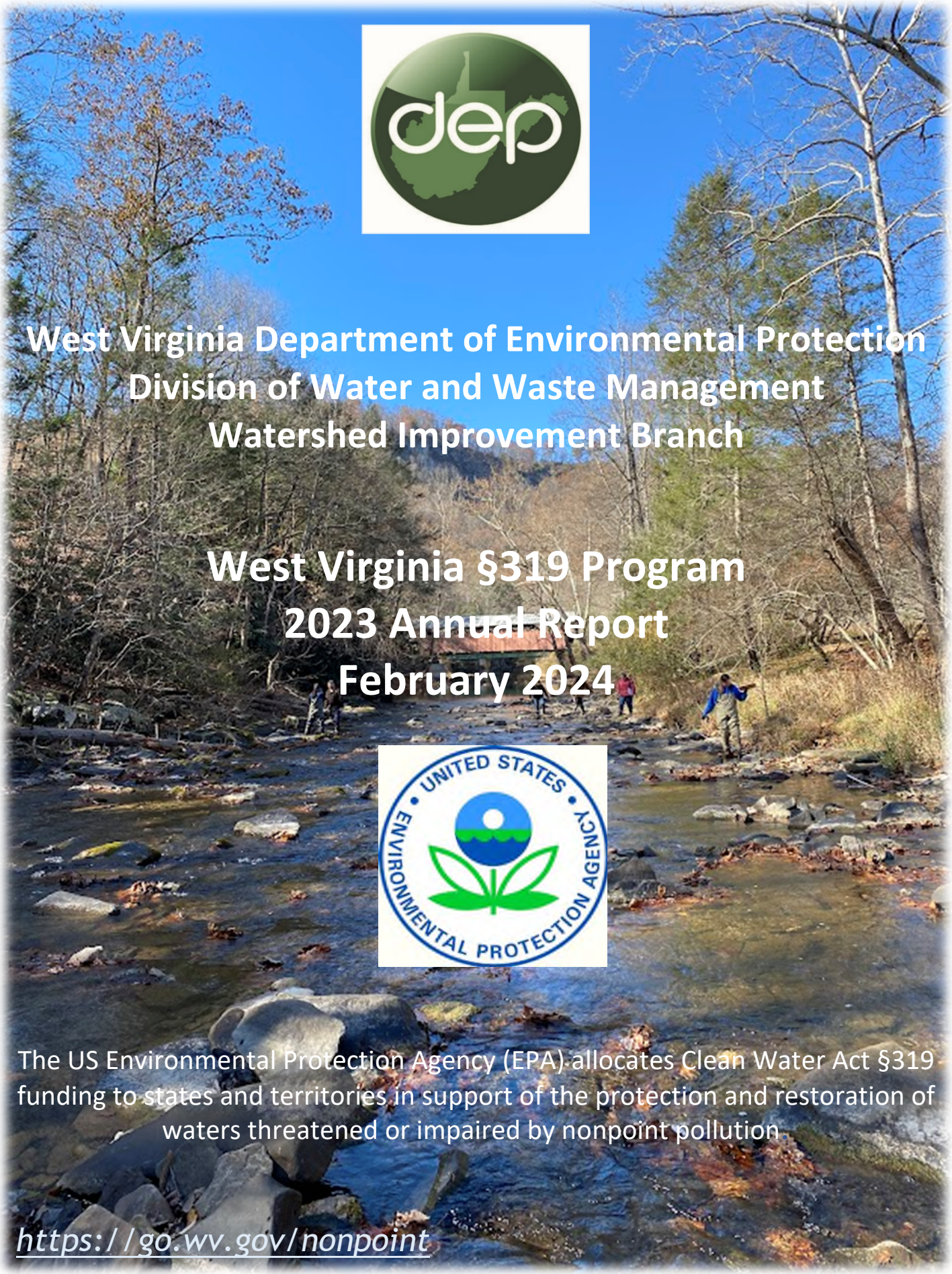


West Virginia Department of Environmental Protection
Division of Water and Waste Management
Watershed Improvement Branch

West Virginia §319 Program
2023 Annual Report
February 2024

The US Environmental Protection Agency (EPA) allocates Clean Water Act §319 funding to states and territories in support of the protection and restoration of waters threatened or impaired by nonpoint pollution.

https://go.wv.gov/nonpoint

west virginia department of environmental protection

Division of Water and Waste Management
Watershed Improvement Branch
Nonpoint Source Program

Nonpoint Source Program Annual Report
Submitted February 2024

Statement of policy regarding the equal opportunity to use and participate in programs.

It is the policy of the WVDEP to provide its facilities, services, and programs to all persons without regard to sex, race, color, age, religion, national origin, or handicap. Proper licenses/registration and compliance with official rules and regulations are the only sources of restrictions for facility use or program participation. WVDEP is an equal opportunity employer.

West Virginia's NPS Program is funded by a Clean Water Act §319 Grant administered by the EPA.

Report prepared by
Timothy Craddock, §319 Program Coordinator

Acknowledgements

Photo contributors - Callie Sams, Jennifer Skaggs, Alana Hartman, Martin Christ, Sara Prior, Tomi Bergstrom, Jennifer Liddle, Jason Fillhart, Kara Grosso, Autumn Crowe, Timohty Craddock, and Jim Fedders. WVDEP's *Watershed Improvement Branch* (WIB) §319 Program acknowledges the efforts of all staff, partners and multiple stakeholders that contributed information in this report, and those who have played roles in projects, monitoring, outreach etc. The names and organizations are too numerous to mention but if you would like to know more about organizations in your area contact: *timothy.d.craddock@wv.gov*.

Executive summary

The purpose of this report is to provide an overview of West Virginia's Nonpoint Source (NPS) Program activities for the past calendar year. This includes implementation summaries, staff a select partner highlights, Management Plan updates, watershed-based planning, and select project highlights from those completed in 2023. Also included is our most recent §319 success story and multiple appendices that provide additional details.

Table of Contents

Note: For additional information or for jumping to a certain section of the report, hyperlinks are embedded in the document. To move within the report the link is *blue*. Links to the internet or social media sites are *green*. All links are *italicized* and underlined except for the **Table of Contents.** It is also linked but is not underlined.

Introduction

In 2023 West Virginia's §319 Program provided technical assistance and financial support to 90 projects ranging from general administration, grant management, outreach, planning, monitoring, and a wide assortment of implementation. Most of our projects focus on *watershed-based plan* (WBP) priority basins; however, implementation also occurred through our *additional grant opportunities* (AGOs), and from our statewide partners. These projects were often on a smaller scale and timeframe. Many projects complement the efforts within WBPs while others were standalone projects focusing on local nonpoint source issues. Final reports for AGOs completed in 2023 are available on request. *Table 1* looks at the numbers for ALL projects. Additional details are available in the appendices.

Table 1. §319 Program/Project summary.

Federal Fiscal years	2019	2020	2021	2022	2023
§319 allocations	$1,749,996	$1,806,000	$1,855,200	$1,855,000	$1,925,500
§319 funds spent	**$1,596,895**	**$556,564**	**$727,105**	**$403,665**	**$248,595**
Funding	91%	31%	39%	22%	13%
§319 projects	**16**	**19**	**17**	**14**	**11**
Nonpoint	3	4	3	4	4
Nonpoint (AGOs)	4	6	3	4	TDB
Watershed	8	9	11	6	7
Completed projects	**15**	**5**	**1**	**0**	**0**
Projects	94%	26%	6%	0%	0%
Spending	91%	31%	39%	22%	13%
Grant expiration	Sep-23	Sep-24	Sep-25	Sep-26	Sep-27
Cancelled §319 projects	1	2	1	1	0

Implementation

Best management practices (BMPs)

The major goal of most §319 projects is the implementation of the best and most effective BMP that will reduce the target pollutants and be easily maintained throughout their lifespan. This maintenance is critical to the project's success, but unfortunately, there is not sufficient funding to support the necessary upkeep. Partners and program managers must often get creative and leverage funding from a wide variety of non-federal sources. The buy-in to this process is important to long-term success.

In 2023 BMP implementation occurred in 22 HUC12 size basins [*Figure 1*]. Overall BMP implementation is also represented graphically in *Figure 2*. Figure 2 compares major categories using a log(n) calculation. Additional details are provided in the appendix section. Most of the agricultural efforts are a result of implementation through WV Conservation Agency's (WVCA) *Agricultural Enhancement* (AgE) Program as well as their efforts in priority basins. The AgE Program usually implements practices in the spring so due to the timing of the 2023 §319 award, AgE implementation will not occur until 2024.

The focus of most of WVCA's watershed projects is bacteria reduction, while the AgE implementation targets nutrients through nutrient and pasture management practices. In 2023 bacteria reductions made up much of the effort.

Figure 1. HUC12 sized basins where §319 project activity occurred in 2023.

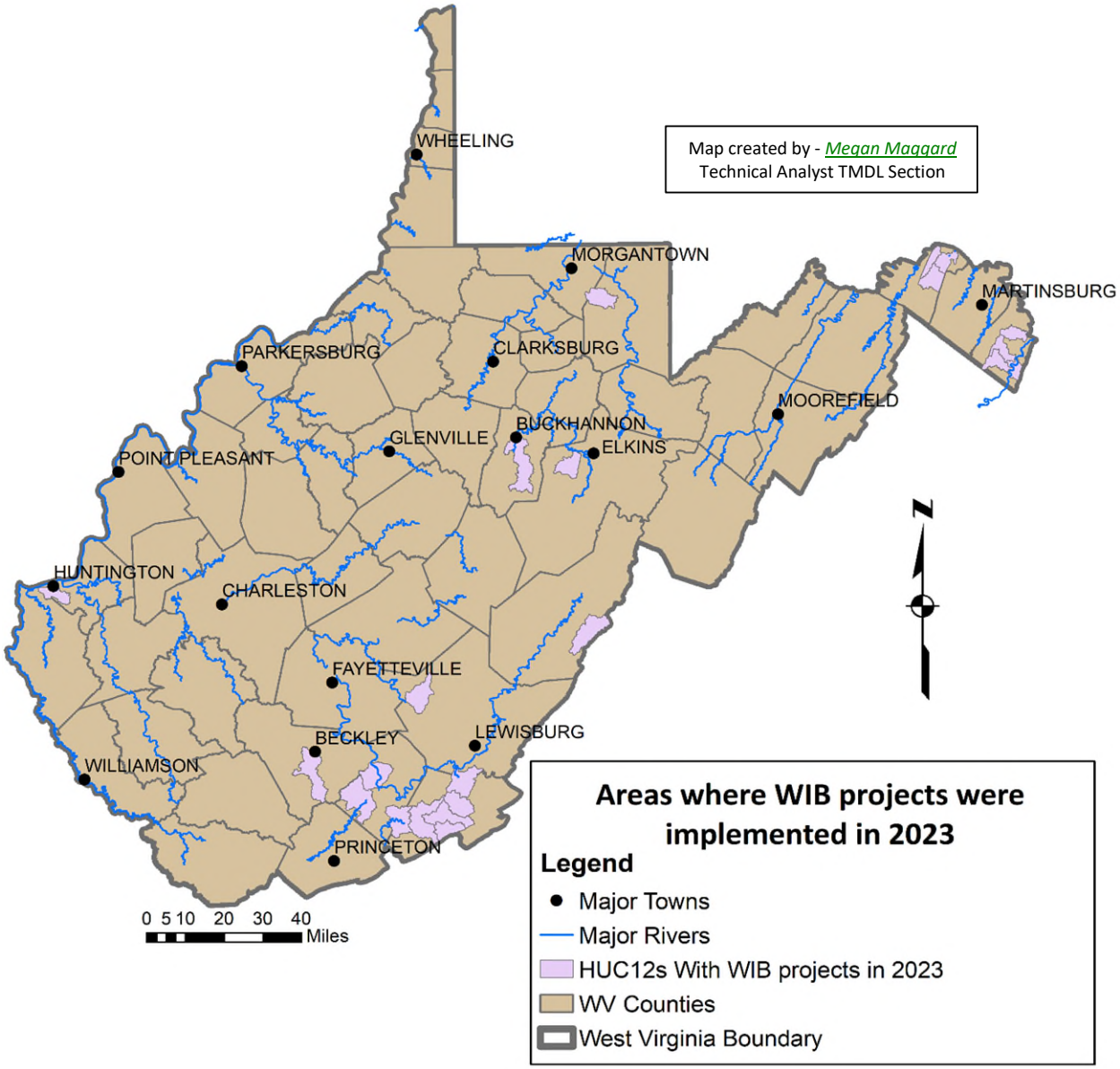
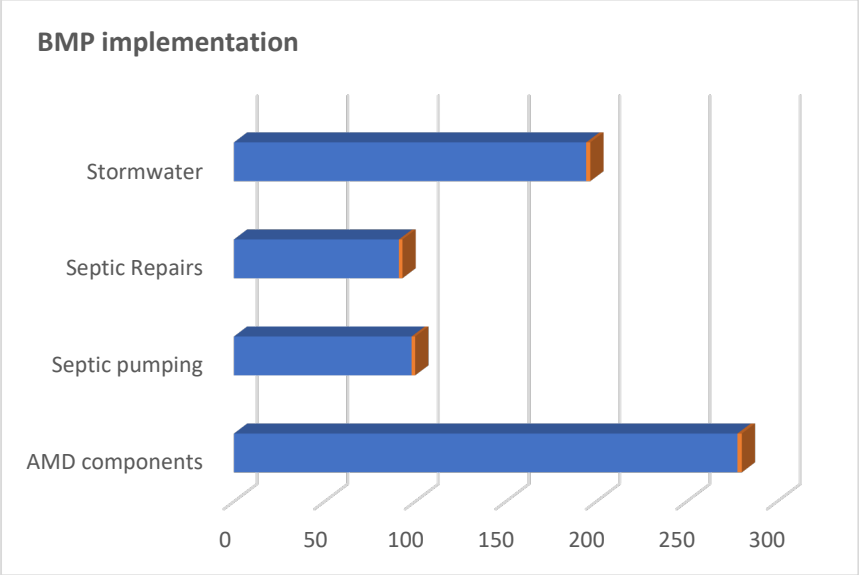


Table 2. HUC12 basin names from the map. Note: includes AGOs.

