west virginia department of environmental protection

West Virginia's Nonpoint Source Program
2011 Annual Report

west virginia department of environmental protection

February 2012

STATEMENT OF POLICY REGARDING THE EQUAL OPPORTUNITY TO USE AND PARTICIPATE IN PROGRAMS

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West Virginia's Nonpoint Program is funded by a Clean Water Act Section 319 Grant administered by the U.S. Environmental Protection Agency.

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Introduction

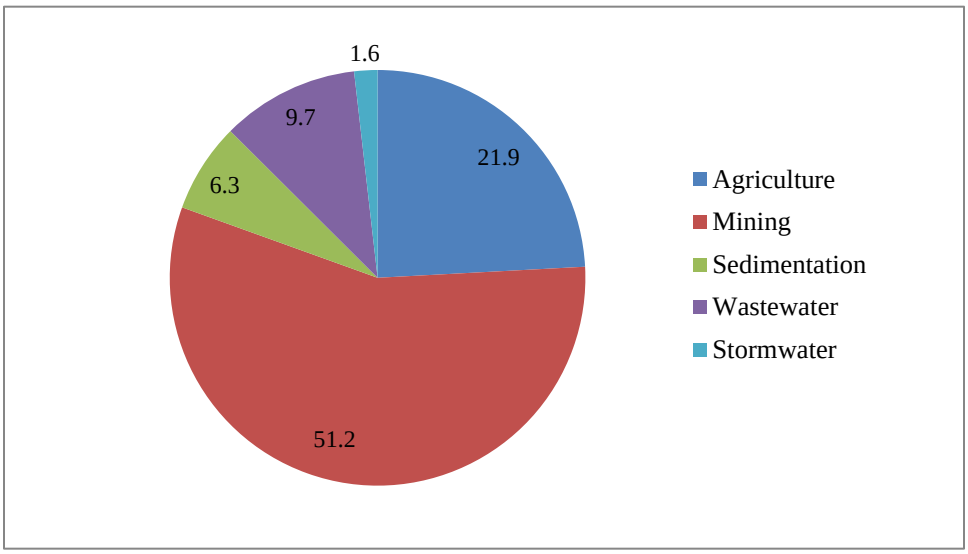
According to recent survey information of our nation's streams, rivers, wetlands and estuaries, nonpoint source (NPS) pollution is the largest source of water quality problems. Approximately 40% of our waters surveyed do not support their designated uses due to NPS pollution. NPS pollution is impairment associated with precipitation and run-off, and other non-permitted activities. Since it is mostly un-regulated, NPS is the people's pollution. Many communities and local organizations are working together to improve their environment. Participation is the key; local leaders must understand the importance of sustainable practices, low impact development (LID), and partnering with stakeholder groups in order to restore and protect our state's waters for the future.

Section 319 of the Clean Water Act (CWA) distributes grant monies to the states to implement NPS programs. This national program, administered by the US Environmental Protection Agency (US EPA), is vitally important and its results have been significant. Section 319 provides monies for base and incremental grant programs.

Base grants provide monies for our staff. These experts are essential for project management and for encouraging participation from local communities and organizations in areas impacted by NPS pollution. Base grant monies also support outreach and education activities, monitoring and many partner agencies that work to address NPS pollution. West Virginia has allocated $8.3 million towards base grants since 2007.

Incremental grants are used for project implementation. The planning and the areas that are targeted are driven by the 303(d) list and TMDL (total maximum daily loads) process. West Virginia has allocated $9.3 million towards incremental grants since 2007.

Figure 1: Sources of NPS pollution in West Virginia



The three major sources in the Mid-Atlantic region are mining, agriculture and stormwater run-off. These sources contribute acidity, heavy metals, sediment, pathogens and nutrients to our nation's waters, and also dramatically change their overall ecological integrity.

In West Virginia, the three leading cause of NPS impairments are mining, agriculture and wastewater.

Partnerships

- **Federal Government**: (US EPA) provides guidance, reviews plans, tracks progress and distributes §319 funds to the states. Office of Surface Mining (OSM) provides oversight and additional funds for acid mine drainage (AMD) projects. Natural Resource Conservation Service (NRCS) works closely with WVCA, providing technical assistance and specifications for a wide variety of agricultural best management practices (BMPs).
- **State Government**: DEPs NPS Program is responsible for administration and project management. This is the lead agency that receives and distributes §319 funds. WV Conservation Agency (WVCA) is

responsible for agricultural BMPs as well as certain stream restoration and construction projects. WV Division of Forestry (WVDOF) is responsible for timber management activities including roads, and in some cases will provide technical assistance for riparian development. The NPS Program also partners with several offices and programs within DEP (e.g. Office of Oil and Gas, Abandoned Mine Lands, Watershed Assessment Branch etc.) and other state agencies (e.g. Division of Health and Human Resources (DHHR)) depending upon the type of project.

- **Non-Government Organizations**: The NPS Program partners with many NGOs to help reduce the impacts from nonpoint pollution. Examples include many watershed associations, and organizations such as the WV Water Research Institute, Canaan Valley Institute, Freshwater Institute, The Mountain Institute and many others. This group makes significant contribution towards the implementation of projects.

This report will provide summaries of the activities associated with base and incremental grant activities in fiscal year 2011, and will also provide information on the progress of grants that are still active within this reporting period.

Executive summary

Incremental grants

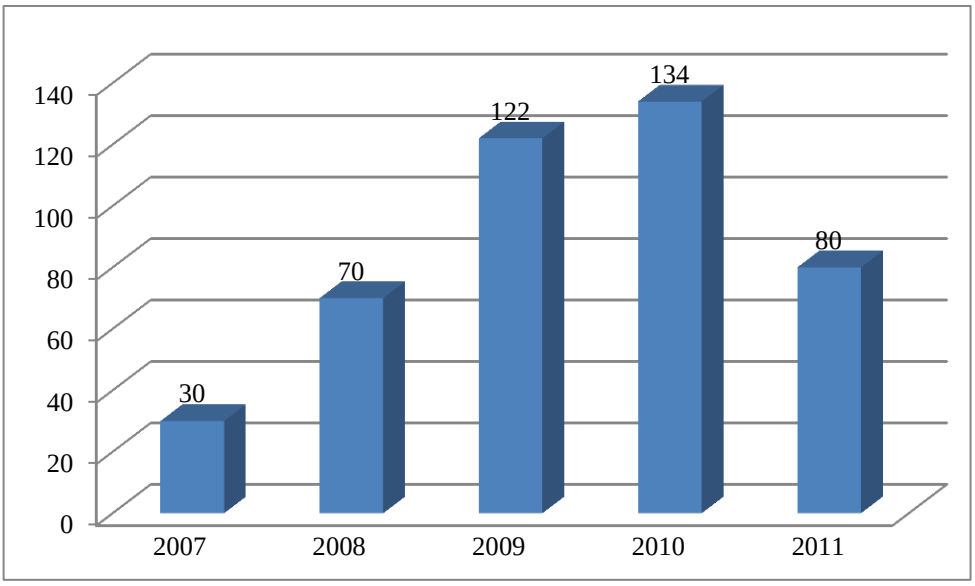
The program continues to expand despite recent budget cuts to the national program. In FY 2011 2006 grants were closed-out and 2007-2011 grants remain active. There are 35 incremental grants active, of these 22% have been completed. Several grants in the earlier years of the period remain active due to on-going monitoring or other improvements to the systems. During the period the NPS program implemented projects, developed watershed based plans (WBPs), and provided monitoring and outreach support in the following HUC 8 watersheds (See the map in Appendix 2).

HUC 8	Sub-watershed	Activities
Cacapon River	Lost River	Projects and outreach
Cheat River	Lower Cheat	Projects, monitoring and outreach
Elk River	Upper Elk	Planning
Greenbrier River	Kitchen/Back Creeks	Projects, monitoring and outreach
Lower New River	Wolf Creek	Projects, monitoring and outreach
Monongahela River	Deckers Creek and West Run	Projects, monitoring and outreach
Potomac Direct Drains	Sleepy Creek, Opequon Creek and Elk Run	Planning, projects, monitoring and outreach
South Branch Potomac	Mill Creek	Projects and monitoring
Tug Fork River	North Fork of Elkhorn	Planning, monitoring and outreach
Tygart Valley River	Upper Buckhannon	Projects and monitoring
Upper Guyandotte	Winding Gulf	Projects, planning and outreach
Upper Kanawha River	Cane Fork	Planning
Upper Ohio South	Fourpole Creek	Planning and outreach
West Fork	Lamberts Run	Projects and monitoring

Over the past year the 35 active incremental projects reduced a significant amount of NPS pollutants. Heavy metals from AMD projects were reduced by **267,764 lbs/yr** (81,366 Aluminum, 165,506 Iron and 16,852 Manganese); acidity was reduced by **661,295 lbs/yr**. From agricultural projects, nutrients were reduced by **46,217 lbs/yr** (38,146 Nitrogen and 8,071 Phosphorous) and sediment was reduced by **1,776 tons/yr**. Pathogens were reduced by **5.31E+15 CFUs** from agricultural and wastewater projects. Summary tables are provided in Appendix 4.

A total of **436** (17 different types) of BMPs were installed from 2007-2011. Figure 2 provides a graph of the numbers in each fiscal year. Note: BMPs with units in acres or feet are counted as one BMP, even though their impact is far greater on water quality.

Figure 2 – Number of BMPs from 2007 through 2011



West Virginia's FY 2011 §319 grant totaled **$1,873,120** with **$828,738** (44%) and **$1,044,382** (56%) split between the base and incremental portions (Appendix 1).

Base grants

WV Department of Environmental Protection

The WV Department of Environmental Protection (DEP) is the lead state agency for the NPS Program. As discussed briefly in the introduction the base grant supports program staff, 'The Basin Coordinators (BCs)' as well as other supporting programmatic efforts and agency partners.

Potomac Basin Coordinator: The water quality drivers in this region are the Chesapeake Bay TMDL for nutrients and sediment, and local bacteria and biological impairments. WVDEP's Potomac Basin Coordinator (PBC) coordinates the nonpoint BMP data collection effort for the Chesapeake Bay Program, and participates in its Watershed Technical Workgroup. The PBC also works with local watershed associations and interacts with local governments. The PBC is funded by Chesapeake Bay grant monies.

- Planning and implementation: During this period, the PBC continued to facilitate the Watershed Implementation Plan (WIP) writing group and the WV Tributary Strategy Implementation Committee. The PBC sought input from Planning and Development Councils (Regions 8 and 9), watershed groups, and stakeholder workgroups to refine the WIP through increased "reasonable assurance" and local specificity of the voluntary actions it prescribes. This work culminated in the submission of the Phase II WIP to EPA in December, 2011. As part of the implementation of the WIP strategies, the PBC encourages local governments to minimize pollution from new development by assisting them with grants to strengthen stormwater ordinances.
- Outreach and education: The PBC set up a display about good lawn care techniques for the Chesapeake Bay room at the Tri-County Fair in August and presented stream quality activities at Hampshire County schools, 4-H and Stream Scholars camps. The PBC provided updates for the Chesapeake Bay website and the corresponding quarterly e-newsletter.

- 319 Program: The PBC actively participates in several watershed groups, serving as a liaison with state agencies and programs, and helping them with grants. During this period, the PBC mentored new WVCA watershed staff by providing by-laws templates, agenda advice, and potential project sites for the new South Branch Potomac group, and providing background information and contacts for Back Creek and Elks Run. In Mill Creek of Opequon Creek watershed, the PBC's outreach resulted in a successful buffer planting in November 2011 that was carried out by multiple partners. The PBC also worked with the Southern Basin Coordinator and Mill Creek partners to locate areas with septic system problems and to increase participation in the 319 septic system cost-share programs.

Southern Basin Coordinator: Water quality concerns in this region are varied, with wastewater being the most prevalent concern. The Southern Basin Coordinator (SBC) is now considered a wastewater expert and has developed many successful partnerships involving agencies, volunteers and community leaders in an effort to eliminate Pathogen pollution. The SBC also deals with AMD and stormwater issues in the urban areas. Collected baseline data on project areas and submitted for de-listing consideration. The SBC is funded by §319.

- Planning and implementation: Facilitated numerous wastewater planning meetings. The focus of many of these efforts was to get the support of local public service districts (PSDs) and to train them to be the primary management entity for the new alternative systems. The SBC reviewed and commented on AGO and incremental proposals as needed and she provided oversight and reported on several natural stream projects.
- Outreach and education: Presented at several regional water festivals, participated in the Envirothon competition, both in the planning and teaching aspects, and facilitated and presented at a variety of public meeting and events.
- 319 Program: This year's EPA tour focused on projects in the Southern Basin. There are several successful projects are located in this region. These include Kitchen Creek, Summerlee, and restoration efforts in the Upper Guyandotte. The success can be attributed to the expert advice from the SBC and her willingness to work with a wide variety of partners and her ability to diversify funding opportunities

Northern and Western Basins: The Western Basin (WBC) and Northern Basin Coordinator's (NBC) positions became vacant in 2011 due to retirement and a resignation. Activities in these basins are watched closely monitored by the Watershed Program Coordinator and the NPS Program Coordinator. Technical assistance and site assessments are provided when necessary. The northern basin has several credible volunteer organizations who have been involved with §319 programs for many years. Additionally, the National Mineland Reclamation Center (NMLRC) is housed within the WVU Water Research facility. NMLRC personnel are experts in AMD remediation and have been partnering with the NPS Program for many years. Western basin activities are mostly outreach and education; however, recently the Morris Creek project team has been revitalized, a new watershed based plan (WBP) has been approved in Cane Fork, and there is work in the Fourpole Creek watershed through partnerships with Marshall University, WVCA and the city of Huntington. The WBC is funded by 106 grant monies, while the NBC is funded by §319.

