Grounded GSI

ENGAGING COMMUNITIES WITH
GREEN STORMWATER INFRASTRUCTURE

2016 - 2018

Grounded Strategies
For
Richard King Mellon Foundation

Photo Credit: Neil Strebig

grounded

PREPARED BY

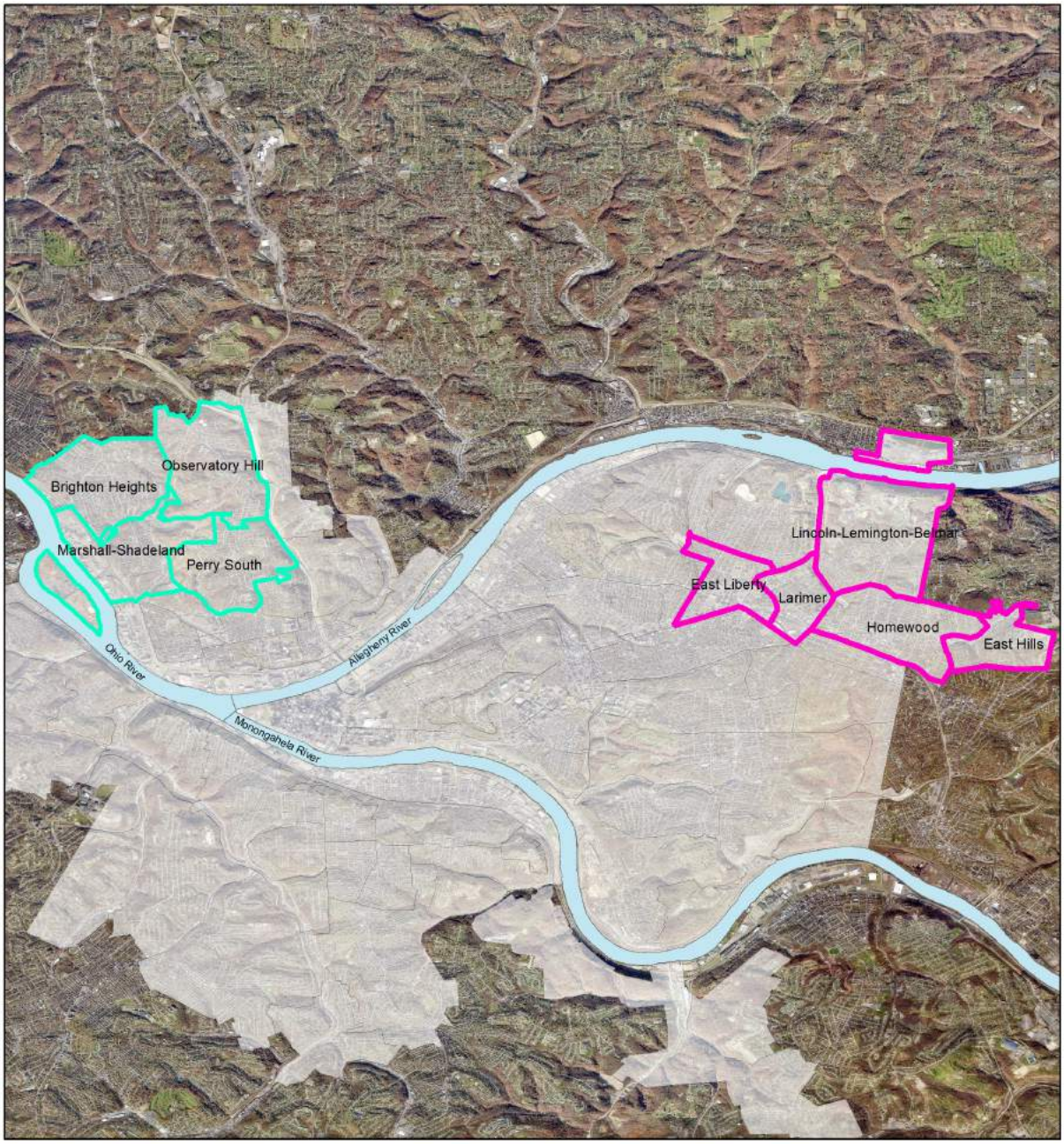
Grounded Strategies
6587 Hamilton Ave
Pittsburgh, PA 15206
groundedpgh.org

THE TEAM

Ariam Ford, MCP
Rebecca Mizikar, RLA
Tom Mulholland
Masoud Sayles
Rachel Bowers
Lydia Kramer

TABLE OF CONTENTS

PROJECT COMMUNITIES



Legend

- A42 Neighborhoods - 2017 Focus
- O27 Neighborhoods - 2018 Focus
- PGH Neighborhoods
- Rivers

1 inch = 8,539 feet
1 inch = 1.62 miles

N

EXECUTIVE SUMMARY

Introduction

Grounded works to improve the social, economic, and environmental health of distressed communities by building capacity through collaborative greenspace and land use projects. We mobilize residents, policy-makers, and like-minded organizations to ensure communities have the resources, knowledge, tools, and partners to make change happen in the places they live, work, and play.

Purpose

The Grounded GSI project demonstrates how the reduction of combined sewer overflows in the region can also improve community health and achieve community co-benefits. This effort increases awareness and literacy at the community level regarding stormwater management best practices and local policy. Using collaborative community design, we demonstrate how green solutions can be used to create vibrant and creative community green spaces that serve the dual purpose of capturing stormwater. Most importantly, our GSI projects serve as touchstones and catalysts for broader outreach and education around stormwater management best practices, environmental justice advocacy, and community placemaking.

Project Communities

Grounded worked in the following project communities to implement the GSI project between 2016 and 2017. The project communities are also shown on the map to the left.

O27 Sewershed

- Brighton Heights
- Marshall-Shadeland
- Observatory Hill
- Perry Hilltop

A42 Sewershed

- East Hills
- East Liberty
- Homewood
- Larimer
- Lincoln Lemington Belmar (LLB)

Process

Over the past two years, the Grounded GSI project has impacted nine project communities by

- Recruiting and training two cohorts of resident Stormwater Liaisons;
- Implementing a Community Stormwater Survey to understand how residents experience the effects of stormwater in their everyday lives;
- Analyzing and sharing data results with project partners, municipal agencies, and community advocates;
- Convening residents to share their personal stormwater stories at community round table events; and
- Demonstrating how GSI can be integrated into community-scale greenspaces by working with community members to co-design and construct seven community scale green stormwater infrastructure projects .

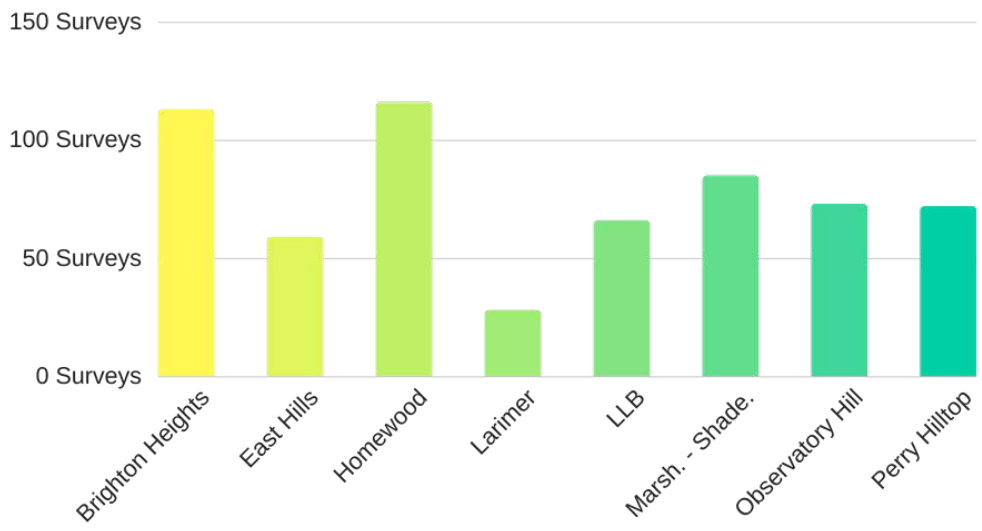
Results & Findings

In order to put boots on the ground and to spread a grass roots message about the benefits of green stormwater infrastructure, grounded recruited and trained two cohorts of Neighborhood Liaisons. Liaisons learned about stormwater management infrastructure, Pittsburgh's combined sewer overflow problem, and how green stormwater infrastructure can play an important role in the solution. Once trained, Liaisons went into their communities and collected over 700 surveys about resident experiences with stormwater, aesthetic preferences for stormwater management infrastructure, and suggestions for the types of open spaces needed in project communities. To spread knowledge and collect data, Liaisons presented at community meetings, tabled at community events, and canvassed door to door.

