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Slippery Rock Creek Priority Watershed Report 2004 Update

Introduction

This is the fourth annual update to the Slippery Rock Creek Priority Area Report, developed by the Knox District Mining Office (Knox DMO) to update the restoration and monitoring activities occurring in the Slippery Rock Creek Priority Area during 2004.

The Slippery Rock Creek Priority Area is located approximately 4 miles south of Interstate 80 in Butler County. The watershed lies 10 miles east of the town of Slippery Rock within Venango, Washington, Marion, and Cherry Townships. It is flanked by the communities of Boyers and Eau Claire, and approximately bound by State Routes 38, 58, 308 and 4010. The Slippery Rock Creek Priority Area is approximately 34 square miles in size and was expanded in 2004 to include the Blacks Creek Watershed. [Slippery Rock Priority Area Map](#)

Restoration efforts have progressed in the watershed though the construction of a fly ash cap at the Western Hickory (Campbell) site and the installation of a treatment wetland at the BC19 and BC19B discharges. Future restoration efforts will focus on O&M issues associated with SR87/88 (Ferris) and SR87/88 (Ferris). A treatment system will be installed during the summer of 2005 to treat the SR89/SR94 (Hilliards, Higgins Cr.) discharges and work will begin on remediating the BC16 abandoned gas well discharge. BAMR is currently working on several projects including Thomas Trib, DeSale Phase 1A, Ruth (12.2/9B) and B&D (12.1). Water quality will continue to be monitored by the Knox DMO staff.

Activities – January 1, 2004 – December 31, 2004

Western Hickory (Campbell)

This site was mined and reclaimed under Western Hickory Coal Co. Inc.'s SMP No. 10803018. Three post-mining discharges resulted that were being passively treated but chemical treatment was still required to meet effluent criteria (manganese levels high). Quality Aggregates, Inc. constructed a two-foot thick flyash cap in 2004 to reduce infiltration at the site along with the addition of the alkaline material. Water quality will be evaluated in 2005 and if the manganese effluent criteria is not met after the flyash cap is installed then a Pyrolusite AMD treatment system may be installed to remove the manganese from the discharges. and look at WQD.

BC19 and BC19B

Stream Restoration Incorporated (SRI) received a \$60,000.00 Round 4 Growing Greener Grant to install a 0.5-acre treatment wetland to remediate two abandoned oil well upwellings (BC19 and BC19B) discharging mine drainage into Blacks Creek. Construction of the wetland was completed during the summer of 2004 and it is expected to prevent approximately 6,000 lbs/year from entering Blacks Creek. Water quality is currently being collected to evaluate the wetlands performance and an update on this system will be included in the 2005 Update.

BC16

SRI was awarded a 2004 EPA 319 Grant in the amount of \$151,740.00 to construct a 1-acre treatment wetland and 5,000 square foot horizontal flow limestone bed to treat an abandoned oil well upwelling, known as BC16, in the Blacks Creek Watershed. BC16 originates upstream from the BC19 and BC19B discharges and contributes approximately 19,000 lbs/yr of iron and 6,300 lbs/yr of manganese to the stream. An update on the construction of this treatment system will be included in the 2005 Update.

SR81 (Ferris)

A \$120,000.00 Round 2 Growing Greener Grant was awarded to SRI to construct an anoxic limestone drain and associated 0.5-acre wetland to treat a discharge of 3-tons/yr acidity and 1 ton/yr iron and to increase the alkalinity in 2 miles of Slippery Rock Creek. Along with the installation of a passive treatment system, a gob pile was removed, restoring four acres of wildlife habitat at the site. During the construction of this treatment system, a significant flow was encountered and the scope of work was revised to accommodate needed changes. Construction of the treatment system was completed during the fall of 2003. Water quality data shows the system with a net alkaline final effluent averaging 6 mg/l of iron and 4 mg/l of manganese, however there has been no discernable improvement in water quality at the downstream monitoring point in Slippery Rock Creek (64).

Erico Bridge Discharge Abatement project is a Growing Greener Grant awarded to Stream Restoration Inc. for \$866,000. The system was completed during in 2004 and consists of three anoxic limestone drains with ponds, wetlands and a horizontal flow limestone bed. The effluent from the treatment system (HFLB) has an average pH of 7.0, net alkalinity of 78.1 mg/l, 1.6 mg/l of iron and 4.1 mg/l of manganese with aluminum below detection levels. Since the system was constructed, the downstream water quality in Seaton Creek (19.1) has shown an increase in pH and alkalinity and a decrease in iron and manganese levels.

SR89/SR94 (Hilliards/Higgins Cr.)