West Virginia Save Our Streams: As of October 2011, the WV Save Our Streams (SOS) Program has a new coordinator. The new coordinator brings 13 years of experience in aquatic ecology and research under the U.S. Geological Survey. With the well-established program the focus thus far has been on outreach and education, networking, and planning. As part on an ongoing duty the volunteer assessment database (VAD) will be upgraded. The NPS program supports and supervises the activities of SOS but the program funded with 106 and water quality management grant funds.

- Planning and implementation: The SOS coordinator has taken an active role in providing technical support for various watershed organizations. He has been responsible in training the newly formed Arbuckle Creek Watershed Organization in order to document bacteria loads to the New River. Collaboration will be with the New River Clean Water Alliance, National Park Service, and National Parks Conservation Agency. Additionally he will offer technical support to the Morris Creek

Watershed in revising their watershed based plan with the intent to reduce AMD loads using limestone fines.

- Monitoring: The SOS coordinator has assisted with a study on Elkhorn Creek in regards to recovery of the benthic community following a diesel spill. SOS protocol designates workshops to be conducted between the months of April and October. However several instances have arose which will require monitoring outside of this designated time period. With stream restoration projects slated to begin on Davis Creek and Knapps Creek, SOS would like to document benthic communities before and after in an effort to measure success by way of recovery. While still early for scheduling events, thus far seven workshops are set with others tentatively planned. Renewal of existing monitoring groups will also be conducted.
- Outreach and education: The SOS coordinator worked in partnership with the SBC in the highest ranked aquatics section for the Envirothon teaches the teacher's day. He will be collaborating efforts with Project Wet to teach the benthic aspect of the program. Additionally he attended the Mid Atlantic Stream Restoration Conference and is scheduled for Rosgen's Applied Fluvial Geomorphology.

Water Festivals: A West Virginia Water Festival (WF) is a one-day water education event for 5th grade students. The festival is designed to heighten children's awareness about natural resources and their role in helping to protect them. Teachers are given the opportunity to obtain up-to-date information about natural resources and to learn of innovative approaches for teaching these concepts in their own classrooms. The presentations at WFs are primarily based on activities from the national Project WET curricula. Project WET is a water education program, designed by teachers and water resource professionals, with the mission of reaching children, parents, educators and communities of the world with water education. We believe that by creating an atmosphere of fun and exploration, we can successfully engage student's interest in our water resources and hopefully help them cultivate an understanding and sense of responsibility to the natural world.

Education → Awareness → Understanding →Action

Students learn:

- That water is essential to all living things;
- The value of water as a natural resource;
- Some of the threats and challenges facing our water resources;
- About the effect of human actions and nonpoint source pollution on water and nature; and
- About the need for responsible action and what they can do in their own community

Topics that are addressed at WFs are:

- Water quality/aquatic species;
- Water conservation;
- Water cycle/forms of matter;

In 2011, the West Virginia DEP sponsored 4 water festivals throughout the state. The festivals were located in Kanawha County, Putnam County, Fayette County, and McDowell County. Each water festival reached approximately 250 children.

WV Conservation Agency

The WV Conservation Agency (WVCA) remains the primary entity responsible for the implementation of the West Virginia agriculture and construction components of §319 Program and for coordinating and implementing water quality improvement projects. WVCA acquires 319 base funding and ensures a sufficiently high level of base staff competency. WVCA is responsible for the achievement of the goals and objectives of these programs while meeting the milestones in the required time frame.

WVCA's Conservation Specialists (CS) support volunteer watershed associations, educate citizens on NPS pollution issues, identify local stakeholders, partners and funding sources, and take the lead for several project teams. WVCA's Conservation Service Director (CSD) is responsible for the project coordination, for WVCA 319 programs financial management, implementation tracking, and reporting to DEP. Incremental funds are used to install specific projects designed to remedy or decrease contributions to the impairment of the priority watershed in which the projects are installed. The CSD provides daily supervision and programmatic guidance to project managers and 319 staff. In addition to the statewide support WVCA focuses efforts in the following project areas:

Chesapeake Bay
- *Sleepy Creek*
- *Lost River*
- *Mill Creek*

Upper Kanawha River
- *Campbell's Creek*

Greenbrier River
- *Second Creek*
- *Kitchen Creek*
- *Back Creek*
- *Muddy Creek*
- *Meadow River*
- *Milligan Creek/Davis Spring*
- *James River/Potts Creek*

Lower Ohio South
- *Fourpole Creek*

Outreach and education

The dissemination of NPS information plays a critical role in creating public awareness of issues and how they can be dealt with. Instruction takes place in one-on-one and group settings. Education is provided on many NPS topics; this transfer of information is delivered through distribution of brochures, fact sheets, conference presentations, watershed models, hands-on field days, articles written on NPS topics and published in newsletters, demonstration sites, presentations to school students, community groups, watershed associations, landowners, land/resource users, professionals, local farmers, developers, contractors, engineers, government representatives, the general public, and staff.

WVCA staff demonstrates the installation of streambank materials.

WVCA staff assists local schools and conservation districts statewide with the Envirothon, land judging contest, outdoor classrooms, Enviroscape demonstrations, and other

conservation programs. WVCA staff also participates in the WV State Conservation Camp, a natural resource camp for high school aged children, instructing the watershed management class. The WV Contractor's Expo was held in the fall of 2011. CSs attended and presented NPS workshops to representatives of the construction industry.

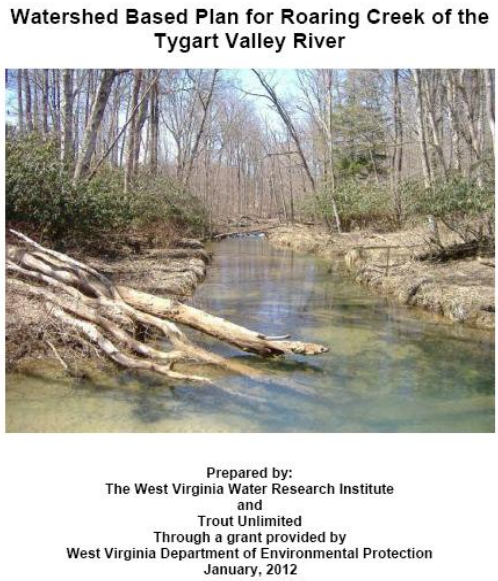
Watershed Resource Center

The Watershed Resource Center (WRC) focuses on providing training, information transfer, and assistance to all aspects of water quality efforts throughout West Virginia. WRC provides specific training and educational needs identified as necessary to understand watershed and nonpoint source impacts and solutions. WRC will provide statewide support at workshops, conferences, meetings, field days, and general functions related to water quality. WRC provides desktop publishing as needed for all field staff and watershed associations upon request.

The WRC participates in the West Virginia Watershed Network (WVWN) and their efforts to continually recognize the efforts of volunteers. Watershed associations (WAs) are offered educational workshops on watershed planning, watershed board members training, watershed prioritization and displays for networking. At Watershed Celebration Day (WCD) WAs were presented with awards for their achievements in a variety of categories, ranging from accomplishments in water quality monitoring to project implementation. WRC handles all nominations, scholarships, and registrations for the event.

WRC maintains the WVWN website, coordinates, publishes and distributes the Water Net Newsletter. The WVWN website includes upcoming events, links to participating agencies/organizations, Water Net publications, meeting minutes, funding opportunities, WCD on-line nominations and registration, riparian resources and is a showcase gallery for successful projects across the state. The newsletter is a quarterly publication distributed to WAs and agencies working with watershed groups. It features pertinent information on the latest news of watershed activities around the state, technical resource and contact information, upcoming trainings, and available resources for water quality related issues throughout the state.

Watershed based plans



EPA Region III is one of the few regions that uses and maintains a watershed tracking database (tracker). Its purpose is to track the progress of watershed based plans (WBPs). This is an additional tool used in conjunction with Grants Reporting and Tracking System (GRTS). The tracker is maintained by EPA personnel but recent analysis has discovered inconsistencies between the two databases. EPA Region III has made an effort to correct these and in doing so has asked for assistance from the NPS Program Coordinator.

The NPS Coordinator created spreadsheets that contained fields similar to the tracker. These spreadsheets were populated with project data from GRTS and incremental proposals. Working with EPA, the spreadsheets were used as templates that will allow the two databases to communicate so that the information is more accurate. This was several months of work for several EPA Regional employees and the NPS Program Coordinator.

This was a useful exercise. It provided the NPS Coordinator with a better understanding of the overall impacts of incremental projects in a watershed. Modified versions of the spreadsheets are included in Appendix 5.

In addition to tracker work the NPS Program submitted four new WBPs to EPA. These plans are in the review, approval or needs revisions phase of the process. They include the Upper Elk River protection plan, Roaring

Creek in the Tygart Valley, Milligan Creek in the Greenbrier, Piney Creek in the New, and Potts Creek/Sweet Springs in the James. A small grant of $30,000 was also made available to work on a protection plan for Back Creek in the Potomac.

Table 1: WBPs with corresponding tracking spreadsheets

HUC 8	Plan name	Status	Plan year	More information
Cacapon	Lost River	Active	2006	
Cheat	Lower Cheat	Active	2005	May need revisions
	North Fork Blackwater	Active	2005	Needs revisions
Greenbrier	Second Creek	Active	2008	
Upper Guyandotte	Upper Guyandotte	Active	2006	
Upper Kanawha	Morris Creek	In-active	2004	Needs revisions
Monongahela	Deckers Creek	Active	2005	May need revisions
	West Run	Active	2008	
New	Wolf Creek	Active	2009	
Potomac Direct	Sleepy Creek	Active	2008	Nearly complete
	Mill Creek Opequon	Active	2008	
South Branch Potomac	Mill Creek	Active	2007	
Tug Fork	North Fork Elkhorn Creek	Active	2007	
Tygart Valley	Upper Buckhannon River	Active	2006	May need revisions
West Fork	Lamberts Run	Active	2006	Nearly complete

WBP work is an important component of the NPS Program's planning activities. New plans are currently under development, several plans are in some stage of the EPA review process, and some reviews have been completed by EPA, with recommendations for revisions.

Project descriptions

This section provides project highlights and summaries of active incremental projects. Much of this past year has been dedicated to improving tracking procedures and updating program management resources. The ultimate goal is to provide quicker response when questions arise regarding expenditures, improve access to NPS Program resources and highlight the environmental impacts of NPS projects. By improving information we can better communicate the progress being made.

Mining projects

Deckers Creek

Kanes Creek South and Morgan Mine Road

Fiscal year: 2007
Grant amount: $300,000 (federal) $229,340 (match)

This project targets some of the last areas contributing acid mine drainage to Kanes Creek, following other FODC projects that have been supported with nonpoint source pollution funding. OAMLR reclaimed Kanes Creek South Site #3 in 2002. As part of the reclamation, underground mine portals, impoundments and refuse piles were reclaimed, and the AMD from them was routed to six discharge areas, with a total of 13 discharging pipes. The Morgan Mine Road AMD source is an un-reclaimed collapsed portal.

The work of FODC in these areas has been delayed by problems with Rights-of-Entry. On two occasions, landowners have stated they would allow construction of AMD projects on their lands, and have then withdrawn their permission.

Nevertheless, the project is continuing. FODC has hired Skelly and Loy, an engineering company, to evaluate the possibility of installing an AMD treatment project in an area that one landowner has offered. FODC has identified a portion of one landowner's holdings that would be satisfactory for treating most of the AMD. FODC is seeking quotes from surveyors and appraisers in order to arrange a purchase using OSM WCAP funds.

FODC has determined that it will be impossible to treat the Morgan Mine Road AMD source within the time frame of this nonpoint source award. To treat the AMD, a treatment system would have to be built on land that is under permit. This permit holder has, on other occasions, been very slow to work out Right-of-Entry agreements on lands with no permits, and FODC is not confident a Right-of-Entry can be secured in the remaining time frame.

FODC has monitored AMD loads at the six discharge areas that were established by OAMLR. FODC has also measured loads at the mouth of the unnamed tributary that carries water to the main stem of Kanes Creek. The loads from the contributing sources closely match the load in the tributary.

Discharge Areas	Loads by chemical (lbs/yr)			Discharge Areas	Loads by chemical (lbs/yr)		
	Aluminum	Iron	Acidity		Aluminum	Iron	Acidity
1	65	28	790	4	830	1,300	12,000
2	1,100	1,400	15,000	5	740	680	14,000
3	110	57	1,100	6	140	160	2,100
Tributary	3,850	1,680	40,900	Totals	3,000	3,600	45,000

Sandy Run

Fiscal year: 2008
Grant amount: $367,290 (federal) $210,000 (match)

The Kanes Creek watershed has a complex mining history. Between two permitted mines (the T&T "Old Reliable" mine, currently under permit to Arch Coal, and the Hovatter mine, for which the permit has been revoked) lies an area that was mined by several different operators before 1977. Two projects were completed in this area by DEPs Office of Abandoned Mine Lands and Reclamation (OAMLR). Each project established at least one major AMD discharge.