Grounded collected, aggregated, and analyzed the survey results. Results are presented in subsequent sections of this report in chart and map form. Survey results helped Grounded to understand aesthetic preferences for GSI and the types of stormwater problems residents experience. Grounded also used the survey mapping responses to find the locations where resident reported stormwater issues overlapped with PWSA priority capture areas. We then identified the vacant lots within these two overlapping areas to provide a snapshot of the opportunity that exists in project communities to use vacant land as locations for community scale GSI installations.

Grounded GSI Community Survey

705 Surveys Total



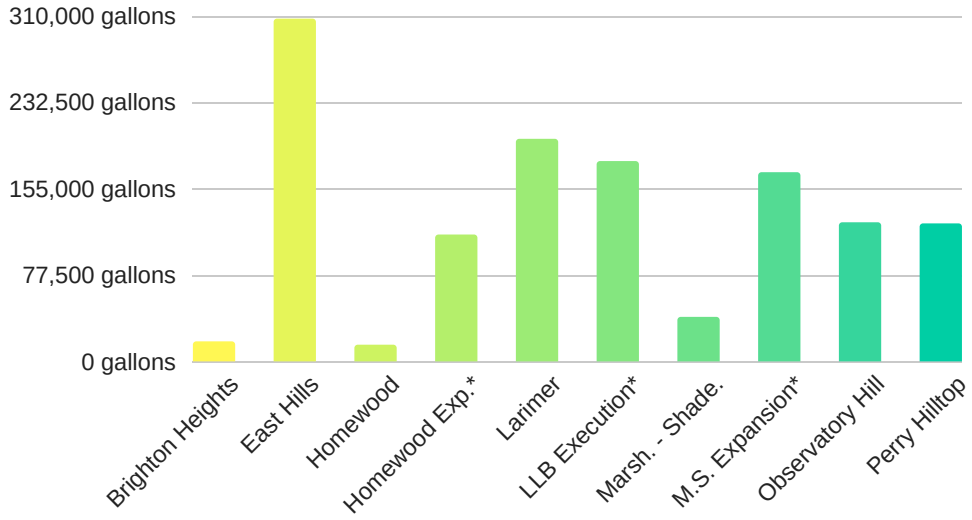
Grounded GSI Demonstration Projects

Gallons of Stormwater Captured Annually:

840,118 Gallons

Annual Design Capture*:

1,223,415 Gallons



*Represents the total potential capture of GSI features if all sites are fully brought on-line. Additional funding and utility oversight from PWSA anticipated.

The O27 Sewershed is comprised of four neighborhoods in Pittsburgh's North Side. These communities include Brighton Heights, Marshall-Shadeland, Observatory Hill, and Perry Hilltop. O27 GSI Liaisons collected a total of 343 Surveys. While individualized survey mapping responses are not available for the individual communities, a GIS overlay analysis revealed that there are 740 vacant lots sitting in the PWSA priority capture area in the O27 project communities. The PWSA priority capture area in the O27 sewershed covers 123 acres.

The A42 sewershed is comprised of the neighborhoods of East Hills, East Liberty, Homewood, Larimer, and Lincoln Lemington Belmar. The PWSA priority capture area in the A42 sewershed covers 1,432 acres of land. There are 3,241 vacant lots within this priority area totaling 353 acres. Ultimately, 25% of the PWSA Priority Area in these project communities are vacant lots. A42 Grounded GSI Liaisons collected 362 community surveys throughout the sewershed.

Further insights about the data collected is presented in subsequent sections of this report.

Finally, to demonstrate potential ways that GSI can be integrated into community landscapes, Grounded worked with community partners to install seven (7) GSI demonstration projects, designed expansions for two of those seven projects, and completed a concept design for a project in Lincoln Lemington Belmar in partnership with the City of Pittsburgh. Currently installed Grounded GSI demonstration projects capture and divert 840,118 gallons of stormwater Annually. However, if all Grounded GSI projects were to be fully executed and brought on-line, Grounded GSI features would capture and manage over 1.2 million gallons of stormwater every year.

Conclusions & Recommendations

During the course of the Grounded GSI Project, a number of important points of understanding became evident and are more thoroughly discussed in subsequent sections of this report. Overarching summary points about conclusions and recommendations that can be drawn from the Grounded GSI project are presented below.

- Partner and site selection for community scale GSI is a lengthy and engagement intensive process that is central to project success.
- Site character is a primary determinant for deciding what types of projects will work well in a community.
- While lower budget community scale projects offer lower capture rates, they are highly impact

ways to engage residents in the process through hands on learning.

- Sustainable maintenance planning is the number one priority of residents and project partners.
- Engaging residents in the project by asking them to share their personal stormwater stories is the best way to get buy in and interest from those living in project communities
- GSI can be used as a catalyst to drive residents to take action on other environmental justice issues.
- Tech learning curves should be addressed and mitigated when educating communities about technical subjects such as stormwater management infrastructure.
- Cost will always be a barrier for residents attempting to address stormwater issues on their own properties, especially for low-income residents living in distressed communities.
- Clear and appropriately scaled GSI design and implementation policies are needed for the Pittsburgh region in order to make the execution of these projects more effective and efficient.
- Policy makers and agencies should strategize on how to help residents assess and address stormwater management issues on their own properties that are contributing to larger over-capacity problems in the combined sewer system.
- Fellowship based outreach events with food and opportunities to socialize are more highly attended and more effective than lecture styled outreach tactics.

Next Steps

Following the completion of the Grounded GSI project, Grounded stands poised to:

- Utilize the PWSA priority area vacant lot locational data for the O27 and A42 to identify and select parcels to undergo site specific suitability analysis for GSI feature installation;
- Pursue the execution of additional Grounded GSI demonstration projects on priority parcels;
- Launch the Grounded GSI project in other Pittsburgh priority sewersheds as identified by PWSA;
- Share survey data analysis with municipal authorities and work to provide insights into GSI execution and maintenance policy development;
- Pursue the full execution of Grounded GSI demonstration projects to bring all projects full on-line and obtain total design capture; and
- Work with PWSA to site, design, and execute new Grounded GSI demonstration projects.

Grounded GSI Marshall-Shadeland Workday at Providence Connections

INTRODUCTION

GROUNDED STRATEGIES

Grounded works to improve the social, economic, and environmental health of distressed communities by building capacity through collaborative greenspace and land use projects. We mobilize residents, policy-makers, and like-minded organizations to ensure communities have the resources, knowledge, tools, and partners to make change happen in the places they live, work, and play.

PROJECT OVERVIEW

The Grounded Strategies Green Stormwater Infrastructure (GSI) Project demonstrates how green solutions can be used to address both pressing stormwater issues and community greenspace needs. We listen to residents to understand the types of openspaces desired in project communities, and show underutilized space can be used to create these creative community spaces and to reduce stormwater runoff.

In the process of sharing knowledge of stormwater management issues, helping communities understand combined sewer overflows, and building green stormwater infrastructure demonstration projects, the Grounded GSI project organically elevates the voices of passionate and active residents communities within regional infrastructure investment discussions. Grounded normalizes the terminologies of sustainability by building literacy and awareness around urban infrastructure challenges, and showing residents how issues of environmental justice affect their everyday lives. Armed with a deeper understanding of the issues, residents are transformed into stormwater champions poised to make meaningful and long lasting contributions to large scale infrastructure discussions.

Purpose

The City of Pittsburgh and many surrounding municipalities operate on a combined sewer system. In a combined sewer system, waste water flushed from our homes and businesses mixes with rainwater flowing into our storm drains. The mixture travels in a single pipe headed to the sewage treatment plant. When it rains, these pipes can fill to capacity, causing a mix of stormwater and sewage to overflow of into our rivers and streams: these are called combined sewer overflows, or CSOs. PWSA and ALCOSAN are currently under a consent decree which stipulates that the authorities must develop and enact a solution to reduce the level of non-point source pollution caused to our rivers and streams by combined sewer overflows.

Grounded Strategies' Green Stormwater Infrastructure (GSI) project advocates for the use of green solutions to capture stormwater while creating valuable community green spaces for everyone to enjoy. While the stormwater management resiliency dialogue is extremely prevalent in the region, especially so with an unusually high average rainfall this season, there remains a disconnect for many in understanding the force behind the issue. Crafting and executing a strategy to reach, inform, demonstrate, and engage the public about the CSO issue and green solutions can be a daunting task. Poor messaging can leave residents without a clear understanding of this critical issue that affects them every day. This, in turn, leads to a diminished sense of urgency and makes it difficult for individuals to imagine themselves as part of the solution. Additionally, large infrastructure investments have historically been dictated from the top down, and have often left the most vulnerable communities divested, saturated with environmental nuisances, and with little to no decision making power about the nature of the public investment.

