

Boyce Park Passive Treatment System
SRI O&M TAG Project #43 Request #1
OSM PTS ID: PA-281

Requesting Organization: Allegheny County Conservation District
Receiving Stream: Piersons Run
Watershed: Turtle Creek
Municipality/County: Plum Boro, Allegheny Co.
Latitude/Longitude: 40° 27' 52" N/ 78°44' 56 " W

The Boyce Park passive treatment system is located in Boyce Park, Plum Boro, Allegheny County, PA and was constructed around 2008. The treatment system was designed by Skelly & Loy to treat multiple abandoned mine discharges located inside the county park. On 5/11/16, Amy Miller of the Allegheny County Conservation District (ACCD) contacted Stream Restoration Incorporated (SRI) on behalf of the park regarding several problems including water quality and maintenance issues of the system and outstanding obligations associated with Chapter 105 permitting.

On 6/14/16, Cliff Denholm met with the ACCD to conduct a site investigation of the treatment system. The passive treatment complex treats three mine discharges (BP2, BP3, and BP4) using a mixture of Auto-Flushing Limestone Ponds, Vertical Flow Ponds, settling ponds, and a polishing wetland. Amy reported that park staff had begun to take over maintenance of the system including flushing the Vertical Flow Ponds and had made adjustments to the wetland water elevation. During the site inspection, field water quality parameters were measured and are provided in the table below.

Sample Point	Flow	pH	Temp.	DO	ORP	ALK
BP2 L.S. Pond	NM	7.7	21.1	8.6	NM	100
BP3 VFW	33	6.0	14.1	5.7	NM	54
BP2/BP3 Pond	46	7.3	21.6	10.2	126	60
BP4 Pond 1	5	3.9	19.9	7.9	294	0
BP4 VFW2	Est. 3	4.6	33.9	7.4	178	0
BP4 Pond 2	NM	4.6	23.7	8.5	236	1
Final Wetland	54	7.7	20.7	8.6	176	55

The Final Wetland had an excellent pH and good field alkalinity. A water sample was collected for laboratory analysis which revealed that the water was net-alkaline with relatively low metal concentrations. Water monitoring of the BP4 treatment train revealed that this portion of the treatment system was not performing as well as preferred, but the water flowing from BP2/BP3 Pond was good quality and a higher flow rate which completed treatment of the BP4 discharge. As water quality at the effluent of the system was good, a decision was made to not conduct maintenance through the O&M TAG program at that time in order to allow the park staff to continue their flushing regimen. A recommendation was made to regularly monitor the system to see how the flushing regimen affects the treatment system. A site visit conducted by BMI on 11/16/16 indicated that the

system was still producing good water quality. Another passive system snapshot is planned for 2018. Data for the system will be reviewed to determine if maintenance is yet needed.

During the 6/14/16 inspection, the following O&M issues were identified:

- The inlet box grates for BP3 & BP4 were covered with sludge and debris. Both were cleaned at the time, but will need to be regularly inspected and cleaned.
- The BP2 limestone pond had a mixture of algae and aluminum solids on top of the limestone. The water level appeared to be at the surface and the siphon appeared to turn on and then off quickly not allowing a full flush of the pond. The limestone may be clogged although the pond was producing alkaline water and a good pH. Eventually the limestone within this pond will need to be cleaned.
- The BP4 Pond2 looked to have quite a bit of algae, metal solids, and debris, but it was difficult to tell how deep and how full the pond really is. Eventually this material will need to be removed.
- Very little vegetation was growing in the final wetland due to previous high water level.

The most immediate concern of the ACCD was addressing outstanding issues related to Chapter 105 permitting associated with constructing the system. The Allegheny County Parks Department had received a letter from the PA DEP stating that as-builts of the system as well as a mitigation monitoring report for the final wetland needed to be submitted. At the 6/14/16 field meeting, Amy provided 24" X 36" paper copies of the design and as-built drawings. SRI had these maps scanned in PDF format which were then provided to the ACCD and placed on Datashed. During the field visit, little vegetation was growing in the wetland. A high water mark was observed and Amy reported that the water level within the wetland had only recently been lowered. A decision was made to postpone the wetland monitoring event until the following year in order to provide time for the wetland to re-establish. Wetland monitoring was conducted and a report prepared by BioMost in September 2017, which was provided to the ACCD to submit to the PA DEP.

Additional Recommendations:

- Conduct water monitoring of the system on at least a quarterly basis. Contact SRI for assistance if the water quality begins to decline.
- Continue to follow the flushing regimen.
- Regularly inspect and clean the inlet box grates for BP3 & BP4.
- Eventually the BP2 limestone will need to be stirred and washed once water quality begins to decline.



Top Left: The inlet box grates for BP3 & BP4 were found to be covered with sludge and debris which could prevent AMD from entering the system.

Top Right: Both were cleaned at the time, but will need to be regularly inspected and cleaned.

Bottom Left: The BP2 Limestone Pond was covered with aluminum solids and algae. As the pond was producing very good water, a decision was made to leave it be for the time being, but will likely need to be cleaned in the near future.

Bottom Right: Several of the ponds had large amounts of algae growing in them, but did not appear to negatively affect treatment effectiveness.



Top Left: Final Wetland with no plants prior to lowering water level (6/10/14)

Top Right: Final Wetland shortly after removing stop logs. Water level was lower, but vegetation had not yet had time to become re-established (6/14/16)

Bottom: Final Wetland after given a year to re-establish under good growing conditions (9/18/17)