Burnside Branch	050500020701	Lower Sleepy Creek	020700040205
Rock Camp Creek	050500020702	Middle Sleepy Creek	020700040203
Upper Indian Creek	050500020703	Headwaters Deckers Creek	050200030201
Middle Indian Creek	050500020704	Warm Spring Run	020700040503
Lower Indian Creek	050500020705	Headwaters Knapp Creek	050500030202
Lower Second Creek	050500030703	Fourpole Creek	050901011006
Mill Creek-Meadow River	050500050605	Tenmile Creek-Buckhannon River	050200010304
Little Bluestone River	050500020909	Madame Creek-New River	050500040201
Headwaters Piney Creek	050500040102	Bullskin Run	020700070301
Roaring Creek	050200010406	Evitts Run	020700070302
Elks Run	020700041107	Furnace Run-Shenandoah River	020700070303

Overall BMP implementation will show a decrease in 2023 due to the timing of AgE practices as mentioned on page 2. Additionally, there are still impacts from the pandemic, but these are beginning to lessen. We do not anticipate any future pandemic impacts.

Figure 2. §319 2023 BMP implementation.



Categories	Total	Log(n)
AMD components	278	2.4
Septic pumping	98	2.0
Septic repair	91	2.0
Stormwater	194	2.3

Units were cubic yards, acres, feet, and individual units. See *appendix 2* for more details.

Numbers don't lie, but in this case they might. There was significantly more septic implementation but due to the units they appear as less when compared to the overall.

Load reductions

Figure 3. A portion of the Hinton map showing the one of many potential GI project sites.

We are seeing an increased interest in green infrastructure (GI) and creative stormwater implementation. A major effort occurred in the upper New River basin focused on the riverside city of Hinton. We are coordinating with this small community to develop conceptual designs, which will eventually move towards implementation. A summary of this report begins on page-21 and the full report is available upon request.

In the past, the WVDEP *Clean Water State Revolving Fund* (CWSRF) has focused on larger infrastructure projects such as wastewater and water treatment, which is a significant need, but there is an interest and shift to other NPS options. We have had several meetings in 2023 focusing on potential GI projects.

Load reduction (LR) details are available in *appendix 3*, and the final LR goals presented from the 2019 Management Plan are presented in *Table 4*. The largest contributor to nonpoint source (NPS) pollution in West Virginia is bacteria, primarily from failing septic systems and agriculture runoff, as well as acidity and

metals from abandoned mine lands. These two together account for approximately 75% of the NPS impairments.

Chesapeake Bay Program

West Virginia's Chesapeake Bay (CB) Tributary Team partners continue to work on nitrogen and phosphorus reductions for the CB TMDL. Our partners implement nonpoint source strategies from the *Phase 3 Watershed Implementation Plan* (WIP), such as stream restoration, cattle exclusion with riparian buffer planting, and stormwater management practices, which achieve local benefits while reducing nutrient loads. The wastewater strategy has largely been implemented and is focused on holding the line. In 2022, WVDEP began partnering with Chesapeake Bay Trust to apply federal project funds to the Green Streets, Green Jobs, Green Towns grant program for West Virginia applicants. Seven West Virginia projects were funded this year through this program. The CBP's Habitat Goal Implementation Team held its fall 2023 quarterly meeting in Kearneysville, WV; field trips to the WV DNR's brook trout hatchery in Hardy County and Trout Unlimited's stream restoration project in Hampshire County were well-received.

Table 3 shows historic, recent and WIP3 (goal) loads of total nitrogen and total phosphorus. Modeled progress during the 2022 progress year (July 2021-June 2022) is still dampened due to the expiration of some practices once they reach their modeled lifespan.

Table 3. WV's progress toward reducing CB pollutants.

Pollutant	Category	2013 Progress (Baseline)	Progress 2022	Progress 2023	WV WIP3 goal
Nitrogen	Agriculture	3.31	3.37	3.37	not specified
	Urban Runoff	1.20	1.21	1.22	
	Natural+Deposition	2.60	2.57	2.58	
	Septic	0.34	0.35	0.35	
	Wastewater+CSO	0.70	0.40	0.40	
	All Sources	**8.15**	**7.89**	**7.93**	**7.79**
Phosphorus	Agriculture	0.14	0.13	0.13	not specified
	Urban Runoff	0.06	0.06	0.06	
	Natural+Deposition	0.22	0.21	0.21	
	Septic	0.00	0.00	0.00	
	Wastewater+CSO	0.14	0.04	0.04	
	All Sources	**0.56**	**0.44**	**0.44**	**0.40**

Units: million lbs/yr

Results are from the CAST model, available at: *http://cast.chesapeakebay.net*

Basin Coordinators, Programs and WVCA highlights

WIB staff and our internal and external agency partnerships are critically important to the success of West Virginia's NPS Program. We rely heavily on the personalities and knowledge of everyone to deliver our program to those who need it most. We understand there are still many that can use our services and we will continue to strive to deliver those, especially to underserved areas.

WV Conservation Agency

Figure 4. Photo from one of many field days held across the state. Here participants listening to experts in forestry management in the Greenbrier Valley Conservation District.

The *WV Conservation Agency* (WVCA) remains the primary entity responsible for the implementation of the West Virginia agriculture and construction components of §319 Nonpoint Source (NPS) Program and for coordinating and implementing water quality improvement projects statewide. The WVCA develops WBPs in priority watersheds and in most cases WVCA's conservation specialists act as project managers for §319 projects within their districts. WVCA also provides a wide variety of technical information and assistance to landowners, state and federal agencies, watershed groups, conservation districts, and others in the selection of Best Management Practices (BMPs) to protect the natural resources of the state. WVCA is governed by the State Conservation Committee (SCC).

WVCA works closely with the *14 Conservation Districts* (CDs) for administration of various programs and provides administrative and technical support to the CDs through staffing. The role of CDs nationwide is to coordinate assistance from all available sources—public and private, local, state, and federal to develop locally-driven solutions to natural resource concerns. To assist with BMP implementation, CDs offer equipment rental and keep stock of various products that are available for landowner purchase.

Outreach activities include youth expos, the annual small farms conference, statewide soil tunnel trailer and multiple agricultural and forestry field days. Examples of technical assistance include nutrient management planning, cover crops, soil sampling, critical area planting, invasive species removal and more. WVCA provided outreach to more than 1,500 participants and provided technical assistance to more than 400 landowners and other interested stakeholders.

Northern Basin

The Northern Basin Coordinator (NBC) Martin Christ supported subgrantees in the "Northern Basin" of West Virginia with advice, information, and assistance with data collection and quality assurance. He also maintained records of BMPs and load reductions in GRTS and attended the National Nonpoint Source Conference.

The watershed groups and other partner the NBC worked with included WVU's *West Virginia Water Research Institute* (WVWRI, *Save the Tygart Watershed Association* (STTWA), *Buckhannon River Watershed Association* (BRWA), *Guardians of the West Fork* (GWF), *Friends of the Cheat* (FOC), *Friends of Deckers Creek* (FODC) a variety of agency partners and other NGOs. The primary issue for most of these partners was acid mine drainage (AMD).

The NBC has also supported and provided advice and assistance to the SBC and worked with Friends of the Tug Fork River (FotTFR) on their first §319 effort.

Southern Basin

Sara Prior came on board in May 2023, as the Southern BC (SBC). She works in a diverse basin with a wide range of issues. She learned quickly with visits and assistance form the NPS Coordinator, NBC, and others. The SBC provided procedural advice, technical assistance and performed many hours of outreach throughout the basin.

The SBC worked with a wide range of watershed groups (WGs), agency partners and other NGOs. These include the *Piney Creek Watershed Association* (PCWA), *Friends of the Tug Fork River* (FotTFR), *Greenbrier River Watershed Association* (GRWA), *Plateau Action Network* (PAN), Marshall University, WV Rivers Coalition (WVRC), WV Conservation Agency (WVCA) and the city of Hinton. As mentioned above the basin has a wide range of issues including bacteria pollution, AMD, sedimentation, and a variety of stormwater issues.

Western Basin

The Western BC (WBC) Tomi Bergstrom works in the most urban region of the state with two of the largest urban areas. She provides technical assistance, helps with planning, grant writing and performs a tremendous amount of outreach not only in the western basin but statewide due to her Project WET Coordinator position.

The SBC worked with a wide range of partners and WGs including the *Coal River Group* (CRG), *Fourpole Creek Watershed Association* (FCWA), *Twelvepole Rising*, *Morris Creek Watershed Association* (MCWA), *Davis Creek Watershed Association* (DCWA), Coalfield Development Corporation (CDC), the cities of Charleston and Huntington stormwater departments and many others – see the Project WET section. She also manages multiple summer interns, which were hired to assist with the workload.

Cy Pres
Six watershed groups in the impacted area of the Elk River chemical spill on January 9, 2014, received $105,142 in January of 2022 to implement watershed improvement projects within their basins. To 2023, five of the groups have initiated projects including septic replacement in Davis Creek and Fourpole Creek basins, and streambank and erosion control projects along Morris Creek and the Coal River, and a major litter cleanup from a large flood on Buffalo Creek.

Potomac Basin

The Potomac (PBC) Alana Hartman facilitated in-person meetings, coordinated field trips, performed outreach, provided a wide variety of grant management, technical assistance, and monitoring support. Her focus is the many moving parts of the Chesapeake Bay (CB) Program, but she still manages to support all the other activities within her basin.

The PBC works with the Tuscarora Creek Project Team, the newly formed Town Run WG, *Warm Springs Watershed Association* (WSWA), *Sleepy Creek Watershed Association* (SCWA), Cacapon Institute (CI), Canaan Valley Institute (CVI), the city of Martinsburg and Romney, Eastern Panhandle Conservation District, and many more. She also serves of a variety of CB workgroups and is the main contact for *WV's Tributary Team*.

BC Joint Efforts

All BCs served on the *WV Watershed Network* committee, which hosts a quarterly newsletter, training, and a statewide gathering, hosted in September of 2023 in Canaan Valley. All BCs assisted with the EPA Wetland Program Development Grant by filming a segment on the one or more assessable *wetlands* in their basin. This also included creating factsheets, updating the wetland resources page on WVDEP's website, and installing signs at each of the wetland sites. The new *VISTA Program* was launched in 2023 and each BC supervised and supported the VISTAs watershed work in their basin.

Project WET

As part of the *Project WET* (Water Education Today) program, the WBC certified over 240 educators in Project WET Curriculum. She reached over 4,410 students, teachers, and citizens of West Virginia with outreach events at the *WV Science Teachers Association* Conference, Ice Cream & the Arts, Water Wonders STEAM Summer Camp, Dive into Water STEAM Summer Camp, WV Envirothon, Berkeley County Youth Fair, *Wetland Master Naturalist Program*, Camp WALDO, World Water Day events, and others.

Over 1,700 students were reaching through programming conducted at Water Festivals across the state. As part of an EPA Wetland Development Grant, she created the WV Wetland STEAM Booklet, which was printed and utilized at summer camps and wetland educator courses. Tomi Bergstrom received the 2023 Project WET Coordinator of the year award at the National Project WET Coordinators Conference.

WV Save Our Streams

In the calendar year 2023, the *WV Save Our Streams* (SOS) Program Coordinator led five vernal pool workshops, thirteen SOS workshops, and participated in 23 outreach events. The spring vernal pool workshops had 90 participants. The *WV Vernal Pool Monitoring Program* was developed in partnership with state/federal agencies via EPAs Wetlands Program Development Grant.

The WV Save Our Streams program hosted 13 water quality monitoring workshops across the state. They included four in the northern basin, four in the Potomac basin, four in the southern basin and one in the western basin. A wide variety of new and seasoned groups participated. Additionally, the SOS Coordinator participated in 23 outreach events, providing stream ecology and water quality education to a wide range of audiences.

The SOS Coordinator serves as the Education Committee Co-Chair for the *West Virginia Envirothon Competition*, a statewide competition for high school students. The winning team competes at the national competition and receives scholarship awards to go toward college education. The SOS Coordinator leads the WV Envirothon Aquatics Team.

The SOS Coordinator is working with the Chesapeake Monitoring Collaborative, the Virginia Institute of Marine Science, and WVDEP colleagues to upgrade the SOS *Volunteer Assessment Database* to align with the Chesapeake Bay Data Explorer. The new platform will better serve volunteer water quality monitoring organizations across the state of West Virginia and allow water data to be easily shared and utilized by the public and partner organizations.