Grounded's GSI Project aims to empower residents with the language of sustainability and the technical knowledge of the issue so they can effectively advocate for infrastructure investments that bring equitable development to Pittsburgh neighborhoods. We target communities with high concentrations of vacant land, as this is a prime opportunity for reclamation using GSI; and seek to support communities of color, communities suffering from economic disenfranchisement, and communities lacking adequate access to outdoor public space and play areas.

Grounded GSI

Partnerships & Collaborations

Brightwood Civic Group

New Hope Church

Holy Ghost Catholic Church

St. John The Baptist Church

Christian Fellowship Center Church

St. Thomas Lutheran Church

Cafe on the Corner

Pressley Ridge School

Brighton Heights Citizens Federation

St. Thomas Lutheran Church

New Life Family Worship Center

Blessed Nunzio Sulprizio Shrn

All Saints Episcopal Church

Hosanna Church

Allen Church AME Church

St. George Ukrainian Catholic

Risen Lord Parish

Brighton Heights Lutheran Church

St. Cyril of Alexandria Church

Morrow Elementary School

Pittsburgh Morrow 5-7 Campus

Observatory Hill, Inc

Pittsburgh Seventh Day Adventist

Riverview United Presbyterian Church

Incarnation Catholic Parish

Archeparchy of Pittsburgh

Perry Hilltop Citizens Council

Homewood Children's Village

Operation Better Block

Allegheny County Conservation District

3 Rivers Wet Weather

Larimer Consensus Group

Allegheny Land Trust

Pittsburgh Parks Conservancy

Nine Mile Run Watershed Association

Negley Run Watershed Task Force

Pennsylvania Resources Council

East Hills Consensus Group

Lincoln Lemington Belmar Consensus Group

Javier Soto of the Miami Foundation

Winchester Thurston School

Stormworks

Process

The Grounded GSI project followed a multi-step process of community engagement, data collection, and demonstration in order spread knowledge about green stormwater infrastructure best practices at the grass roots level. This process is detailed in the following pages.

Connect with Community Organizations

Imagine an organization trying to tackle a complex problem such as combined sewer overflows on their own. Now, imagine an organization using existing community partnerships to fully understand the current stormwater management landscape in order to provide a comprehensive engagement experience and to build a strong foundation for community action. Grounded has found that the second approach to be the most impactful way to advocate for green stormwater infrastructure solutions that serve multiple community needs.

Since 2016, Grounded has worked with a host of community partners to share information about stormwater issues in the region, to exchange ideas and approaches to solving these problems, and to connect residents in project communities to resources to help address and advocate GSI in their communities moving forward.

A key part of the success of the Grounded GSI project was the ongoing collaborative relationship with the Pittsburgh Water and Sewer Authority beginning during project development and discovery. A comprehensive approach to using green infrastructure to address stormwater management issues necessitated a thorough understanding of the goals and plans of the municipal authority charged with managing stormwater in the City of Pittsburgh. Grounded strengthened the existing relationship with PWSA by meeting with agency staff, sharing and vetting potential locations for demonstration projects, including them as panel experts and presenters at outreach events, participating in PWSA GSI design charrettes and plan reviews, and finally by sharing the results of our community stormwater survey to provide PWSA a grass-roots "check" on their stormwater project priorities.

Gather and Review Stormwater Data

In 2016, PWSA released a draft version of the City-Wide Green First Plan. The Green First Plan is the City's road map to improving stormwater management infrastructure throughout Pittsburgh while implementing a commitment to putting "green first" and prioritizing green stormwater

infrastructure in a strategic and tactical manner. The plan outlines the analysis of Pittsburgh's stormwater management issues and needs and prioritizes areas of actions. An outcome of the plan was the delineation of areas of the city where PWSA would focus on using green infrastructure to manage stormwater. These areas, referred to as PWSA Priority Capture Areas, form the base layer of Grounded's community stormwater survey analysis. By taking a look at what is happing on the ground in these priority areas, Grounded has been able to identify areas where PWSA priorities and community priorities overlap.

While working in the A42 Sewershed, Grounded joined a coalition of partners working to advocate for and implement green stormwater solutions in Pittsburgh's Negley Run Watershed. As part of the Negley Run Watershed Task Force, Grounded participated in collaborative discussions around microshed planning as a solution for GSI implementation at scale. As delineated in the Negley Run Microshed Plan, the grand concept is for individual residents to work together to collectively divert the stormwater from their block into a larger conveyance system that would ultimately release stormwater into the rivers. While PWSA and the Army Corp of Engineers are in the midst of developing alternative designs for this system, Grounded has taken this concept and tested in one of our demonstration projects by disconnecting a series of town home downspouts and redirecting flow into a communal rain garden array.

Recruit and Hire Stormwater Liaisons

The Grounded GSI Neighborhood Liaison program turns engaged residents of project communities into green stormwater infrastructure champions. Liaisons are the first line of outreach and authentic connectivity to the neighborhoods served by our work. Throughout the program, Liaisons learned about stormwater management issues and GSI, engaged in direct outreach and education activities, and served as a feedback loop for community desires about the location and types of GSI desired by collecting data. Liaisons completed 15 hours of work per month for a 10-month period. Liaisons were compensated for their time and passion through a taxable monthly stipend of $225.

Training Liaisons as Stormwater Advocates

As part of the GSI Neighborhood Liaison program, Liaisons participated in a 4-week training series to learn about the Grounded GSI Project, pertinent stormwater issues, and the benefits of green stormwater infrastructure. Session topics included:

- Session 1: Introduction to "The Problem"
- Session 2: Solutions + Co-benefits
- Session 3: Grounded GSI, Liaison Roles
- Session 4: Stormwater Management Best Practices Expert Panel

Liaison training continued throughout the duration of the project. Ongoing training activities included a field trip to ALCOSAN, GSI expert round tables, and individual research assignments.

Engage Communities & Residents

Equipped with knowledge about CSOs and green stormwater infrastructure, Liaisons engaged in a variety of outreach and engagement activities to share what they learned with their community. Activities included presenting at community meetings, tabling at community events, and engaging residents through social media and door-to-door outreach.

Grounded GSI Neighborhoos Liaison Program Expert Panel

Implement Grounded GSI Community Survey

Grounded Strategies GSI Liaisons spent the bulk of their time in the program implementing a Community Stormwater Survey. Project area residents were asked to share their favorite open spaces, locations and descriptions stormwater management problems in their communities, and finally, ideas about the types of green spaces needed in their communities. Data collected was overlayed with PWSA priority areas in an effort to identify overlaps between reported stormwater liabilities and opportunities to increase a community's open space portfolio.

The Grounded Stormwater Survey was implemented in nine Pittsburgh project neighborhoods across two sewersheds. The O27 survey was implemented in the winter of 2016 to the spring of 2017. The A42 Survey was implemented in the fall and winter of 2018. Survey results for each community have been provided in the subsequent sections of this report. Both survey rounds tried to get at the heart of two questions: (1) Where and what types of GSI are preferred by residents, and (2) What additional community desires may be coupled with GSI investments.

Where and What Types of GSI are Preferred by Residents?

By understanding where and what types of GSI residents prefer, Grounded has been able to aggregate responses by community to provide guidance to agencies and organizations seeking to install GSI features within these nine project neighborhoods. Infrastructure decisions such as stormwater management that affect the daily lives of residents must include their voices. Environmental justice demands that those historically and habitually left out of these decisions be pushed to the forefront, and their input and critique valued and adhered to at the highest levels. By gathering this type of information at the individual scale, Grounded can provided a more holistic reflection of community needs for partners, community leaders, and municipal authorities.

What Additional Community Desires May Be Coupled With GSI Investments?

The second concept captured in the Grounded GSI community survey is the idea that green infrastructure can be designed into other outdoor amenities to create additional value for communities while expanding their greenspace inventory. It is well proven that living in close proximity to greenspace has benefits for the health, happiness, and wellbeing of residents. To understand the co-benefits sought by residents, Grounded included very candid questions

O27 Sewershed Community Survey

STORMWATER SURVEY: MARSHALL-SHADELAND

gtech

Green stormwater infrastructure can capture and filter stormwater before it becomes a problem. Below are some photos of examples. Circle no more than two images below to show what kinds of green stormwater infrastructure you'd most like to see in your neighborhood.

Where would you like to see green infrastructure in your neighborhood? Please write the place name, street address, or intersection.

What other kinds of outdoor spaces could your neighborhood benefit from? Check your top two choices.

- ❑Spaces for kids to play
- ❑Flower gardens
- ❑Small parks
- ❑An area to display art
- ❑Neighborhood gateway or welcome sign
- ❑Vacant lots could be cleaned up
- ❑Other_____

Optional: If you are interested in staying informed about this project, please leave your contact info here.

Name_____

Email_____

Phone ___ ___ - ___ ___ - ___ ___ ___ ___

Comments or questions?

