



NONPOINT SOURCE SUCCESS STORY

Maryland

Tarkiln Run pH Impairment Remedied by Successful Acid Mine Drainage Drainage Treatment

Waterbody Improved

Maryland's Tarkiln Run, a tributary to Casselman River in Garrett County, was impaired by low pH associated with acid mine drainage (AMD) and was added to the Clean Water Act (CWA) section 303(d) list in 1996. An assessment of an AMD seep impacting Casselman River tributaries ranked this stream high priority for mitigation. Successful AMD mitigation brought the stream into compliance with the state water quality standard for pH. As a result, the Maryland Department of the Environment (MDE) is delisting Tarkiln Run for pH impairment in Maryland's 2018 Integrated Report.

Problem

Tarkiln Run headwaters are in Maryland's Savage River State Forest south of US I-68 near Amish Road; it is a tributary to the Casselman River's North Branch (Figure 1). Western Maryland's Casselman River watershed drains to Pennsylvania toward the Ohio River. Prior to WWII, the river and its tributaries were commonly high-quality waterways that supported native brook trout. During several following decades, coal mining changed the local hydrology, which resulted in AMD that caused pH declines in numerous streams, including Tarkiln Run.

The Casselman River watershed, including Tarkiln Run and other streams, was listed for pH impairment in 1996. In 2005, water quality monitoring to support pH total maximum daily load (TMDL) development found that Tarkiln Run was consistently below the Maryland water quality standard for pH, which requires that pH be within the range 6.5–8.5.

In 2008 EPA approved the pH TMDL for pH-impaired streams in western Maryland, including Tarkiln Run. Water quality monitoring in 2010–2013 showed that Tarkiln Run pH continued to fall below Maryland's water quality pH standard most of the time.

A benthic macroinvertebrate assessment performed in 2011 and 2012 rated the stream as 2.25, which is classified as *poor* on the benthic index of biological integrity. Maryland's 2014 Integrated Report clarified the pH conditions in the Casselman River watershed by separately listing Tarkiln Run for pH impairment.

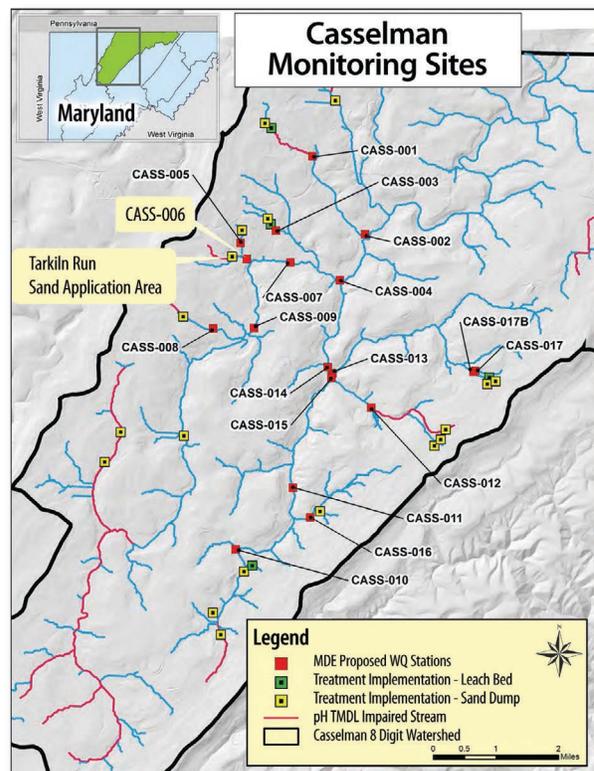


Figure 1. Casselman River watershed monitoring sites.

Story Highlights

In late 2008 MDE initiated watershed planning to make the Casselman River watershed eligible for CWA section 319(h) grant implementation funds. The planning process included assessment of potential AMD



Figure 2. Tarkiln Run sand dump site.

mitigation sites like Tarkiln Run. The plan also analyzed AMD mitigation technologies. One of the technologies recommended to address pH while also minimizing capital and operation and maintenance costs was limestone sand application, sometimes called a limestone “sand dump.” This technique involves constructing a driveway for a dump truck to pull up adjacent to the stream so that measured quantities of pulverized limestone can be delivered directly to stream edge. Then, natural variation in stream flow distributes the particles of limestone downstream. The limestone sand particles in the stream tend to raise in-stream pH and increase acid neutralizing capacity. The amount and timing of limestone sand application at each site is determined by periodic monitoring of in-stream pH.

In 2011 the U.S. Environmental Protection Agency accepted the Casselman River Watershed Plan for pH Remediation, and section 319(h) grant funds were approved to help mitigate AMD-impacted areas. Tarkiln Run was selected to be one of 11 Phase I projects because the land was publicly owned, the site was accessible and permit requirements were attainable. In mid-2013 one limestone sand application site was constructed. During its first year of operation, the Tarkiln Run site received 41.65 tons of limestone sand (Figure 2).

Results

After installing the limestone sand application sites, MDE’s Abandoned Mine Land Division (AMD) periodically monitored the pH at Tarkiln Run and scheduled delivery of limestone sand to the application sites as needed. After a period of adjustment in late 2013 and early 2014, water quality data collected in Tarkiln Run from mid-2014 through 2016 demonstrated

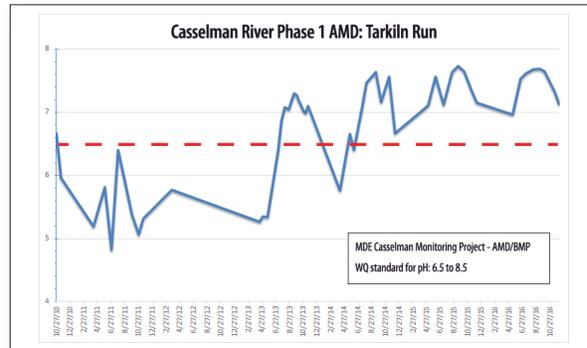


Figure 3. Tarkiln Run meets the pH standard.

that in-stream pH consistently met Maryland’s water quality standard (Figure 3). As a result, MDE is delisting Tarkiln Run for pH impairment in Maryland’s 2018 Integrated Report.

Benthic macroinvertebrate assessments were performed in 2014, 2015 and 2016. The overall average rating was 3.167, which is categorized as *fair* on the benthic index of biological integrity—an improvement from the *poor* rating received in 2011–2012.

Partners and Funding

MDE AMDL and MDE Integrated Water Planning Program (IWPP) cooperated to write the Casselman River Watershed Plan for pH Remediation. Drafting the plan used \$55,000 from the federal fiscal year (FFY) 2008 CWA section 319(h) grant. MDE was awarded \$644,115 from the FFY2009 CWA section 319(h) grant to help pay for mitigating more than a dozen different sites impaired by AMD in the Casselman River watershed. The Garrett Soil Conservation District (SCD) was hired to oversee contractor hiring, construction management and inspection for all these project sites, including the Tarkiln Run limestone sand application project. The SCD’s total capital cost for the Tarkiln Run site was only \$8,868.

Other partners contributed work at no cost to the project. Watershed plan drafting by MDE IWPP staff was funded by the section 319(h) grant that supports the state Nonpoint Source Management Program. Also, before/after water quality monitoring by MDE’s Field Services Program was funded by separate ongoing section 319(h) grant projects. The Maryland Fisheries Service assessment and analysis was independently funded by the state of Maryland.



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