An off site Surface Mining Permit (SMP) mitigation project at the SR89 (Magnum) site was delayed in September 2003 because road bonds could not be obtained in time to start construction. Construction of the treatment system, consisting of a combination of a Vertical Flow System (VFS), settling ponds and wetlands, was expected to begin during the summer of 2004 but was delayed due to inclement weather. Construction is now

scheduled in 2005. Maintenance is scheduled at the SR94 (Bertha) treatment system in the summer of 2005. The wellhead diverting the discharge into the treatment system is leaking, and water is bypassing the system.

SR114D (Argentine). During the summer of 2003 SRI repaired the drop inlet between the first and second settling basin, but retention time in the wetland cells remains an issue.

SR85/86 (Ferris) The compost in cell 1 of the VFS is spent/clogged (obstructs the discharge from migrating to the under drain system), and the valve used to flush the system is broken. Additionally, beavers have plugged outlet pipes from the wetlands. BAMR's B&D crew is scheduled to replace the compost and limestone in cell 1 of the VFS. The compost removed from the system will be trucked to the Magnum site and used as substrate. The Slippery Rock Watershed Coalition (SRWC) has offered to purchase and replace the broken valve. Operation and Maintenance tasks/repairs to the system will be coordinated with the construction activities at SR89/Magnum site during the summer of 2005.

SR87/88 (Ferris)

Maintenance is also needed on the SR87/88 treatment VFS. An overflow pipe needs to be installed between cell 1 and cell 2. Quality Aggregates Inc. has provided the needed pipe and the PA Game Commission will provide the use of their backhoe for the excavation and installation. This work is expected to be completed during the summer of 2005.

DeSalle Phase 1A

BAMR completed aerial photography of the DeSalle Phase IA site during the fall of 2003 and land reclamation, including the elimination of a highwall and incorporation of fly ash into the spoil material, was initiated on the headwaters of Seaton Creek in 2004. The reclamation activity is expected to be completed during the summer of 2005 and is expected to decrease the volume and increase the quality of the discharge, which has a low pH, high acidity and high levels of iron, manganese and aluminum.

Mining Activities

During 2004, there was one new surface mining permit issued in the Slippery Rock Creek Priority Area and two previously issued permits:

Quality Aggregates, Inc., SMP No.10030101, Venango Township, Butler County, Hindman Mine – a bituminous coal surface mining permit encompassing 95 acres. Approximately 38 acres of limestone and 58 acres of Upper and Lower Clarion coals are to be mined, along with the reclamation of 14 acres of abandoned mine land and over 1500 feet of highwall. Beneficial use coal ash will also be applied to the mined areas. Site is currently being mined.

Annandale Sandstone, SMP No. 10010309, Venango Township, Butler County - a noncoal surface mining permit encompassing 16.0 acres of sandstone mining. Site is currently being mined.

Ben-Hal Mining Company, SMP#10970104, Venango Township, Butler County, Fehl Mine - a bituminous coal surface mining permit encompassing 130.8 acres. Approximately 78.7 acres of Middle Kittaning Coal will be mined along with the reclamation of 54.7 acres of abandoned mine land. Site is currently being mined.

Surface Mine Conservation Inspectors from the Knox DMO inspects both of these active mine sites on a monthly basis. An update on the status of these sites will be included in next year's report.

TMDL

Total Maximum Daily Load ("TMDL") reports were completed for Blacks Creek and Seaton Creek in 2002 and approved by the EPA in January of 2005. The TMDLs were done to address the impairments noted on the 1996 Pennsylvania 303(d) list, required under the Clean Water Act. All impairments in the Blacks Creek and Seaton Creek watersheds resulted from acid mine drainage from abandoned coal mines and abandoned oil and gas drilling. The TMDLs address the three primary metals associated with acid mine drainage, iron, manganese and aluminum.

TMDLs include calculations of the loadings, for each metal of concern listed and acidity, that can safely be put into the streams and meet the state water quality criteria. The Seaton Creek TMDL, when implemented, is expected to achieve the water quality standards. Future mining activities in Blacks Creek and Seaton Creek watersheds, will be required to meet the percent reductions noted in the TMDL document for discharges.