STORMWATER SURVEY: MARSHALL-SHADELAND

gtech

Which neighborhood do you live in?
❑Brighton Heights ❑Marshall-Shadeland ❑Observatory Hill ❑Perry Hilltop Other_____

Where in your neighborhood have you noticed stormwater issues like flooding, flooding in basements, and erosion? Circle or star the areas on the map where there are stormwater issues and write a brief explanation in the notes section below.

Notes:

A42 Sewershed Community Survey

GTECH Green Stormwater Infrastructure
Community Survey - East Hills

Name: Phone Number:

Email: Interested in volunteering? Y N

1) Where is your favorite outdoor space in your neighborhood? Why?

2) What type of outdoor spaces and amenities are needed in your neighborhood?
(Check all that apply)

- ☐ Playspaces for Children
- ☐ Flower gardens
- ☐ Small Parks
- ☐ Public Art
- ☐ Signage
- ☐ Public Plazas/Performance Spaces
- ☐ Exercise/Recreational Activities
- ☐ Other _____

3) When it rains, do you experience any problems on your property or street?
(Check all that apply)

- ☐ Wet basement
- ☐ Sewer/basement backups
- ☐ Pooling/ponding water
- ☐ Springs/streams
- ☐ Flooding
- ☐ Other _____

4) Have a great idea or specific issue? Tell us!

GTECH GSI
ENGAGING COMMUNITIES WITH GREEN STORMWATER INFRASTRUCTURE

GTECH GSI
ENGAGING COMMUNITIES WITH GREEN STORMWATER INFRASTRUCTURE

East Hills

Legend
- Priority Areas
- Negley Run Sewershed
- Landmarks

1. Crescent Elementary School
2. Imani Christian Academy
3. East Hills Park
4. East Hills Community Center

these preferences within the community survey. Using this data, we have been able to aggregate the results by neighborhood, providing a valuable reference for those engaged in greenspace creation in the nine project communities.

While reviewing the survey response analysis for both the O27 sewershed and the A42 sewershed, it will become apparent that the survey questions were slightly altered between implementation cycles. Using our lessons learned from the O27 survey process, the A42 survey was updated in a variety of ways aiming to capture more candid and personal resident feedback.

No selection maximums

Selection maximums have the potential to give a perception of a picking between finite and predetermined options rather than allowing residents to create a unique palette of answers to suit the needs of their community.

No photo choices

Asking residents to choose between a limited number of photos on a short survey as a proxy for their aesthetic preferences led residents to focus more on choosing the prettiest picture rather than reflecting on the context of their community. By removing the photos and including questions specifically about the good parts of their community, it is possible to get a snapshot into how residents already like to spend time outside. With this information, it is possible to create spaces that enhance, reinforce, and reflect those organic open space preferences.

Zero in on personal experiences

Including questions about the way residents currently experience the effects of poor stormwater management helps to personalize survey while creating a data set that can be analyzed for trends between neighborhood and certain types of stormwater management issues. The more specific the data, the more customized the solution can be.

Conduct Outreach and Education

To help residents understand and begin to address the negative effects of stormwater runoff on their property, Grounded hosted a series of GSI community resource roundtables where interested and concerned residents met face to face with partnering stormwater experts and home improvement resource providers in an informal setting. The goal of these roundtables was to identify and provide resource providers and informational materials that help residents address the side effects of stormwater mismanagement (wet basement/mold/flooding/etc.). Grounded sees this as a necessary

Grounded GSI Community Stormwater Roundtable Flyer

addition to broader community education about stormwater, and provides an incentive for residents to get involved once they have a deeper understanding of their own stormwater stories and the green solutions available to help.

Consolidate and Analyze Community Surveys

Grounded GSI Liaisons collected over 700 community stormwater surveys throughout the duration of the project. The success of the Grounded GSI Community Survey can be directly attributed to the passion and dedication of the GSI Liaisons. As liaisons collected surveys, the Grounded team uploaded the results into an excel sheet for aggregation. Survey results and analysis for each project community is provided in subsequent sections of this report.

This report also included a geo-spatial analysis of mapping survey responses collected in the A42 sewershed. Respondents were asked to identify areas in their community that experience frequent stormwater management issues and to mark those areas on the map on the back of the survey. Using these maps, Grounded was able to digitize the mapping responses and create consolidated layers of survey responses using Geographic Information Systems (GIS).

Using GIS, Grounded was able to overlay these layers of respondent identified stormwater issue areas on top of maps of PWSA priority capture areas as put forth in the City-Wide Green First Plan. By overlaying these two layers, Grounded was able to identify specific areas that both PWSA and community residents recognize as stormwater management priority areas.

To go a step further, Grounded then created a unique layer of these overlapping areas, and then completed a GIS analysis to identify vacant lots that fall withing these areas identified as priorities by both PWSA and community residents.

The ultimate result of this analysis is a collection of vacant parcels identified as prime potential project areas for GSI by both PWSA and the community. Ideally, by combining these potential project areas with the desired GSI and open space features desired by residents, municipal authorities and other organizations involved in GSI work can create working stormwater mitigation features that serve a host of co-benefits for the community as a whole.

Share Findings With Community Partners, Policy makers, and Public Agencies

Following the analysis of the community stormwater survey, Grounded will share the results published in this report with project partners, including PWSA. Anonymous project results are available in both excel and shapefile form to be shared with project partners upon request. Mapping data will be shared and uploaded to online repositories of regional stormwater issues, including Three Rivers Wet Weather's stormwater atlas. This project report will remain available on Grounded's website as an ongoing resource.

Demonstrating how GSI can be integrated into community-scale greenspaces

Grounded believes that outreach coupled with immediate action is the best way to help communities gain and sustain momentum around addressing issues of environmental justice. Grounded put this value into practice during the Grounded GSI project by matching Stormwater Liaison education and outreach and the Community Stormwater Survey with tangible, community-scale GSI demonstration

Grounded GSI Community Design Charrette in East Hills

Community Planting Day at Grounded GSI Larimer Demnostration Project

projects designed, planned, and executed with the help of project partners and residents living in the project communities.
Due to a variety of factors including site selection difficulty and funding constraints, not every project community within the Grounded GSI received a demonstration project. However, community involvement was central to the seven (7) executed GSI demonstration projects completed.

First, grounded assessed the PWSA priority capture areas to identify ideal locations for projects that would support the efforts of the agency. Grounded then worked to identify land owning community partners within the PWSA priority areas. For partnerships, Grounded prioritized community organizations owning publicly accessible land with room for GSI installations and a easily accessible source of stormwater runoff. This proved to be a difficult task as much of the vacant land in project communities is privately owned. Additionally, Grounded had to prioritize project sites adjacent to buildings or parking lots for a source of runoff. This is because the cost of accessing street flow via a curb cut is an extensive and expensive process requiring a lengthy permitting process and high cost engineering support that did not align with the time line or budget of this project.

After identifying viable sites, grounded reached out to potential partners, to introduce them to the project and process. Once an organization chose to participate as partners, Grounded hosted a series of community design charrettes at which community residents were invited to learn about green stormwater infrastructure and play an active role in designing a new GSI feature for their community.

Once the community driven designs were vetted and deemed technically sound, grounded worked with project partners to execute the installation of the GSI feature. To do so, Grounded worked with Grounded GSI Neighborhood Liaisons, local contractors, local material suppliers, and neighborhood community volunteers to construct seven operational GSI features.

Following the installation of Grounded GSI demonstration projects, Grounded developed and provided sustainable maintenance plans to project partners to help them care for their new community asset.

Project profiles for Grounded GSI demonstration projects can be found in subsequent sections of this report.

Results & Findings

The following section outlines the results and findings of the Grounded GSI project.

Grounded GSI Project Sewersheds

The Grounded GSI project was executed in both the O27 and A42 sewersheds of Pittsburgh. These two locations were identified by PWSA as priority sewersheds in addressing the City's combined sewer overflow problem. Grounded's work in O27 spanned from 2016 to 2017 while our work in A42 went from 2017 to 2018.

Neighborhood Liaisons

The following section introduces the Grounded GSI Neighborhood Liaisons that participated in the two cohorts, one cohort for O27 and another for A42. Quotes from and pictures of Liaisons are included along with the number of surveys they collected as part of the project.

Community Stormwater Survey Results - Charts

Results from the qualitative Community Stormwater Survey questions are presented in chart form in the following section. O27 qualitative questions differ slightly from those in A42 as explained in the process section of this report.

Community Stormwater Survey Results - Mapping

Maps in the following section show the following:

PWSA Priority Areas
High priority stormwater capture areas published by PWSA

Resident Identified Issue Areas
Locations identified by residents as stormwater problem areas

Vacant Lots in PWSA/Resident Priority Areas
Vacant lots that fall within both a PWSA Priority area and a Resident Identified Issue Area

There are no mapping results provided for the O27 sewershed in the following section. This is because a very small number of survey respondents from O27 responded to the mapping questions. Grounded attributes this disparity to a lack of proper support for Liaisons administering the survey

as well as shortfalls in the formatting in the survey. After work in the O27 sewershed was complete, Grounded amended the survey to address issues of incomplete responses. These alterations resulted in a robust mapping response for the A42 sewershed. Mapping results and analysis for the A42 sewershed Community Stormwater Survey are included in this section.

