Project/Request Information

Project Title

Purpose of Grant (one sentence summary-this is a 255 character field)

Integrated Design in the Four Mile Run Watershed: moving the green-infrastructure conceptual design forward to preliminary design and assessing the feasibility of phases 1 and 2, Panther Hollow Lake and Four Mile Run daylighting in Junction Hollow.

Project Description

Please provide an overview of this project

The Four Mile Run Watershed, comprised of the Junction Hollow, Panther Hollow, Forbes Run, and Saline Street Run sub-basins, sits at the heart of the City of Pittsburgh. The watershed touches 10 neighborhoods, contains all of Schenley Park, contains and is bordered by dozens of major educational, medical, commercial, and cultural institutions, drains into the ALMONO development site, and leads to a major sewer outfall (M29) into the Monongahela River which contributes approximately 400 million gallons of combined sewer overflow every year-- ranked in the top three of Pittsburgh's sewer outfalls for its major contributions. Additionally, there is ongoing and severe flooding in the low-lying areas of the sewershed, particularly in sections of Pittsburgh's Greenfield neighborhood, which are resulting in public health and safety issues, compromising property values, and damaging homes and businesses.

Upon completion of the Regional Parks Master Plan in the early 2000's, the Parks Conservancy began to investigate the potential for full restoring Panther Hollow Lake and its surrounding environs as a major park amenity once again. We commissioned conceptual work to examine the potential for daylighting the outlet from Panther Hollow Lake, and restoring a more natural stream channel and riparian habitat from the lake to the Monongahela River. This work led to the realization that the health of the upper reaches of the watershed were critical to the lake and areas beyond.

With support from the Richard King Mellon Foundation, the Pittsburgh Parks Conservancy embarked on a visionary effort to restore the hydrologic and ecological health of the Panther Hollow Sub-Watershed, located within Schenley Park and the neighborhood of Squirrel Hill. The Panther Hollow Watershed totals 780 acres, encompassing part of Schenley Park and the adjacent neighborhoods of Oakland and Squirrel Hill. At its core are Panther Hollow Run and Phipps Run in Schenley Park which join just above Panther Hollow Lake. The two streams and lake comprise an important natural and recreational area, containing one of the few remaining above-ground sections of streams within the City of Pittsburgh. At the upper end of this urbanized watershed, the tributary streams that feed the watershed and lake have been "beheaded," buried, and diverted to the combined sewer system at the Four Mile Run combined sewer outlet, discharging to the Monongahela River. Implementation of that watershed restoration plan began in earnest in 2014, and thus far two major green infrastructure installations within Schenley Park have been constructed, in partnership with PWSA, ALCOSAN, and the City of Pittsburgh. Pre- and post-construction monitoring is being performed by the University of Pittsburgh. Additional design work for a third component of that plan (Schenley Drive "Green Street) began in 2014 and was completed in 2016 with the support of the Heinz Endowments.

Those plans formed the basis for a major green-infrastructure first conceptual design encompassing the entire former watershed/current sewershed, initiated in late 2015 and completed in summer 2016 through the support of the Heinz Endowments, and in close collaboration with PWSA and the City of Pittsburgh.

Stormwater management is of course a critical issue in the Pittsburgh region in large part due to a federal consent decree for water quality, particularly as it relates to combined sewer overflows and sanitary sewer overflows. The Allegheny County Sanitary Authority has submitted a draft Wet Weather Plan and the Pittsburgh Water and Sewer Authority has recently completed a comprehensive

assessment of green infrastructure potential in each sewershed in the city.

Given the significant contributions of the Four Mile Run Watershed to this problem and the significant opportunity presented by scalable investments in green infrastructure in the watershed, the Heinz Endowments recognized that the Parks Conservancy is well-positioned to lead a process to develop a concept plan to provide critical connections within the watershed using green infrastructure. Our team (consisting of the landscape architecture urban planning and firm of Phronesis, aided by engineering firm of Burns & McDonell, with community engagement aided by Jackson/Clark Partners) produced a high-quality conceptual design using a green-infrastructure, applied system approach. This process involved a detailed overlay of existing watershed restoration plans and designs, park master plans, daylighting concepts, community plans, and known stakeholder and transportation plans throughout the (former) Four Mile Run watershed and Schenley Park. Those known plans and designs were then extensively analyzed in close coordination with PWSA and ALCOSAN to determine the potential for rainwater capture. That information was then translated into two sets of guiding principles. The first were citywide: 1) public realm investments that are cost effective (as opposed to infrastructure that is "hidden" or entirely gray); 2) workforce development opportunities; 3) re-establish riverfront connections; 4) take a complete streets approach; 5) focus on healthy, walkable communities; 6) ensure it is resilient infrastructure; 7) people, planet, place and performance. The second were watershed/park/communities specific: 1) ecological restoration; 2) stream daylighting; 3) network of green streets; 4) long-term maintenance + "green" workforce; 5) demonstrate, educate, monitor, optimize; 6) kit of parts approach; 7) reduce flooding. The final results of this phase of work culminated in a system-wide green infrastructure conceptual design for Four Mile Run that integrates into the overall community plans. Furthermore, the process undertaken can serve as a model for other work citywide, and has informed and in many ways driven an overall green-first, adaptive management approach to combined sewer overflow reduction, water quality compliance and flood control that both underpins and potentially catalyzes public realm investments and other important community development needs.