Water Quality Indicators

Key stream monitoring points being evaluated for this years report include:

| | |
|------|---|
| 18 | Murrin Run at Goff Station |
| 30 | Tributary to Seaton Creek downstream from Abel/Dreshman (Chernicky) |
| 23 | Western tributary to Seaton Creek downstream DeSale Phase II |
| 25 | Eastern tributary to Seaton Creek downstream DeSale Phase I |
| 19.1 | Seaton Creek at Erico Bridge |
| 46 | Slippery Rock Creek below SR114 and SR115 |
| 67 | Slippery Rock Creek above confluence with Seaton Creek |
| 68.1 | Seaton Creek above confluence with Slippery Rock Creek |

The following is a short outline of what the water quality or monitoring is showing at the various locations.. For a complete list of sample points and water quality data: [Monitoring Point Descriptions and Water Quality Data.](#)

18 – The water quality in Murrin Run, above its confluence with Seaton Creek, shows increases in pH and alkalinity and decreases in acidity, iron and aluminum. Improvements in water quality can be attributed to the Goff Station treatment system and reclamation at the Brookville Pit, upstream from this monitoring point.

30 – Water Quality in Seaton Creek downstream from the Abel/Dreshman (Chernicky) land reclamation site shows that pH and alkalinity have both increased while iron and aluminum levels have decreased. However, recent water quality is showing an increasing trend in acidity and elevated levels of manganese.

23 – Downstream from the DeSale Phase II treatment system, pH and alkalinity have both increased since the system was installed while acidity, iron and aluminum levels have been reduced. Manganese levels continue to fluctuate.

25 – After the DeSale Phase I treatment system was constructed in 2000, water quality at the headwaters of Seaton Creek showed an improvement with an increase in pH and alkalinity and decrease in metals. However, levels of iron, manganese and aluminum are still high. Reclamation currently under way at the DeSale Phase IA site, at the headwaters of this tributary, is expected to further improve the water quality at 25.

19.1 - Since the Erico Bridge treatment system has been constructed, along with the gob pile removal and wetland construction, water quality in Seaton Creek below these sites has shown improvement. pH has increased from 4.7 to 6.4, alkalinity increased from 8.0 to 26.2 mg/l and acidity levels have decreased from 50.1 to 23.7 mg/l. Iron levels are showing a decreasing trend and aluminum levels are below detection limit. Manganese levels have decreased from 15.0 to 6.4 mg/l.

46 - The water quality in Slippery Rock Creek below the SR114B, SR114D and SR115 treatment systems shows an increase in alkalinity accompanied by a decrease in acidity. The Argentine treatment systems are producing excess alkalinity increasing the buffering capacity of Slippery Rock Creek downstream from their locations. Iron and manganese levels are low and aluminum is below the detection limit.

67 – Slippery Rock Creek above its confluence with Seaton Creek shows an increasing trend in pH along with decreases in iron, manganese and aluminum. Water quality collected in 2004 has shown increasing levels of acidity.

68.1 – Water quality in Seaton Creek, upstream from its confluence with Slippery Rock Creek and downstream from its confluence with Murrin Run, shows an average pH of 6.7, net alkalinity and an average iron concentration of 2.7 mg/l and an average manganese of 5.3 mg/l. Aluminum levels are below the detection limit.

Future Activities

The SRWC remains a leader for restoration efforts in the Slippery Rock Creek study area. Knox DMO will continue to monitor the water quality and update the "[Slippery Rock Priority Area Monitoring Points and Water Quality Data](#)" on the Knox DMO website.

BAMR is currently collecting and evaluating the water quality at the Thomas Trib site along with the Knox DMO staff. It is suspected that this site has been contaminated with ARMACO sludge (the source of high metals contamination in adjacent parts of the watershed). A flyash analysis may be performed to determine the presence of this sludge, and BAMR may consider developing a project in the future. SRI is also considering submitting a Growing Greener proposal for the Thomas Tributary.

BAMR is currently in the project development stage on two projects in the Slippery Rock Creek study area: Ruth (12.2/9B) and B&D (12.1). A geophysical investigation was conducted during the summer of 2003 to determine the impact the subsurface materials are having on the discharge on the Ruth site. Drilling is anticipated during the spring of 2004 to validate the findings of the geophysical study and to and used for the design a remediation plan. Act 181 advertising for the Ruth project could begin as early as July 2004. The B&D site is currently in the advertising process for Act 181 reclamation. Last year a soils study was conducted along with drilling to determine the composition of the subsurface materials to facilitate the design of a remediation plan. If an acceptable proposal is not submitted in the next four months, BAMRs Division of Acid Mine Drainage Abatement will begin the design of the project.

The Slippery Rock Creek Watershed Team will continue to meet quarterly to review system performance, assist in planning, monitoring, and project development activities. Team members are Sherry Carlin, Ely Heferle, Tim Van Dyke, Tim Gillen, Jim Plesakov, Roger Bowman, Terry Elicker, and Jon Smoyer.