To learn about all WVDEP's Watershed Improvement Branch Programs go to: *https://go.wv.gov/wib*

Images from the field

Potomac Basin

Figure 5. In May 2023, the Tuscarora Creek Project Team attendees visited an in-progress stream restoration project on Tuscarora Creek, funded through §319 and other sources.

Northern Basin

Figure 6. FODC works hard to maintain one of many acid mine drainage (AMD) treatment sites.

Southern Basin

Figure 7. The SBC is leading an activity at the 2023 Water Celebration Day held at Moncove Lake State Park.

Western Basin

Figure 8. One of many WV wild wonderful wetlands.

Save Our Streams

Figure 9. The Envirothon winning team received aquatics training from WIB staff in preparation for the national competition.

Stream Partners VISTAs

Figure 10. WIB's Stream Partner Program VISTAs.

In 2023, a VISTA program was created to support watershed groups and the Stream Partners Program housed in the WV DEP's Watershed Improvement Program. The goal is to increase environmental stewardship, community revitalization and organizational capacity to selected watershed groups across the state.

A storymap highlighting their successes is coming soon. Learn more about WV Stream Partners Program *here*.

Management Plan updates

Table 4. Load reduction goals of the 2019 management plan.

5-year goals	Acidity	Total Metals	Nutrients		Sediment	Coliform
			Nitrogen	Phosphorus		
units	lbs/yr	lbs/yr	lbs/yr	lbs/yr	tons/yr	CFU
Targets	350	180,000	400,000	300,000	20,000	2.00E+15
2019		12	532,240	185,812		2.84E+14
2020	47	14,921	292,151	276,030	53	2.58E+13
2021	73	23,048	620	448	56	1.07E+13
2022	30,359	3,825	97,766	114,547	90	1.89E+13
2023	11,659	2,404				1.89E+13
Totals	**42,138**	**44,210**	**922,777**	**576,837**	**199**	**3.58E+14**

In the 2021 §319 annual report a table was provided that gave insight into the management plan progress thus far. Now we can report on the overall progress of the 2019 – 2024 plan. *Table 4* provides an update of the five-year load reduction goals and progress on the objectives are shown in *appendix 4*.

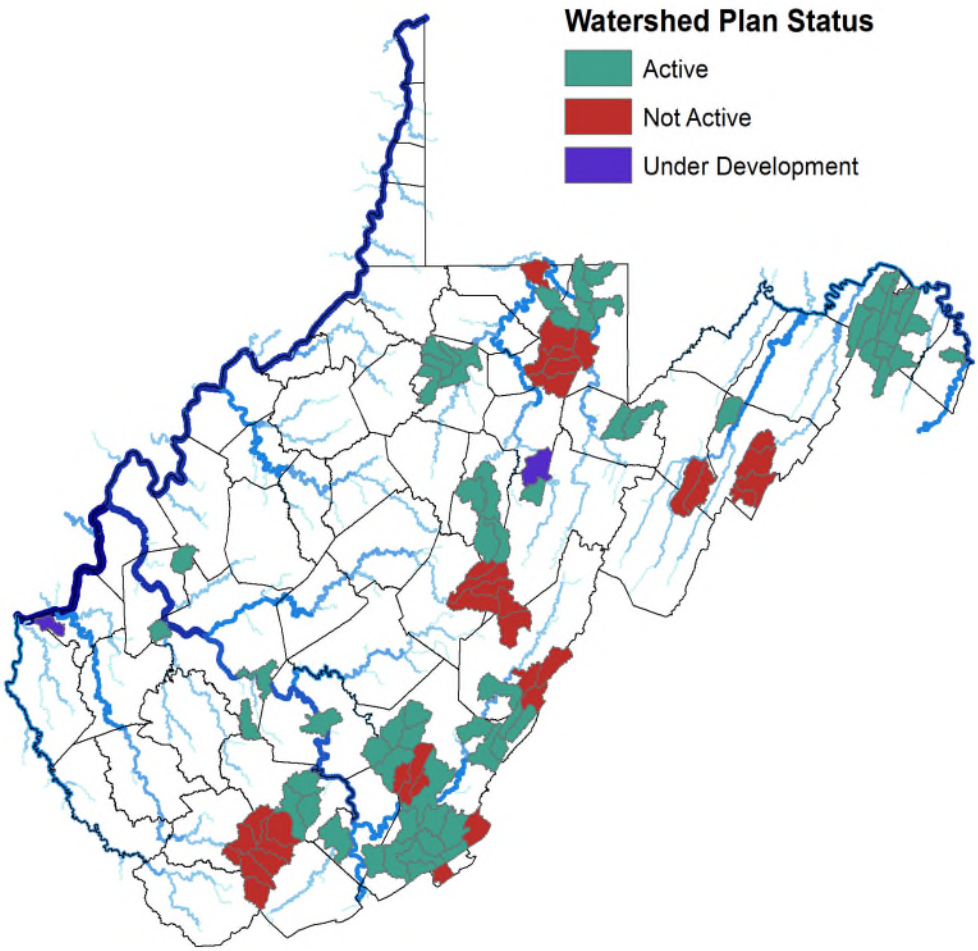
Note: A revised management plan was submitted to EPA in the fall of 2023. Reviews are in progress.

Projects designed to reduce **metals** and **sediment** have been more difficult during pandemic years due to the types of materials needed, supply chain issues and personnel shortages. Future improvements are likely as pandemic effects become less of a factor. Unfortunately, we did not achieve the goals established for about 50% of the pollutant categories. These targets are based on an assessment of previous years as well as future projections. A more thorough analysis of trends will be needed so that projections can be more reliable and achievable. However, without the pandemic years my confidence is high that most targets would have been met.

There may have been other factors that contributed to the underperformance of projects but those are unknown at this time. Moving forward, more thorough planning processes involving the partners earlier in the process will likely improve results.

Watershed-based plans

Figure 11. West Virginia §319 WBPs



West Virginia has developed a total of 42 watershed-based plans (WBPs). Those having recent project implementation or planning activities have recently been summarized in the previous annual reports. There is not enough new information from active plans to justify another summary currently. Usually, two WBPs are summarized in each annual report, but in 2023 there is only one. All of West Virginia's §319 WBPs are posted within the NPS Program's *watershed-based plan website*.

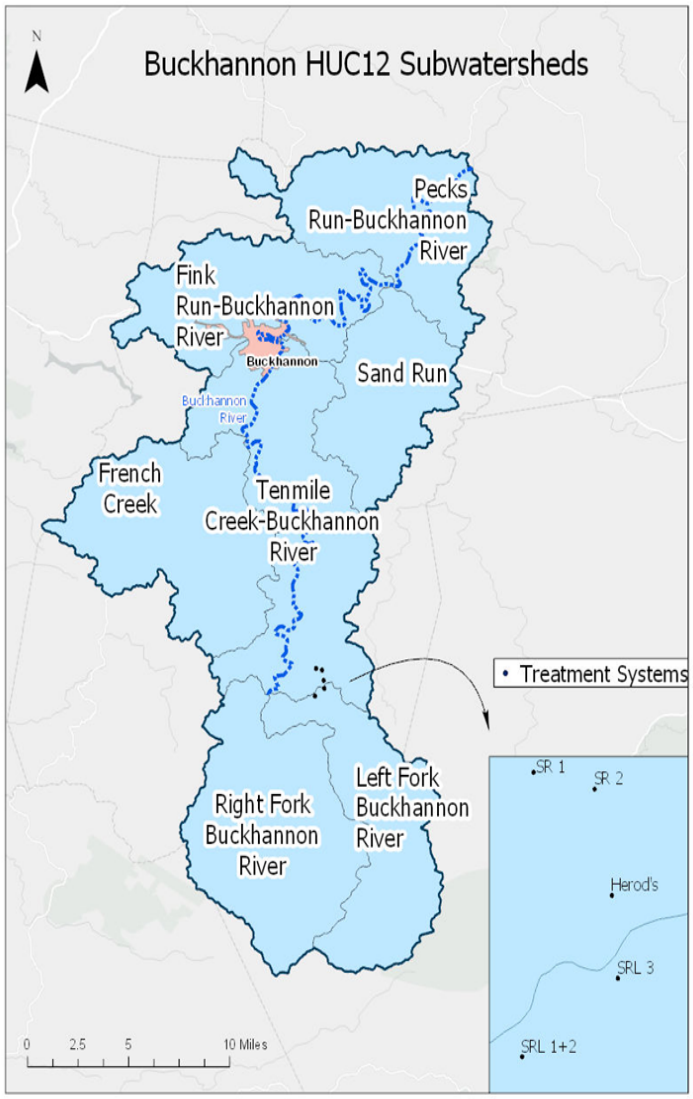
The Fourpole Creek WBP was submitted to WIB in late 2023, and revisions to Sleepy Creek and Lambert Run WBPs were submitted to EPA in 2022. The revision reviews have recently been completed, and these WBPs will require a few additional updates. The NPS Coordinator completed the Fourpole Creek WBP review and that WBP is currently being revised. The Upper Buckhannon WBP is highlighted in this report.

Watershed description

The Upper Buckhannon River watershed consists of 127,623 acres in north-central West Virginia. It is a sub-watershed of the Tygart Valley River Watershed and includes most of Upshur County and parts of Barbour, Lewis, Webster, Harrison, and Randolph counties. There are 329 stream miles in the watershed, more than 90 miles of which are impaired. The four dominant water quality problems within the watershed are metals, pH/acidity, sediment, and fecal coliform bacteria. The main sources of these contaminants are coal mining, acid precipitation, agriculture, road construction and use, logging, and wastewater.

The Left and Right Forks of the Buckhannon River begin in southwestern Randolph County and meet near Alexander to form the Buckhannon River mainstem. The river then flows for approximately 45 miles in a generally northern direction until the confluence with the Tygart River downstream of Carrollton.

Figure 12. Project locations on Smooth Rock Lick Run, Swamp Run, and Herods Run.



Historic mining in the region has negatively impacted water quality. The large mining complex near Alton, WV is an abandoned mine site that is supervised by the WVDEP Office of Special Reclamation, where WVDEP oversees active treatment. However, some of the mine drainage requiring treatment is outside the boundary. To address these sites and others, the Highlands Institute for Environmental Research and Education submitted a watershed-based plan (WBP) for the Upper Buckhannon River in 2004. The WBP was based on the TMDL analysis for the Buckhannon River from 2001. The plan allowed the Buckhannon River Watershed Association, Inc. (BRWA) to pursue funding for passive treatment remediation of the mine discharges in the watershed. The five projects completed to date are noted on the map.

Watershed plan goals

Goals in the watershed are wide-ranging. However, for the purpose of this report, the goals are to reduce metal loads, increase pH, and improve the overall watershed habitat and health through the restoration of impacted streams that are tributaries to the Buckhannon. Thus, improving the overall vitality of the Buckhannon River mainstem.

Project highlights

Table 5. Upper Buckhannon project summary.

Projects	Fiscal year	Cost	Reductions (lbs/yr)
1. Smooth Rock Lick 1 and 2	2010	$219,007	Acidity: 40,403 Metals: 1,525
2. Smooth Rock Lick 3	2010	$107,100	Acidity: 4,401 Metals: 3,611
3. Smooth Rock Lick 1 and 2 Phase 2	2013	$34,082	Acidity: 2,435 Metals: 8
4. Swamp Run 1	2016	$660,000	Acidity: 89,000 Metals: 8,087
5. Herods Run	2017	$335,000	Acidity: 23,338 Metals: 4,354
6. Swamp Run 2	2020	$280,000	Acidity: 26,398 Metals: 4,034

***Total load reductions**: 185,975 lbs/yr (acidity) – 21,618 lbs/yr (metals)*

Most of the projects consisted of a catch basin and a series of limestone channels and leachbeds, and often a finishing wetland. Various challenges were encountered. Project #3 was constructed in response to the largest of those. This project mitigated large flows and sediment from outside the treatment area. It was thought that a pipeline path contributed to the damage but attempts to reach agreements and solicit cooperation with the pipeline company failed.

Figure 13. Photo of a settling pond at Swamp Run 1 before entering the wetland.

Figure 14. Photo of limestone terracing treating the Swamp Run 2 South seep.

Partnerships/Funding

Projects were funded through CWA's §319 funds through WVDEP's WIB, matched with funds from OSM's WCAP. In some cases, WVDEP provided additional funds. A citizens' group, BRWA, contributed many hours of labor developing and overseeing each of the projects. Partners for the project included WVU-NMLRC, OSMRE, WVDEP-WIB, through its Stream Restoration Program, WVDNR (through fish population studies), and the BRWA. Total project cost including match is more than $2.3 million dollars thus far.

