Assessing the benefits of at source vs. in stream AMD treatment: Implications for managing water liabilities under the WVDEP's Bond Forfeiture Program[i]

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Abstract: The Cheat River in northern West Virginia was impaired by historic acid mine drainage. Restoration efforts since 1995 have improved the Cheat River fishery but Muddy Creek remained a significant source of AMD, reducing fishery potential. The West Virginia Department of Environmental Protection's Office of Special Reclamation (OSR) was obliged to treat several bond forfeiture sites within the Muddy Creek watershed at significant cost but, since the majority of acid load resulted from numerous, abandoned mine land (AML) discharges no improvements in stream water quality were realized.

OSR currently has nine active treatment sites, one passive treatment system, and three treatment systems yet to be constructed. Although a majority of the treatment sites were constructed between 2004 and 2006 OSR had been treating AMD in this drainage as early as 1995. To date the OSR has spent over $3.4 million in construction cost including modifications to the T&T treatment site and approximately $10 million in O&M cost, or roughly $648 thousand on an annual basis, and OSR now manages 10 NPDES outlets.

Since the majority of the AMD comes from AML sites in the Martin Creek sub watershed. The previous NPDES permitting structure resulted in OSR discharging compliant water into "dead" streams. To remedy this, OSR is pursuing an NPDES permitting structure that will allow for in-stream treatment in lieu of treating at-source.

Earlier analysis conducted by the West Virginia University Water Research Institute (WRI) indicated that, whereas the money spent on at source AMD treatment had no beneficial effect, significant stream recovery would result if those funds were applied to an in stream treatment strategy. In October 2015 OSR and WRI initiated a study to evaluate the benefits of in stream vs. at source AMD treatment. The project demonstrated significant cost savings and increased environmental benefit by applying in-stream lime dosers at strategic locations within the stream system rather than using lime dosers to treat individual sources. By utilizing portable dosers and placing them at strategic locations within the Martin Creek watershed we identified optimal locations for permanent installation of in-stream dosers. Results of the first year of the project are presented.

Additional Key Words: Stream restoration, NPDES

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[i] Oral paper presented at the 2017 National Meeting of the American Society of Mining and Reclamation, Morgantown, WV: ***What's Next for Reclamation?*** April 9 - 13, 2017. Published by ASMR, 1305 Weathervane Dr. Champaign, IL 61821.

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