Appendix A

Slippery Rock Creek Study Area Treatment Systems

| Treatment System Name | Funding Source(s) | Funding Amount | Project Contributors | Treatment System Design |
|--|--|-----------------------|--|---|
| SR 115 (Argentine) | CONOCO Fines | \$31,000.00 | NRCS, Butler County Cons. District, H.R. Stewart, Jr. | Retention Pond and Wetlands |
| SR114B (Argentine) | Bond Forfeitures Black Fox Mining | \$30,000.00 | Hedin Environmental, CDS Associates, Jesteadt Excavating | ALD and Wetlands |
| SR114D (Argentine) | Bond Forfeitures Black Fox Mining | \$30,000.00 | Hedin Environmental, CDS Associates, Jesteadt Excavating | ALD and Wetlands |
| SR94 (Bertha/Higgins Corner) | CONOCO Fines | \$30,000.00 | Butler County Cons. District, PA Game Commission | ALD |
| SR85/SR86 (Ferris) | Reclamation Agreement | \$50,000.00 | Knox DMO, Kerry Coal Co. | VFS |
| SR87/SR88 (Ferris) | EPA 104(b) 3 Grant FY 94/95 | \$66,000.00 | Knox DMO, Harrisburg BMR, Penn's Corner, Puryear Excavating | VFS |
| SR84/SR88 (Ferris) | Reclamation Agreement | \$35,000.00 | Knox DMO, Kerry Coal Co. | Retention Pond (below 2 Ferris VFS) |
| SR81 (Ferris) | Growing Greener Grant NW01771 | \$120,000.00 | Amerikohl, SRI, Knox DMO, PGC | ALD and Wetlands |
| SR101A (Higgins Corner) | EPA 319 Grant | \$82,000.00 | Hedin Environmental, SRI, BAMR | ALD and Wetlands |
| SR109 (Argentine) | EPA 104(b) 3 Grant FY 96 | \$55,000.00 | Puryear, Knox DMO, Penn's Corner, BMR | VFS and Wetlands |
| 27F (DeSale Phase I) | WRPA WR-10 Grant | \$391,707.00 | Amerikohl, SRI, Knox DMO | VFS and Wetlands |
| 23F (DeSale Phase II) | Growing Greener Grant NW90624 | \$449,342.00 | Amerikohl, SRI, Knox DMO | VFS and Wetlands |
| 10A/10B/10C (DeSale Phase III) | Growing Greener Grant NW10324 | \$166,000.00 | Amerikohl, SRI, Knox DMO | Collection System, VFS, Pond and Wetlands |
| ST38/ST39/ST40/ST41/ST42 (Goff Station) | Growing Greener Grant NW90003 and WRAP Grant | \$840,751.00 | Quality Aggregates, SRI, Knox DMO | 2 VFS and Wetlands |
| SR96 (Hilliards) | Growing Greener Grant NW90647 and EPA 319 Grant | \$55,000.00 | SRI, Jesteadt Excavating, PGC, Knox DMO | ALD and Wetlands |
| Erico Bridge | Growing Greener NW10270 | \$866,000.00 | SRI, Quality Aggregates, Aquascape, Biomost, Butler Co. Commissioners, McClymonds Trucking | 3 ALDs and Wetlands |
| BC19 & BC19B | Growing Greener NW20377 | \$60,000.00 | SRI | Treatment Wetland |
| BC16 | EPA 319 Grant | \$151,740.00 | SRI | Horizontal Flow Limeston Bed and Treatment Wetland |

Appendix B

Slippery Rock Creek Study Area Land Reclamation

| Project Site | Funding Source | Acres Reclaimed | Project Contributors | Type of Project |
|--|-------------------------------|------------------------|--|--|
| Sunbeam Tipple | Reclamation Agreement | 21.2 | Kerry Coal Co., Knox DMO | Tipple Reclamation with Coal Ash |
| Brookville Pit (Tiche Property) | Consent Order and Agreement | 27 | Quality Aggregates Inc., SRI Knox DMO | Abandoned Pit and Spoil Pile Reclamation with Coal Ash |
| SR101/SR81/Ferris/SR114 T-637/Higgins | CONOCO Fines | 5.2 | Butler County Cons. District, PA Game Commission | Refuse Pile Reclamation with Rec Lime |
| Abel/Dreshman (Chernicky Site) | Landowner Reclamation Program | 56 | Amerikohl, Fike Associates, BAMR, BCCD, Knox DMO | Abandoned Surface Mine Reclamation with Coal Ash |
| Erico Bridge | Growing Greener NW10268 | | SRI, Butler Co. Commissioners Quality Aggregates Inc., McClymonds Trucking | 25,000 yard gob pile removed and 2-acre wetlands constructed |