Friends of Deckers Creek (FODC) proposed to treat the acidity in these two sources using FY 2007 319 funds. In the last half year, FODC secured matching funds through OSM's Watershed Cooperative Agreement Program (WCAP), finalized an engineering design with Skelly & Loy and hired a contractor to construct the project. Construction will be complete in early 2012.
Contractors offered higher bids than expected. However, after a decrease in the scope of the project, an increase in funds made available from the NPS Program, and an extension of the deadline, an effective project can be completed. A future project will be added to provide even more acid neutralization.

The project is expected to eliminate pollutant loads from the Satcher Portal, which was opened and sealed in the 2009 OAMLR project and the Blanket Drain #1 discharge, which is a part of an earlier OAMLR project.

Pollutant	Loads by source (lbs/yr)		Total load	Expected reduction	Expected final load
	Satcher Portal	Blanket Drain #1 Discharge			
Aluminum	2,600	500	3,100	2,500	600
Iron	11,800	1,400	13,200	10,600	2,600
Acidity	61,100	8,300	69,400	55,500	13,900

Slabcamp Run Mainstem

Fiscal year: 2010
Grant amount: $211,800 (federal) $142,700 (match)

In June, 2009, Friends of Deckers Creek proposed to use FY 2010 nonpoint source funds to build a remediation project to address three AMD discharges to the mainstem of Slabcamp Run. Open limestone channels carry the AMD all the way from the discharges to the stream. The greatest challenge for this project will be installing AMD treatment in steep terrain. FODC will hire engineers earlier in the process to support decisions about feasible conceptual designs. FODC is developing a project through consultation with landowners and discussions with AMD experts.

FODC has contacted landowners in West Virginia and Virginia. Landowners support the elimination of these nonpoint pollution sources, but they have not yet reviewed any actual conceptual designs showing the footprint of the projects.

The project will eliminate AMD loads discharging from portals that were sealed and refuse piles and impoundments that were reclaimed by OAMLR in 2004. AMD sources are named for monitoring points identified by OAMLR. One open limestone channel, OLC 650, drains two collapsed portals. OLC 750 receives AMD from two reclaimed impoundments and a reclaimed refuse pile.

Discharge areas	Loads by chemical (lbs/yr)		
	Aluminum	Iron	Acidity
OLC 650	2,390	2,350	27,600
OLC 750	3,400	2,830	37,000
Totals	5,790	5,180	64,600
Slabcamp mainstem	7,800	5,300	82,000

Slabcamp Tributary

Fiscal year: 2011
Grant amount: $274,089 (federal) $185,726 (match)

Slabcamp Run has one small tributary. Remediation of water quality in that tributary will improve the productivity and diversity of a six acre wetland that lies adjacent to a 700-foot stretch of the Deckers Creek Trail. That rail-trail is already popular for bird and wildlife watching, and will become even more valuable with a diverse wetland.

OAMLR and FODC constructed projects on this site using FY 2003 319 funds. Those projects, however, are not supplying enough alkalinity to neutralize two well-characterized acid sources on this tributary. FODC will install additional acid neutralization projects at the two well-characterized sources. Additional monitoring during project development may quantify one additional source, in which case plans may be modified.
Three AMD sources are well characterized. The headwaters of the tributary carry a small load of acidity, which is being neutralized by a limestone leach bad installed by FODC in 2007. An open limestone channel (OLC250) receives AMD from a pair of wet-sealed portals and discharges it to the tributary immediately downstream from the limestone leachbed. One more wet-sealed portal delivers AMD to the wetland.

Pollutant	Loads by source		Total loads	Expected reduction	Expected final load
	OLC250	OLC300			
Aluminum	3,900	1,400	5,300	4,800	500
Iron	500	600	1,100	1,000	100
Acidity	32,000	18,400	50,400	45,400	5,000

Lower Cheat River

Dinkenberger Road

Fiscal year: 2008
Grant amount: $150,000 (federal) $100,000 (match)

Phase 1 of this project was completed in 2003, and consists of a limestone leach bed and open limestone channels. The AMD was collected in a pool at the mouth of the portal (this pool was pre-existing, but was upgraded by adding a small dike to the downstream side). Water from the pool discharged into a limestone leachbed along a bench approximately 20 feet above Dinkenberger Rd. Discharge from the leach bed flowed down a limestone rip-rapped channel and through a culvert under Dinkenberger Rd. A small limestone splash basin at the culvert exit diffused the erosive force of the flow and helped redirect the water into an 860-foot open limestone channel. This channel ran parallel to Dinkenberger Rd. and discharged into a small stream just before its confluence with the North Fork of Greens Run. The limestone leach bed and the open limestone channel in this passive treatment system achieved some acid reduction for several months after installation. The leachbed was treating approximately 6.8 tons/yr of acidity while the open limestone channel treated approximately 9.5 tons/yr. The limestone leach bed and the open limestone channel were removing 20% and 28% of the acid load respectively.

In 2005, a major storm caused a large amount of organic debris to fall into the leachbed. In turn, this caused plugging of the leachbed and the mine water began to bypass this part of the treatment system. In 2006, the leachbed was wrapped with a fabric cover to prevent further clogging. Since 2006, the water chemistry at the Dinkenberger site has improved over the pre-construction chemistry. The treatment system is currently reducing 24% of the acidity, 15% of the iron and 4% of the aluminum.

Phase II of the Dinkenberger Road project has modified the existing passive treatment system by conveying the water from the enhanced Phase I limestone bed under Dinkenberger Road and through a series of limestone step pools. The water will then be conveyed via open limestone channel into the receiving stream. The goal of Phase II of this project is to remove 80% of the pre-construction acid and metal loads.

Loads (lbs/yr)	Acid load	Fe load	Al load
Pre-construction	68,147	2,182	820
Estimated Phase II post-construction loads	10,222	437	164
Target loads (all of Greens Run)		10,594	4,445

The construction of the Phase II Dinkenberger Road project is nearly complete. Minor adjustments to the finished project still need to be made. Post-construction sampling will begin when the minor adjustments are complete.

Pringle Run (Pase Property Phase II)

Fiscal year: 2008
Grant amount: $150,000 (federal) $100,000 (match)

Phase I of the Pase Project was completed in 2004. The project site is located just outside of Tunnelton, WV, and consists of a vertical flow reactor, a metals collection basin, and an open limestone channel to convey the

mine drainage into an existing road culvert. A vertical flow reactor contains two components; the first component is a compost filled pond, which drains from the bottom into an anoxic limestone drain. The purpose for the compost pond is to strip the oxygen from the water as well as obtain sulfate reduction from the bacteria living in the compost substrate. The anoxic limestone drain allows the limestone to treat the acidic drainage without iron oxides coating the limestone.

This project was installed in October of 2004, and was efficient in reducing mine drainage for the first several months. Since then, the system's performance has decreased. As a result of this decrease, NMLRC, in conjunction with DEP and FOC, added additional treatment measures to the system. These treatment measures involved using steel slag to line the channels from the seeps to the compost filled pond. Secondly, additional organic material was added into the pond, which added more bacteria to help break down the mine drainage, as well as rejuvenated the bacteria that were already present. Phase II of the Pase project is needed to continue the improvement of the water quality emanating from this site.

Currently, the treatment system installed during Phase 1 of the Pase project is reducing less acid and metal loads than the amounts that were estimated before construction. While the reductions just from this project currently do not meet the goals set forth in the Cheat River WBP for Pringle Run, Phase II of this project will aid in meeting of the targets specified in the TMDL. The goal of Phase II of this project is to remove 80% of the pre-construction acid and metal loads.

Loads (lbs/yr)	Acid load	Fe load	Al load	Mn load
Pre-construction	95,600	3,200	8,200	1,200
Estimated Phase II post-construction loads	76,480	2,560	6,560	960
Target loads (all of Pringle Run)		87,200	40,500	9,300

Engineering on this site began in late fall of 2011, with construction expected to begin in winter or spring of 2012. The submittal process for all permit applications has also begun. Pre-construction sampling is on hold due to ongoing surveying/engineering of the site.

Upper Muddy Creek

Fiscal year: 2009
Grant amount: $115,521 (federal) $77,014 (match)

Phase I of this project was completed in October 2005, and consists of open limestone channels, open limestone channels lined with steel slag, and limestone leachbeds.

During construction, this project ran into multiple problems. Due to the nature of the unconsolidated sediments found on the strip bench, the seeps on the bench would dry up and pop out in another location during the construction of the leachbeds. To remedy this situation, the contractor placed the leachbeds on the next bench down where better material was available, and installed conveyance channels to move the seep water to the leachbed. Due to the seep problems encountered at this site, several leachbeds were combined in order to collect the drainage from additional seeps. Upon collecting these flows, it was discovered that a fifth seep had contributed AMD to Muddy Creek, but was hidden by the flow from the other seeps. To remedy this situation, a small collection sump and channel were installed to convey the seep into the main channel of the treatment system.

The second phase will aid in treating the water by utilizing freshwater from Muddy Creek. Water will be channeled from the creek through a steel slag leachbed. The slag leachbed will discharge into an existing wetland located at the outfall of the system. The existing wetland located at the outfall of the system will be modified in an effort to further neutralize the mine drainage. Originally, this site produced 96 tons per year of acidity, 3.8 tons per year of iron, and 8.11 tons per year of aluminum. As of June 2010, this project had reduced

approximately 81% of the acid load, iron load by 93% and the aluminum load by 64%. Upon completion of phase II of this project, we anticipate a higher reduction in iron, an increase in the reduction of Aluminum to 90%, and an expected neutral discharge.

Loads (lbs/yr)	Acid load	Fe load	Al load
Pre-construction	192,000	7,600	16,200
Estimated Phase II post-construction loads	20,000	380	1,620
Target loads (all of Muddy Creek)		110,303	23,320

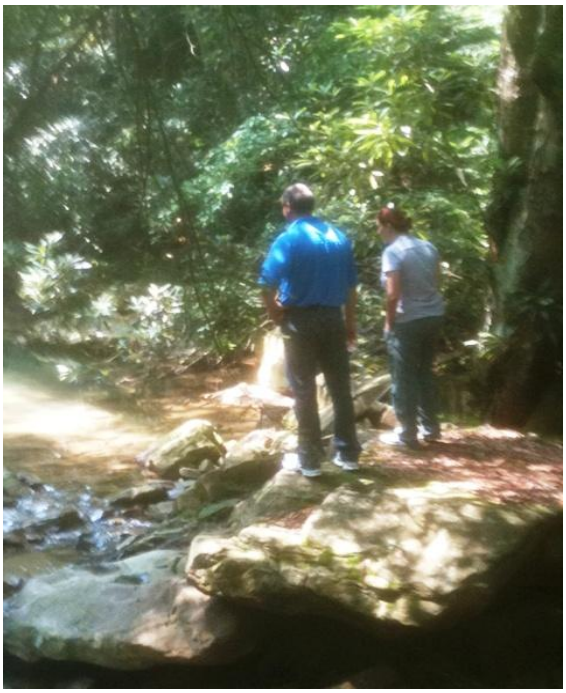
According to the Cheat River WBP, 40,000 lbs/yr of Al and 94,500 lbs/yr of Fe were discharged into Muddy Creek in 2005. Once constructed, the Upper Muddy Creek Phase II project is expected to remove 7,220 pounds per year of iron and 14,580 pounds per year of aluminum.

All applicable permits for this project are currently being applied for. Pre-construction sampling of this project site is ongoing. Matching funds are also currently being pursued through OSM's WCAP program. When these funds are secured, engineering will proceed. It is anticipated that engineering for Phase II of this project will likely occur during the next reporting period, with construction to follow.

Jeff Eanes (Beech Run Road)

Fiscal year: 2010
Grant amount: $271,860 (federal) $181,240 (match)

The Jeff Eanes Beech Run Road Project aims to address numerous AMD seeps located in the Sovern Run watershed, a small tributary of Big Sandy Creek. Big Sandy Creek is a tributary to the Cheat River with the confluence located near the border of Preston and Monongalia Counties. This passive acid mine drainage treatment project, while aimed at helping to remove Sovern Run from the state's 303(d) list of impaired watersheds, will add 2 miles of fishable water in Sovern Run.



GAO analysts observe aquatic life in the lower stretches of Sovern Run.

The proposed project area consists of approximately six to seven AMD seeps spread out over the eastern portion of the property along the base of an existing high wall feature.

Proposed treatment for this project consists of constructing vertical flow wetland (VFW) or sulfate-reducing bioreactor (SRB) type treatment systems in parallel upon capture of the seeps at various locations along the existing gas line and installing open limestone channels or French drains to convey the water from the seep areas to the VFWs. At the site, a ponded area created by mine drainage will be used as part of the treatment process. Currently, the AMD routes through another ponded area and combines with the other seeps farther downstream. Following the alkalinity treatment ponds, the outfalls would be combined into a settling pond or aerobic wetland-type system, which would utilize the existing inundated area created by AMD that it currently flows through on the site. Farther downstream, the waters will be combined into a final polishing wetland in the power line cleared area. Following the wetland system and after the existing culvert under the power line access road, a proposed steel slag leach bed is proposed to provide some additional alkalinity for the water and the headwaters of Sovern Run. A preliminary

engineering design was completed.

During the reporting period Friends of the Cheat (FOC) staff completed monitoring in an effort to collect more data to inform system design. FOC anticipates at least two more pre-engineering sampling trips to bolster minimal lab data.

