

FUNDING GREEN INFRASTRUCTURE ON A WATERSHED BASIS: LESSONS FROM THE PENNYPACK EXPERIENCE

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“Green infrastructure” is an approach to water management and stormwater control that relies on protecting, restoring, and replicating natural hydrologic processes. Rather than storm sewers, gutters, and stormwater ponds, it uses infiltration basins, vegetation, grass swales, buffers, and other techniques to control the volume and velocity of stormwater nearer its source. These measures are intended to protect the stormwater capacity and quality of urban streams and waterways.

Relying on a fundamental understanding of watersheds, green infrastructure involves implementing dispersed projects that take advantage of the infiltration capacity and biological characteristics of sites across the watershed.

Can Pennsylvania’s traditional funding system for water-related infrastructure accommodate watershed-based multi-municipal approaches to green infrastructure?

The Pennypack Watershed

The recent experience of several municipalities in the Pennypack watershed in Montgomery County highlights some issues. The Pennypack watershed covers 56 square miles and over 300,000 people. It includes the 1,334 acre Pennypack Park, part of the Fairmount Park system. The watershed discharges to the Delaware River in the City of Philadelphia. The Pennypack watershed is extremely flood-prone, and communities have taken various measures to alleviate flood damages in the region. Over the past three decades, flooding has been directly responsible for \$5 million in property damages and caused six deaths in the Hatboro, Horsham, and Upper Moreland areas.

With the assistance of the Pennsylvania Environmental Council (PEC) and the Environmental Finance Center (EFC), four municipal entities sought funding from PENNVEST (the Pennsylvania Infrastructure Investment Authority) in 2009 to support “green” stormwater facilities within the Pennypack watershed in Montgomery County. These were the Borough of Hatboro, Horsham Township, Upper Moreland Township, and the Upper Moreland School District. The applicants sought \$3.5 million in support of coordinated work on 14 sites in the watershed—three in Hatboro, five in Horsham, four in Upper Moreland, and two in the School District.

Their experience highlights a number of continuing obstacles to green infrastructure funding, which does not neatly fit the standard model for infrastructure evaluation and expenditures.

Watershed Planning Framework

Green infrastructure works best when there is a sophisticated understanding of watershed functions. The municipalities along the Pennypack have been working together for

several years to address both flooding and stormwater management on a watershed-wide basis. These past projects laid the groundwork for the 2009 PENNVEST applications.

In 2006, the Center for Sustainable Communities at Temple University-Ambler published the *Pennypack Creek Watershed Study*. Led by Dr. Jeffrey Featherstone, this was the culmination of four years of work intended to help municipalities understand hydrology, improve flood control, and reduce water pollution. The study was supported by grants from the William Penn Foundation, Federal Emergency Management Agency (FEMA), and participating municipalities of the Pennypack Creek watershed, including Abington Township, Bryn Athyn Borough, Hatboro Borough, Horsham Township, Jenkintown Borough, Lower Moreland Township, Rockledge Borough, Upper Dublin, Upper Moreland Township, Upper Southampton Township, and Warminster Township.

The comprehensive study covered twelve municipal jurisdictions and ten hydrological sub-basins within the watershed. Based on hydrological data, as well as the locations of past FEMA flood insurance claims, the study classified areas along the Pennypack Creek as “major damage centers.” The study provided a technical basis for developing a watershed Stormwater Management (Act 167) Plan to be completed by the end of 2010.

In 2008, PEC commissioned EFC to provide stormwater financing training to a number of municipalities along the 611 highway corridor, which encompassed the Pennypack watershed. Although the training did not happen due to municipal leaders’ time and capacity constraints, a decision to pursue a multi-municipal application for green infrastructure funding emerged from these cooperative endeavors.

Decision to seek funding for multi-municipal green infrastructure solutions

The goal was to finance a multi-municipal effort to implement green infrastructure stormwater solutions at sites identified in the watershed study. Seventeen sites were strategically chosen based on the Temple-Ambler study assessments and recommendations. Most chosen sites were publicly owned open fields, many of which were unused or infrequently used. In total, the projects were to provide for sixty-nine additional acre feet of stormwater storage capacity. The types of proposed stormwater management measures consisted mainly of creating and retrofitting basins by excavating and lowering fields, restoring small wetlands, and re-vegetating floodplains. In early 2009, with the approval of the municipalities, PEC met with PENNVEST staff to discuss the project.

