

July 28, 2022

Mr. Christopher Garges
Township of Solebury
3092 Sugan Road
P.O. Box 139
Solebury, Pennsylvania 18963

**RE: Aquetong Creek Restoration Project
 Wetland Mitigation Monitoring Year #2 - Spring 2022
 Solebury Township, Bucks County, Pennsylvania
 PH Project No. 0388.011**

Mr. Garges:

Princeton Hydro, LLC (Princeton Hydro) conducted a site visit on May 26, 2022 to perform the Year 2 Spring wetland mitigation monitoring of the Aquetong Creek Restoration Project located in Solebury Township, Bucks County, Pennsylvania (Site). The PADEP-approved Restoration Waiver 16 (Authorization ID No. 1278424, dated October 23, 2019) requires the monitoring of the wetland restoration areas in accordance with the Mitigation Plan narrative provided as S4 of the Aquetong Creek Restoration Project Environmental Assessment Addendum, dated June 2019, last updated September 2019. The goals for the wetland restoration component of the project are to 1) achieve a minimum of 85 percent coverage by desirable hydrophytic species within the restoration areas as proposed within the restoration plan, 2) to achieve at least 85 percent woody plant survivorship, 3) minimize the aerial coverage of undesirable, non-native species to the maximum extent practicable, and 4) to stabilize the stream channel. The primary goals of the Spring monitoring inspection were to assess the Site's wetland hydrology and identify if any adaptive management strategies may need to be implemented, primarily the encroachment of undesirable, non-native species.

During the Spring monitoring inspection, the Site's wetland creation and enhancement areas (restoration areas) possessed desirable native hydrophytic species as a result of the implemented hydrological regime, including areas designed to be subject to backwater flooding, primarily, within the wetland benches along Aquetong Creek. The backwater inundation of the wetland benches created an opportunity for water retention and the subsequent development of desirable obligate hydrophytic plant species along the banks of Aquetong Creek and its associated tributary. Observed herbaceous hydrophytic species, particularly within the backwater flooded creation and enhancement areas, included dark green bulrush (*Scirpus atrovirens*), common rush (*Juncus effusus*), lurid sedge (*Carex lurida*), fox sedge (*Carex vulpinoidea*), fowl manna grass (*Glyceria striata*), and blue water speedwell (*Veronica anagallis-aquatica*). Additionally, the amended wetland creation area that was barren in 2021 possessed 100% vegetative coverage, dominated by fowl manna grass. Overall, it appears the restoration areas are continuing on a positive developmental trajectory at the time of the Spring 2022 monitoring event.

A headcut was observed directly downstream of the confluence of Aquetong Creek and its tributary. Some erosion was observed along the southern bank and undercutting was occurring at the toe of slope as a result of the headcut, which may further impact the stabilization and hydrologic connection of the wetland creation and enhancement areas along the Aquetong Creek. As a result, it is recommended that continued monitoring of the headcut and surrounding areas be conducted. Stream monitoring, which includes repeated surveys of the



longitudinal profile to track this headcut and others, has been conducted in 2020 and 2021, and is scheduled for 2022. Findings and recommendation from this monitoring are detailed in the separate Riverine Monitoring Report by Princeton Hydro.

The Site possessed greater than 85 percent survivorship of the installed trees within the restoration areas, and the majority of installed trees were greater than 5 feet in height. Additionally, most live stakes installed along the banks of Aquetong Creek and its tributary were budding and producing new leaves. American sycamore (*Platanus occidentalis*), black willow (*Salix nigra*), red maple (*Acer rubrum*), and pin oak (*Quercus palustris*) plantings were particularly healthy and thriving. These positive developments will continue to contribute to the high percentage of woody species survivorship and vertical heterogeneity of the Site.

At the time of inspection, several undesirable non-native and noxious species were observed within and adjacent to the restoration areas. Observed non-native species included common reed (*Phragmites australis*), charlock mustard (*Sinapsis arvensis*), reed canary grass (*Phalaris arundinaceae*), Japanese bristlegrass (*Setaria faberi*), and Canada thistle (*Cirsium arvense*). Japanese bristlegrass, yellow flag iris (*Iris pseudacorus*), and Canada thistle cover was decreased compared to Fall 2021. However, common reed, charlock mustard, and reed canary grass coverage increased compared to Fall 2021. In 2021, two dense, isolated patches of common reed were observed on the western bank of the tributary to Aquetong Creek and on the southwestern bank of Aquetong Creek. As of Spring 2022, new growth was observed within a greater extent along the banks of Aquetong Creek and its tributary. Additionally, charlock mustard was present upslope of the wetland creation zones throughout the Site. Yellow flag iris was observed growing along the banks of the tributary to Aquetong Creek. Reed canary grass was observed along both banks of Aquetong Creek and its tributary, throughout the Site. It is recommended that an herbicide treatment targeting these species be conducted in the Fall of 2022.

Overall, the wetland mitigation site is on a positive developmental trajectory as evidenced by high survivorship, vertical development of installed woody species, and a diverse herbaceous understory comprised of a suite of desirable native species. Additionally, the proposed hydrological regime is present, as evidenced by the development of the aforementioned hydrophytic species.

If you have any questions or require additional information, please don't hesitate to contact me via email at ibabson@princetonhydro.com or phone at 908-237-5660 (Ext. 132).

Sincerely,

A handwritten signature in cursive script that reads 'Ivy Babson'.

Ivy Babson
Staff Scientist II
Princeton Hydro, LLC

cc: Chris Mikolajczyk, CLM, Senior Project Manager, Princeton Hydro
Michael Rehman, CERP, PWS, Director of Ecological Services, Princeton Hydro