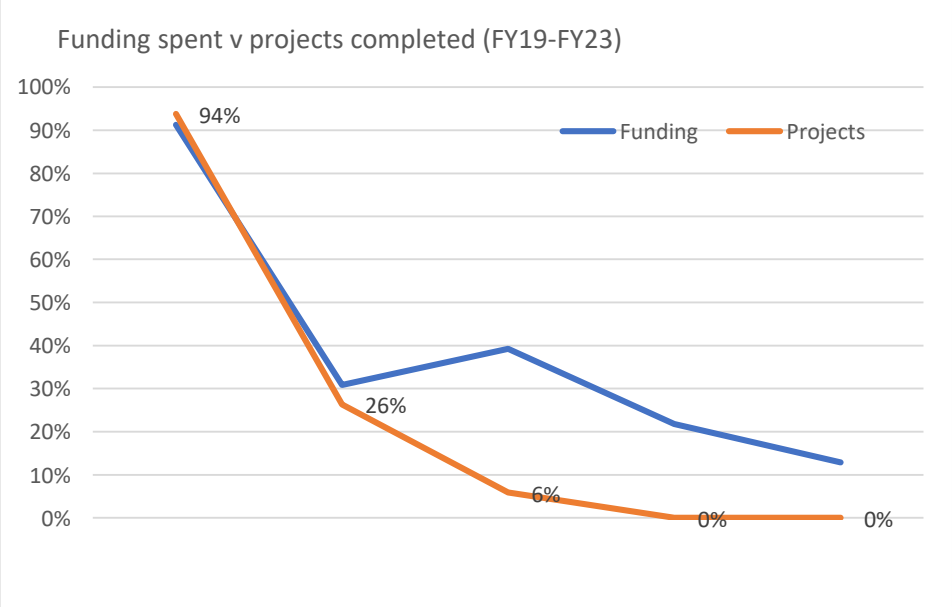
Watershed projects and our success story

The FY19 (2023 calendar year) project completion rate was better than FY16-18 –> the years that showed most of the pandemic impacts. Although lingering effects of the pandemic were still problematic last year, the issues are becoming less so. Additionally, staff, stakeholders and local project managers are learning to adapt and react quicker to changing situations.

In this section we highlight four completed watershed projects and one success story. The watershed projects include acid mine drainage remediation, agricultural implementation, source water protection, and green infrastructure outreach. The last two are projects from our nonpoint funding allocation. The 2023 success story tells the story of the development of a unique and prosperous wetland that has been embraced by the school and community.

Twenty-one watershed projects and AGOs were completed in 2023. These were funded with §319 from FY19 and FY20. *Figure 15* graphically represents the progress through each fiscal year cycle.

Figure 15. Project vs funding progress from FY19 – FY23.



On the left side of the graph the lines are close together because funding and implementation are strongly correlated. *The spending closely matches implementation*. As the graph moves right the gap between project spending vs. implementation widens because most implementation and project spending have not yet occurred. Unfortunately, West Virginia's NPS Program returned slightly more than $68,000 in unspent funds. This was due to multiple factors, but the largest contributor was a landowner that was unwilling to allow access even after an agreement had been reached. The funding was reallocated to an alternate project, but all the funds could not be spent. Additionally, several projects were completed under budget.

EPA Region III offered the funds back to the region if states were able to submit successful proposals focusing on specific categories. West Virginia may recover a portion of that funding in FY24 - three radically different proposals were submitted totaling approximately $300,000.

Waterbody improved

Roaring Creek, in the Tygart Valley River watershed, west-southwest of Elkins in Randolph County has been severely degraded due to abandoned coal mining operations occurring primarily within the Kittle Hollow subdrainage. This project consisted of treating the deleterious acid mine drainage emanating from one of these legacy mines by adding open limestone channels, limestone leach beds, settling ponds, and an aeration wheel. Various stakeholders collaborated to make this project an environmental success. Recent monitoring demonstrates that the project has reduced metal and acidity loads and will continue to yield further reductions.

Problem

Figure 16. Photo of the source water at the North Portal site before construction.

Roaring Creek, located in the Tygart Valley River watershed, is located west-southwest of Elkins, WV in Randolph County, WV. Abandoned coal mining operations date back to the 1930s and occur mainly within the Kittle Hollow subdrainage of Roaring Creek. These abandoned mine sites produce varying amounts of AMD. These sources of impairment have caused the degradation of the lower section of Roaring Creek (below Coalton, WV) and its inclusion on the state's 303(d) list. The Mars Portals sites on Roaring Creek, consist of a draining, open portal (Mars Portal 1), a collapsed portal (Mars Portal 2), and a portal that was reclaimed by the West Virginia Office of Abandoned Mine Lands and Reclamation (WVAML) with a wet seal (North Portal). These Acid Mine Drainage (AMD) sources make up the headwaters for Kittle Hollow and are a major source of acidity and metals associated with a legacy of coal mining practices in the area.

Story highlights

Roaring Creek, located in the Tygart Valley River watershed, is located west-southwest of Elkins, WV in Randolph County, WV. Abandoned coal mining operations date back to the 1930s and occur mainly within the Kittle Hollow subdrainage of Roaring Creek. These abandoned mine sites produce varying amounts of AMD. These sources of impairment have caused the degradation of the lower section of Roaring Creek (below Coalton, WV) and its inclusion on the state's 303(d) list. The Mars Portals sites on Roaring Creek, consist of a draining, open portal (Mars Portal 1), a collapsed portal (Mars Portal 2), and a portal that was reclaimed by the West Virginia Office of Abandoned Mine Lands and Reclamation (WVAML) with a wet seal (North Portal). These Acid Mine Drainage (AMD) sources make up the headwaters for Kittle Hollow and are a major source of acidity and metals associated with a legacy of coal mining practices in the area.

Results

Prior to treatment and based on research results from the 2012 Roaring Creek Watershed Based Plan, the North Portal contributed acidity loads of 105,200 lbs/yr, Fe loads of 9,400 lbs/yr, Al loads of 6,400 lbs/yr, and Mn loads of 1,000 lbs/yr. The goals of this project were the removal of 84,160 lbs/yr of acidity, 7,520 lbs/yr of Fe, 5,120 lbs/yr of Al, and 800 lbs/yr of Mn. Monthly post-construction sampling began in December of 2022 and concluded at the end of the project in August of 2023. Average pollutant load reductions to date are shown in *Table 6*.

Figure 17. Drone flyover snapshot of the North Portal Project in June 2023.

Table 6. Average pollutant load reductions to date for Phase I of the North Portals project.

North Portals Project Average Pollutant Load Reductions		Loadings in Pounds Per Year						
		t. Fe	D. Fe	t. Al	D. Al	t. Mn	D. Mn	Acidity
	AVERAGE IN-Untreated Water	1,605.7	298.1	822.7	750.2	131.3	138.7	4,803.8
	AVERAGE OUT-Treated Water	349.0	173.0	101.3	19.0	168.9	161.4	-3,901.5
	REDUCTION	**1,256.7**	**125.1**	**721.4**	**731.2**	**-37.6**	**-22.8**	**8,705.3**
	% REDUCTION	**78%**	**42%**	**88%**	**97%**	**-29%**	**-16%**	**181%**

Recent average sampling results indicate that the untreated water is not as heavily loaded with metals and acidity as reported in the 2012 WBP. Results indicate that the system is substantially reducing the metal concentrations and the effluent is net alkaline. New limestone can contain small amounts of iron, manganese, and copper oxides. The Mn negative could be due to remnant manganese. The average difference is about 30 lbs/yr but that is expected to go down.

The system is still discharging an average of 349 lbs/yr of iron, 101 lbs/yr of aluminum, and 169 lbs/yr of manganese (all totals) annually into Roaring Creek. Phase II aims to facilitate further metal reductions, including manganese, and adds alkalinity to the system.

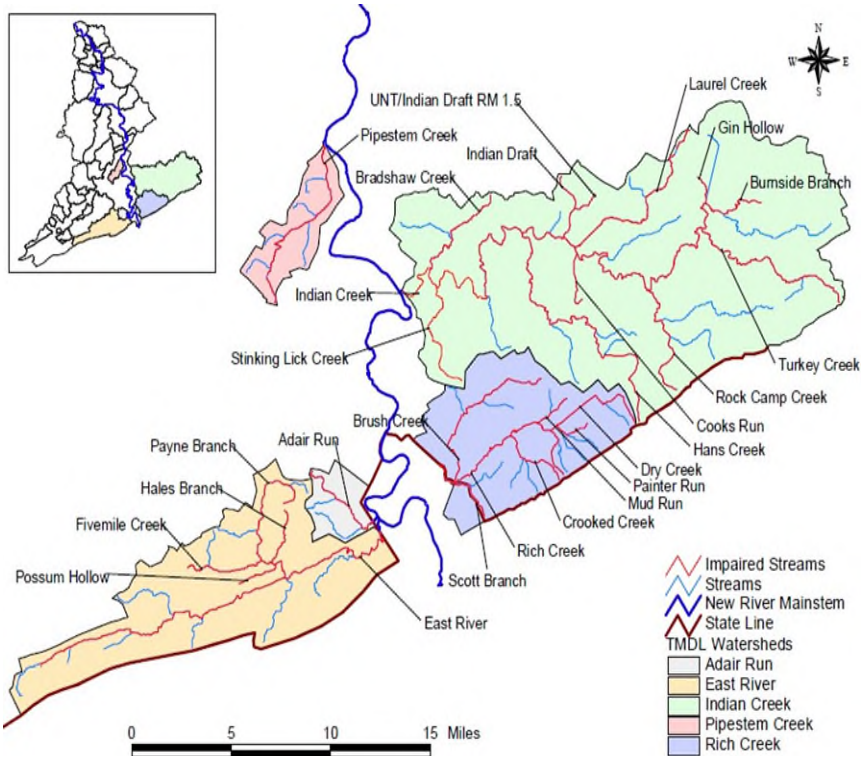
Partners and funding

The WV Water Research Institute's (WVWRI) National Mine Land Reclamation Center (NMLRC) partnered with Save the Tygart Watershed Association (STTWA) to accomplish the remediation of the North Portal. The NMLRC and STTWA partnered with the landowners of the project site, Penn Virginia, who agreed to provide engineering and design services for the project at no cost. In addition to this in-kind donation, NMLRC applied for and received WVDEP §319 funding for all three stages, and STTWA received an OSM WCAP grant to match NPS1704 and NPS1800, to fund this project in full. AllCon completed the construction for Phase I. Additional limestone was added by Blue Ridge Construction under the direction of WVDEP-AML. For Phase I of the project, WVDEP contributed $302,876 via §319(h) funds, OSMRE contributed $100,000 via the WCAP program, Penn Virginia provided a $60,000 match for engineering services and the STTWA provided in-kind in the amount of $15,561. Total construction costs were just over $300,000.

Fecal Coliform Loading Reduced in Indian Creek

Burnside Branch is a tributary of Indian Creek in Monroe County, West Virginia, which is a tributary of the New River (*Figure 18*). This stream is heavily impacted by cattle and other livestock feeding on karst geology and near karst windows and open sink holes. Agriculture in this area consists primarily of beef cattle and sheep operations with limited dairy production. The project had two goals: 1. to evenly distribute grazing throughout the karst area, spreading nutrients and bacteria laden waste in a manner that will reduce concentrated runoff and groundwater infiltration of fecal coliform polluted water and 2. to reduce the volume of septic system effluent reaching the stream by rehabilitating failing septic systems.

Figure 18. TMDL watersheds in the Upper New River watershed.



Problem

Indian Creek was placed on the 303(d) list in 2006 due to fecal coliform bacteria contamination. In the in the Burnside Branch hydrologic unit of the Indian Creek watershed, the TMDL calls for a fecal coliform load reduction of **1.97E+13 CFU/year** due to pastureland and **1.93E+11 CFU/year** due to failing septic systems.

Project results

The modeled fecal coliform load reduction due to agricultural BMPs was **8.02E+12** CFU/year, and for septic system rehabilitation it was **5.68E+8** CFU/year. This is 41% of the TMDL load reduction goal for pastureland and 29% of the TMDL load reduction goal for septic systems. Load reductions were achieved by installing **27,362 ft** of sensitive area exclusion fence, **19,344** ft of pasture division fence, rehabilitating **9 septic systems**, and **pumping 9** septic tanks.

Highlights

The Indian Creek watershed consists of 5 HUC12 watersheds (Burnside Branch, Upper Indian Creek, Rock Camp Creek, Middle Indian Creek, and Lower Indian Creek). This project focused efforts only within the Burnside Branch HUC12 watershed (050500020701). Due to the success of this project, the septic program has expanded to all 5 of the Indian Creek HUC 12 units. The success of this project has been a testament to the value of collaboration between watershed associations, county sanitarians, landowners, WVCA, and WVDEP.

Agricultural load reduction for this project was calculated according to Table 1 below, where D = A x B x C where D = load reduction, A = baseline load per animal unit, and C = number of animal units impacted by BMPs installed. The baseline load per animal unit was obtained from the project proposal document (2018). This project impacted 397 animal units.

The following dimensional analysis equation was developed by WVDEP to calculate load reduction per septic system repair/replacement.

$$\left(\frac{365\ days}{1\ year}\right) * \left(\frac{50 gal}{1\ day/person}\right) * \left(\frac{3{,}785.4\ mL}{1\ gal}\right) * \left(\frac{10{,}000\ CFU}{100\ mL}\right) * \left(\frac{2.4\ people}{1\ house}\right) * \left(\frac{100\%\ efficiency}{100}\right)$$

This is equal to a load reduction of 1.66E+10 CFU/year per septic system repair/replacement (house) (100% efficiency). The same equation is used to calculate load reduction per septic pumping; however, 25 gallons is used in place of 50 gallons of sewage per day with a 50% efficiency. This is equal to a load reduction of 4.15E+09 CFU/year per septic pumping. *Table 7* below shows load reduction due to completed units, calculated using the method above.