The site-specific proposals were designed to use cost-effective and simple engineering techniques to mitigate flooding, improve water quality, and reduce stormwater runoff and pollution. The applicants felt that that the proposed projects employed EPA-recognized wet weather green infrastructure practices and opted to pursue Green Reserve funding. The Green Reserve program was authorized by the American Recovery and Reinvestment Act (ARRA), which stipulated that 20% of the funds be designated for “green infrastructure, water or energy efficiency improvements or other environmentally innovative activities.”

Application process

Discussions with PENNVEST in February 2009 made it clear that the project would need sufficient information to demonstrate a water quality benefit and compliance with any Act 167 planning or ordinance requirements. In addition, the application would need to identify the responsible entity or entities for repayment of loan funds and provide sufficient information to permit review of the project costs, and consistency with local and county land use requirements. PENNVEST indicated that it preferred a single application if this were a single project, but noted issues with separate land ownership and difficulties in fixing responsibility for repayments given that the construction would occur in several jurisdictions.

The proposal represented an innovative plan for watershed-wide stormwater management among Pennypack communities. The decision to apply for funding jointly emphasized their desire to take a coordinated and holistic approach to addressing stormwater and flooding, with associated benefits to the watershed.

While PENNVEST initially indicated that the agency preferred one application to five, several complicating factors ultimately required the entities to apply separately. The applications involved four distinct borrowers as landowners (three municipalities and a school district) each with different taxpayers. (The Hatboro-Horsham School District had initially been part of the project, but withdrew due to an inability to handle the administrative complexity).

On a logistical level, coordinating four different applications proved to be very challenging. Because the on-line application was not designed for borrowers to apply as a group for collaborative projects, the PENNVEST application website did not have any mechanism to oversee and manage multiple applications simultaneously. This was particularly difficult given that multiple people from various entities worked on each application. It also meant that numerous descriptions had to be repeated in different places, and that the project could not be presented as a coordinated whole.

Although PEC and EFC helped to coordinate the application processes for the entire group, the municipalities and school district were responsible for compiling and submitting financial and other documents. It took significant amounts of time for each entity to convene meetings, conduct site reviews and cost estimates, and pass necessary council and board resolutions to keep the application process moving. Because the representatives from the participating institutions were top-level decision makers, such as city managers or superintendents, the application was often not a first priority. Additionally, they were often unaccustomed to the level of administrative work needed to submit the volume of documents that the application required.

Nevertheless, the four applicants provided all of the documentation, the final financial paperwork, soil assessment, land use consistency, stormwater ordinances, and other

documents by May 18 in time for review. Four separate applications were filed and all four were evaluated separately by DEP staff.

Because the project sites did not require very extensive engineering designs or very much steel or concrete, the applicants opted to submit design/build proposals. The proposed Pennypack stormwater projects seemed to be well-suited for a design/build approach, whereby site-specific modifications and vegetation issues could be addressed at the same time as the final engineering. The PENNVEST website states that design/build projects are eligible for funding consideration if “an applicant can clearly articulate how the ‘design build’ project will meet DBE [disadvantaged business enterprise], Davis Bacon [Wage Act], complete the necessary environmental reviews and provide a timeline for project completion.”

PENNVEST informed PEC and EFC that the agency has only ever funded one design/build project, though the single project was not submitted for consideration for Green Reserve funds. In discussions held with staff at the DEP southeastern regional office, DEP supported design-build while noting that applicants had to provide enough technical information for DEP permitting. The DEP southeastern regional office provided guidance on how to adjust the proposal language.