Building upon the success of this conceptual plan, which relied heavily on the thorough input and engagement of representatives from nearly 40 different community-based organizations, institutions, agencies, city departments, non-profit groups and businesses within the watershed, we propose to take this conceptual plan to the next critical level of detail: preliminary design for the first two major phases of the concept. That work will involve several steps: 1) refinement of the conceptual plan through community engagement and integration of other work focused primarily on transportation connections and needs in the same geographic area; 2) data collection and technical site studies; 3) preliminary technical design (10% of final design) and production of a probable cost estimate. We propose to continue working with Phronesis and their team in coordination with PWSA, the Urban Redevelopment Authority (URA), City of Pittsburgh, ALCOSAN and others.

1: Community engagement will be coordinated by the Parks Conservancy (PPC). Working with established stakeholder partners (from the conceptual design phase), as well as with the deep community engagement process led by the Greenfield Community Association aided by Jackson/Clark Partners, our team will refine the conceptual design in two locations: Panther Hollow Lake and in the Four Mile Run stream daylighting/Junction Hollow areas. Several important design details were not addressed fully in the conceptual plan/stakeholder process, and rely on further community input. Those details include: size and edge type of lake; infrastructural components associated with the lake; pre-treatment options that implicate Phipps and Panther Hollow Run streams themselves; recreational/programming options surrounding the lake; connections between the lake and other areas of the park to the south (i.e. railroad crossing); configurations of the above-ground daylit stream; and the integration of trenchless sewer construction options between the southern end of Schenley Park and the river and its implications for transportation options.

2: Geotechnical Investigations: it's necessary to understand, through exploratory field work, lab and field testing, and subsurface investigations what the potential and constraints are at the site, in and around Panther Hollow Lake and within the potential stream corridor. These investigations will make possible the preliminary design, in conjunction with the stakeholder and community input we gather.

3: Preliminary Technical Design (10% of total) and Probable Cost Estimate: we will develop the criteria necessary to provide an integrated solution with the highest number of possible benefits at the most reasonable cost. Because of the complexities of the location where the two existing combined sewers come together (at the nexus of key transportation corridors, within the 100 year FEMA floodplain), providing alternatives at this location with different cost estimates will help position this discussion in the proper context.

All work will be summarized in a Draft Basis of Design Memorandum, and an Opinion of Probable Construction Cost for both projects will be completed.

Facilities

Please describe the facilities, or space, in which this proposed work will take place.

The Parks Conservancy will provide and seek out meeting space that is appropriate for the stakeholders and community members involved to work effectively. For example, meetings have been conducted in Phipps Conservatory and the Schenley Park Visitors Center, both located centrally within the watershed. Primary work by the consulting team will take place remotely.

Over what period of time will this funding be used?

Project Start Date
09/05/2016

Project End Date
06/30/2017

Project Budget
What is the total cost of the project
$484,483

Request Amount
What amount of funding are you requesting from The Heinz Endowments?
$164,863

Please select the type of support you are seeking.

You may select up to 4 types, indicating the percentage of support for each selection. All selections must add up to 100%.
Program (100%)

Funding Partners

Please list any other funding partners.

Richard King Mellon Foundation, PWSA, City of Pittsburgh, ALCOSAN

Staff

If applicable, indicate The Heinz Endowments' staff person this should be brought to the attention of.

Matt Barron, Rob Stephany, Andrew McElwaine

Goals and Measures

Goal Alignment & Past Performance

Endowments' Program Area/Goal

Which of the Endowments' Program Areas/Goals is related to this proposal? Please select from drop-down below

Environment-[A] Promote sustainable urban design

Connection to The Heinz Endowments' Goal

How does this project connect to the goal you selected above?

• Sustainability & Environment -- Promote and support sustainable communities within a sustainable region.
• Community & Economic Development -- Support innovative community and economic development across the region.