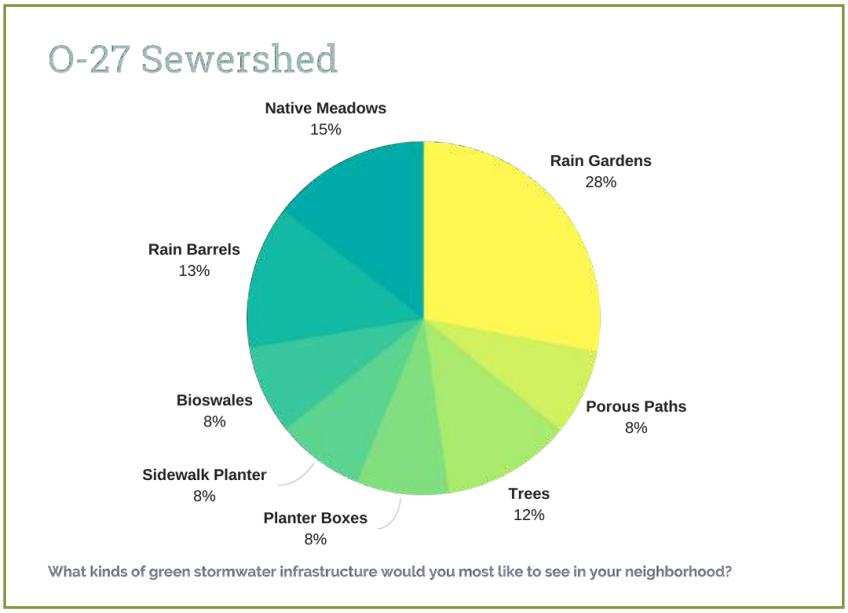
Grounded GSI Demonstration Projects

This section also includes the project profiles for the Grounded GSI demonstration projects completed between 2016 and 2018. Although demonstration project profiles are grouped with the data analysis from their respective communities, the demonstration project process and data analysis process happened in tandem, allowing us to only tangentially integrate community responses into the broader community design process completed with project partners. If repeated, full data collection and analysis should be completed prior to demonstration project site selection.

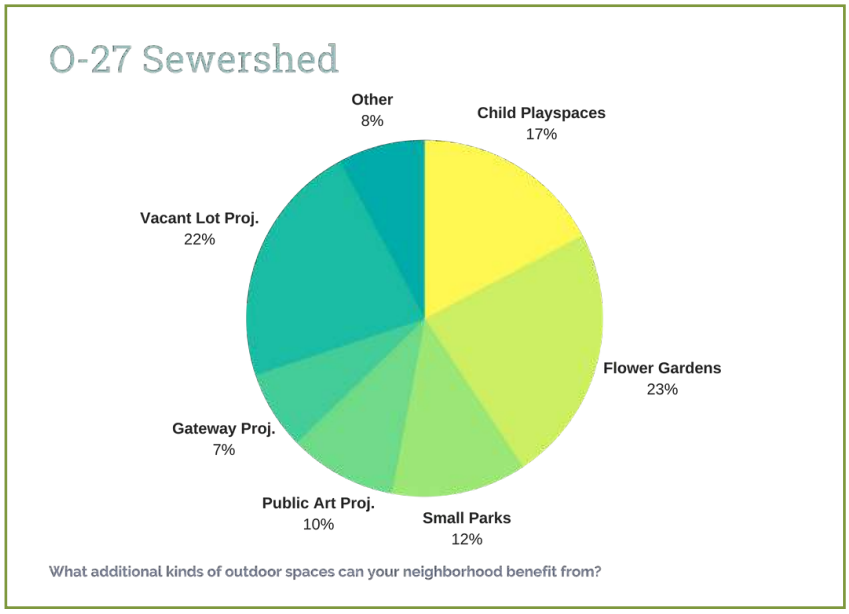
However, this does not mean that both elements do not have value on their own. The Community Stormwater Survey data is an excellent launching point for PWSA, Grounded, and other organizations looking to optimally site GSI features in Pittsburgh communities. Similarly, executed Grounded GSI demonstration projects provided an engaging community design process for residents living around the feature and an example of how GSI could work at the local scale for all other observers.

O27 Sewershed

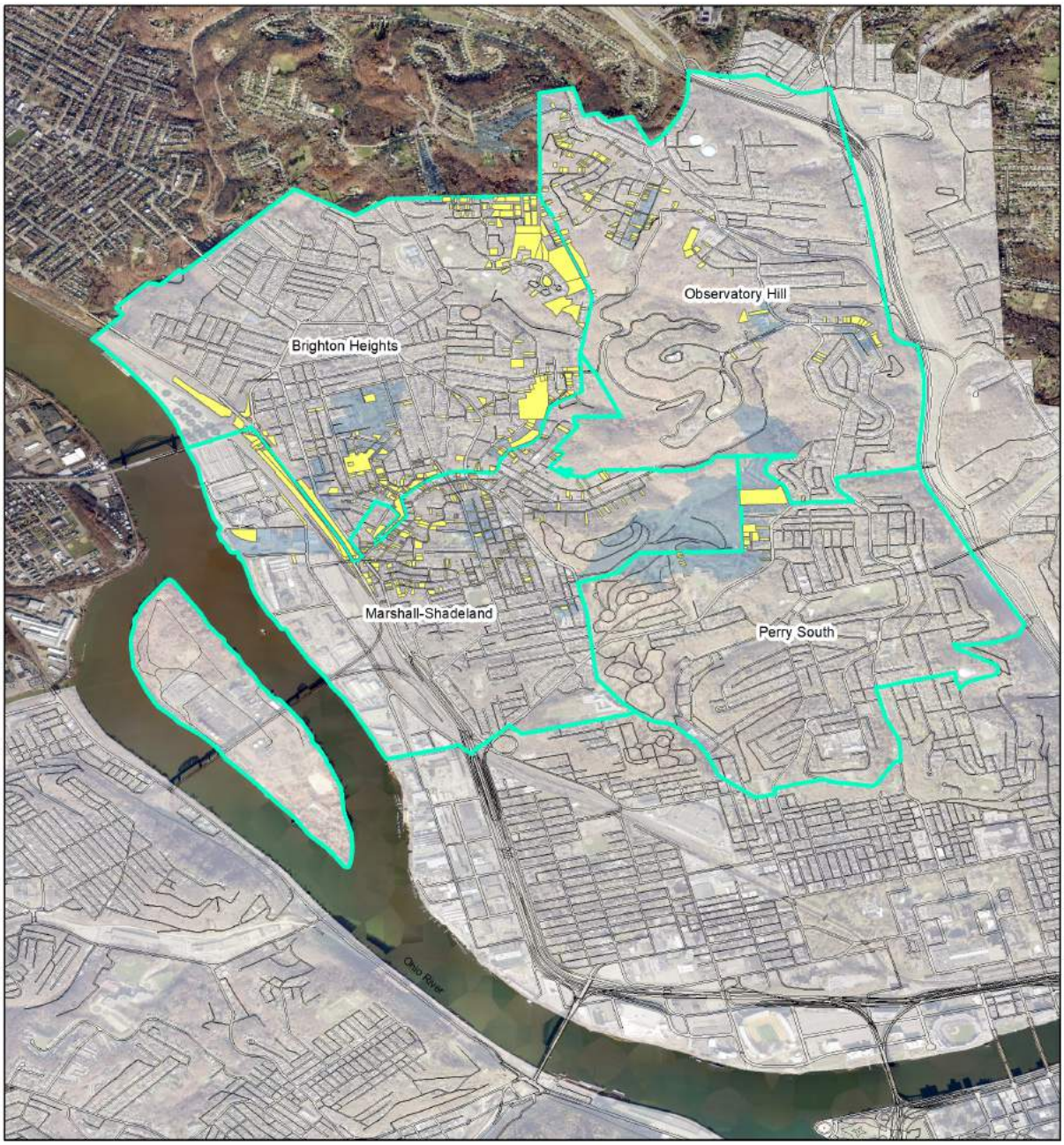
The O27 Sewershed is comprised of four neighborhoods in Pittsburgh's North Side. These communities include Brighton Heights, Marshall-Shadeland, Observatory Hill, and Perry Hilltop. O27 GSI Liaisons collected a total of 343 Surveys. While individualized survey mapping responses are not available for the individual communities, a GIS overlay analysis revealed that there are 740 vacant lots sitting in the PWSA priority capture area in the O27 project communities. The PWSA priority capture area in the O27 sewershed covers 123 acres.