Table 7. Fecal Coliform Load Reductions in HUC12 50500020701

Pollutant reduced	BMP	Implementation to date	Total reductions achieved to date (CFU/year)
Fecal Coliform	Septic Pumping	9	3.73E+10
Fecal Coliform	Septic Repair/Replacement	9	1.49E+11
Fecal Coliform	Exclusion Fence	27,362’	5.31E+12
Fecal Coliform	Pasture Division Fence	19,344’	2.71E+12
Total fecal coliform reductions achieved:		8.21E+12 CFU/year	

Partners and funding

WVDEP, WVCA, Monroe County health department, Indian Creek Watershed Association, landowners, local contractors, local septic pumpers. The grant award was $121,770.00 and was spent in full.

Figure 19. Digging out old drain lines.

Figure 20. Failing septic tank prior to being replaced by a new system.

Co-Implementation of Source Water Protection and Watershed-Based Plans
A WV Success Story

Source Water Protection Plans (SWPP) and Watershed-based plans (WBPs) have overlapping goals to improve water quality. We formed partnerships between water utilities and the surrounding community to implement projects with co-benefits for nonpoint source pollution reduction and drinking water protection.

Problem

Water utilities have no authority over what lies upstream of their intake and their limited resources are dedicated to water treatment not source water protection. Water utilities must seek additional funds to implement their source water protection plans or develop partnerships with groups who share their goal of improving the quality of their source water.

Solution and results

We identified three areas where waterbodies have WBPs within a source water protection area. We created the Safe Water for WV program to assist water utilities in forming partnerships to reduce nonpoint source pollution and advance source water protection efforts, with an emphasis on community engagement strategies. Collaboration was key in identifying and carrying out priority projects. Projects that contributed towards the Source Water Protection and WBP implementation include:

Safe Water Harpers Ferry

Harpers Ferry Water Works draws their drinking water from Elks Run and serves a population of over 2,000 residents.

- *Community Education:* We hosted the Earth Day WaterFaire that featured nature walks, a rain barrel workshop, tree plantings, and kids' activities attended by 85 residents.
- *Youth Education*: We developed a curriculum to teach students about the source of their drinking water, reaching 239 students over two years.
- *Community Project:* We installed a riparian buffer project at Gap View Farm planting 887 trees and shrubs at the headwaters of Elks Run.

Safe Water Marlinton

The Town of Marlinton pulls their drinking water out of Knapp Creek, serving a population of just under 2,000 residents.

- *Community Education:* We hosted an open house at the water plant reaching 75 kids and their parents.
  - *Youth Education:* We educated students at Marlinton Middle School about non-point source pollution and keeping our drinking water sources clean.
- *Community Project:* We developed a wetland park featuring educational signage about the role wetlands play in improving drinking water sources.

Safe Water Buckhannon

The City of Buckhannon gets their drinking water from the Buckhannon River, serving a population of around 22,000 residents.

- *Community Education:* We hosted the Buckhannon Riverfest to highlight efforts to protect source water and reached over 150 people.
- *Community Project:* We supported a feasibility study to reduce fecal coliforms in a tributary of the Buckhannon River.

Evaluation, Partners, and Funding

The Safe Water for WV Program is effective in educating and engaging citizens in source water protection and pollution reduction strategies within watershed-based based plans. Diverse stakeholders participated and are interested in continuing the program. Along with water utilities, partners included the WV Department of Environmental Protection, WV Conservation Agency, WV Division of Natural Resources, WV Bureau of Public Health, Elks Run Watershed Group, Sustainable Solutions, Potomac Valley Audubon Society, Greenbrier River Watershed Association, Yew Mountain Center, and Pocahontas County Parks and Recreation, Buckhannon River Watershed Association, and Mountain Lakes Preservation Alliance.

Table 8. Project budget summary.

Source	Budgeted Amount	Actual Expended
§319 Funds	$80,000	$80,000
Matching Funds	$53,506	$57,653
Total	$133,506	$137,653

Introduction

WVDEP is providing stormwater management technical assistance to Hinton WV, with a focus on developing green infrastructure (GI) solutions to improve water quality and provide ancillary community benefits. Communities request to receive technical assistance by submitting an expression of interest form and detailing the community needs and stormwater concerns.

The stormwater management technical assistance helps to educate local elected officials and stakeholders about the benefits of GI and then guides the community through steps to implement GI solutions. The technical assistance process begins with a community workshop to identify potential challenges and existing opportunities. The workshop consists of a series of pre-and post-workshop conference calls and an on-site convening of stakeholders to discuss issues and the community's specific GI goals. The workshop is accompanied by a feasibility assessment for implementing GI solutions. The assessment and workshop input are then used to develop a concept design plan for one or more GI solutions. The community may use the concept design plan to seek funding to implement GI solutions to address stormwater concerns per community goals.

This report documents the technical assistance provided. It summarizes outcomes and identifies the community goals, challenges, and recommended actions. The technical assistance includes the following:

1. Engagement with Hinton and other stakeholders to identify concerns and priorities related to stormwater.
2. Identification of opportunities to implement GI concepts in a context-sensitive manner.
3. Develop concept designs for the highest priority GI opportunity areas.

Community demographics

The City of Hinton is in Summers County, WV in the heart of the New-River Greenbrier Valley. The city was incorporated in 1880 and was a major railroad terminal on the Chesapeake and Ohio line. The CSX railroad stills continues operations in Hinton today. Hinton is approximately three square miles in size with a population of 2,556 residents. The median household income in Hinton is $32,600 with a cost of living 27% lower than the US average. In comparison, the median household income in West Virginia is over $48,000. Due to its location at the confluence of the New River and Greenbrier River and proximity to the newly created New River Gorge National Park and Preserve, Hinton is becoming a significant waypoint for tourists.

Project goals

This project seeks to involve the Hinton community and stakeholders in the identification of stormwater concerns and priority action areas, including the identification of significant areas of impervious surface that can be managed with GI practices. The project goals include using GI practices to minimize stormwater contributions to the sanitary sewer system, including rooftop downspouts; improve stormwater management; improve water quality in the New River; and create a sense of place in a revitalizing area. The final product of the technical assistance program is to provide the City of Hinton with a concept design plan for the highest priority GI opportunity areas to facilitate Hinton securing funding for implementation.

Community workshop

Representatives from the City of Hinton, Region 1 Planning and Development Council, New River Gorge Regional Development Authority (NRGRDA), community stakeholders, residents, and Tetra Tech's engineering team gathered at Hinton City Hall for a two-day GI public meeting and workshop on August 2 and 3, 2022.

Following the workshop, the participants, and Tetra Tech's engineering team participated in a site tour to view the potential GI implementation locations.

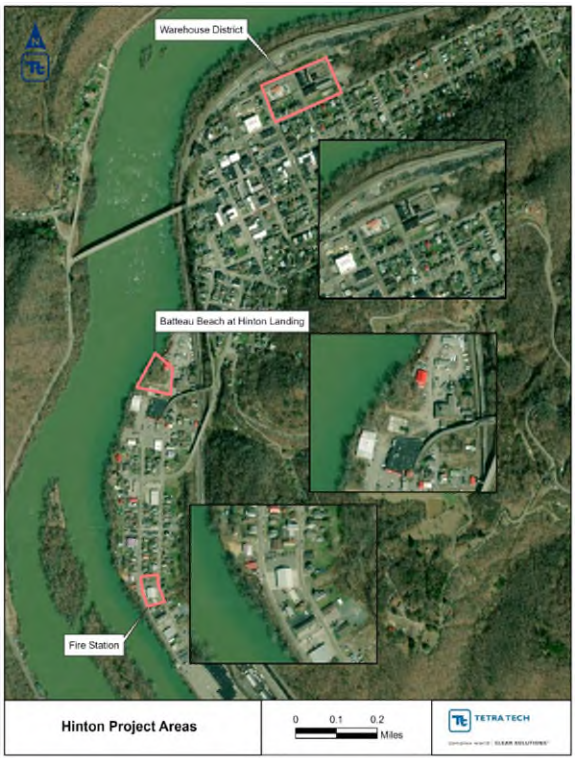
Site evaluations

Tetra Tech conducted a preliminary site visit and identified multiple locations that were potential candidates for GI. These sites provided the basis for the GI evaluation and workshop described in this memo. The GI candidate locations were selected based on initial assessments of drainage

issues, ownership, presence of drainage infrastructure, available green space, and the amount of impervious area draining to them. Because Hinton is an older city, a significant portion of the stormwater infrastructure was constructed at least 50 years ago, and few records exist to document the exact layout and location of the pipe network.

The areas of interest included the new park and boat launch site (Batteau Beach at Hinton Landing), which is part of a redevelopment of a former industrial site along the New River, the fire station further south from Batteau Beach at Hinton Landing, and the Warehouse District on the north side of the city (*Figure 21*).

Figure 21. Potential GI project areas.



Site selection

The team conducted a prioritization discussion about the three areas of interest. There was universal agreement that the Warehouse District was the highest priority area for GI planning. To provide additional information to Hinton, should the city decide to move forward with GI practices at other sites in the future, a short evaluation exercise was conducted to clarify the pros, cons, and next steps for each site before beginning the in-depth planning exercise for the Warehouse District.

Conceptual design

A concept design was developed for the Warehouse District to manage stormwater flows from the street surfaces, building roofs, and some upstream drainages. The concept design reflects the GI practices and preferences expressed by the workshop participants. The proposed design includes multiple types of green infrastructure strategies: bioretention, bioswale, green roof, impervious surface conversion and regenerative stormwater conveyance. Three major site considerations were evaluated in depth. These include:

1. Soil characteristics
2. Geology; and
3. Drainage areas.

Estimated costs

Opinion of probable construction costs for the concept designs are presented in *Table 9*, grouped by drainage area. These costs were developed using approximate quantities derived from the concept plans and assumptions regarding GI practice dimensions, configurations, and material type. Unit costs for construction items were based on a combination of published sources from similar cost items and previous experiences in similar projects.

Table 9. Summary of probable construction costs.

Categories	DA1	DA2	DA3	DA4	DA5	DA6	DA7
Construction	$96,201	$164,615	$549,105	$150,899	$155,556	$29,973	$216,996
Mobilization etc.	$35,159	$60,887	$185,935	$50,619	$35,778	$6,894	$71,609
Totals construction cost	**$131,360**	**$225,502**	**$735,040**	**$201,518**	**$191,334**	**$36,867**	**$288,605**
Survey	$8,000	$5,000	$7,000	$8,000			$4,000
Geotechnical	$7,000	$5,000	$8,000	$8,000			$5,000
Design/Management	$26,272	$45,100	$73,504	$40,304	$9,567	$1,843	$28,860
Implementation total	**$172,632**	**$280,602**	**$823,544**	**$257,822**	**$200,901**	**$38,710**	**$326,465**
Grand total							$2,100,676

Next steps

Using the concept designs provided, Hinton may move forward with the full design of one of more of the project sites. Grant opportunities are available to assist with both design and construction phases. A grant for design has been awarded and is in progress.

NONPOINT SOURCE SUCCESS STORY

West Virginia

High School's Wetland Project Benefits Cranberry Creek, Builds Partnerships, and Yields Ecological and Educational Success

Waterbody Improved

An aging pond on the Woodrow Wilson High School (WWHS) campus was identified as a major source of fecal coliform pollution in Cranberry Creek due to dozens of resident waterfowl. This unique project consisted of pond draining, wildlife relocation, wetland creation, riparian and wetland plantings, and stream restoration. Various stakeholders collaborated to make this project an environmental and educational success. Recent monitoring demonstrates that the project has reduced fecal coliform loads and will continue to yield further reductions.

Problem

The Piney Creek watershed is in southern West Virginia (WV). It is the largest contributing watershed to the lower New River, and many Piney Creek tributaries are impaired for bacteria, sediment, and iron. The creek flows into WV's New River Gorge National Park and Preserve. Cranberry Creek is a significant urban tributary of Piney Creek, with many impervious parking lots and roadways in its watershed, including in the city of Beckley. Cranberry Creek collects sediment-containing runoff from dirt roads, barren lands, eroding streambanks, and past mining practices. The communities in this watershed have centralized wastewater systems; however, bacterial contamination occurs from overflow conditions during flooding events and leakage from the aging sewer infrastructure. Other sources of bacteria include pet waste and waterfowl. A 50-year-old pond on the local high school's campus supported a large population of geese that defecated on the parking lot and school grounds, causing a health concern for staff and students. Water samples from the pond indicated high fecal coliform levels.

Story Highlights

After approval of the Piney Creek watershed-based plan in 2012, the Piney Creek Watershed Association (PCWA) began working on rain gardens and a land stabilization project. PCWA identified the WWHS project as a way to reduce bacterial contamination and sediment loads in Cranberry Creek while teaching students and the community about stream restoration, water quality, and the importance of wetlands.

Figure 23. The WWHS project transformed an old pond into a thriving wetland ecosystem. Inset photo: Girl scouts a nd other volunteers plant trees to buffer the wetland.

PCWA's technical advisory committee met monthly to plan to transform the pond into an emergent wetland, daylight the natural drainage flowing from the site, and replace invasive with native plant species.

PCWA worked with the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), who designed the project, provided oversight of the pond dewatering, and designed the wetland and stream drainageway (Figure 1). The pond was dewatered in April 2021, and PCWA worked with residents and state and federal agencies to relocate the fish and domesticated ducks to private ponds. A local contractor constructed the wetland and shaped the drainageway following the natural stream restoration protocols outlined in the NRCS plans.