FOC staff met with the landowner during the reporting period to discuss the preliminary conceptual design, draft a landowner right-of-entry agreement, and conservation easements. The landowner is very interested in learning about the treatment technologies to be incorporated in the project design and has requested a group site visit to further his understanding. The engineering firm has agreed to participate in this meeting pro bono which will not only educate the landowner and build trust, but will also help FOC's Executive Director understand site features and project design as she was not employed by FOC when the site was chosen or the original proposal was drafted.

FOC has been in regular contact with OSM staff regarding matching fund availability. Despite the cuts to the agency's budget, the new project selection process, and the FY2012 continuing resolution, OSM staff believes that WCAP funding will be available. FOC has begun drafting this proposal, but must finalize the landowner right of entry agreement prior to submission. Pending a November 2011 site meeting and the signing of a landowner agreement, FOC will apply for match funding immediately. Additional match will be sought from DEP's Stream Restoration Fund (SRF).

The goals of this project are the approximate removal of 90% or 60,860 lbs/yr of acid, 90% or 1,841 lbs/yr of iron, 90% or 7,197 pounds/yr of aluminum, and 50% or 972 lbs/yr of manganese, in addition to generating extra alkalinity to neutralize downstream sources of acid.

In July of 2011 the Government Accountability Office (GAO) toured the Sovern Run project areas and visited the mouth of the stream at Big Sandy. GAO investigators witnessed the results of restoration observing fish and other aquatic life in the lower sections of the stream.

Lamberts Run

Lamberts Run Site 6

Fiscal year: 2009
Grant amount: $250,000 (federal) $100,000 (match)

The Guinn Portal site (Site 6) on Lambert Run is located northwest of Clarksburg in Harrison County, West Virginia. The site consists of a draining, open portal and an old air shaft. The portal discharges approximately 194 gallons per minute and is a major source of metals associated with a legacy of coal mining practices. This project is another in a series of projects aimed at removing Lambert Run from the state's 303(d) list of impaired watersheds. The project area consists of the areas adjacent to two open portals. Treatment for this project will entail the construction of channels to direct the water, waterfalls to provide oxidation, and wetlands/settling ponds to collect the metals in the effluent.

The Lambert Run WBP says that Site 6 is contributing 2,000 lbs/year of aluminum and 23,020 lbs/yr of iron to Lambert Run (based on 2003 sampling). The passive treatment system planned for Site 6 will reduce aluminum by 560 lbs/year and iron by 10,243 lbs/year. Although the Site 6 project will not meet the TMDL requirements for iron, the reductions from Site 6, in addition to the Site 5 (Allan Meadows) project, should meet the allocated load levels.

Loads (lbs/yr)	Acid load	Fe load	Al load
Pre-construction	26,400	23,020	2,000
Estimated post-construction loads	5,280	4,604	400
Target loads (1903 in Lambert Run TMDL)	Not determined	2,430	8,113

Right-of-entry has been secured for Site 6. NMLRC has secured all project funding, including a grant to be used for matching funds from the OSM Watershed Cooperative Agreement Program. Engineering is nearing completion for this project, and construction will begin in early 2012.

In July of 2011 the GAO toured the Lamberts Run project areas. This was GAO's first exposure to AMD treatment. The NPS Program believes that the Lamberts Run projects are excellent examples of successful AMD treatment.

Upper Buckhannon River

Smooth Rock Lick

Fiscal year: 2007
Amount: $88,840 (federal) $67,373 (match)

Smooth Rock Lick is in the Upper Buckhannon watershed. The project area is located at the top of the Smooth Rock Lick sub-watershed adjacent to the Alton Special Reclamation site. The closest town, Alton, is 2.8 miles northwest of the site. The project site consists of mine spoil with a seep emanating from the spoil. Treatment for this project entails using a limestone leach bed installed at the head of the seeps and using an 800 foot open limestone channel to convey the drainage down the hill to a settling basin which will collect any precipitated metals still in the effluent.

The Upper Buckhannon WBP says that 37,564 lbs/year of aluminum and 48,194 lbs/yr of iron need to be reduced to meet TMDL goals. Upon installation of the treatment system at Smooth Rock Lick 3, we observed a total reduction of 3,077 pounds per year of acidity, 360 pounds per year of aluminum, and 515 lbs/yr of iron. The discharge is also now alkaline, producing 657 lbs/yr of alkalinity.

Loads (lbs/yr)	Acid load	Fe load	Al load
Pre-construction loads	3,080	515	360
Post-construction loads	-657	0.001	0.001
Target load reductions (Entire length of Smooth Rock Lick)		48,194	37,564

Construction of the passive treatment system at Smooth Rock Lick 3 has been completed. Post-construction water sampling has begun. Two rounds of samples have been collected. Another sampling round occurred in the winter of 2011.

West Run

Fiscal year: 2010
Grant amount: $43,509 (federal) $30,340 (match)

West Run is a small tributary located just north and east of Morgantown, WV. The watershed has many abandoned mines located in the headwaters of this watershed. The first project aimed at addressing these discharges will be located on the northern end of the Morgantown Airport (Hart Field). There are two portals discharging variable amounts of AMD into the main stem of West Run. The two portals (one collapsed and one open) discharge into a flat area adjacent to an access road, through a culvert, and proceed down a 2,500 ft channel where it discharges into West Run.

Treatment for this project consists of collecting the effluent from the portals and conveying them via an open limestone channel into a series of beds designed to neutralize the acidity as well as collect the precipitated metals. Additionally, a steel slag bed will generate alkalinity which in turn will aid in neutralizing the effluent.

The West Run WBP says that this site is contributing 282,000 lbs/yr of acidity, 19,200 lbs/year of aluminum, and 30,000 lbs/yr of iron to West Run. The passive treatment system planned for the Morgantown Airport Portals site is estimated to reduce acidity by 225,600 lbs/yr, aluminum by 15,360 lbs/year, and iron by 24,000 lbs/year.

Loads (lbs/yr)	Acid load	Fe load	Al load
Pre-construction	282,000	30,000	19,200
Estimated post-construction loads	57,000	6,000	3,840
Target loads		22,279	11,752

All applicable permits for this project are currently being applied for. The conceptual designs are complete and pre-construction sampling of this project site is ongoing. It is anticipated that engineering for Phase II of this project will likely be completed during the next reporting period, with construction to follow.

Wolf Creek

Summerlee Bioremediation

Fiscal year: 2010
Grant amount: $54,456 (federal) $36,304 (match)

The Summerlee refuse pile is located at the headwaters of the Wolf Creek watershed and discharges into an unnamed tributary. It is the most significant source of AMD within the watershed. The goals of this project are to reduce the iron and aluminum discharging from the Summerlee Site, by constructing a terraced landscape that will promote low-pH ferrous iron oxidation, and modifying an existing wetland to increase its ability to retain metals and add alkalinity. By exploiting natural processes that occur on a low-pH iron mound, iron can be rapidly oxidized by passing the water over "aeration terraces." Iron oxidized to the ferric form can precipitate out of solution to low concentrations even at very low pH values. The reduced load of iron continuing in to the wetland for further treatment will increase the treatment efficiency and operational lifetime of the wetland.

Floating wetland cells

In early May final grade was achieved for both the upper and lower terraces. Several artesian seeps were collected by the excavation and the new channel turned out to be an excellent water delivery system. The new channel has been dubbed the "seep trench channel". The seep trench channel was essentially turned into a 200 ft. long level lip spreader. In May 2011 uniform sheet flow was delivered to the upper and lower terraces and will serve as the starting point of comparing pre-construction data to post construction data.

Coinciding four days after the upper terraces were operational; Bill Burgos arrived to start collecting data. Bill Burgos is a professor of Environmental Engineering at Penn State University and is researching the removal

of iron and acidity via biological low-pH oxidation. His research is funded by the OSMs 2010 National Technology Applied Science Program. Dr. Burgos is interested in addressing the high priority topic of "Advances in Passive Treatment of AMD," of which Summerlee was chosen as a primary research site. Shortly after the terraces were operational, installation of baffle wall partitions began in the wetland enhancement area. The hydraulic residence time of AMD is extremely important with respect to the extent of Fe (II) oxidation and Fe removal. By distributing water around the site residence times can be increased, and as a result enhance Fe (II) oxidation. The baffle wall partitions were installed in late May 2011.

The project was delayed by the difficulty of planting wetland species. The soils in the wetland enhancement area were heavily armored with iron over decades of AMD. Wetland species were introduced to the wetland enhancement area via four different methods: local transplanting, greenhouse transplants, hand seeding, and seeding mixed with topsoil. Of the methods tried, local transplanting and seeding mixed with topsoil were the most responsive to establishing new plants in the wetland enhancement area.

In July, two master's students and one PhD student from Penn State University collected water quality samples and genetic RNA samples. RNA samples will be analyzed to characterize microbial communities, and if enough data is collected it may be possible to track microbial colonization throughout the lifespan of the project. This data will help shed light on the presence/absence of oxidizing bacteria and how their activity is related to oxidative removal of Fe from AMD at low pH. In early August, Phase 3 of the project started, which involved installing baffle walls in an old settling pond. While researching different baffle materials we discovered floating wetland systems. Not only can floating wetland systems help divert/re-route water to increase residence time, they can help facilitate heavy metal removal/uptake and precipitation. Installing a floating wetland system was the logical way to proceed versus a plastic membrane.

Post-construction load reductions were estimated at 40-60% for iron and 20-40% for acid. At this point the data set below is still in its infancy, and until further data is collected the performance of the system can't be fully analyzed. The calculations below compare one year and six months of pre-construction data to four months of post-construction data.

Pollutants	Pre-construction Loads (lbs/yr)	Targeted reductions (lbs/yr)	Post-construction Loads (lbs/yr)	% reductions
Acid	323,701	64,740 - 129,480	214,254	34%
Aluminum	14,745		7,015	52%
Iron	75,385	30,154 - 45,231	48,145	36%
Manganese	8,426		4,675	45%

Agriculture projects

Note: Many of the agricultural projects have wastewater and sediment components.

Lost River

Fiscal year: 2007
Grant amount: $430,490 $308,190 (match)

The Lost River, located in eastern Hardy County, West Virginia, is an unusual river. During periods of low flow, the river sinks into the mountains to re-emerge miles downstream as the Cacapon River. It is also unusual in having the greatest density of poultry houses in the Potomac Highlands. The Lost River WBP calls for a 33.4%, reduction in delivered fecal coliform load, a total allocation of 1.01E+19. A suite of BMP's has been selected to reach this reduction. These practices will encourage landowners to install riparian buffers, address sedimentation from failing stream banks, participate in the USDA's Conservation Reserve Easement Program (CREP), obtain permanent easements, and retire erodible lands.

Ryan Miller has completed his feedlot relocation which consists of: heavy use protection, waste storage, pipeline and trough. These structures serve his herd of approximately 150 feeder calves. The facility will reduce surface and groundwater pollution from excess nutrients and pathogens caused by sediment and manure run-off. Mr. Miller fed the calves in an existing barn located next to a creek, where they were not confined. Miller's permit was approved for a natural stream restoration project (1,985 feet), which also entails a CREP component. Construction began in the spring/summer 2011.

Ivy Whetzel installed a four acre riparian buffer along Bear's Hell Run this quarter. Ms. Whetzel was a key landowner in the Bear's Hell effort. A variety of hardwoods and fruit trees were planted at this location in order to also enhance the wildlife diversity. All trees were matted and tubed. This property is typically fertilized and used for hay and pasture. Some buffer existed in certain areas where gaps were filled in and other areas were un-buffered prior.

WVCA staff has continued to work with Mr. Garlin Funkhouser on his alternative watering system. With the unexpected depth of well, it has been determined after much investigating that solar is not the feasible solution. Three quotes for solar were collected and it was the consensus of the project manages and NRCS that the best solution based upon cost and maintenance is to go with an AC pump on the well. This was completed in the late spring of 2011.

Feedlot (Before)

Feedlot (After)

Mr. Teets has entered into a contract for feedlot relocation along Lost River. The contract will consist of heavy use area protection, waste storage, and roof runoff with underground outlets, and a watering facility. This relocation will move 200 cow/calf pairs that are currently being fed near the surface water. NRCS also has a contract with the landowner for another structure for additional animals that is inclusive of streambank fencing. This project was completed in the summer of 2011.

Additional monies ($125,000) were secured from 2010 carry-over funds for additional natural stream design projects in the Lost River watershed.

Sleepy Creek

Fiscal year: 2008
Amount: $292,552 (federal) $195,036 (match)

Sleepy Creek watershed is located in Morgan County, West Virginia (87%) and Fredrick County, Virginia (13%). It flows 42 miles north into the Potomac River. Within the watershed two streams have a TMDL. These streams are Sleepy Creek and Indian Run. Both are impaired for fecal coliform bacteria. WVDEP source tracking revealed that about 14% of the homes have inadequate sewage treatment. The remainders of the sources are attributed to agriculture and a small percentage to urban stormwater.

WVCA and Morgan County Health Department administers the residential components of the project, WVCA administers the agricultural component and the whole SC Project Team administers the urban component of the project. During 2009-2011 a total of 43 septic systems have been upgraded, 69 septic systems have been pumped.

Volunteers from the Sleepy Creek Watershed Association (SCWA) planted 200 trees on Washington Homeopathy property in the Morgan County Business Park. Participants included the Berkeley Springs Lions Club, Morgan County Master Gardeners, Berkeley Springs High School Leo Club, Eastern Panhandle Conservation District (EPCD) and local residents. The tree planting project will help slow storm water pollution into Sleepy Creek and its tributaries. Chesapeake Bay Forester Herb Peddicord provided instruction to the 35 participants on correct tree planting techniques.