This project links two goals listed above by placing innovative green infrastructure at the center of a broader community development strategy that will provide jobs, improve quality of life, raise property values, and solve environmental problems. The Four Mile Run Watershed provides an ideal location for a green infrastructure to underpin and drive community development due to the presence of strong institutional partners, the connection with Hazelwood and the ALMONO site, the transportation opportunities afforded within the corridor, and the presence of strong markets and edge markets. This project will be a powerful test case of green infrastructure as a community development strategy and a guidepost for future efforts. Furthermore, it will ensure that previous design efforts for both Schenley Park and its surrounding communities and institutions are integrated into this overall effort, seeking to maximize the most impactful and critical components of those plans while at the same time encompassing new contexts: federal and state water quality compliance, flood control, and the potential for leveraging public dollars for those needs into the public realm in a manner that accomplishes many collateral benefits.

Past Performance

If this request is for an existing or similar project/program, please provide highlights of past performance of the project/program.

Through a public interest partnership between the Pittsburgh Parks Conservancy, ALCOSAN, PWSA and the City of Pittsburgh's Department of Public Works (DPW), we were able to install two of the top three green infrastructure solutions proposed in the Panther Hollow Watershed Restoration plan with work completed in December 2014. The Panther Hollow Watershed is actually one of the four sub-watersheds within what is now the M29 sewershed, an area that is roughly the same as the former Four Mile Run Watershed.

That partnership has garnered additional interest in investment in implementation of green infrastructure solutions, but success is dependent on having construction-level plans in place to be funded. Funding from The Heinz Endowments allowed us to continue the work by developing the first phase of design documents for the third priority green infrastructure solution identified in the watershed restoration plan -- a Green Street along Schenley Drive within the park, between the park entrance at Forbes Avenue and the intersection at Panther Hollow Drive, adjacent to Phipps Conservatory and the Schenley Park Visitor's Center.

A late 2015 grant from the Heinz Endowments then allowed us to take those key plans and coordinate with PWSA and the City of Pittsburgh for a broader, total Four Mile Run Watershed/M29 sewershed level concept using green infrastructure as its primary organizing principle. The proposed work we are requesting additional support for is the continuation of that design process to the preliminary phase, so that as soon as possible, this integrated design can move forward into implementation. The M29 sewershed has been identified, and verified, as one of Pittsburgh top three priority areas for focused work to achieve compliance with federal and state water quality standards and under the federal consent decree (currently under review/amendment to potentially encompass a more adaptive, green-first approach). The additional context of severe flooding in the shed, and the need to link the ALMONO mixed-use development and the centers of research and business within Oakland and beyond, make investment and focus in this area extremely likely in the near future. Ensuring community support, integrated design, and technical feasibility and cost estimates by the close of 2016/early 2017 will position this work favorably in the coming 1-2 years as large-scale green infrastructure and continued transportation investments move forward.

The Schenley Park/Four Mile Run Concept Plan contains the following:
- it recognizes that Schenley Park is well-positioned within the sewershed to accept stormwater from the combined system in Squirrel Hill and the universities in Oakland. Corridors through and nearby the park can be enhanced to complete streets, consistent with the Peduto administration's recent policies. And Junction Hollow provides high volume capture potential and could accommodate a connection to the Monongahela River.
- it outlines a plan to redirect stormwater from Squirrel Hill and the universities into Schenley Park by making improvements to the public space of the neighborhoods, specifically the Squirrel Hill business district and by leveraging future plans by Carnegie Mellon University in particular. Relying on the Schenley Drive Green Street plan (funded by the Heinz Endowments), this corridor can become both a major demonstration project and a complete street. This corridor is one of the area's most visible and well-traveled, one of Pittsburgh's top ten bicycling commuter routes, and well-used by vehicle and foot traffic as well.
- it describes how the M29 sewershed consists of 362.3 acres of impervious surface area that need to be managed for CSO compliance; and how approximately 60% of that total area (217.7 acres) need to be managed through green infrastructure strategies (assuming that the ALCOSAN facility is upgraded as planned). Within the conceptual plan, there is potential to capture 25.8 million gallons of rainwater per 1.5" rain event.
- the concept describes how 80,000,000 million gallons of spring-fed water that are currently directed into the combined sewer at the overflow inlet in Panther Hollow Lake can be removed from the system and

diverted into a stream daylighting project. Doing so will significantly reduce or eliminate the flooding experienced in the Greenfield community ("The Run"), and at the same time will allow for ecological restoration to provide ecosystem services in the valleys in the park at the same time doing a large amount of the work of water treatment.
- looking at the issues in this area from an urban design framework, the plan suggests that there is great potential not only for ecological restoration, but for significant partnership and research opportunities with the surrounding institutions; significant public educational opportunities through partner organizations including Phipps Conservatory and the Carnegie Institute & Library (as well as through PPC itself); and that the potential for a riverfront reconnection enhances and supports the long-term plan for the ALMONO development.