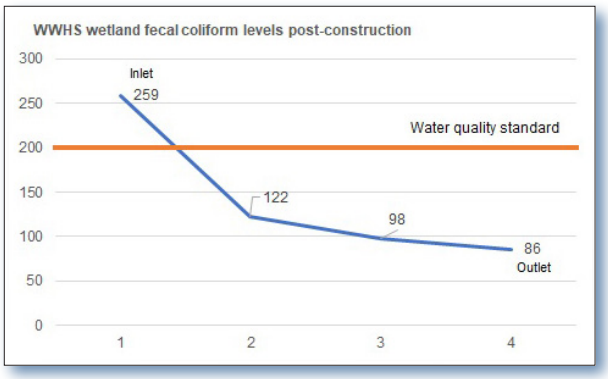


Figure 24. Post-construction data show bacteria level s decline as water moves through the wetland.

In May 2021, high school biology students seeded pollinator species in pots, and West Virginia University Institute of Technology (WVU Tech) maintained them in the campus greenhouse. In August, students, teachers, local volunteers, Master Gardeners, and WVU Tech women's soccer team members planted a pollinator garden adjacent to the project area. In April 2022, Girl Scouts helped plant live stakes and trees at an Earth Day event, learning about the importance of wetlands and other water quality issues. The carpentry class at the Academy of Careers and Technology built two walking bridges crossing the upper stream channel to provide access to the nearby softball field. Interpretive signage has also been installed. The high school biology classes are using the site as an outdoor classroom. Two enterprising students raised over $40,000 to fund a boardwalk and teaching pavilion. Multiple signs about wetlands, pollinators and the project details have been erected. The project is improving water quality and educating and inspiring students and local citizens.

Results

Pre-project data collected in 2020 (mid-summer, low-flow conditions) on the 0.75-acre pond showed the fecal coliform bacteria count exceeded 2,300 colony-forming units (cfu)/100 milliliters (mL). Post-project monitoring shows fecal coliform levels significantly decline (by an average of 32%) after flowing through the wetland (Figure 2). Further reductions are expected as the wetland and surrounding vegetation matures.

The project has created a thriving wetland filled with a wide range of species. Partners added over 1,750 plants, including willow, silky dogwood, and many other species. Many amphibians and wetland birds have been seen. A few Canada Geese still visit the site occasionally. Native flowers are growing in the pollinator garden, the wetland, and along the downstream channel, attracting bees and butterflies. The WWHS biology classes and faculty remain engaged. Future plans include constructing an accessible boardwalk that will extend over and around the wetland.

Partners and Funding

Many local groups and citizens collaborated on the project. Jim Fedders, PCWA's Executive Director, served as the project manager. NRCS provided engineering design services and construction oversight. ALL-CON, LLC, a local contractor, constructed the wetland and drainage channel. The WV Department of Environmental Protection (WVDEP) and the WV Conservation Agency provided expertise and guidance throughout the project. The WV Division of Natural Resources and the U.S. Fish and Wildlife Service helped capture and relocate fish from the pond. Local community members relocated the domestic waterfowl from the project area. The Beckley Area Foundation (BAF) provided grant funding for the pollinator garden and other project enhancements. Biology students started pollinator seeds in the classroom with the assistance of New River Master Gardeners. WVU Tech provided greenhouse resources to maintain and propagate plants, and the women's soccer team worked with the local Rotary club, 4-H clubs, and volunteers to plant the pollinator bed. The Beckley Fire Department watered the pollinator garden. Students and faculty at the Raleigh County Academy of Careers and Technology built walking bridges. The Girl Scouts of Black Diamond Council provided grant funding and planted live stakes and bare root shrubs. The City of Beckley installed asphalt curbing and continues to support PCWA. The Raleigh County Board of Education, a key partner, continues to support the efforts of students and teachers to maintain and enhance the site.

Funding sources included a U.S. Environmental Protection Agency section 319 $60,000 grant for constructing the wetland, a $15,000 grant from WVDEP's Water Quality Management Fund, and a BAF $6,670 community grant for interpretive signage, lumber for the walking bridges, live stakes, bare root shrubs, and seeds and planting materials for the pollinator garden. A $2,250 WV American Water grant to the girl scouts supported purchasing trees. Total project costs were $126,000, including $40,000 from student fundraising.

U.S. Environmental Protection Agency
Office of Water
Washington, DC

EPA #
December 2023

For additional information contact:

Timothy Craddock
West Virginia Department of Environmental Protection
304-926-0499 • timothy.d.craddock@wv.gov

Click-here to read the story map.

Appendices

Appendix 1. Project status FY19-FY23

Cancelled Complete

Note: Match and totals are included at the end of the project status table.

Org	FY 2019	NPS#		Awards	
NPS Program			$559,932		32.0%
WVDEP	WVDEP Statewide NPS Program			$340,260	
WVCA	WVCA Statewide NPS Program	1709		$65,000	
EPA	Watershed Plan Tracking EPA in-kind			$10,000	
WVRC	WVRC Integrating SW and WBP II	1723		$80,000	
FOC	AGO - Monitoring and maintenance	1751		$14,500	
FODC	AGO - Stream data loggers	1752		$9,800	
TU	AGO - Increasing riparian delivery	1753		$14,000	
WVRC	AGO - WV Watershed Network	1755		$10,000	
Watershed Projects			$1,190,064		68.0%
FOC	Muddy Creek Dream Mountain II	1789		$127,691	
FODC	Marilla Park Restoration	1702		$118,121	
FODC	Dillan Creek Remediation Phase 1	1823		$193,066	
FODC	Slabcamp Run AMD Phase I	1703		-$193,067	
WVURC/STTWA	Roaring Creek N. Portal	1704		$302,876	
PCWA	Crescent Elementary SW	1705		$122,429	
WVCA	Indian Creek II	1706		$121,770	
WVCA	Mill Creek Meadow River	1707		$111,200	
WVCA	Second Creek III	1708		$127,000	
Org	**FY 2020**	**NPS#**		**Awards**	
NPS Program			$546,612		30.3%
WVDEP	WVDEP Statewide NPS Program			$363,620	
WVCA	WVCA Statewide NPS Program	1729		$68,000	
WVDEP	Rain garden			$6,000	
WVDEP	GI in southern WV			$68,353	
STTWA	Beaver Creek WBP Development	1730		$10,000	
EL	AGO - Appalachian Watershed Stream Monitors	1809		$15,000	
FCWA	AGO - Rain barrel workshop	1816		$1,395	
NRC	AGO - Green infrastructure training	1812		$6,800	
PCWA	AGO - Rain barrel/nonpoint education	1808		$3,200	
WSWA	AGO - Warm Springs Run monitoring/weather	1814		$2,000	
WVRN	AGO - WVWN/Capacity	1806		$15,000	
Watershed Projects			$1,259,388		69.7%
FOB	Beaver Creek Seep 100-02	1731		$182,211	
FOC	Sovern Tom Clark Passive Treatment	1732		$11,781	
FOC	Sovern 62 Improvements	1792		$173,940	
FODC	Dillian Creek Pase 2 (Soon to change)	1733		-$191,500	
FODC	Marilla Gulley Sediment Restoration	1824		$191,500	
WVURC/GWF	Lambert Site 7 Passive Treatment	1734		$65,252	
WVCA	Sleepy Creek VI	1735		$92,130	
PCWA	Little League Convention Center II	1736		$97,132	
WVCA	Anthony Creek Ag BMPs	1737		$150,000	

FY 20 continued					
WVCA	Pipestem Creek Ag BMPs	1738		$117,663	
WVCA	Cherry Fork Ag BMPs	1739		$151,500	
Org	**FY 2021**	**NPS#**		**Awards**	
NPS Program			$554,390		29.9%
WVDEP	WVDEP Statewide NPS Program			$375,240	
WVCA	WVCA Statewide NPS Program	1788		$116,900	
FOC	Roaring Creek - Cheat WBP	1818		$52,250	
EPA	EPA Watershed Tracker support			$10,000	
BRWA	AGO - Septic pumping	1813		$2,500	
BRWC	AGO - Bacteria source tracking	1815		$2,750	
FODC	AGO - Richard mine monitoring	1807		$15,226	
Watershed Projects			$1,300,810		70.1%
CVI	Tuscarora Creek Phase III	1783		$95,477	
FOB	Beaver Creek AMD	1784		$132,252	
FOC	Sovern Tom Clark Phase III	1785		($192,500)	
FODC	Slabcamp OLC-650 Phase III	1786		$270,031	
FODC	Richard mine - Deckers Creek monitoring	1819		$41,083	
WVCA	Back Creek Phase IV	1779		$156,000	
WVCA	Elks Run Phase III	1780		$96,800	
WVCA	Indian Creek III	1781		$150,000	
WVCA	Indian Creek IV	1820		$67,000	
WVCA	Second Creek VI	1817		$14,500	
WVCA	Mudlick Run of Anderson Run I	1782		$110,000	
WVURC/GWF	Lambert Run Site 2	1787		$150,000	
Org	**FY 2022**	**NPS#**		**Awards**	
NPS Program			$870,349		46.9%
WVDEP	WVDEP Statewide NPS Program			$418,456	
WVDEP	GI implementation	1836		$85,893	
WVCA	WVCA Statewide NPS Program	1795		$156,200	
WVRC	SWP and WBP integration	1796		$100,000	
EPA	EPA Watershed Tracker support			$10,000	
MRVA	AGO - Bio-swale at the park	1811		-$15,918	
CDC	AGO - West Edge rain garden	1805		$20,000	
FOC	AGO - Cheat River monitoring	1804		$20,000	
WVRC	AGO - WVRC volunteer monitoring	1810		$15,000	
Watershed Projects			$984,651		53.1%
FOC	Dinkenberger improvements	1797		$173,400	
WVURC/GWF	Lambert Site 7 - Phase II	1799		$148,920	
WVURC/STTWA	North Portals - Phase II	1800		$197,982	
WVURC/BRWA	Swamp Run - Phase II	1801		$149,999	
FODC	Beulah Chapel upgrades	1798		$262,100	
PCWA	Piney Creek wastewater treatment	1802		$52,250	
Org	**FY 2023**	**NPS#**		**Awards**	
Nonpoint Funds			$759,961		39.5%
WVDEP-WIB	WVDEP §319 Statewide Program			$528,461	
WVCA	WVCA §319 Statewide Program	1825		$100,500	
FOC	Shavers Fork WPP	1826		$60,500	
FotTFR	Tug Fork WBP	1827		$60,500	
EPA	EPA Watershed Tracker (in-kind)			$10,000	

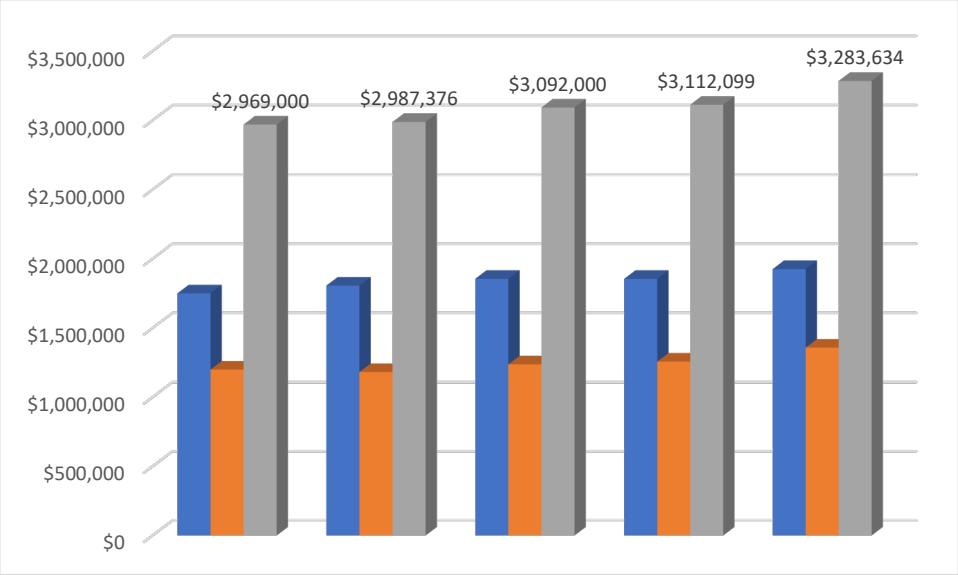
FY23 continued

Additional Grant Opportunities			$119,246	
FODC	Marilla Streambank Repair	1835		$20,000
	Other AGOs yet to be awarded			
Watershed Projects			$1,165,539	60.5%
WVCA	Anthony Creek Phase 2	1828		$150,000
WVCA	Spring Creek Phase 2	1829		$145,000
WVWRI-GWF	Lambert Site 8 - Phase 2	1830		$242,073
WVWRI-STTWA	Mars Portals Phase 3	1831		$300,000
WVWRI-BRWA	Smooth Rock Lick Phase 3	1832		$224,753
CVI	Mill Creek restoration design/survey	1833		$51,463
PCWA	Piney Creek Wastewater Phase 2	1834		$52,250

FY19 – FY23 §319 awards including match.