There seemed to be internal inconsistency both within DEP and between DEP and PENNVEST regarding design/build policies. While funding ultimately comes from PENNVEST, DEP acts as a gatekeeper for all projects applying for Green Reserve funding. DEP controls which projects are passed on for final scoring and consideration by the PENNVEST Board. The main DEP office in Harrisburg conducted the final review, and it appeared that the Harrisburg office required a great deal more design information than the regional office as a predicate to scoring the applications. One e-mail to applicants from the DEP engineering staff in Harrisburg stated that “the items we need immediately to proceed with these design/build projects are conceptual designs, sealed specs, and hydrology reports.” Another requested “hydrology and hydraulics reports” together with “biddable plans and specs” for each site. The applicants attempted to respond, and provided justifications for the design-build approach and for the overall cost estimates.

The separate Pennypack applications were not advanced by DEP to the final phase for PENNVEST Board consideration. In the end, each application was considered as a regular engineered stormwater control project rather than considered for Green Reserve funding. (Notably, the green infrastructure projects in Pennsylvania that have received Green Reserve funds have been limited to tree planting and impervious pavement projects, which do not require much, if any, design). In sum, the coordinated watershed-based project with fourteen sites was treated as four unrelated, separate infrastructure projects, and stalled out at the DEP stage of review. Aspects of watershed-wide planning and consistent green infrastructure approaches were not as relevant as fitting the applications into a standard municipal-based stormwater structure application.

Conclusions

The Pennypack communities' experience highlights a number of challenges to securing financing for green infrastructure projects on a multi-municipal level. The following recommendations could help address some of these obstacles.

1. Accommodate multi-municipal applications more effectively

Although PENNVEST guidelines purport to reward multi-municipal projects, most multi-municipal work that PENNVEST funds involves communities connected by pipes, or using a common wastewater treatment plant. Green infrastructure on separate sites pursuant to a coordinated plan, however, does not fit that model. The proposed individual green infrastructure sites in this instance are insignificant if treated as isolated projects, and only effective if implemented jointly in a strategic manner, but there is no way to account for this in the process. This separation undermined the collaborative multi-municipal aspect of the overall project, which was meant to be viewed as an innovative joint effort.

In order to better accommodate multi-municipal applications, PENNVEST could make adjustments to its application structure to allow for multiple applications to be considered together. This would allow multiple applications from separate borrowers to still be viewed as a joint set of projects.

Alternately, municipalities might be authorized to organize umbrella entities to handle joint applications that implement watershed plans. Such entities might include nonprofit entities, stormwater authorities, or counties. In the Pennypack case, for instance, Montgomery County could act as the coordinating entity, although it may be difficult to specify a single borrower in this scenario. Changes to state legislation regarding PENNVEST authority could also make it easier for multi-municipal applications implementing a coordinated watershed plan.

2. Accommodate design/build for green infrastructure

Although PENNVEST identifies green infrastructure as a priority, many aspects of the PENNVEST application process have not changed to fit the needs of green infrastructure projects. Among these is the lack of guidelines for design/build submittals for green infrastructure, where the site work is important. DEP's expressed preference for detailed upfront design information is not applicable to many types of green infrastructure projects that require some basic engineering but not the same level as traditional pipe and concrete gray infrastructure.

The unique characteristics of green infrastructure projects may be better served through a separate application track designed specifically to evaluate green infrastructure projects, rather than review them alongside other stormwater projects, such as water treatment plants. Changes can specifically authorize design/build construction as recommended by the *Governor's Sustainable Water Infrastructure Task Force Report*, published in 2008.

Many other state agencies in Pennsylvania, including the Department of Transportation, have shifted to incorporate more design/build projects. In order to properly prepare and educate local leaders, engineers, and agency staff about design/build water contracts, state agencies could provide trainings, help answer procedural questions, and prepare model financing documents.

3. Prefer funding green infrastructure for stormwater on watershed basis

In order to further encourage and incentivize green infrastructure, more prominence should be given to stormwater projects that take a watershed-wide approach. PENNVEST is revisiting its approach to such projects, and future revisions should expressly privilege projects that implement watershed plans – placing a high priority on coordination, site selection, and best green infrastructure solutions that implement a well structured plan. Stormwater funding is in some respects the poor relation in PENNVEST funding availability, and collaborative green infrastructure is even less privileged. But guidelines and funding set asides such as Green Reserve could be structured to heavily favor these approaches because of their multiple benefits for watershed health and multi-municipal collaboration.

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