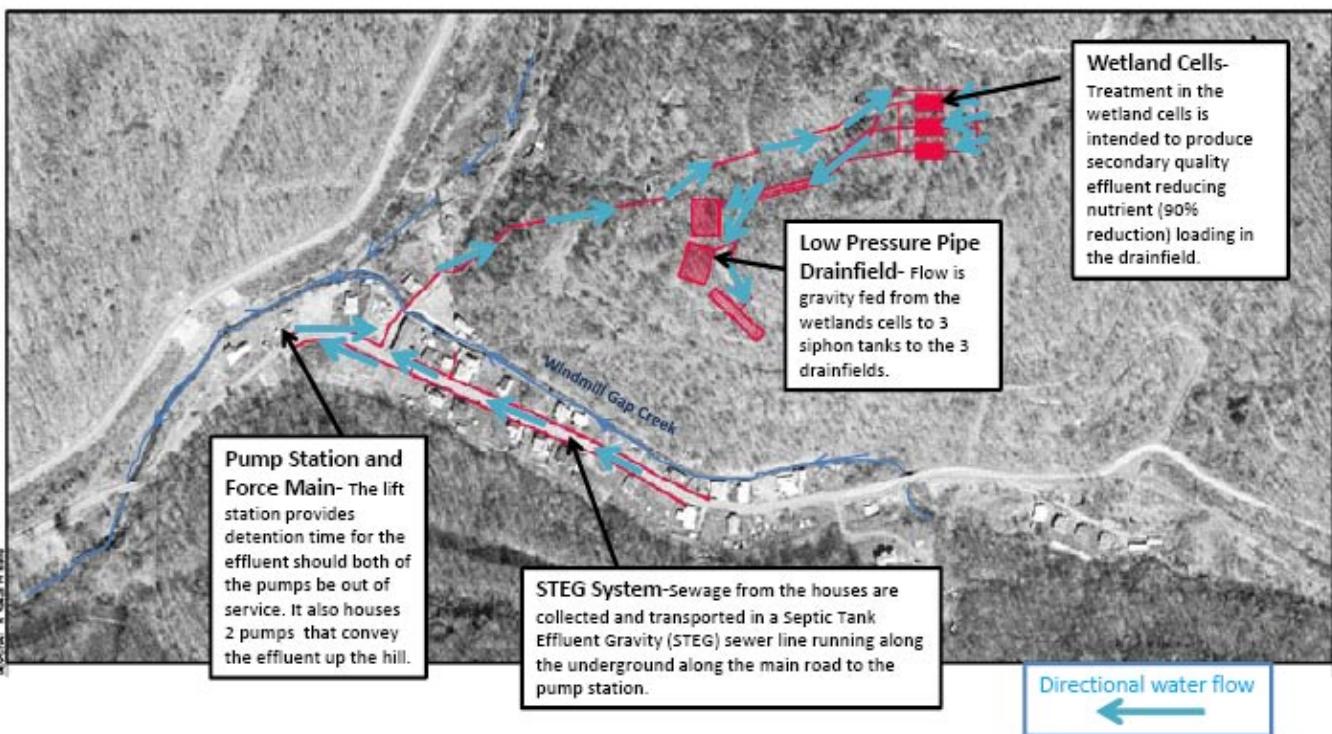


# COMMUNITY WASTEWATER SYSTEM RESTORES THE STREAM AND PROTECTS CITIZEN'S HEALTH

## WATERBODY IMPROVED

Windmill Gap is a trout stream that lies in the headwaters of Elkhorn Creek in southern West Virginia's coalfields. This area is largely un-sewered with an estimated 67% of households in McDowell County lacking wastewater treatment. Water monitoring results indicated high levels of fecal coliform bacteria coming from failing septic systems in the community of Ashland. The Wastewater Treatment Coalition of McDowell County (WTCMC) worked with residents to install a community wastewater system. As a result of the community system, the stream now meets the state standard for fecal coliform bacteria and WVDEP anticipate the stream to be delisted in 2012 from the 303(d) list.