FY	§319 allocation	Budgeted match	Spent match	Total
19	$1,749,996	$1,199,088	$1,219,004	$2,969,000
20	$1,806,000	$1,181,376		*$2,987,376*
21	$1,855,200	$1,236,800		*$3,092,000*
22	$1,855,000	$1,257,099		*$3,112,099*
23	$1,925,500	$1,358,134		*$3,283,634*

Funds spent for FY19 were shown in *Table 1*. The above totals are from the workplans. The match in FY20-23 are not yet final and projected totals are *italicized*. The graphical representation below clearly shows the upward trends. There is a +10% difference when comparing *FY19* vs. *FY23*.



Appendix 2. BMPs that were implemented in 2023.

Year	GRTS#	NPS#	Subgrantee	Project	Basin	HUC12	BMP	Imp#	Unit
19	14	NPS1823	FODC	Dillan Creek Phase I	Headwaters Deckers Creek	050200030201	Open limestone channel	277	FT
19	14	NPS1823	FODC	Dillan Creek Phase I	Headwaters Deckers Creek	050200030201	AMD treatment system	1	IU
19	5	NPS1705	PCWA	Crescent Elementary	Headwaters Piney Creek	050500040102	Infiltration Basin	194	CY
21	8	NPS1780	WVCA	Elks Run Phase III	Elks Run	020700041107	Raingarden/ bioretention basin	0.22	AC
21	8	NPS1780	WVCA	Elks Run Phase III	Elks Run	020700041107	Tree/Shrub Establishment	0.18	AC
19	6	NPS1706	WVCA	Burnside Branch - Indian Creek	Burnside Branch	050500020701	Wastewater (pumpout)	2	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Burnside Branch	050500020701	Wastewater (pumpout)	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Burnside Branch	050500020701	Wastewater (pumpout)	4	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Burnside Branch	050500020701	Wastewater (pumpout)	6	IU
19	6	NPS1706	WVCA	Burnside Branch - Indian Creek	Burnside Branch	050500020701	Wastewater (pumpout)	3	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Burnside Branch	050500020701	Wastewater (pumpout)	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Burnside Branch	050500020701	Wastewater (pumpout)	3	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Lower Indian Creek	050500020705	Wastewater (pumpout)	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Lower Indian Creek	050500020705	Wastewater (pumpout)	4	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Lower Indian Creek	050500020705	Wastewater (pumpout)	6	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Lower Indian Creek	050500020705	Wastewater (pumpout)	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Lower Indian Creek	050500020705	Wastewater (pumpout)	3	IU
20	7	NPS1735	WVCA	Sleepy Creek VI	Lower Sleepy Creek	020700040205	Wastewater (pumpout)	1	IU
20	7	NPS1735	WVCA	Sleepy Creek VI	Lower Sleepy Creek	020700040205	Wastewater (pumpout)	5	IU
20	7	NPS1735	WVCA	Sleepy Creek VI	Lower Sleepy Creek	020700040205	Wastewater (pumpout)	1	IU
20	7	NPS1735	WVCA	Sleepy Creek VI	Lower Sleepy Creek	020700040205	Wastewater (pumpout)	2	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Middle Indian Creek	050500020704	Wastewater (pumpout)	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Middle Indian Creek	050500020704	Wastewater (pumpout)	4	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Middle Indian Creek	050500020704	Wastewater (pumpout)	6	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Middle Indian Creek	050500020704	Wastewater (pumpout)	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Middle Indian Creek	050500020704	Wastewater (pumpout)	3	IU
20	7	NPS1735	WVCA	Sleepy Creek VI	Middle Sleepy Creek	020700040203	Wastewater (pumpout)	1	IU
20	7	NPS1735	WVCA	Sleepy Creek VI	Middle Sleepy Creek	020700040203	Wastewater (pumpout)	5	IU
20	7	NPS1735	WVCA	Sleepy Creek VI	Middle Sleepy Creek	020700040203	Wastewater (pumpout)	1	IU
20	7	NPS1735	WVCA	Sleepy Creek VI	Middle Sleepy Creek	020700040203	Wastewater (pumpout)	2	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Rock Camp Creek	050500020702	Wastewater (pumpout)	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Rock Camp Creek	050500020702	Wastewater (pumpout)	4	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Rock Camp Creek	050500020702	Wastewater (pumpout)	6	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Rock Camp Creek	050500020702	Wastewater (pumpout)	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Rock Camp Creek	050500020702	Wastewater (pumpout)	3	IU

Year	GRTS#	NPS#	Subgrantee	Project	Basin	HUC12	BMP	Imp#	Unit
21	9	NPS1781	WVCA	Indian Creek Phase III	Upper Indian Creek	050500020703	Wastewater (pumpout)	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Upper Indian Creek	050500020703	Wastewater (pumpout)	4	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Upper Indian Creek	050500020703	Wastewater (pumpout)	6	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Upper Indian Creek	050500020703	Wastewater (pumpout)	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Upper Indian Creek	050500020703	Wastewater (pumpout)	3	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Burnside Branch	050500020701	Wastewater [Repair/Upkeep]	4	IU
19	6	NPS1706	WVCA	Burnside Branch - Indian Creek	Burnside Branch	050500020701	Wastewater [Repair/Upkeep]	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Burnside Branch	050500020701	Wastewater [Repair/Upkeep]	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Burnside Branch	050500020701	Wastewater [Repair/Upkeep]	2	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Burnside Branch	050500020701	Wastewater [Repair/Upkeep]	5	IU
19	6	NPS1706	WVCA	Burnside Branch - Indian Creek	Burnside Branch	050500020701	Wastewater [Repair/Upkeep]	4	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Burnside Branch	050500020701	Wastewater [Repair/Upkeep]	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Burnside Branch	050500020701	Wastewater [Repair/Upkeep]	3	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Lower Indian Creek	050500020705	Wastewater [Repair/Upkeep]	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Lower Indian Creek	050500020705	Wastewater [Repair/Upkeep]	2	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Lower Indian Creek	050500020705	Wastewater [Repair/Upkeep]	4	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Lower Indian Creek	050500020705	Wastewater [Repair/Upkeep]	5	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Lower Indian Creek	050500020705	Wastewater [Repair/Upkeep]	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Lower Indian Creek	050500020705	Wastewater [Repair/Upkeep]	3	IU
20	7	NPS1735	WVCA	Sleepy Creek VI	Lower Sleepy Creek	020700040205	Wastewater [Repair/Upkeep]	1	IU
20	7	NPS1735	WVCA	Sleepy Creek VI	Lower Sleepy Creek	020700040205	Wastewater [Repair/Upkeep]	2	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Middle Indian Creek	050500020704	Wastewater [Repair/Upkeep]	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Middle Indian Creek	050500020704	Wastewater [Repair/Upkeep]	2	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Middle Indian Creek	050500020704	Wastewater [Repair/Upkeep]	4	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Middle Indian Creek	050500020704	Wastewater [Repair/Upkeep]	5	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Middle Indian Creek	050500020704	Wastewater [Repair/Upkeep]	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Middle Indian Creek	050500020704	Wastewater [Repair/Upkeep]	3	IU
20	7	NPS1735	WVCA	Sleepy Creek VI	Middle Sleepy Creek	020700040203	Wastewater [Repair/Upkeep]	1	IU
20	7	NPS1735	WVCA	Sleepy Creek VI	Middle Sleepy Creek	020700040203	Wastewater [Repair/Upkeep]	2	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Rock Camp Creek	050500020702	Wastewater [Repair/Upkeep]	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Rock Camp Creek	050500020702	Wastewater [Repair/Upkeep]	2	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Rock Camp Creek	050500020702	Wastewater [Repair/Upkeep]	4	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Rock Camp Creek	050500020702	Wastewater [Repair/Upkeep]	5	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Rock Camp Creek	050500020702	Wastewater [Repair/Upkeep]	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Rock Camp Creek	050500020702	Wastewater [Repair/Upkeep]	3	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Upper Indian Creek	050500020703	Wastewater [Repair/Upkeep]	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Upper Indian Creek	050500020703	Wastewater [Repair/Upkeep]	2	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Upper Indian Creek	050500020703	Wastewater [Repair/Upkeep]	4	IU

Year	GRTS#	NPS#	Subgrantee	Project	Basin	HUC12	BMP	Imp#	Unit
21	9	NPS1781	WVCA	Indian Creek Phase III	Upper Indian Creek	050500020703	Wastewater [Repair/Upkeep]	5	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Upper Indian Creek	050500020703	Wastewater [Repair/Upkeep]	1	IU
21	9	NPS1781	WVCA	Indian Creek Phase III	Upper Indian Creek	050500020703	Wastewater [Repair/Upkeep]	3	IU

Appendix 3. Load reductions achieved in 2023.

GRTS#	NPS#	Subgrantee	Project	Basin	HUC12	Pollutant	LR	Unit
5	NPS1705	PCWA	Crescent Elementary Retrofit	Headwaters Piney Creek	050500040102	Pathogens (Coliform)	4.57E+11	cfu/year
6	NPS1706	WVCA	Burnside Branch	Burnside Branch	050500020701	Pathogens (Coliform)	2.49E+10	cfu/year
7	NPS1735	WVCA	Sleepy Creek VI	Lower Sleepy Creek	020700040205	Pathogens (Coliform)	4.15E+09	cfu/year
7	NPS1735	WVCA	Sleepy Creek VI	Lower Sleepy Creek	020700040205	Pathogens (Coliform)	2.08E+10	cfu/year
11	NPS1738	WVCA	Pipestem Creek Ag BMPs	Little Bluestone River	050500020909	Pathogens (Coliform)	2.91E+10	cfu/year
8	NPS1780	WVCA	Elks Run Phase III	Elks Run	020700041107	Pathogens (Coliform)	1.23E+10	cfu/year
9	NPS1781	WVCA	Indian Creek Phase III	Upper Indian Creek	050500020703	Pathogens (Coliform)	4.15E+09	cfu/year
9	NPS1781	WVCA	Indian Creek Phase III	Lower Indian Creek	050500020705	Pathogens (Coliform)	2.08E+10	cfu/year
9	NPS1781	WVCA	Indian Creek Phase III	Middle Indian Creek	050500020704	Pathogens (Coliform)	3.74E+10	cfu/year
9	NPS1781	WVCA	Indian Creek Phase III	Burnside Branch	050500020701	Pathogens (Coliform)	8.30E+10	cfu/year
9	NPS1781	WVCA	Indian Creek Phase III	Rock Camp Creek	050500020702	Pathogens (Coliform)	1.08E+11	cfu/year
6	NPS1706	WVCA	Burnside Branch	Burnside Branch	050500020701	Pathogens (Coliform)	7.88E+10	cfu/year
7	NPS1707	WVCA	Mill Creek - Meadow River	Mill Creek-Meadow River	050500050605	Pathogens (Coliform)	2.08E+10	cfu/year
8	NPS1708	WVCA	Second Creek Karst III	Lower Second Creek	050500030703	Pathogens (Coliform)	6.18E+12	cfu/year
7	NPS1735	WVCA	Sleepy Creek VI	Lower Sleepy Creek	020700040205	Pathogens (Coliform)	4.14E+09	cfu/year
7	NPS1735	WVCA	Sleepy Creek VI	Lower Sleepy Creek	020700040205	Pathogens (Coliform)	2.47E+10	cfu/year
7	NPS1735	WVCA	Sleepy Creek VI	Lower Sleepy Creek	020700040205	Pathogens (Coliform)	3.28E+10	cfu/year
11	NPS1738	WVCA	Pipestem Creek Ag BMPs	Little Bluestone River	050500020909	Pathogens (Coliform)	3.89E+11	cfu/year
9	NPS1781	WVCA	Indian Creek Phase III	Upper Indian Creek	050500020703	Pathogens (Coliform)	2.08E+10	cfu/year
9	NPS1781	WVCA	Indian Creek Phase III	Lower Indian Creek	050500020705	Pathogens (Coliform)	6.22E+10	cfu/year
6	NPS1706	WVCA	Burnside Branch	Burnside Branch	050500020701	Pathogens (Coliform)	7.88E+10	cfu/year
7	NPS1707	WVCA	Mill Creek - Meadow River	Mill Creek-Meadow River	050500050605	Pathogens (Coliform)	2.08E+10	cfu/year
8	NPS1708	WVCA	Second Creek Karst III	Lower Second Creek	050500030703	Pathogens (Coliform)	6.18E+12	cfu/year
7	NPS1735	WVCA	Sleepy Creek VI	Middle Sleepy Creek	020700040203	Pathogens (Coliform)	4.14E+09	cfu/year
7	NPS1735	WVCA	Sleepy Creek VI	Middle Sleepy Creek	020700040203	Pathogens (Coliform)	2.47E+10	cfu/year
7	NPS1735	WVCA	Sleepy Creek VI	Middle Sleepy Creek	020700040203	Pathogens (Coliform)	3.28E+10	cfu/year
11	NPS1738	WVCA	Pipestem Creek Ag BMPs	Little Bluestone River	050500020909	Pathogens (Coliform)	3.89E+11	cfu/year
9	NPS1781	WVCA	Indian Creek Phase III	Middle Indian Creek	050500020704	Pathogens (Coliform)	2.08E+10	cfu/year
9	NPS1781	WVCA	Indian Creek Phase III	Lower Indian Creek	050500020705	Pathogens (Coliform)	6.22E+10	cfu/year
06	NPS1706	WVCA	Burnside Branch	Burnside Branch	050500020701	Pathogens (Coliform)	7.88E+10	cfu/year