The 319 Grant also provided monies for the porous or permeable paving of a 5,000 sq. ft. parking lot. The project team partnered with Mountain View Solar located at U.S. 522 Business Park. All of the permeable materials allow precipitation to percolate through areas that would traditionally be impervious. This project is an innovative technique to control storm water runoff and slow pollution into tributaries of Sleepy Creek. Because the stormwater that runs off paved or impermeable surfaces picks up dirt and debris as well as pesticides, fertilizers, oil, antifreeze and other contaminants, it can be a major cause of pollution in streams and water ways. When rain falls on these surfaces, it is not filtered through plants, gravel and soil and results in excess runoff which cannot be absorbed into the ground. The excess travels into lakes and streams and eventually into the Chesapeake Bay.

In June 2011, the SC Project Team installed 3,267 feet of "Turf Cell," an open cell concrete block type material weighing up to 60 lbs. each. After installation, the block was filled with small stone, which was compacted in the cell openings. Another 1,000 sq. ft. overflow lot was covered with "Geo Block 2," a recycled plastic open grid which is interlocked and filled with 70% stone and 30% soil. The grid has open cells in which grass can grow. The third portion of the demo site was a 1,000 sq. ft. parking area using "Geo Pave" units which hold stone in place through a herringbone cell pattern with a mesh bottom. The demonstration areas will have signs identifying the products used in the project to aid builders and homeowners who may wish to install porous paving.

WVCA and the EPCD are well into the 3rd year of the Agriculture Enhancement Program. The purpose of the program is to increase farm productivity by conserving soil and making wise use of agricultural resources and improving water quality by offering

technical and cost-share assistance as an incentive to implement best management practices. One of the farms that signed up for the 2011 program is in the SC Watershed and requested streambank fencing. This is site is home of a summer camp for city kids and teaches 10 home schooled children in Berkeley Springs. They focus on environmental education. The children are going to pre and post stream monitor this site before construction. EPCD cost shared on 1,290 feet of goat/horse fence with a 35 foot buffer.

Recent monitoring data provided by the Dept. of Agriculture and Cacapon Institute has been inconclusive regarding fecal coliform contamination in Sleepy Creek. Readings exceeding standards still occur in a limited number of samples, slightly greater than 10% of the time. These exceedances have all been associated with precipitation events. Indian Run, one of the tributaries in Sleepy Creek has a TMDL allocation of 2.28E+12 CFU; recent samples near the mouth have shown no exceedances. The SC Project Team held a recent meeting (additional meetings are scheduled in the near future) to discuss next steps, which will most likely result in an incremental proposal focusing on monitoring.

Second Creek

Kitchen Creek

Fiscal year:	2009		2011	
Grant amount:	$108,523 (federal)	$72,350 (match)	$49,520 (federal)	$33,014 (match)

Kitchen Creek in Monroe County, West Virginia is a small tributary and headwater stream of Second Creek. This stream is heavily impacted by cattle grazing in close proximity to the stream. Agriculture in this area consists primarily of beef cattle and dairy operations. The goal of this project is to restrict grazing along the stream banks and contain concentrated animal waste, preventing it from entering the water body. BMPs will include waste storage facilities, riparian buffer development, prescribed grazing and nutrient management. Alternative water development will also be implemented to compensate for livestock no longer having access to the stream.

Doug Dransfield Dairy Farm, practices 100% complete.

Maintenance was conducted on the stream crossings for this farm. Spring time rains and heavy traffic through the stream crossings by livestock compromised the stability of the walkway. A heavy use area protection practice was installed utilizing Farm Bill WHIP funds to fix and prevent any additional runoff from this structure. This maintenance will allow the previous load reduction to be preserved.

Waste storage facility at the Dransfield Dairy

Jeff Cook Beef Cattle Farm, practices 75% complete.

The livestock watering system comprising of a spring development with 1700 gallon reservoir and approximately 5000 feet of pipeline was installed first to provide water to troughs that will lure cattle away from the stream was completed. Due to excess rock, the pipeline was not able to reach all intended locations on the farm. This sparked the need to submit an additional grant to obtain funding to for a watering system and additional exclusion fencing.

Two of the three sections of fence were completed during this reporting period. The third fencing practice will be completed under the Kitchen Creek II grant. Additionally, two stream crossings were also installed.

As a result of the stream exclusion fencing and the buffer width that has reduced the farms necessary feedlot size, the feedlot will have to be relocated to a different location of the farm. This is another reason for submitting an additional grant proposal (Kitchen Creek III) in order to build a roofed livestock feeding facility and prevent any additional bacteria load from feeding livestock.

Load Reduction	Total	Target for this farm	Target for watershed
Fecal coliform	1.01E+13	1.11E+13	6.01E+13

Steve Dransfield Dairy, practices 50% complete
Construction has begun, but not completed on the second waste storage facility for this farm. Construction will soon begin on the livestock watering system and stream exclusion fencing to be funded under the Kitchen Creek II grant.

Load Reduction	Total	Target for this farm	Target for watershed
Fecal coliform	1.14E+13	1.43E+13	6.01E+13

An educational farm field day was conducted in June in conjunction with the West Virginia University Extension Service and the Greenbrier Valley Conservation District. The purpose of the workshop was to inform farmers about the projects being conducted in the headwater streams of Second Creek which include Kitchen and Back Creeks as well as conservation practices that could be incorporated into their farming operation to protect water quality. The event was held at the Steve Dransfield farm on Kitchen Creek. Thirty-two landowners attended.

Back Creek

Fiscal year: 2010
Gant amount: $115,428 (federal) $76,953 (match)

Back Creek in Monroe County, West Virginia is a small tributary and headwater stream of Second Creek. This stream is heavily impacted by cattle grazing close to the stream and sensitive karst topography. Agriculture in this area consists primarily of beef cattle and dairy operations. The goal of this project is to restrict grazing along the streambanks and karst depressions, and contain concentrated animal waste. BMPs will include a waste storage facility, riparian buffer development, livestock exclusion, prescribed grazing and nutrient management. Alternative water development will also be implemented to compensate for livestock no longer having access to the stream.

Roland Oelschlager, practices 30% complete.

The livestock watering system consisting of four ponds, five watering troughs, and a spring development was completed during this reporting period. Exclusion fencing for these practices did not begin until after the end of the reporting period and therefore we are unable to attribute any load reductions at this time.

Mill Creek of South Branch

Fiscal year: 2009
Grant amount: $174,000 (federal) $123,093 (match)

The Mill Creek of the South Branch of the Potomac Water Quality Project continues to promote buffers, alternative watering systems for livestock, fencing, feedlot improvements, wetland development and restoration and septic upgrades. The project coordinator is working hand-in-hand with NRCS on many projects to promote agricultural BMP's. Many of our visits are made jointly and we then work with the landowner to find the most appropriate program for the individual needs. Although an unseasonably wet construction season, we were able to implement several large agricultural water quality improvement projects.

D. Kuykendall completed his streambank fencing project along a tributary leading into Spring Run. We were able to install 5,500 feet of streambank fencing which totally excluded the livestock access. Coupled with the stream crossing and water development, this project is now complete. A conservation plan was also developed in cooperation with NRCS which will allow the landowner to better manage his pastures.

Wetland restoration

M. Turner implemented a very large streambank exclusion fencing project on her property in Mill Creek. On this farm we installed 2,005 linear feet of woven wire to exclude the cattle from the stream. Thirty-five foot buffers of existing and natural regeneration compliment the fencing project. The landowner is working with NRCS to clean-out and rebuild the failing pond on site, which will be used as the watering source.

R. Mitchell completed the last section of exclusion fencing on his farm to complete his contract. This entailed 1,177 feet of exclusion fencing that complimented the solar project that was installed last year.

D. Evans completed the construction of his poultry litter storage shed. This producer had applied for EQIP several years in a row and had been turned down for funding; a 40 x 72 foot structure was installed to NRCS standard and now houses all the litter being removed from his two layer houses. Litter had previously been stored in the field. A nutrient management plan was also developed in cooperation with this contract.

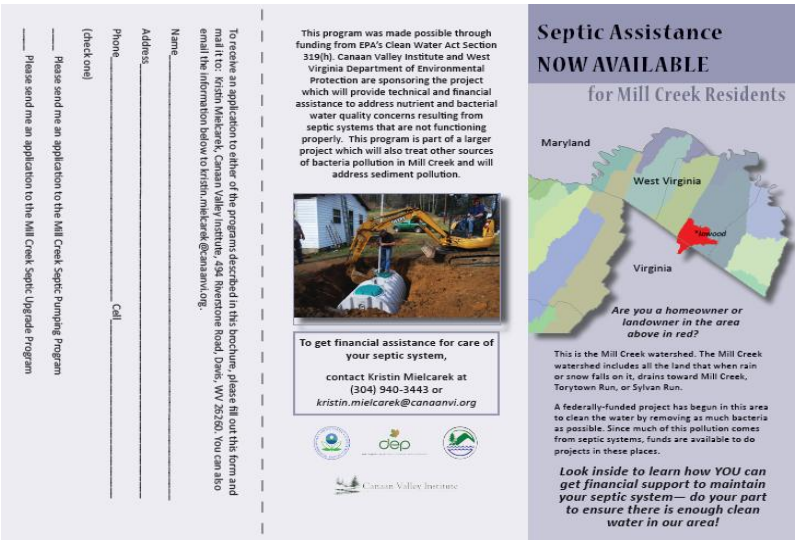
S .Sites contracted and completed 500 feet of streambank fencing and restored three acres of wetlands. He will be completing his alternative watering system over the winter which will entail developing a spring.

BMP	Units needed	# installed	Goal	Fecal reduction	Nitrogen (lbs/yr)	Phosphorous (lbs/yr)
Feedlot relocation	3	3	100%	6.90E+12	3861	470
Run-off control	2	1	50%	1.15E+12	0	0
Riparian buffers	400 ac	386	97%	2.87E+14	21,865	2,125
Fencing	338,000 ft	55,464	16%	2.84E+13	776,467	73,450
Alternative water	10	13	130%	2.21E+13	97	9
Septic upgrades	6	2	33%	3.28E+12	0	0
Septic pumping	0	25	100%	1.04E+12	0	0
Wetland restoration	3	3	100%	4.86E+12	0	0
Litter shed	1	1	100%	2.3E+12	1,287	157

Mill Creek Opequon

Fiscal year: 2009
Grant amount: $448,081 (federal) $299,722 (match)

This project is intended to reduce fecal coliform and sediment loads in Mill Creek of the Opequon Creek watershed, Berkeley County, WV. The fecal coliform reduction goal is 2.8E+14 cfu, primarily through septic system upgrades and incentives for pumping septic systems. An additional 7.2E+12 cfu are expected to be reduced through agricultural BMPs, including providing assistance for nutrient management planning. The sediment reduction goal is 85 lbs/yr, to be achieved primarily through natural stream restoration projects near the headwaters of Mill Creek. Residential practices will also be employed to achieve reductions of both pollutants.



Septic brochure for Mill Creek

Two workshops in the watershed regarding septic systems will serve to educate residents and professionals about proper function and maintenance of septic systems. Rain barrel workshops and pet waste outreach efforts will educate residents about stormwater management. NPS projects planned (excluding agricultural practices covered under existing cost-share programs) include 51 upgrades of septic systems, 25 coupons for 50% off the cost of pumping a septic system, three acres residential vegetative buffers, two rain garden demonstrations, one culvert improvement demonstration, 1000 feet of natural stream restoration, four public workshops, one pet waste reduction campaign, and agricultural nutrient management planning. From late 2010 through mid. 2011 the following progress has been made:

- A grant project team was developed and includes members of the Opequon Creek Project Team (OCPT), and representatives from DEP, Canaan Valley Institute (CVI), the Department of Agriculture, and the Potomac Riverkeeper.
- The project team strategized on outreach efforts for boosting participation in the septic upgrade program. It was proposed that this would be a suitable project for an Eagle Scout, and proposals were sought.
- The project team identified a Girl Scout interested in a partnership on a project. A project description was developed and presented to her. The project goal was to conduct outreach to Mill Creek homeowners to boost participation in the septic upgrade program. The Girl Scout reviewed the project description and determined the project to be outside her capabilities. It was determined that volunteers from OCPT, Virginia Onsite and Soil Services, and CVI will conduct the outreach.
- The natural stream restoration Project intended to stabilize approximately 1000 feet of the Mill Creek mainstem, just upstream of Gerrardstown and in the midst of the area targeted for septic system improvements was begun. The project will involve site assessment, design, permitting, construction and as-built documentation.
- In April 2011, CVI completed site assessment work. Design and permitting are scheduled for summer 2011, and construction is scheduled for fall 2011 or summer 2012.
- One rain barrel demonstration workshop was held in May 2011 and one was held in June 2011
- A tour of the Conley NSD project was organized. DEP and CVI hosted the GAO at the site as part of an audit being conducted of the 319 grant program.
- Partners from DEP and CVI walked the length of an unnamed tributary of Mill Creek which runs behind several homes in the Gerrardstown area. A list was developed of the properties where site conditions indicate that their septic system is not adequately treating the wastewater entering the creek. Outreach is currently being conducted with these property owners.
- A second brochure was developed which highlights only the septic pumping and septic upgrade portions of this grant. This is part of the targeted outreach being done to increase homeowner participation in these programs.