- 28% of survey respondents prefer Rain Gardens over all other types of GSI features.
- Preferences for native meadows were often coupled with comments about regular maintenance and community beautification



- The majority of O27 respondents believe their communities need more flower gardens. Similar to native meadows, this was often a proxy for the desire for well landscaped, regularly maintained streetscapes.



Legend

- O27 Neighborhoods
- PGH Neighborhoods
- Vacant Lots in PWSA Priorty Area (O27 Sewershed)

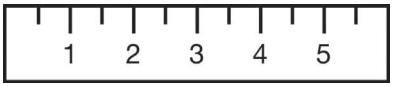
1 inch = 2,500 feet
1 inch = .47 miles

N

027 Sewershed

740

Vacant Lots in PWSA Priority Area



6.34

Acres of Vacant Land in PWSA Priority Area

27%

Proportion of City-Owned Vacant Lots in PWSA Priority Area

BRIGHTON HEIGHTS

Total
Surveys
Collected

113

Brighton Heights is a neighborhood in Pittsburgh, Pennsylvania's northside area. It has a zip code of 15212, and has representation on Pittsburgh City Council by the council member for District 1 (North Neighborhoods). The Western gateway to the neighborhood, Brighton Heights Boulevard, is opposite the McKees Rocks Bridge and accessible via Route 65/Ohio River Boulevard. The Pittsburgh Bureau of Fire houses 35 Engine and 33 Truck (formerly 34 Truck) in Brighton Heights.

Once a predominantly German area, Brighton Heights now has a varied ethnic mix. The community is notable for its solid stately architecture, with many fine early 20th Century homes and churches built of stone and brick, featuring stained glass windows and ornamental woodwork and fireplaces. Because of the high quality and variety of the architecture of the neighborhood, Brighton Heights is one of the regularly featured neighborhoods of Pittsburgh's annual house tours.

"Brighton Heights (Pittsburgh)." Wikipedia, Wikimedia Foundation, 15 Aug. 2018, en.wikipedia.org/wiki/Brighton_Heights_(Pittsburgh).

Favorite Thing About Neighborhood:

Brighton Heights has consistent and strong citizen involvement in community projects, including neighborhood clean-up and community gardening projects. Brighton Heights is also culturally diverse.

Why are you excited about this project?

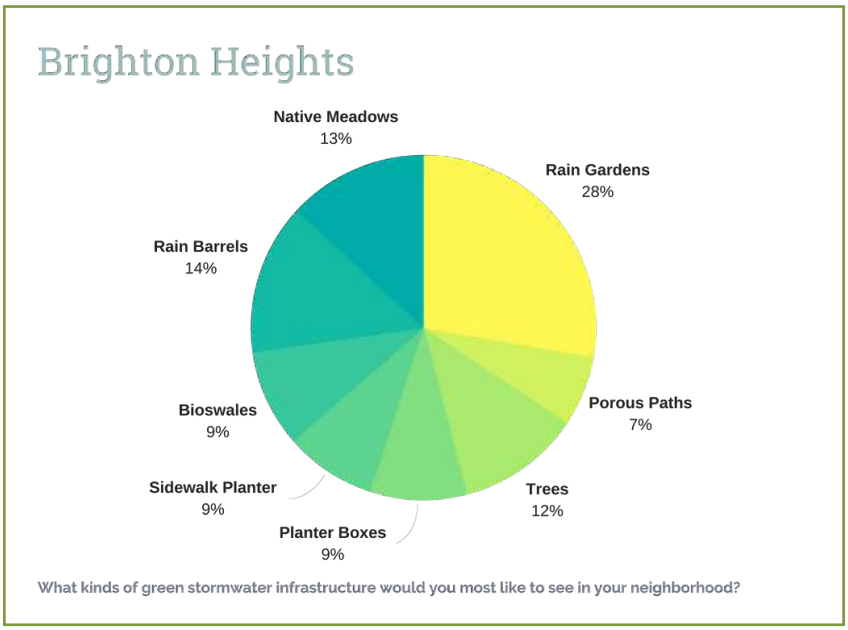
This is a great opportunity for Brighton Heights to improve the quality of existing green spaces and to create new green spaces that assist in stormwater management. This project also provides a great opportunity for residents to contribute to planning discussions, where they can improve the aesthetic quality and ecological integrity of their neighborhood.

What are ways that you are currently involved in your neighborhood?

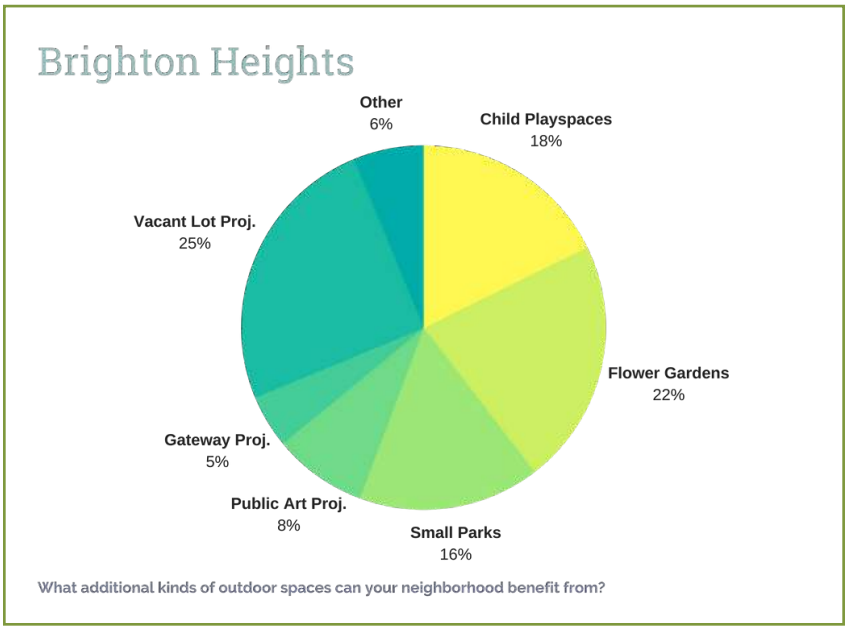
I am a member of the Brighton Heights Citizens Federation, and in the past, I have been involved in a number of community gardening projects. I am also active in my neighborhood block watch program. Last year, I started a landscaping and consulting company called Northside Native Landscapes that focuses on the use of native plants in urban landscapes.

Adam Hnatkovich

Grounded GSI Liaison - Brighton Heights



- Preference types for GSI in Brighton Heights mirror the overall trend in O27.
- Rain gardens remain the most attractive GSI feature for the neighborhood.



- Brighton heights is most in need of flower gardens and playspaces for children. Preference for these two features are shared by nearly half of all respondents.
- 25% of respondents said that vacant lots need to be addressed in their communities.

BRIGHTON HEIGHTS

LOCATION:
Riverview Manor Senior Living Facility

COMMUNITY PARTNERS:
Landforce
FedEx Ground
Accenture

HARD COSTS:
$5,762

GALLONS OF STORMWATER CAPTURED ANNUALLY:
18,152 gallons

FedEx Ground volunteers build the frame of a planter.

FedEx Ground volunteers attach a pond liner material to the frame.

Two completed flow-through planter boxes.

PROJECT DESCRIPTION

Riverview Manor is a low income senior living community under the National Church Residences umbrella. The residence is in a primarily residential area right next to the Pittsburgh Morrow public school. Grounded worked with Riverview Manor residents on a plan to disconnect their outdoor pavilion downspouts and remove the runoff from Pittsburgh's overburdened combined sewer system. Grounded worked with residents and volunteers to design and construct two large ow through planters filled with gravel and infiltrating piping to slow down and store rainwater. As water runs o the roof, it is channeled through disconnected downspouts into beds of planted soil. The planters serve the dual benefit of beautifying the picnic area and relieving pressure of the stormwater management system.

The co-benefit to the Riverview Manor project was the rehabilitation on of the senior centers fenced in garden. Planted green spaces such as these in urban environments serve to balance the amount of hard scape in the city, naturally capturing and infiltrating stormwater. However, when green spaces are not maintained, they can become eyesores and community liabilities. Grounded helped to breath new life into the Riverview Manor garden by constructing a walking path to circle a newly planted wild flower meadow. Additionally, Grounded carved out space in the plan for bench seating protected from the sun by newly installed shade sails. Now, residents can relax in their garden while enjoying little league baseball games played in the adjacent middle school field.

Residents expressed their deep appreciation of their GSI project, noting that open space upgrades have made the residence "feel more like home."

MARSHALL - SHADELAND

Total
Surveys
Collected

85

Marshall-Shadeland is a neighborhood on Pittsburgh, Pennsylvania's North Side. It has a zip codes of both 15212 and 15214, and has representation on Pittsburgh City Council by the council member for District 1 (North Neighborhoods).