GRTS#	NPS#	Subgrantee	Project	Basin	HUC12	Pollutant	LR	Unit
07	NPS1707	WVCA	Mill Creek - Meadow River	Mill Creek-Meadow River	050500050605	Pathogens (Coliform)	2.08E+10	cfu/year
08	NPS1708	WVCA	Second Creek Karst III	Lower Second Creek	050500030703	Pathogens (Coliform)	6.18E+12	cfu/year
07	NPS1735	WVCA	Sleepy Creek VI	Lower Sleepy Creek	020700040205	Pathogens (Coliform)	4.14E+09	cfu/year
07	NPS1735	WVCA	Sleepy Creek VI	Lower Sleepy Creek	020700040205	Pathogens (Coliform)	2.47E+10	cfu/year
07	NPS1735	WVCA	Sleepy Creek VI	Lower Sleepy Creek	020700040205	Pathogens (Coliform)	3.28E+10	cfu/year
11	NPS1738	WVCA	Pipestem Creek Ag BMPs	Little Bluestone River	050500020909	Pathogens (Coliform)	3.89E+11	cfu/year
09	NPS1781	WVCA	Indian Creek Phase III	Upper Indian Creek	050500020703	Pathogens (Coliform)	2.08E+10	cfu/year
09	NPS1781	WVCA	Indian Creek Phase III	Lower Indian Creek	050500020705	Pathogens (Coliform)	6.22E+10	cfu/year
14	NPS1823	FODC	Dillan Creek Phase I	Headwaters Deckers Creek	050200030201	Metals (Iron)	130.2	lbs/year
14	NPS1823	FODC	Dillan Creek Phase I	Headwaters Deckers Creek	050200030201	Metals (Aluminum)	295.2	lbs/year
14	NPS1823	FODC	Dillan Creek Phase I	Headwaters Deckers Creek	050200030201	Acidity	2953.6	lbs/year
4	NPS1704	NMLRC	Roaring Creek - North Portal	Roaring Creek	050200010406	Metals (Iron)	1256.7	lbs/year
4	NPS1704	NMLRC	Roaring Creek - North Portal	Roaring Creek	050200010406	Metals (Aluminum)	721.4	lbs/year
4	NPS1704	NMLRC	Roaring Creek - North Portal	Roaring Creek	050200010406	Acidity	8705.3	lbs/year

Load reduction summary.

Pollutants	Totals	Log(N)
Acidity	11,659	4.1
Metals (Aluminum)	1,017	3.0
Metals (Iron)	1,387	3.1
Pathogens (Coliform)	2.12E+13	13.3

Appendix 4. 2019 Management Plan progress summary

Administration	Status	Comments
Provide leadership in managing the NPS Program		These are annual goals that are consistent with each §319 workplan. Each of these goals are either complete or progress was satisfactory.
Represent the DWWM in multi-agency and stakeholder organizations		
Project management of all watershed projects; includes tasks such as technical guidance, support, and oversight and compliance management.		
Coordinate and oversee NPS Program grant projects relating to nonpoint source issues in non-priority watersheds to foster a better understanding of NPS pollution, as well as more recognition for the NPS Program.		
Participate and coordinate in the development of work plans and grant proposals in priority watersheds.		
Maximize the use of all funds to achieve water quality standards in NPS impaired streams		
Establish a targeted monitoring approach for NPS Program projects including baseline, pre-and post-project to better evaluate the effectiveness of BMPs. Work with WAB and local partners to coordinate monitoring efforts.		
Participate in and coordinate with the WVWN.		
Coordinate with appropriate agencies, watershed associations and Public Service Districts to address failing on-site wastewater systems.		
Coordinate with project teams to propose additional funding opportunities and activities to conduct streambank stabilization projects in priority watersheds.		
Participate in the Cheat and Monongahela River TMDL implementation plans		
Develop guidelines for an urban runoff management program that promotes low impact development practices		
Coordinate with WVCA and NRCS to implement CREP/EQIP programs in priority watersheds		
Provide conservation education and information to educators, youth, and the public		
Increase capacity for watershed associations to actively participate in and provide leadership for NPS watershed projects		

Watershed Management	Status	Comments
Conduct restoration activities and BMP implementation in priority watersheds with the goal of achieving load reductions that will meet their designated uses by 2025.		
By 2020 develop two-four new WBPs in priority areas as designated by the Watershed Management Framework and TMDL processes.		WBP activity is on-going driven by local stakeholders, agency, and NGO support. Multiple WBPs were approved, and we are working on source water, WBP integration efforts. New and revised plans are being developed in the Potomac and Cheat watersheds. Progress has been steady on many of the Greenbrier basin agricultural plans. Recent monitoring suggests that Second Creek is nearing completion. We have not been successful in developing WPBs in the Ohio River basins but will have one in 2024.
Every two years evaluate the progress and revise existing active WBPs as needed.		
By 2020 complete the proposed watershed projects and achieve the required load reductions (LRs) that will meet the designated uses in three existing WBPs.		
Every two-year's or more frequently when needed or requested by EPA, report on active WBPs in accordance with the milestones established in approved plans		
By 2020 target priority basins in the Little Kanawha, Upper, Middle and Lower Ohio for the development of two new WBPs		
Support and encourage the remediation of watersheds impacted by wastewater in priority watershed and on a statewide basis by promoting the statewide efforts of the CWSRF and Agricultural Loan Programs.		
Support provides funding and technical assistance within priority watersheds and on a statewide basis to stream restoration projects that restore the streams natural hydrologic conditions and reduce sedimentation		

Support and encourage the protection of healthy watersheds and work with local stakeholders to educate their communities on their importance. This includes waters identified as high quality and outstanding national resources, as well as those that remain high quality but may be threatened by NPS pollutants.		
If there is local stakeholder interest, funding and agency support, a Watershed Protection Plan (WPP) will be developed to protect high value water bodies identified as Tier 3. The goal is to develop one WPP within the next five years		WPP is a priority, particularly in WV's Chesapeake Bay counties. WV currently has two WPPs, one is active (Back Creek) the other has been challenging (Upper Elk). An ILF project in the Upper Elk is underway. There appears to be future WPP opportunities in several Greenbrier/Cheat drainages.
If there is local stakeholder interest, funding and agency support efforts will be made to protect high priority wetland and riparian areas and other high value watershed resources, including water quality reference streams, in priority restoration and protection watersheds. The goal is to engage land trust, local landowners, and others to implement conservation easement protection (CEP). The goal is to develop two-four CEPs within each of the approved WPPs within the next five years		
Support the development of the WVWAPP tool and encourage WVDEP to develop statewide criteria to define healthy waters that will ensure better protection of high quality watersheds		

Agriculture	Status	Comments
Target statewide opportunities and priority watersheds promote the conservation of cropland, pastureland, and other land within the agriculture community through technical assistance, BMP implementation, conservation planning, nutrient management, monitoring, and education.		
Every two-years develop 10 Conservation Plans under the Farm Bill Programs		Nearly all goals have been exceeded or nearly so. Where numbers are lower the goal is expected to be met soon. The Ag WQLP hasn't been promoted but has recently gained some attention in publications etc. WVDEP's CWSRLF and WVCA plans to put additional emphasis on the program.
Every five years 25 nutrient management plans will be written or reviewed managing the estimates provided in Table 7 for pounds/year of nitrogen and phosphorus through the implementation of BMPs		
Every five-years provide technical assistance to 25 agriculture producers with the development, protection, stabilization and/or maintenance of riparian areas or with resource management advice that protects surface water		
Provide estimated reduction of sediment from stabilization/restoration of failing streambank, etc.		
Provide estimated sediment reductions due in part to change in management schemes; rotational grazing, exclusion, etc.		
Provide information on the Agriculture Water Quality Loan Program to 10 agricultural landowners on an annual basis.		

Manage pesticides to protect surface and groundwater.		
Every two-years coordinate pesticide collection to protect surface and ground water in cooperation with WVDA		Efforts have been delayed due to turnover/covid and budget restraints within the WVDA.
By 2020 organize a minimum two pesticide collection pickup by in cooperation with WVU Extension and the WVDA.		

Support monitoring programs in priority watersheds impaired by agricultural nonpoint pollutants.		
WVCA staff will assists landowners, watershed associations and partner agencies with stream monitoring activities in priority watersheds as needed.		Goals complete and on-going.

Stormwater	Status	Comments
Improve and protect West Virginia's soil and water resources by reducing the amount of erosion from earthwork sites through education and technical assistance.		
Provide technical assistance and/or information to 2,500 attendees at the WV Construction & Design Exposition over the course of five years through an informational display booth with technicians on hand to answer questions		Estimated numbers are down. The average is > 10 ECPs/yr primarily because of more local contractual assistance to smaller MS4s. Most likely this service will not continue.
Every two-years review and/or provide advice with writing 40 construction erosion and sediment control plans with estimates of soil saved		

Provide education and technical assistance on stormwater BMPs.		
From 2015-2020 provide five stormwater workshops or demonstration projects		These goals have been exceeded.
By 2018 present 20 stormwater management workshops across the state		
By 2016 provide technical advice regarding stormwater management quality and/or quantity issues to 20 clients		

Resource Extraction	Status	Comments
If funding allows, the NPS Program will coordinate to the extent possible with DEP's OAMLR, OSR, OO&G and WVDOF on future project opportunities in watersheds impaired by resource extraction activities.		
Where projects align with current WBPs, or where TMDLs and other sources of information suggest alternate WBPs could be developed to fully restore smaller impacted watersheds; the NPS Program will partner with local stakeholders, our agency and partner agencies to develop restoration projects.		NPS projects continue to receive support from OSM-WCAP; however, AML funds have been limited. The most significant contribution is the investment in the Muddy Creek watershed. The infrastructure bill will provide opportunities to make significant future progress
If funding allows, the NPS Program will partner with DEP's mining program and the federal OSM to provide support for long-term operation and maintenance of passive and active AMD treatment		

Support the WVDOF in their administration of the Logging and Sediment Control Act (LSCA), which reduces the potential impacts to water quality from forestry operations. The NPS Program will work with the WVDOF to support LSCA activities, the objectives listed below as well as other activities that promote the protection of water quality from NPS pollution; however, WVDOF is the primary agency for implementing all forestry management activities.		
Every three-years participate in the Forestry BMP Committee that updates and revises the WVDOF BMP Manual		WVDOF layoffs have impacted NPS inspections related to LSCA and other incentives. NPS remains committed and is still a partner. AGO funding supported a WVU/WVDOF study.
Increase community/landowner involvement with Urban Forestry Program, Stewardship Incentive Program (SIP) and Forest Incentive Program		
Encourage proper forestry management on all forest lands, which will ensure a productive forest and enhance water quality		

Chesapeake Bay Program	Status	Comments
WV is a headwater state for the Chesapeake Bay watershed and the NPS Program will support the goals of the CB Agreement by serving on committees, participating in regular meetings and calls, and providing input to the future development of the Bay TMDL and models. The NPS Program will also work on specific objectives that support the general goals of the CB Program.		
Implement local TMDL WBPs and CB WIP to reduce nutrients, sediment and fecal coliform to local waters and the Chesapeake Bay		WVDEP staff continue to participate in project teams to implement WBPs and identify CB funding opportunities. Progress is good, and on-going. Targets have been. Several towns in the region have implemented voluntary ordinances and adopted GI practices. There are no CAFOs.
Participate in the development of local TMDLs in Warm Springs Run and Rocky Marsh Run to enhance TMDL/NP coordination by identifying opportunities to incorporate information needed for WBP development		
Continue to work with local governments to incorporate post construction stormwater requirements in local ordinances		
Continue implementation of agriculture BMPs and WV NPDES CAFO permitting and enforcement consistent with the WIP and WBPs		

Progress legend

Status		Notes
Complete		In some cases, complete may refer to on-going particularly if the milestone is an annual goal.
Progress made		
No progress		

Appendix 5. FY24 §319 grant request

Sub-grantees	Nonpoint Funds	§319	Match	Total
WVDEP-WIB	WVDEP §319 Statewide Program	$530,654	$415,935	$946,589
EPA	EPA Watershed Tracker (in-kind)	$10,000		$10,000
WVCA	WVCA §319 Statewide Program	$94,000	$62,667	$156,667
	Total Nonpoint	**$634,654**	**$478,602**	**$1,113,256**
	Watershed Project Funds			
WVWRI-SSTWA	Mars Portals Phase IV	$300,000	$200,000	$500,000
FOC	Cheat Canyon Sediment Remediation	$162,450	$113,000	$275,450
WVCA	Upper Meadow River II	$100,000	$85,377	$185,377
CRG	Browns Creek Phase III	$200,000	$133,000	$333,000
CVI	Mill Creek Restoration	$280,169	$186,877	$467,046
CVI	Tuscarora Poor House Restoration	$161,031	$111,355	$272,386
PCWA	Beaver Coal Sediment Reduction	$63,000	$42,000	$105,000
	Total Watershed	**$1,266,650**	**$871,609**	**$2,138,259**
	Total Grant request	**$1,901,304**	**$1,350,211**	**$3,251,515**

2024 subgrantees: US Environmental Protection Agency (EPA), WV Conservation Agency (WVCA), WV University Water Research Institute (WVUWRI), Save the Tygart Watershed Association (SSTWA), Coal River Group (CRG), Canaan Valley Institute (CVI), Piney Creek Watershed Association (PCWA).