## PROBLEM



Windmill Gap is a small headwater stream located in McDowell County, West Virginia and flows along the community of Ashland. After leaving Ashland the stream flows through many small communities along the Elkhorn Creek to the Tug River and into the Ohio River. Windmill Gap is a designated trout stream with naturally reproducing trout utilized regularly by anglers in the Eastern United States. With little to no agriculture activity in this watershed, no known municipal wastewater treatment system, and no permitted wastewater treatment for 90% of the homes, the primary source of fecal coliform is failing onsite wastewater treatment systems from individual homes and businesses. Ashland, a former coal camp, did not have adequate wastewater treatment due to the limited lot sizes, proximity to the stream and roughed terrain. Since the decline of the mining industry in the area, Windmill Gap has been receiving high levels of fecal coliform causing putrid odors, dramatic discoloration of the stream bed, and impacting biological communities.

The primary nonpoint source problem within the Elkhorn Creek watershed is pollution from fecal coliform bacteria from malfunctioning septic systems. In 2002 EPA developed a Tug Fork Total Maximum Daily Load (TMDL) that used a model to calculate required load reductions for aluminum, iron, and manganese. Monitoring data in 2005 showed no metals violations; however there were violations of the state's water quality standard for fecal coliform bacteria. This resulted in the entire 2.8 miles of Windmill Gap listing on the West Virginia's 303(d) Impaired Streams List in 2006. TMDL's typically require 100% reduction from failing septic system sources. Aside from fecal coliform impairments, Windmill Gap is a pretty headwaters stream that supports a healthy biological community.

## PROJECT HIGHLIGHTS

In 2004 the WTCMC created a county wide Wastewater Plan that identified Ashland as a top priority project. A Watershed Based Plan was then created for the North Fork of Elkhorn Creek and soon after 319 funding was designated to address the failing septic issue in Ashland. The success of this project was dependent on the number of traditional and nontraditional partner's who contributed to this project including volunteer labor to hand dig the drain field.

A traditional sewer system would not work for this community because of the rough terrain, small lots and proximity of the stream. Therefore, CVI provided an alternative decentralized design for the community to treat the pollution sources. This project was 100% grant funded and we received 100% buy in from the community. Currently, this project provides wastewater treatment for 23 homes and a renovated company store in the town of Ashland, West Virginia.

This project is a model to other communities trying to address infrastructure needs with an untraditional approach. Since the Ashland Community system was installed, the WTCMC has continued to implement the watershed based plan by promoting the repair or installation of septic systems where feasible downstream and the next larger community downstream.

## RESULTS

The Ashland Community of 22 homes and 2 businesses now has a working wastewater system and local residents make up the Ashland Utility that manages the system. Since the project was completed, the stream no longer has a foul smell and the streambed has changed from black to brown.

The construction of this community system resulted in more than a 98% reduction of fecal coliform (all samples have been well below water quality standards (**TABLE 1**). Post project monitoring was conducted during low flow events during fall 2010. All 6 samples were sent to the lab for analysis and came back within the state limit.

Also, macroinvertebrate results after the system installation and after less than a year have resulted in improved biological conditions downstream. The entire 2.8 miles of Windmill Gap should be fully restored and removed from the 303(d) list in 2012.

## PARTNERS AND FUNDING

This project was a success because of the many different partners' involved from local groups, nonprofit organizations, federal and state agencies, to faith-based groups. The WTCMC's collaborative partners include West Virginia Department of Environmental Protection, Canaan Valley Institute, SAFE Housing and Economic Development ,WV Ministry of Advocacy and Work camps Inc., West Virginia Stream Restoration Fund, Ashland Community Utilities, Inc., McDavid Foundation, Change Happens in Honolulu Hawaii, West Virginia Affordable Housing Trust Fund, West Virginia Stream Partner's Program, Versa Con, Southern Dept. of Transportation, Mountain Resource Conservation and Development Council, McDowell County F.A.C.E.S., McDowell County Health Department, Citizens Conservation Corps of WV, Stafford Consultants Inc., First Presbyterian Church, McDowell County Commission, WV Division of Natural Resources, Travel Beautiful Appalachia Inc. and local Rotary Clubs. The Save Housing and Economic Development nonprofit group administered the funds, Canaan Valley Institute provided technical assistance and project oversight, the Ministry of Advocacy and Work camps Inc. provided funding and volunteer labor, Stafford Engineering provided engineering assistance and project implementation, Versa Con was the hired contractor and donated funding, and many of the other partner's provided technical assistance and funding through the project.