This period was devoted to outreach and project site identification. These activities will result in increased participation in the septic upgrade and septic pumping coupon programs. By spring 2012 we expect to achieve reduction of fecal coliform associated with failing septic systems.

Wastewater projects

Upper Guyandotte

Ury

Fiscal year: 2007
Grant amount: $136,000 (federal) $90,667 (match)

Construction of the Ury wastewater treatment system

This project is located in Ury in the Winding Gulf sub-watershed of the Upper Guyandotte. A 2004 TMDL listed the Winding Gulf for metals and fecal. Fecal reductions called for by the TMDL are 5.61E+14 CFU. This stream and Stonecoal Creek join to form the Guyandotte River. The project is expected to reduce fecal coliform by 2.54E+13 CFU by removing untreated household wastewater. A second project funded by SRF just downstream in the community of Helen will reduce the fecal load by an additional 1.67E+14 CFU. The Helen project was recently completed and the Ury construction will be completed in late 2011.

Two additional projects have been designed and are waiting possible funding. These will serve the communities of Amigo and Rhodell.

The Crab Orchard MacArthur (COMA) PSD was responsible for hiring the contractor and was on-site regularly to oversee construction. A local resident donated property for the drain field; however, this property had severely eroding banks so a small portion of the funds were diverted to address the streambanks. This was important because continued erosion could compromise the drainfield.

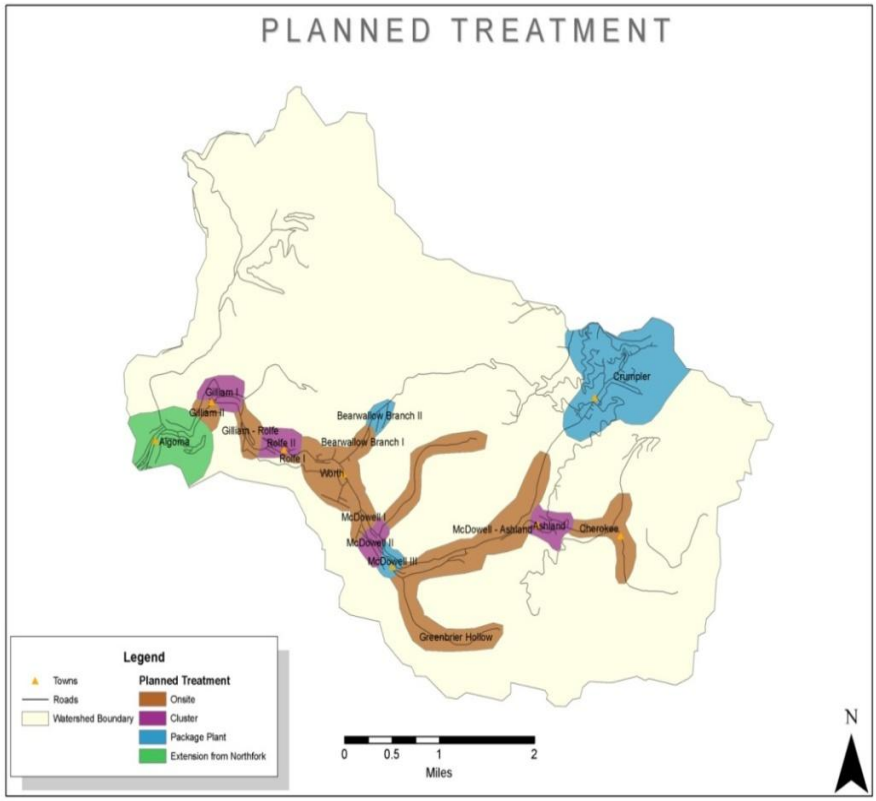
A database was created for homes that are not part of the Ury or Helen systems. The database will facilitate outreach efforts associated with the promotion of DEPs onsite loan program (OSLP), which provides cost-share assistance for septic system upgrades in areas of water quality impairments. The Winding Gulf Restoration Organization (WGRO) and the Upper Guyandotte Watershed Association (UGWA) will conduct public meetings and door-to-door visits to encourage residents to improve their septic systems.

North Fork Elkhorn Creek

NF Elkhorn OSLP

Fiscal year: 2010
Grant amount: $190,739 (federal) $127,161 (match)

The project uses a combination of state revolving loan fund dollars and §319 dollars to facilitate the repair of failing on-site systems. There are approximately 50+ homes in the McDowell, Worth and Bearwallow Branch areas with failing on-site systems. In many cases a nearly direct discharge of sewage and fecal coliform is occurring from these homes.



In April 2011 the sanitarian helped identify homes likely to pass a percolation test. Site visits were conducted to these homes to get approval to do perc tests. Of these homes only three past perc tests. Follow up visits were conducted to help residents complete applications for either the OSLP/319 program or for the USDA's 504 grant program.

The progress has been slow since the Wastewater Treatment Coalition of MacDowell County (WTCMC) hired a new project coordinator who left after only a few months. A new project coordinator was recently hired, and additional follow-up visits will be conducted, if necessary.

In August, WTCMC made site visits to homes further downstream to gage their interest in a perc test. The responses were positive. However, the sanitarian decided that only a few perc tests could be completed due to inaccessibility.

Currently no new systems have been installed so there are no load reductions. The project is approximately 5% complete.

Acknowledgements

The NPS Program thanks all of the **partners** who contributed to this report. This includes but is not limited to DEP's NPS staff, WV Conservation Agency (WVCA) Conservation Specialists, WVU Water Research Institute's National Mine Lands Reclamation Center (NMLRC), Friends of Deckers Creek (FODC), Friends of the Cheat (FOC), Plateau Action Network (PAN), Canaan Valley Institute (CVI), Opequon Creek Project Team (OCPT), Sleepy Creek Watershed Association (SCWA), Upper Guyandotte Watershed Association (UGWA), Winding Gulf Restoration Organization (WGRO), Wastewater Treatment Coalition of MacDowell County (WTCMC) and a wide variety of other volunteers and expert staff who are committed to NPS projects in their region.

Photograph and additional images provided by: Pamela Russell, Kimberly Maxwell, Martin Christ, Levi Rose, Dennis Burns, Carla Hardy, Kristin Mielcarek, Barbara Elliott, Jennifer Liddle and Timothy Craddock

NPS project map created by John Wirts, Program Manager DEP's Watershed Assessment Branch.

Appendix 1: FY 2011 Grant funds

WEST VIRGINIA

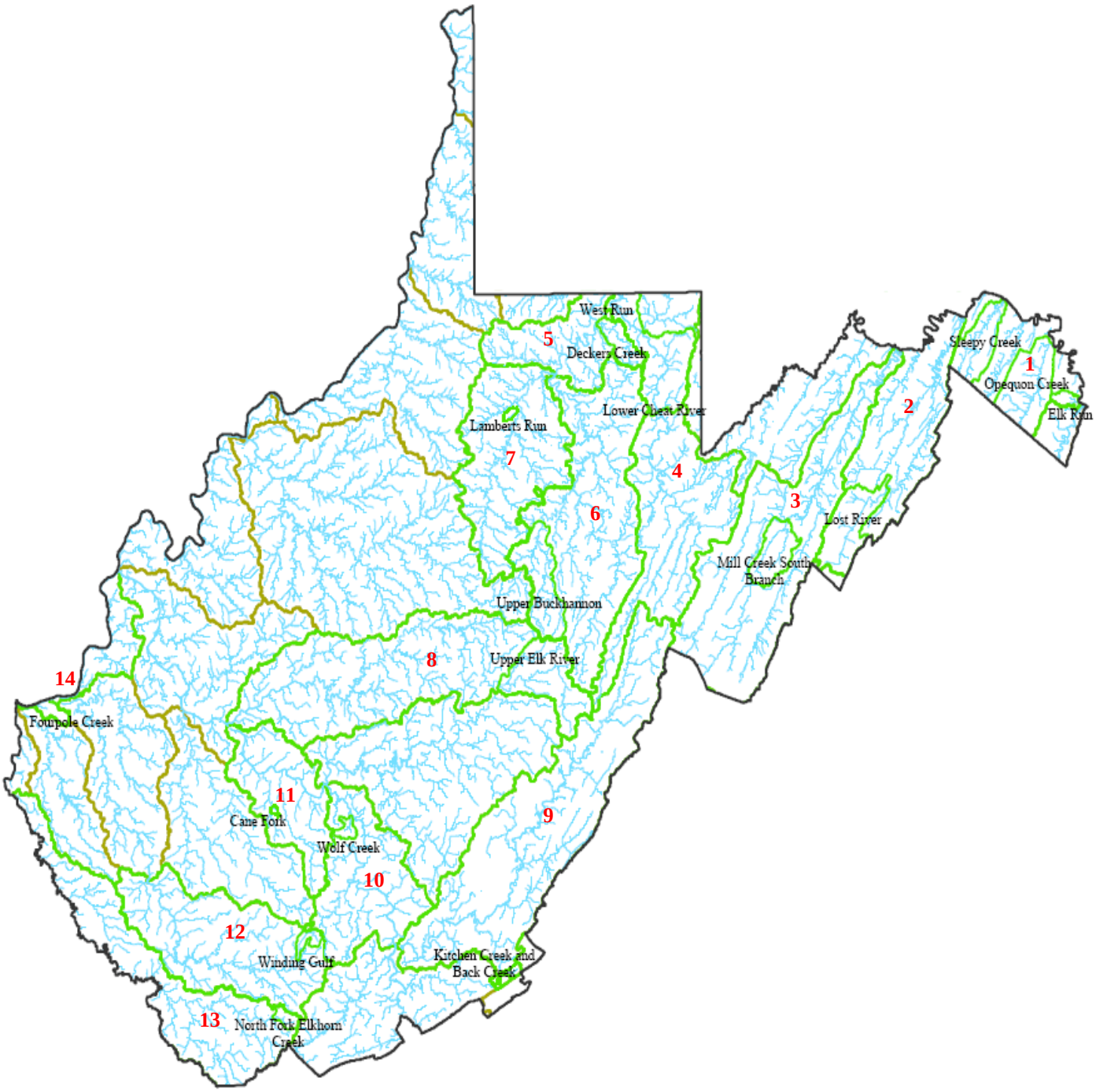
NONPOINT SOURCE PROGRAM
GRANT FUNDS: §319(h)

BUDGET PERIOD FY 2011

OCTOBER 1, 2010 THROUGH SEPTEMBER 30, 2014

BASE GRANT	Federal	State	Total
WVDEP, NPS	$509,795	$339,864	$849,660
WVDEP Oil and Gas	$43,800	$29,200	$73,000
WV Conservation Agency	$275,143	$183,429	$458,572
TOTALS	$828,738	$552,493	$1,381,232
INCREMENTAL GRANT			
Slabcamp AMD Projects	$274,089	$185,726	$459,815
Kitchen Creek II	$49,520	$33,014	$82,534
Muddy Creek	$225,840	$144,140	$369,980
Lambert Run Site 7	$384,933	$256,622	$641,555
Tuscarora Creek	$55,000	$40,890	$95,890
Elk Run	$55,000	$45,700	$100,700
TOTALS	$1,044,382	$706,092	$1,750,474

Appendix 2: NPS project map



(1) Potomac Direct Drains; (2) Cacapon River; (3) South Branch Potomac; (4) Cheat River; (5) Monongahela River; (6) Tygart Valley River; (7) West Fork; (8) Elk River; (9) Greenbrier River; (10) Lower New River; (11) Upper Kanawha River; (12) Upper Guyandotte River; (13) Tug Fork River; (14) Lower Ohio South

Appendix 3: Announcement of Grant Opportunities (AGOs)

Status	Organization	Budget	Expiration	FY	Project type
C	Eastern Panhandle Conservation District	$11,770	31-Dec-10	2007	Washington HS rain garden
C	Potomac Valley Audubon Society	$25,000	31-Dec-10	2007	Watershed education
C	Plateau Action Network	$11,639	31-Dec-10	2007	Fayetteville HS rain garden
	Totals	$48,409			
C	Guardians of the West Fork WA	$15,000	30-Sep-12	2008	AMD Project Maintenance
C	Town of Cedar Grove	$20,000	31-Dec-11	2008	Virginia's Chapel Stormwater Demonstration
	Totals	$35,000			
A	Friends of the Cheat	$45,000	30-Sep-12	2009	Cheat Restoration Sustainability
A	Friends of Deckers Creek	$15,060	30-Sep-12	2009	Monitoring NPS
C	Potomac Headwaters RC&D	$7,134	30-Sep-12	2009	Warm Springs WSA Japanese Knotweed Removal
A	Upper Guyandotte WA	$9,000	30-Sep-12	2009	Wyoming County Wastewater Treatment Plan
A	The Mountain Institute	$9,000	30-Sep-12	2009	Stream Monitors
C	Potomac Valley Audubon Society	$15,129	30-Sep-12	2009	Watershed Education
A	Woodlands Development Group	$6,000	30-Sep-12	2009	Porter Avenue Green Demo Triplex
	Totals	$106,323			
C	Piney Creek WSA	$17,462	31-Dec-10	2010	Pet waste education and rain garden
A	Canaan Valley Institute	$23,046	30-Sep-12	2010	Wastewater Treatment Coalition of McDowell County
A	Canaan Valley Institute	$32,091	30-Jun-11	2010	McDowell County Community Wastewater Design
A	Shepherdstown Daycare Center	$8,645	30-Sep-12	2010	SDC Rain Garden
A	Friends of the Cheat	$20,000	30-Jun-13	2010	Monitoring/mapping, WBP revisions
	Totals	$101,244			
A	Friends of Deckers Creek	$10,230	30-Jun-13	2011	Monitoring & Streambank Assessments
C	Friends of the Lower Greenbrier	$4,200	30-Jun-13	2011	State of the Watershed Report
A	Piney Creek WSA	$5,000	30-Jun-13	2011	Monitoring
A	The Mountain Institute	$20,000	30-Jun-13	2011	Appalachian Watershed and Stream Monitors Program
C	WV Conservation Agency	$15,000	30-Jun-13	2011	WV State Fair Rain Gardens
	Totals	$54,430			
	% complete FY 07-11	45.5			Status: (A) active; (C) complete

The AGO funds base grant funds and can focus on general nonpoint issues or projects in non-TMDL watersheds.

