	alkalinity (mg/l)	acidity (mg/l)	Fe (mg/l)	Mn (mg/l)	Al (mg/l)
raw	3.5	0	420	65	40	15
treated	7.0	168	0	4	8	<1

total metals reported; insignificant dissolved Fe and Al in final effluent; 100 gpm design flow; 35 gpm average flow

FUNDING SOURCE:

Commonwealth of Pennsylvania “Reclaim PA” initiative (Watershed Restoration and Partnership Act)
 Contributions from partners