319 funding was used to help design and construct this project. A total of \$231,650 319 funds were spent with the total project cost valued at \$770,970. The WV DEP's Nonpoint Source Program's Assistant Deputy Director, the Southern Basin Coordinator, and the Save Our Stream's Coordinator all assisted with the project from project planning, implementation and pre and post project monitoring. Matching funds for this project were provided by private, nonprofit and foundation donations, state funds from the Stream Restoration Fund and the WV Stream Partner's Program.

## PHOTOS



Homes downstream from project located directly beside the stream



Wetland cell

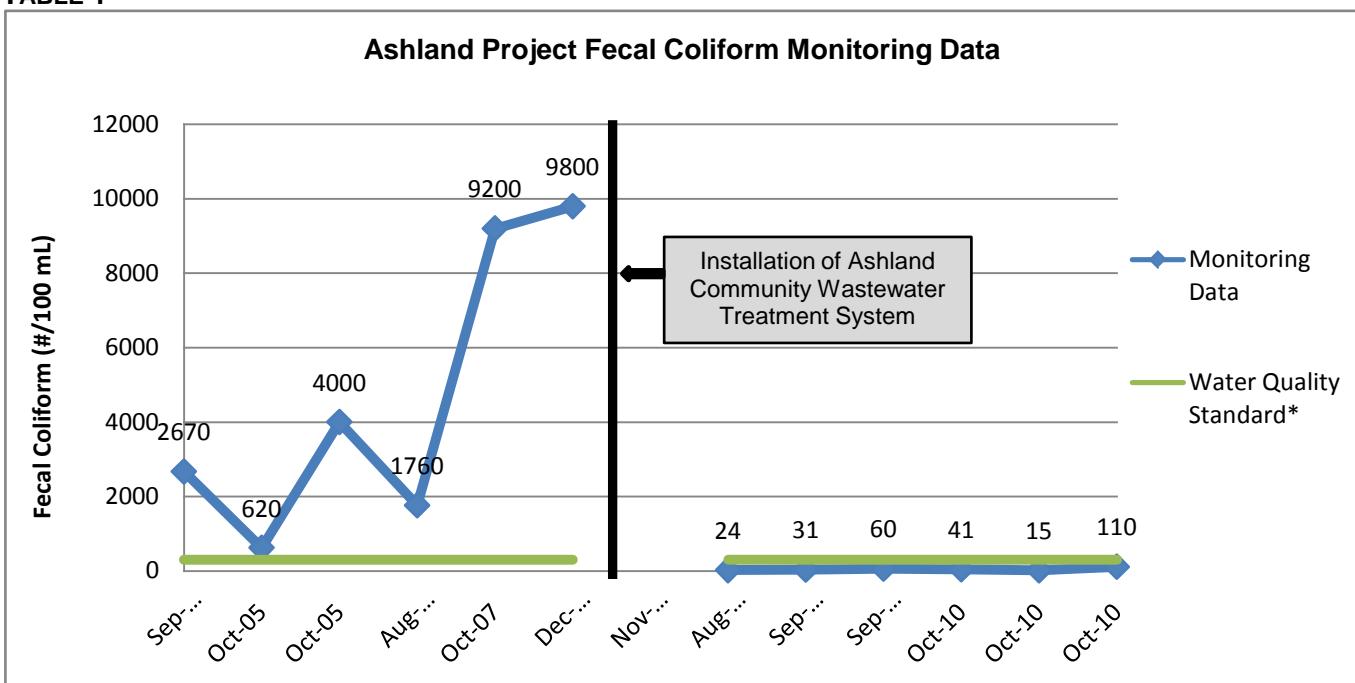


Ashland Community



Installation of individual septic tanks

TABLE 1



This data was collected from the mouth of Windmill Gap just downstream of Ashland. Six samples were collected before and after the project are implemented. West Virginia State Water Quality Standards state that samples are not to exceed 200/100 ml as a monthly mean based on not less than 5 samples per month; nor to exceed 400/100 ml in more than ten percent of all samples taken during the month.

## CONTACT INFORMATION

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