When AGO funding is available, notices are sent to organization that focus on nonpoint issues.

Appendix 4: New load reductions in FY 2011

FY	Project name	Load	Pollutant	Units	FY	Project name	Load	Pollutant	Units	FY	Project name	Load	Pollutant	Units
2006	Sovern 62	40,000	Acidity	lbs/yr	2006	Sovern 62	1,000	Aluminum	lbs/yr	2006	Lost River	5.25E+18	Fecal coliform	CFU
2006	Sovern 62	4,000	Acidity	lbs/yr	2006	Sovern 62	18,000	Aluminum	lbs/yr	2007	Lost River	5.62E+16	Fecal coliform	CFU
2007	Smooth Rock Lick	3,080	Acidity	lbs/yr	2006	Lamberts Site 5	1,000	Aluminum	lbs/yr	2007	Ury	2.54E+13	Fecal coliform	CFU
2008	Upper Muddy	20,000	Acidity	lbs/yr	2007	Kanes Creek	13,549	Aluminum	lbs/yr	2008	Sleepy Creek	2.68E+13	Fecal coliform	CFU
2008	Pringle Run	76,480	Acidity	lbs/yr	2007	Smooth Rock Lick	72	Aluminum	lbs/yr	2008	Sleepy Creek	2.90E+13	Fecal coliform	CFU
2008	Sandy Run	77,000	Acidity	lbs/yr	2008	Smooth Rock Lick	826	Aluminum	lbs/yr	2009	Kitchen Creek	7.27E+13	Fecal coliform	CFU
2008	Smooth Rock Lick	36,900	Acidity	lbs/yr	2008	Upper Muddy	1,620	Aluminum	lbs/yr	2009	Mill Creek Opequon	8.75E+14	Fecal coliform	CFU
2008	NF Greens Run	10,200	Acidity	lbs/yr	2008	Pringle Run	6,560	Aluminum	lbs/yr	2011	Kitchen Creek	6.01E+13	Fecal coliform	CFU
2010	Slabcamp	19,000	Acidity	lbs/yr	2008	NF Greens Run	164	Aluminum	lbs/yr	2011	Elk Run	7.03E+13	Fecal coliform	CFU
2010	Summerlee	213,827	Acidity	lbs/yr	2008	Sandy Run	8,400	Aluminum	lbs/yr	2011	Tuscarora Creek	3.13E+13	Fecal coliform	CFU
2011	Slabcamp	63,000	Acidity	lbs/yr	2010	West Run	15,360	Aluminum	lbs/yr	2011	Muddy Creek	2.86E+13	Fecal coliform	CFU
2011	Lamberts S7	97,808	Acidity	lbs/yr	2010	Slabcamp	2,900	Aluminum	lbs/yr		Totals	**5.31E+18**		
	Totals	**661,295**			2010	Summerlee	7,015	Aluminum	lbs/yr	2006	Conley	615.3	Sediment	tons/yr
2006	Sovern 62	7,600	Iron	lbs/yr	2011	Slabcamp	4,900	Aluminum	lbs/yr	2007	Lost River	1,050.0	Sediment	tons/yr
2006	Sovern 62	17,000	Iron	tons/yr		Totals	**81,366**			2009	Kitchen Creek	15.4	Sediment	tons/yr
2006	Lamberts S5	17,600	Iron	lbs/yr	2006	Lamberts S5	8,200	Manganese	lbs/yr	2009	Mill Creek Opequon	87.0	Sediment	tons/yr
2007	Kanes Creek	9,765	Iron	lbs/yr	2008	Pringle Run	960	Manganese	lbs/yr	2011	Tuscarora Creek	8.3	Sediment	tons/yr
2007	Smooth Rock Lick	103	Iron	lbs/yr	2010	West Run	3,800	Manganese	lbs/yr		Totals	**1,776.0**		
2008	Smooth Rock Lick	676	Iron	lbs/yr	2010	Summerlee	3,892	Manganese	lbs/yr	2007	Lost River	5,271	Nitrogen	lbs/yr
2008	Upper Muddy	380	Iron	lbs/yr		Totals	**16,852**			2009	Kitchen Creek	1,905	Nitrogen	lbs/yr
2008	Pringle Run	3,200	Iron	lbs/yr						2009	Mill Creek SB	30,970	Nitrogen	lbs/yr
2008	NF Greens Run	437	Iron	lbs/yr							Totals	**38,146**		
2008	Sandy Run	2,000	Iron	lbs/yr		Total nutrients	**46,217**	lbs/year		2007	Lost River	4,739	Phosphorous	lbs/yr
2010	West Run	24,000	Iron	lbs/yr		Total metals	**263,724**	lbs/year		2009	Kitchen Creek	547	Phosphorous	lbs/yr
2010	Slabcamp	1,600	Iron	lbs/yr		Total fecal coliform	**5.31E+18**	CFUs		2009	Mill Creek SB	2,785	Phosphorous	lbs/yr
2010	Summerlee	47,445	Iron	lbs/yr		Total acidity	**661,295**	lbs/year			Totals	**8,071**		
2011	Slabcamp	3,700	Iron	lbs/yr		Total (not including fecal)		**971,236** lbs/yr						
2011	Lamberts S7	30,000	Iron	lbs/yr										
	Totals	**165,506**												

Appendix 5: WBP tracking spreadsheets

Lost River			**Project Tracking**							
Project Name	BASINS	Stream Codes	Best Management Practices	# of BMPs installed	Pollutants	Loads	Units	319 funds	Matching funds	Grant year
Lost River	Cacapon-Town	WVPC-24	Riparian buffers	10 ac	Fecal Coliform	5.25E+18	CFU	$215,862	$147,015	2006
			Natural channel restoration	6250 ft	Nitrogen	4,904	lbs/yr			
			Off stream watering w/fence	5	Phosphorus	43,901	lbs/yr			
			Off stream watering/rotational grazing	5	Sedimentation	6,775	tons/yr			
			Feedlot relocation	2						
Lost River II	Cacapon-Town	WVPC-24	Riparian buffers	10 ac	Fecal Coliform	5.62E+16	CFU	$452,604	$308,190	2007
			Natural channel restoration	6000 ft	Nitrogen	5,271	lbs/yr			
			Off stream watering w/fence	5	Phosphorus	4,739	lbs/yr			
			Off stream watering/rotational grazing	5	Sedimentation	1,050	tons/yr			
			Feedlot relocation	2						
			Total BMPs	28	Total nutrients	58,815		$668,466	$455,205	
					Total sediment	7,825				
					Total fecal coliform	5.31E+18				

Mill Creek of Opequon			**Project Tracking**							
Project Name	BASINS	Stream Codes	Best Management Practices	# of BMPs	Pollutants	Loads	Units	319 funds	Matching funds	Grant year
Mill Creek (Opequon)	Conococheague-Opequon	WVP-4	Septic pumping/upgrades	51	Sedimentation	87	tons/yr	$445,521	$279,052	2009
			Riparian buffers	3 ac	Fecal Coliform	8.75E+14	CFU			
			Nutrient management plans	2						
			Natural stream restoration	1000 ft						
			Fencing	2400 ft						
			Armored stream crossing	2						
			Culvert improvement	1						
			Rain gardens	2						
			Total BMPs	61	Total sediment	87	tons/yr			
					Total fecal coliform	8.75E+14	CFU			

Mill Creek of South Branch			**Project Tracking**							
Project Name	BASINS	Stream Codes	Best Management Practices	# of BMPs	Pollutants	Loads	Units	319 funds	Matching funds	Grant year
Mill Creek of South Branch	Mill Creek	WVPSB-25	Riparian buffers	133 ac	Nitrogen	30,970	lbs/yr	$174,000	$123,093	2009
			Fencing	75 ac	Fecal Coliform	1.81E+14	CFU			
			Alternative watering	2	Phosphorus	2,785	lbs/yr			
			Livestock waste storage system	2						
			Poultry manure storage system	1						
			Septic upgrades	2	Total nutrient	33,755	lbs/yr			
			Total BMPs	9	Total fecal coliform	1.81E+14	CFU			

North Fork of Elkhorn Creek			**Project Tracking**							
Project Name	BASINS	Stream Codes	Best Management Practices	# of BMPs	Pollutants	Loads	Units	319 funds	Matching funds	Grant year
Ashland Community Wastewater	Tug Fork	WVBST-99-L-4	Alternative Septic System	31	Fecal Coliform	3.96E+13	CFU	$231,650	$288,535	2008
NF Elkhorn OSLP	Tug Fork	WVBST-99-L	Onsite Wastewater Treatment	22	Fecal Coliform	7.13E+13	CFU	$82,000	$53,000	2009
			Total BMPs	53	Total fecal coliform	1.11E+14	CFU	$313,650	$341,535	

Plan Name	**Sleepy Creek**		**Project Tracking**							
Project Name	BASINS	Stream Codes	Best Management Practices	# of BMPs	Pollutants	Loads	Units	319 funds	Matching funds	Grant year
Sleepy Creek Project	Upper Sleepy Creek	WVP-9	Septic pumping/upgrades	50	Fecal Coliform	1.01E+14	CFU	$292,552	$195,035	2009
	Lower Sleepy Creek		Riparian buffers	20 ac						
	Meadow Branch	WVP-9B	Stream crossings	5						
			Alternative watering systems	5						
			Fencing	5000 ft						
			Total BMPs	62						

Second Creek			**Project Tracking**							
Project Name	HUC CODES	Stream Codes	Best Management Practices	# of BMPs	Pollutants	Loads	Units	319 funds	Matching funds	Grant year
Kitchen Creek	50500030701	WVKNG-23-G	Waste Storage Facility	2	Fecal Coliform	7.27E+13	CFU	$108,523	$72,350	2009
			Alternative Water Sources	10	Sedimentation	15.4	tons/yr			
			Prescribed Grazing	8	Nitrogen	1905.2	lbs/yr			
			Nutrient Management Plan (NMP)	8	Phosphorus	546.9	lbs/yr			
			Riparian Buffers - Vegetative	5.8 ac						
			Stream Crossing	10						
			Fence	7260 ft						
Kitchen Creek II	50500030701	WVKNG-23-G	Alternative Water Sources	3	Fecal Coliform	6.01E+13	CFU	$49,520	$33,014	2011
			Prescribed Grazing	2						
			Nutrient Management Plan (NMP)	2						
			Riparian Buffers - Vegetative	3 ac						
			Stream Crossing	2						
			Fence	5000 ft						
Kitchen Creek III	50500030701	WVKNG-23-G	Alternative Water Sources	2	Fecal Coliform	5.92E+12	CFU	$70,517	$44,012	2012
			Stream Crossing	2						
			Fence	2000 ft						
			Feed Management	2						
Back Creek	505000030701	WVKNG-23-H	Alternative Water Sources	15	Fecal Coliform	4.78E+13	CFU	$115,428	$76,953	2010
			Stream Crossing	5						
			Fence	24000 ft						

			Total BMPs	61	Total nutrients	2452.1	lbs/yr	$343,988	$226,329	
					Total sediment	15.4	tons/yr			
					Total coliform	1.87E+14	CFU			

Upper Guyandotte			**Project Tracking**							
Project Name	HUC CODES	Stream Codes	Best Management Practices	# of BMPs	Pollutants	Loads	Units	319 funds	Matching funds	Grant year
Ury Wastewater Project	050701010101	WVOG-138	Onsite Wastewater Treatment	11	Fecal Coliform	2.54E+13	CFU	$136,000	$90,667	2007
Winding Gulf OSLP	050701010101	WVOG-138	Onsite Wastewater Treatment	24	Fecal Coliform	1.95E+14	CFU	$117,100	$112,500	2010
			Total BMPs	35	Total fecal coliform	2.20E+14		$253,100	$203,167	