The neighborhood is a largely residential area that was annexed by Allegheny City in 1870. It is bordered by Woods Run Avenue on the north, Marshall Avenue on the south, and Riverview Park, Highwood Cemetery, and Uniondale Cemetery on the east. The neighborhood technically extends west to the Ohio River, but in practice the residential district ends at California Avenue. The area between California Avenue and the Ohio River is an industrial site and the home of the Woods Run Penitentiary, now known as State Correctional Institution – Pittsburgh.

"Marshall-Shadeland, Pittsburgh." Wikipedia, Wikimedia Foundation, 15 Aug. 2018, en.wikipedia.org/wiki/Marshall-Shadeland,_Pittsburgh.

Favorite Thing About Neighborhood:

I love the diversity of my neighborhood.

Why are you excited about this project?

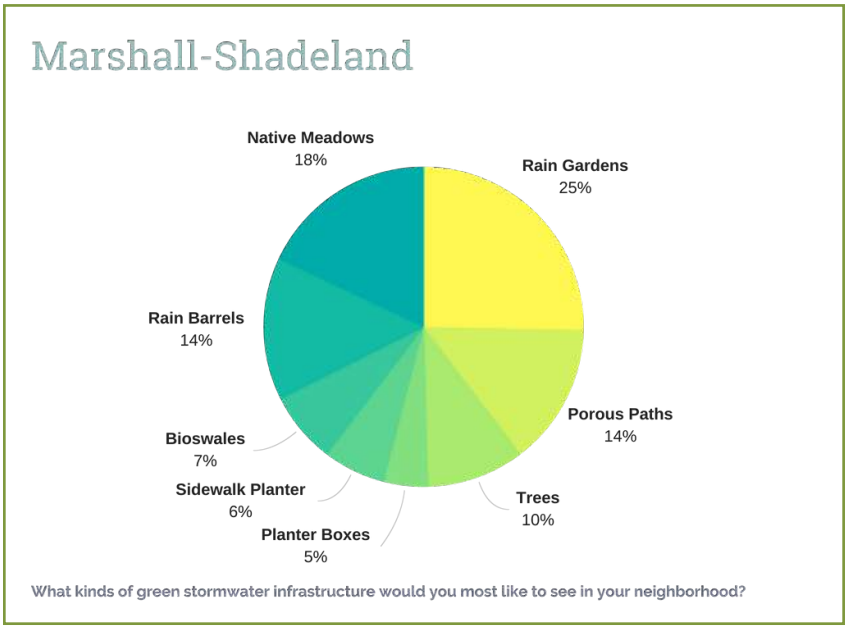
I am excited to learn how this project can enhance my neighborhood by taking a look at the ways stormwater affects foundations and sewage systems in our neighborhood, and how residents can respond to the various issues in our neighborhood. I'm excited about possibly doing a project to enhance what is already going on in the neighborhood such as the new housing that will be coming to Woodland Avenue.

What are ways that you are currently involved in your neighborhood?

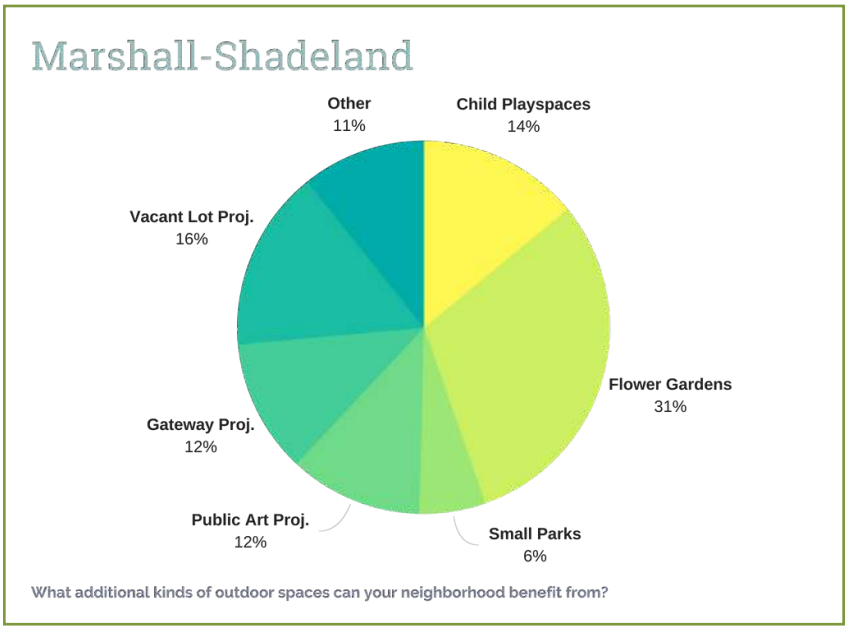
I am a board member of the Brightwood Civic Group and sit on the Housing Committee. I try to ensure that people are aware of what's going on in the community by doing community outreach and community engagement activities on a regular basis. I just received a "Free Little Library" and hope to place this in the neighborhood where residents can have access to books and encourage people to read and interact with each other.

Ginger Underwood

Grounded GSI Liaison - MARSHALL-SHADELAND



- Marshall-Shadeland had the highest percentage of respondents to prefer rain barrels. While providing for meager capture, rain barrels are a powerful visual reminder of good stormwater management.



- Over a third of Marshall-Shadeland respondents said that their community is most in need of flower gardens., once again pointing to the need for well landscaped and aesthetically pleasing public spaces.

MARSHALL-SHADELAND

LOCATION:

Providence Connections, Inc.

COMMUNITY PARTNERS:

Landforce
Carnegie Mellon University,
Winchester Thurston

HARD COSTS:

$6,500

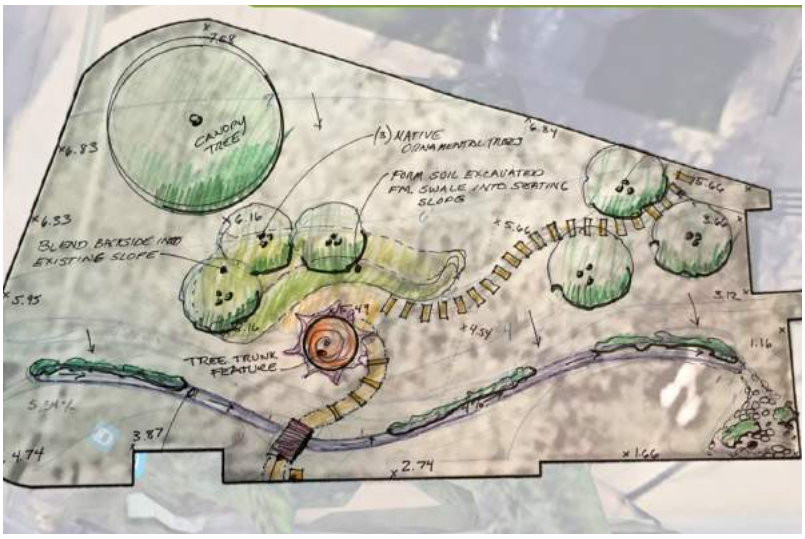
GALLONS OF STORMWATER CAPTURED ANNUALLY:

39,216 gallons*

PROJECT DESCRIPTION:

Providence Connections, Inc. is a community support center that functions to strengthen families and enrich lives through comprehensive education and developmental opportunities for parents and children on Pittsburgh's North Side. As a family and youth oriented neighborhood landmark in one of our target communities for green stormwater infrastructure, partnering with Providence Connections meant re-framing the GSI message for younger ears. Grounded hosted an adult design charrette as well as a charrette with students to identify how green stormwater management could come to life on campus in a fun and interesting way.

To start, Grounded excavated and planted a linear rain garden fronting Brighton Rd. The excavated swale was backfilled with a sand-gravel mixture to retain stormwater and slowly release it into the ground below.



The extra fill from the excavation was used to create a seating area around a newly installed educational gnome home feature shaded by newly planted trees.

If expanded using a curb cut to capture additional flow from the adjacent street, the swale is estimated to manage a total of 209,000 gallons of stormwater annually.*

OBSERVATORY HILL

Total
Surveys
Collected

73

Favorite Thing About Neighborhood:

Riverview Park, it's the focal point of Observatory Hill. Inside the park we celebrate, network, walk the trails, enjoy the dog park with our pooches and on a clear night, we go to the Observatory to gaze at the stars or to watch fireworks. It's where my neighbors/ residents come together, Riverview is the common bond between the residents. We are Riverview Park Strong!

Why are you excited about this project?

First, this is a learning process for myself as I wasn't completely aware of stormwater and it's true effect on society overall. I'm excited to be able to bring this awareness to the residents of Observatory Hill and hopefully have real dialogue on how we can make a difference in cleaning our water, structuring ideas about our infrastructure and teaching our children about how they can also contribute.

What are ways that you are currently involved in your neighborhood?

