

Pine Forest Passive Treatment System
SRI O&M TAG Project #8
OSM PTS ID: PA-225

Requesting Organization: Schuylkill Headwaters Association, Inc. (in-kind partner)
Receiving Stream: Mill Creek
Hydrologic Order: Mill Creek→Schuylkill River→Delaware River
Municipality/County: St Clair Borough & East Norwegian Township, Schuylkill Co.
Latitude/ Longitude: 40°43'02.3916"N / 76°10'33.6828"W
Construction Year: 2005

Stream Restoration Inc. was contacted by Bill Reichert (phone) and by Megan Blackmon (9/15/11 email) of the Schuylkill Headwaters Association seeking assistance in the maintenance of the Pine Forest Passive Treatment System. On 9/19/11, Cliff Denholm met Bill and Megan onsite to conduct a site investigation as part of the system performance evaluation and to identify potential improvements and/or maintenance activities.

The system consists of an intake which captures the flow from a borehole drilled to relieve the hydrostatic pressure in an abandoned underground coal mine. The flow rate is about 1200 gpm. Water flows through a flushable ALD/OLD before discharging into a Settling Pond followed by a treatment wetland complex. The ALD/OLD has been experiencing plugging problems causing the water level to rise and flow on the surface, thus requiring the system to be flushed on a weekly basis to sustain treatment performance. The weekly flushing effort requires a significant commitment of time, especially due to the length of the access road. During flushing events, there appears to be more than just iron solids in the effluent. They often see brownish material as well. A bucket was used to collect solids directly at the borehole which were then analyzed by Stroud Water Research. Based on their understanding, the problem appears to be the bacteria *Gallionella*, which would be difficult if not impossible to eliminate from the system. A workable solution would include either ridding the system of the *Gallionella* problem or reducing their O&M activities of flushing once per week.

Research was conducted but an effective and acceptable solution to the *Gallionella* problem was not identified. A solution was developed, however, to decrease the amount of time spent conducting maintenance. A proposal was provided to the Schuylkill County Conservation District and the Schuylkill Headwaters Association consisting of the following:

Excavate and install a 12" X 6' SmartDrain box which would be connected to the center flush drain. Then all the valves that are typically opened to flush the system would be kept open to allow the SmartDrain to control the flushing. The SmartDrain can be programmed to allow whatever flushing schedule the group would like. In this case, at least once per week would be recommended, but could be increased to daily if desired. This would then eliminate the need to travel to and from the site to open the valves and return the next day to close the valves on such a frequent basis. The cost of the unit would be approximately \$4,500 with installation costs estimates of \$4,000 to \$5,000.

The proposal was rejected, at least for right now, due to concerns with vandalism. An alternative option to use siphons, which would probably flush the system more frequently, was also provided, but that too was rejected for now. They said they would continue with their current procedures and look for other solutions, but may reconsider these options in the future.

The project team thanks the Schuylkill Headwaters Association, Inc. and Schuylkill County Conservation District for all of their efforts including support and assistance. Funding for technical assistance and maintenance was provided by the PA DEP's Growing Greener and the Foundation for Pennsylvania Watersheds grant programs and in-kind services by project partners.

Recommendations:

- Install SmartDrain or siphon-based flushing system



The bacteria *Gallionella* is growing and clogging the limestone aggregate within the Oxidic Limestone Drain causing the water to rise to the surface and flow over top of the system (*top left & right*) and then flow over the spillway (*bottom left*) into the next pond instead of through the OLD. This problem requires flushing of the bed (*bottom right*) on an essentially weekly basis which is quite time consuming.