Deckers Creek			**Project Tracking**							
Project Name	BASINS	Stream Codes	Best Management Practices	# of BMPs	Pollutants	Loads	Units	319 funds	Matching funds	Grant year
Valley Point #12	Headwaters Deckers Creek	WVM-8	Land Reconstruction, AML	1	Metals (Aluminum)	9,400	lbs/yr	$150,301	$103,248	2005
	Outlet Deckers Creek				Metals (Iron)	45,400	lbs/yr			
Valley Highwall/Kanes Creek South	Headwaters Deckers Creek	WVM-8-I	AMD-Limestone Open Channel	2	Metals (Aluminum)	1,600	lbs/yr	$237,694	$161,775	2007
	Outlet Deckers Creek		AMD-Constructed Wetland	2	Metals (Iron)	4,400	lbs/yr			
			AMD-Sulfate Reducing Bioreactor	1						
Kanes Creek South/Morgan's Mine	Headwaters Deckers Creek	WVM-8-I	AMD-Limestone Open Channel	2	Acidity	73,800	lbs/yr	$300,000	$210,000	2008
	Outlet Deckers Creek		AMD-Constructed Wetland	2	Metals (Aluminum)	17,000	lbs/yr			
			AMD-Steel Slag Treatment	2	Metals (Iron)	15,200	lbs/yr			
			AMD-Limestone Leach Bed/Pond	1						
Slabcamp mainstem	Headwaters Deckers Creek	WVM-8-F	AMD-Constructed Wetland	2	Acidity	82,000	lbs/yr	$211,800	$140,700	2010
	Outlet Deckers Creek		AMD-Limestone Open Channel	1	Metals (Aluminum)	7,800	lbs/yr			
			AMD-Vertical Flow Treatment	4	Metals (Iron)	5,400	lbs/yr			
Sandy Run	Headwaters Deckers Creek		AMD-Constructed Wetland	1	Acidity	77,000	lbs/yr	$298,925	$209,340	2011
	Outlet Deckers Creek		AMD-Limestone Open Channel	2	Metals (Aluminum)	8,400	lbs/yr			
					Metals (Iron)	2,000	lbs/yr			
Slambcamp tributary	Headwaters Deckers Creek	WVM-8-F-1	AMD-Limestone Leach Bed/Pond	2	Acidity	63,000	lbs/yr	$274,089	$185,726	2012
	Outlet Deckers Creek		AMD-Limestone Open Channel	2	Metals (Aluminum)	3,800	lbs/yr			
					Metals (Iron)	5,000	lbs/yr			
			Total BMPs	27	Total metals	125,400	lbs/yr	$1,472,809	$1,010,789	
					Total acidity	295,800	lbs/yr			

Lower Cheat River			**Project Tracking**							
Project Name	BASINS	Stream Codes	Best Management Practices	# of BMPs	Pollutants	Loads	Units	319 funds	Matching funds	Grant year
Lower Cheat Passive Treatment Installations	Pringle Run-Cheat River	WVMC-27	AMD-Limestone Open Channel	4	Acidity	312,000	lbs/yr	$371,217	$247,478	2006
			AMD-Steel Slag Treatment	3	Metals (Aluminum)	74,000	lbs/yr			
	Greens Run-Cheat River	WVMV-16-A1	AMD-Limestone Leach Bed/Pond	2	Metals (Iron)	261,400	lbs/yr			
					Sedimentation-Siltation	1,166,000	lbs/yr			
Muddy Creek (Dream mountain)	Muddy Creek	WVMC-17	AMD-Constructed Wetland	2	Acidity	416,000	lbs/yr	$288,391	$192,260	2006
			AMD-Limestone Open Channel	2	Metals (Aluminum)	39,400	lbs/yr			
			AMD-Steel Slag Treatment	2	Metals (Iron)	64,600	lbs/yr			
South Fork Greens Run	Greens Run-Cheat River	WVMC-16-A	AMD-Limestone Leach Bed/Pond	2	Metals (Aluminum)	1,000	lbs/yr	$61,576	$41,051	2006
			AMD-Steel Slag Treatment	1	Metals (Iron)	2,000	lbs/yr			
Sovern Run #62	Lower Big Sandy Creek	WVMC-12-0.5A	AMD-Limestone Leach Bed/Pond	5	Acidity	21,300	lbs/yr	$150,000	$100,000	2009
			AMD-Limestone Open Channel	1	Metals (Aluminum)	19,600	lbs/yr			
					Metals (Iron)	21,200	lbs/yr			
					Metals (Manganese)	2,800	lbs/yr			
Pringle Run Passive Treatment (Phase II)	Pringle Run-Cheat River	WVMC-27	AMD-Limestone Leach Bed/Pond	1	Acidity	109,800	lbs/yr	$150,000	$100,000	2009
			AMD-Steel Slag Treatment	3	Metals (Aluminum)	12,000	lbs/yr			
			AMD-Limestone Open Channel	4	Metals (Iron)	3,600	lbs/yr			
					Metals (Manganese)	1,400	lbs/yr			
North Fork Greens Run (Dinkenberger Rd)	Greens Run-Cheat River	WVMV-16-A1	AMD-Limestone Leach Bed/Pond	4	Acidity	68,200	lbs/yr	$150,000	$100,000	2009
			AMD-Steel Slag Treatment	1	Metals (Aluminum)	2,600	lbs/yr			
			AMD-Limestone Open Channel	3	Metals (Iron)	6,800	lbs/yr			
Upper Muddy (Phase II)	Muddy Creek	WVMC-17	AMD-Constructed Wetland	1	Acidity	54,200	lbs/yr	$115,821	$77,014	2009
			AMD-Limestone Open Channel	1	Metals (Aluminum)	2,200	lbs/yr			
			AMD-Steel Slag Treatment	1	Metals (Iron)	13,200	lbs/yr			
					Metals (Manganese)	1,800	lbs/yr			
Jeff Eanes (Beech Run Rd)	Lower Big Sandy Creek	WVMC-12-0.5A	AMD-Constructed Wetland	1	Acidity	60,800	lbs/yr	$271,860	$181,240	2011
			AMD-Vertical Flow Treatment	2	Metals (Aluminum)	7,200	lbs/yr			
			AMD-Sulfate Reducing Bioreactor	2	Metals (Iron)	1,800	lbs/yr			
			AMD-Limestone Open Channel	2	Metals (Manganese)	1,000	lbs/yr			
			Total BMPs	50	Total metals	539,600	lbs/yr	$1,558,865	$1,039,043	
					Total acidity	1,042,300	lbs/yr			

Lamberts Run			**Project Tracking**							
Project	CODES	Stream Codes	Best Management Practices	# of BMPs	Pollutants	Loads	Units	319 funds	Matching funds	Grant year
Mussel loader	050200020602	WVMW-16	Pond	1	Metals (Iron)	31,600	lbs/yr	$106,663	$78,489	2006
			AMD-Steel Slag Treatment	1	Metals (Aluminum)	34,800	lbs/yr			
			AMD-Constructed Wetland	1						
Site 5	050200020602	WVMW-16	AMD-Limestone Open Channel	1	Metals (Iron)	17,600	lbs/yr	$146,334	$97,614	2007
			AMD-Constructed Wetland	1	Metals (Aluminum)	1,000	lbs/yr			
			AMD-Limestone Leach Bed/Pond	1	Metals (Manganese)	8,200	lbs/yr			
Site 9	050200020602	WVMW-16	AMD-Anoxic Limestone Drain	4	Metals (Iron)	19,200	lbs/yr	$148,993	$99,329	2008
			Wetland Enhancement	1	Metals (Aluminum)	400	lbs/yr			
Site 6	050200020602	WVMW-16	AMD-Limestone Open Channel	3	Acidity	34,200	lbs/yr	$150,000	$100,000	2009
			AMD-Constructed Wetland	3	Metals (Iron)	12,800	lbs/yr			
					Metals (Aluminum)	600	lbs/yr			
					Metals (Manganese)	1,800	lbs/yr			
Site 7	050200020602	WVMW-16	AMD-Limestone Open Channel	1	Acidity	97,800	lbs/yr	$384,933	$156,622	2011
			AMD-Constructed Wetland	1	Metals (Iron)	30,000	lbs/yr			
			Wetland Enhancement	1						
			Total BMPs	20	Total acidity	132,000	lbs/yr	$936,923	$532,054	
					Total metals	158,000	lbs/yr			

North Fork Blackwater River		**Project Tracking**							
BASINS	Stream Codes	Best Management Practices	# of BMPs	Pollutants	Load Reductions	Units	319 funds	Matching funds	Grant year
Lower Blackwater River	WVMC-60-D-3	Land Reconstruction, AML	1	Metals (Aluminum)	13,400	lbs/yr	$62,050	$153,950	2006
		AMD-Limestone Leach Bed/Pond	1	Metals (Iron)	18,200	lbs/yr			
		AMD-Steel Slag Treatment	1						
		AMD-Limestone Open Channel	1						
		Total BMPs	4	Total metals	31600.0	lbs/yr			

Morris Creek			**Project Tracking**							
Project Name	HUC CODES	Stream Codes	Best Management Practices	# of BMPs	Pollutants	Loads	Units	319 funds	Matching funds	Grant year
WVU Tech/Morris Creek Reclamation Project	050500060306	WVK-70	AMD-Constructed Wetland	4	Metals (Aluminum)	33,240	lbs/yr	$583,366	$1,076,611	2003
			AMD-Vertical Flow Treatment	2	Metals (Iron)	285,860	lbs/yr			
			AMD-Limestone Leach Bed/Pond	5	Metals (Manganese)	32,360	lbs/yr			
			AMD-Limestone Open Channel	1						
Jones Hollow Phase I	050500060306	WVK-70	Natural Channel Restoration	593 ft	Sedimentation-Siltation	583	tons/yr	$41,139	$27,427	2005
			Stream Channel Stabilization							

Jones Hollow Phase II	050500060306	WVK-70	Natural Channel Restoration	1800 ft	Sedimentation-Siltation	487	tons/yr	$277,600	$196,000	2006
			Stream Channel Stabilization							
					Total metals	351,460	lbs/yr	$902,105	$1,300,038	
					Total sediment	1,070	tons/yr			

Upper Buckhannon			**Project Tracking**							
Project Name	BASINS	Stream Codes	Best Management Practices	# of BMPs	Pollutants	Loads	Units	319 funds	Matching funds	Grant year
Lower Mudlick Refuse	Fink Run-Buckhannon River	WVMTB-11	Land Reconstruction, AML	1	Metals (Aluminum)	400	lbs/yr	$90,000	$60,000	2008
					Metals (Iron)	2,400	lbs/yr			
Smooth Rock Lick #3	Tenmile Creek-Buckhannon River	WVMTB-32-A	AMD-Limestone Leach Bed/Pond	2	Metals (Aluminum)	400	lbs/yr	$64,401	$42,934	2008
			AMD-Limestone Open Channel	1	Metals (Iron)	2,400	lbs/yr			
Smooth Rock Lick #1/2	Tenmile Creek-Buckhannon River	WVMTB-32-A	AMD-Limestone Leach Bed/Pond	2	Acidity	36,200	lbs/yr	$122,930	$81,954	2009
			AMD-Limestone Open Channel	1	Metals (Aluminum)	38,200	lbs/yr			
			Check Dam	1	Metals (Iron)	48,600	lbs/yr			
Herods Run	Left Fork Buckhannon River	WVMTB-32	AMD-Limestone Leach Bed/Pond	2	Acidity	185,600	lbs/yr	$214,316	$142,877	2012
			AMD-Limestone Open Channel	1	Metals (Aluminum)	15,400	lbs/yr			
					Metals (Iron)	23,400	lbs/yr			
					Metals (Manganese)	6,400	lbs/yr			
			Total BMPs	11	Total metals	137,600	lbs/yr	$491,647	$327,765	
					Total acidity	221,800	lbs/yr			

West Run			**Project Tracking**							
Project Name	BASINS	Stream Codes	Best Management Practices	# of BMPs	Pollutants	Loads	Units	319 funds	Matching funds	Grant year
West Run Phase I	West Run-Monongahela River	WVM-3	AMD-Limestone Open Channel	1540 ft	Metals (Aluminum)	15,360	lbs/yr	$43,510	$30,340	2011
			AMD-Limestone Leach Bed/Pond	4	Metals (Iron)	24,000	lbs/yr			
			AMD-Steel Slag Treatment	1	Metals (Manganese)	3,800	lbs/yr			
West Run Phase II	West Run-Monongahela River	WVM-3	AMD-Limestone Open Channel	1540 ft	Acidity	185,760	lbs/yr	$264,685	$176,456	2012
			AMD-Limestone Leach Bed/Pond	4	Metals (Aluminum)	9,883	lbs/yr			
			AMD-Steel Slag Treatment	1	Metals (Iron)	18,439	lbs/yr			
					Metals (Manganese)	3,811	lbs/yr			
			Total BMPs	12	Total metals	75,293	lbs/yr	$308,195	$206,796	
					Total acidity	185,760	lbs/yr			

Wolf Creek			**Project Tracking**							
Project Name	HUC CODES	Stream Codes	Best Management Practices	# of BMPs	Pollutants	Loads	Units	319 funds	Matching funds	Grant year
Summerlee Phase I	050500040304	WVKN-10-M	Land Reconstruction, AML		Acidity	109,447	lbs/yr	$54,456	$36,304	2010
			AMD-Passive Treatment	Multiple	Metals (Aluminum)	7,731	lbs/yr			
			AMD-Constructed Wetland	1	Metals (Iron)	27,239	lbs/yr			
			AMD-Limestone Open Channel	1	Metals (Manganese)	3,751	lbs/yr			
Fayette Square	050500040304	WVKN-10	Urban Infiltration Basin	4	Oil and Grease	TBD		$83,553	$56,066	2012
			Urban Grassed Swale	4	Chemical Oxygen Demand (COD)	TBD				
			Urban Infiltration Trench	4	Sedimentation-Siltation	TBD				
			TBD - to be determined		Suspended solids	TBD				
			Total BMPs	15+	Total metals	38,721	lbs/yr	$138,009	$92,370	
					Total acidity	109,447	lbs/yr			

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Nonpoint Source Program
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