Slippery Rock Passive Treatment Rehab & Maintenance

A Slippery Rock Watershed Coalition Project

Washington & Venango Townships, Butler County, Pennsylvania
Grant Document Number: C990000637

www.srwc.org

Before/During Rehabilitation: (From Left to Right) Pond D2 at SR1114D full of iron sludge and debris (2020); Iron sludge build up around SR114B ALD outlet pipe prior to rehabilitation (2020); Spurr Excavation, LLC finishing reconstruction of SR114 ALD D; Spurr removing sludge and debris from settling pond at SR81.

Stream Order: Slippery Rock Creek → Beaver River → Ohio River
Project Sponsor: Stream Restoration Incorporated (www.streamrestorationinc.org)
Problem: Five existing passive systems (Ferris Complex, SR81, SR101A, SR114B, SR114D) treating AMD within the Slippery Rock Creek Watershed were nearing the end of their designed operating life or in need of major maintenance.
Goal: Rehabilitate the five aging passive treatment systems to continue treatment and sustain the restoration of Slippery Rock Creek achieved from the systems' original construction.

Project Description: Five passive systems constructed between 1995 and 2002 to treat AMD in the headwaters of Slippery Rock Creek had performed well for >20 years and exceeded their design life but needed rehabilitated as limestone was consumed, treatment media degraded, metal sludge accumulated, pipes compromised and other issues. The Ferris Complex consists of two passive systems constructed in 1997 to treat four AMD discharges. The ***Ferris SR85/SR86 (VK)*** system was improved by redesigning and reconstructing existing VFPs into Jenning's-style mixed media (limestone, compost, and wood chips) vertical flow ponds (JVFPs) and reconfigured to operate in parallel. Further changes involved installing a terraced iron formation (TIF) and a flow splitter box. While not part of the original grant, major maintenance was performed at the ***Ferris SR87/SR88 (JP)*** system including replacing a plugged culvert that conveyed AMD, installing pipes for flow measurements, and washing the limestone only VFP. In addition, large dual culvert pipes under the access road between Wetland 1 and 2 had failed and were replaced with a drivable spillway. The ***SR81*** system was originally designed to treat 60 gpm; however, during construction in 2002, the mine pool was accidentally hit increasing flow to about 200 gpm increasing the pollutant load. SR81 was redesigned with increased treatment capacity. Rehabilitation included enlarging the anoxic limestone drain (ALD), reconfiguring the settling pond and wetland, and constructing a unique z-pile moat and rock berm flow distribution features to utilize an existing AMD impacted natural wetland for additional treatment. Accumulated treatment sludge was removed from the system and placed in a newly constructed dewatering basin. The ***SR101A*** system was constructed in 1998 consisting of an ALD, settling pond and wetlands. Accumulation of sludge had reduced treatment capacity. Maintenance was conducted including removing sludge/organic debris from the system and placing into a newly constructed pond. ***SR114B*** and ***SR114D*** were constructed in 1995. After 28 years of successful operation with little maintenance, they needed to be rebuilt. The ALDs were expanded, and new limestone added, settling ponds and wetlands full of sludge were cleaned and placed in a dewatering basin, Pond B was expanded, and baffle curtains were installed.

After Rehabilitation: Terraced iron formation (TIF) and flow splitter box at the Ferris SR85/86 passive system with the JVFP East (VK1) in background.

The five rehabilitated systems collectively treat an estimated 275 million gallons of AMD, neutralize 207,000 lb of acidity and prevent 32,000 lb of metals from entering Slippery Rock Creek each year while providing an estimated load of ~140,000 lb of excess alkalinity.

Project Partners

PA Department of Environmental Protection Bureau of Abandoned Mine Reclamation ($921,932 Growing Greener Grant) |U.S. Office of Surface Mine Reclamation and Enforcement ($120,000 WCAP Grant)|Foundation for Pennsylvania Watersheds ($30,000 Grant)| Butler County Conservation District Game Lands 95 O&M Fund ($10,188.98) |Stream Restoration Incorporated ($87,283 In-Kind; Grant Administration)|BioMost, Inc. ($236,813 In-Kind; Design/Permitting & Construction) |PA Game Commission (Landowner) |Slippery Rock Watershed Coalition (Project Assistance)