Throughout the conceptual design process, the Parks Conservancy led the effort to engage nearly 40 different entities representing a broad and diverse array of stakeholders in shaping and embracing the plan. We conducted three stakeholder sessions over a 5-month period; and our consultants at Jackson/Clark Partners conducted 24 private interviews with key stakeholders (out of 37 requested). That interview data and information was used to inform the initial concepts and continues to be available as the process moves forward. We also conducted several in-depth input/design sessions with City Planning, URA, Allegheny Valley Railroad, Carnegie Mellon University, Squirrel Hill Urban Coalition, Greenfield Community Association, and PWSA.

Goals and Measures

Briefly describe up to four project/program goals. For each goal please be specific about how you will know that you have achieved your desired outcomes. If your request is for more than one year of support, please include specific measures of success for each year of your project/program.

Goal 1

Example: *A goal for the early literacy program was to increase the number of children able to read at grade level when they entered third grade.*
Building on the stakeholder process we established in the conceptual design, we will obtain broader community-wide support for the conceptual design that enables us to proceed to schematic design within the production of a 10% Basis of Design Memorandum.

Goal 1 Measure(s) of Success

Example: *A measure of success for the after-school program was the reduction in participants' school suspensions from 10 to 3.*
Steps toward accomplishing the goal will include:
1) Synthesizing community census/engagement information from Greenfield Community Association and Jackson/Clark Partners into development of community input sessions.
2) Conducting 2-3 community meetings to provide presentations of conceptual plans and gather input on additional design details related to Projects 1A & 1B (as described in the Conceptual Plan), that is restoration of Panther Hollow Lake and upstream runs; and daylighting/connecting an urban stream to the riverfront.

Examples of key discussion points to inform design of Panther Hollow Lake will include dredging, bank restoration and/or relocation, a sediment disposal plan, control structure modification/replacement, bank stabilization, and an evaluation of the potential for aeration. The potential for pre-treatment of flow into the lake from existing Phipps and Panther Hollow Runs will be evaluated and sized to determine immediate drainage potential and parameters for the lake itself. Community input will also be necessary to consider how surrounding amenities initially identified through the Regional Park Master Plan (i.e. recreational boathouse or other desired programming opportunities) will shape the design.

Examples of key discussion points to inform the design of the stream daylighting area will include review of modeled scenarios that include different channel sizes and configurations. For example, one scenario will examine the minimum size/capacity required to "drain" or accept all flow from Panther Hollow Lake, whereas others will examine additional capacity for other areas of future sewer separation activities and other green infrastructure in later potential phases within other sub-basins.

Measure of success: we will obtain evaluations from each of the community meetings documenting support for the conceptual plan, and noting key design considerations to consider for the next phase of design. We will request information regarding desired channels of communication and community-based opportunities for future input.

Goal 2

We will complete technical site studies to ascertain any site-specific constraints and needs that will influence preliminary design and the overall success of the concept.

Goal 2 Measure(s) of Success

Because PWSA does not currently possess in-house surveying capacity and because geotechnical analysis is required before further design is possible, this work is essential to moving the design forward.

Measure of success: topographical survey, utility coordination, and a bathymetric survey (of the lake terrain itself) will be completed, as well as geotechnical investigations conducted and summarized in a report. We will measure success through the proper identification of design parameters for Panther Hollow Lake, factors that will directly affect alignment and grade of the daylighted stream areas, and the determination of the existing soil infiltration capacity.

Goal 3

We will create a feasible design for the area encompassing the southern area of Schenley Park to the Monongahela River.

Goal 3 Measure(s) of Success

This particular design question is one of the more important and most technically challenging, and has the potential to provide the most impact to the overall question of whether a design that can truly integrate ecological/compliance goals and transportation connections is possible. It necessitates answering the question of whether a separate storm sewer from the southern end of the park to the river is feasible. But there is an extremely high amount of both above and below grade infrastructure-- not to mention a high interest and need in creating multi-modal transportation connections-- that requires a specialized approach to daylighting in this area (trenchless).

Measure of success: We will produce several construction alternatives (such as horizontal directional boring, micro tunneling, etc.) and couple them with the potential design options that will not preclude any major transportation options under discussion.

Goal 4

We will complete preliminary design (10% of total) for an integrated solution that achieves the highest possible degree of environmental compliance, restoration and other urban design benefits at the most reasonable cost.

Goal 4 Measure(s) of Success

We will develop criteria at our initial stakeholder and community meetings that will develop a set of design criteria.

Measure of success: We will produce a technically feasible design that satisfies the established design criteria at a probable cost estimate that is deemed to be reasonable by key stakeholders.