



MKR3 is the largest abandoned mine drainage (AMD) discharge in the Montour Run watershed. It issues from a 16" clay pipe (**left**) located near the headwaters of an unnamed tributary to Montour Run locally known as "Milk Run". Acid generated from the weathering of pyrite in an abandoned underground Pittsburgh Coal Seam mine lowers the pH of the groundwater resulting in aluminum being dissolved from the underlying clay strata. When the low-pH, acidic, aluminum-bearing mine drainage is mixed with alkaline water, the aluminum precipitates as a white substance, giving the stream a milky appearance (**Milk Run 2015 below**).

The Milk Run system removes 72,000 lb/year of acid & 7,000 lb/year of aluminum pollution that previously flowed, unabated, into Montour Run for a century

The Montour Run Watershed Association (MRWA) and related organizations have been working for over two decades to address water quality issues within the Montour Run watershed. The AMD Cleanup Plan completed by MRWA in 2003 identified the MKR3 as the largest source of acid and metals pollution in the watershed.

The Milk Run AMD Treatment System was placed online July 11, 2019 after a one-year construction period that coincided with the wettest period on record. This project was funded by a Range Resources reclamation in-lieu-of-penalty (\$949,089) which included both construction funds and \$191,000 that will be set aside for future system operation and maintenance. Additional funding was received from the U.S. Office of Surface Mining (\$180,000), the S. Kent Rockwell Foundation (\$25,000), and the Foundation for Pennsylvania Watersheds (\$20,000), as well as in-kind assistance from various groups.

The Pennsylvania Department of Environmental Protection; the Allegheny & Washington County Conservation Districts; the nonprofits Stream Restoration Incorporated and Independence Conservancy; landowners RHP Properties (purchaser of Continental Communities, LLC parcels) and Great Rentals, LLC have



been instrumental in helping to restore the Montour Run Watershed. BioMost, Inc. of Mars, PA, a design-build firm that specializes in passive treatment systems designed, permitted, and constructed the Milk Run AMD Treatment System.

Over one mile of Milk Run has been restored, helping to improve the entire Montour Run Watershed

Other than two small solar-powered programmable valve actuators, the passive system requires no electricity, has no moving parts and can operate autonomously for years. Water

is conveyed from the abandoned mine drain via an 8" HDPE pipeline to the first Automatic Flushing Vertical Flow Pond (AFVFP1). A 1.0' H-flume allows measurement of inflow rate. AFVFP1 contains 4,000 tons of AASTHO #3 sized high calcium limestone (>90% CaCO₃) and an underdrain system with five 8" HDPE perforated lateral pipes and a single 12" header pipe that extends to a 14-foot tall Agri Drain Smart Drain. Acid is neutralized through the dissolution of limestone, raising the pH and causing the dissolved aluminum to precipitate. Once per day the Agri Drain Smart Drain (**below**) opens a 12-inch diameter valve to allow the entire volume of AFVFP1 to drain, flushing aluminum solids into Settling Pond 1 (SP1). A second Automatic Flushing Vertical Flow Pond (AFVFP2) that has 2,000 tons of similar limestone provides supplemental treatment during high flow and maintenance events. A second Smart Drain flushes AFVFP2 once per day into Settling Pond 2 (SP2).

Stream flow and stormwater are collected by the Forebay upgradient of AVFP1 and directed around the system to confluence with the effluent of SP2 just above the entrance to the Redwoods Estates Mobile Home Community.