I'm currently the Vice President of Observatory Hill Inc, our community board organization. I serve as the Chairperson and Project Lead in the revitalization of our business district along the Perrysville Ave corridor, in addition to Serving as the Board's Committee Chair for our community by doing community outreach and community engagement activities on a regular basis. I just received a "Free Little Library" and hope to place this in the neighborhood where residents can have access to books and encourage people to read and interact with each other.

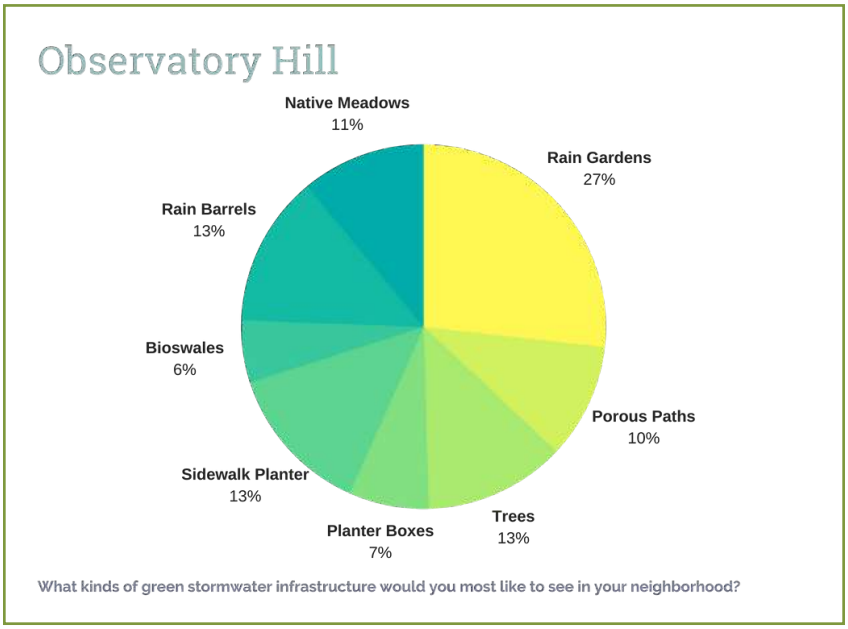
Observatory Hill (also known as Perry North) is a neighborhood in Pittsburgh, Pennsylvania, USA's north city area. It lies within zip codes 15212 and 15214, and has representation on Pittsburgh City Council by the council member for District 1 (North Neighborhoods). The highest elevation in Pittsburgh is 1,370 feet at the Brashear Reservoir at the top of Observatory Hill.[2] The Pittsburgh Bureau of fire houses 34 Engine in Perry North.

Observatory Hill was originally part of Allegheny City. Since Allegheny City's annexation to the city of Pittsburgh in 1907, the Observatory Hill district has expanded and is home to nearly 14,000 residents. The neighborhood has stately homes, a business district, Riverview Park, and the Allegheny Observatory.

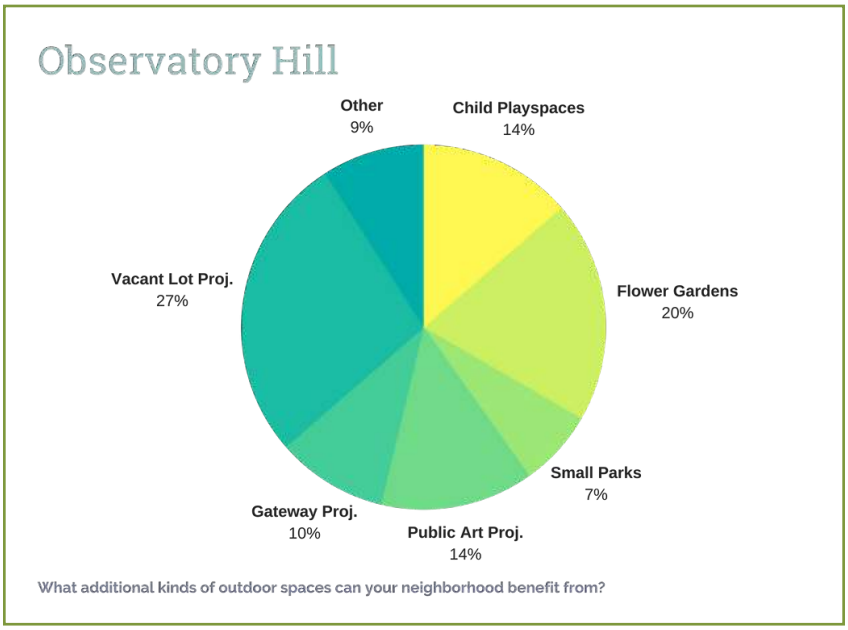
"Perry North (Pittsburgh)." Wikipedia, Wikimedia Foundation, 15 Aug. 2018, en.wikipedia.org/wiki/Perry_North_(Pittsburgh).

Dorrie Smith

Grounded GSI Liaison - OBSERVATORY HILL



- Over a quarter of respondents would like to see more rain gardens in Observatory Hill. Nearly 40% of respondents prefer to see either rain barrels, sidewalk planters, or trees used for stormwater management.



- 27% of Observatory Hill respondents say that their community is most in need of additional vacant lot cleanups.

OBSERVATORY HILL

LOCATION:

Riverview United Presbyterian Church

COMMUNITY PARTNERS:

Landforce
Keys Service Corps
University of Pittsburgh Engineers Without Borders
Iron City Excavation

HARD COSTS:

$11,000

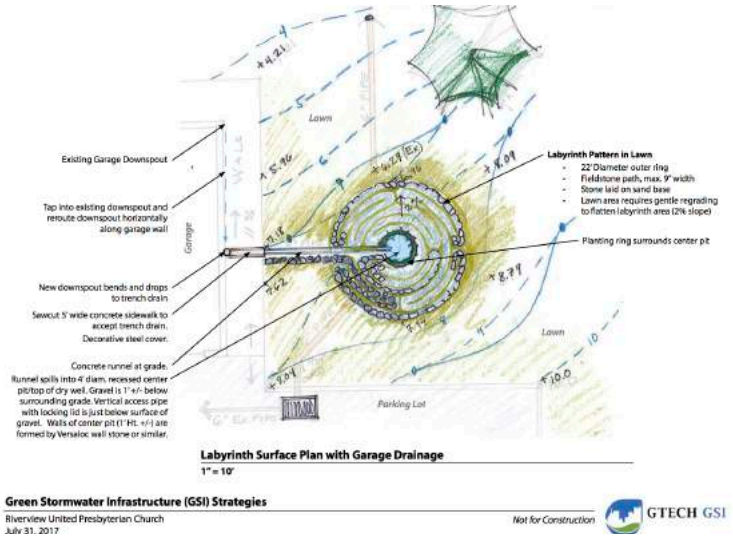
GALLONS OF STORMWATER CAPTURED ANNUALLY:

125,000

PROJECT DESCRIPTION:

Riverview United Presbyterian Church is a community-oriented congregation adjacent to Riverview Park. Along with being a sacramental congregation, the church houses a weekly food bank and thrift store and non-profit office space. Riverview United is a visible symbol of community sandwiched between Riverview Park and highly utilized Perrysville Avenue. A major stormwater issue at Riverview United was ill sited and misdirected downspouts that pull rainwater from the large roof. Many of these downspouts were broken and the water was not properly channeled away from the building. Over time, this caused flooding and moisture problems in the basement of the church. To address this, Grounded worked with University of Pittsburgh Engineers Without Borders to install a large cistern along the street facing side of the building. The cistern connects to existing downspouts, stores the runoff, and channels the overflow into a planted and mulched area surrounding Riverview United's peace pole feature.

The second and most prominent green stormwater infrastructure feature on the site is an engaging labyrinth feature sited just behind the church's parking lot. Before, all runoff from the parking lot was channeled directly into a storm drain on the site.



Grounded worked to re-direct this flow of water out of the sewer system and into an underground gravel basin beneath the surface of the labyrinth. The gravel basing allows the slow release of stormwater into the ground. The labyrinth feature includes a depressed center meant to fill with water during rain events.

This source of water will flow from an additional disconnected downspout on the side of the garage channeled through a dry stream to the central feature. Thanks to all of the work done by Riverview United patrons and volunteers, he labyrinth will act as a community gathering space and a symbol of refuge and serenity for years to come.

Total
Surveys
Collected

72

Favorite Thing About Neighborhood:

The people, and particularly, the children. Northside has been my home for all my life. I was born and raised in Central Northside. My husband and I purchased a home in Perry Hilltop in 2003. I have a passion for education and social justice. I've watched my neighborhood (Northside) go through transformations that are not in the best interest, or "healthy", for it's most indigenous residents. My work is to change that, especially for African American children.

Why are you excited about this project?

Initially, to work in my neighborhood as a community liaison. As I became more familiar with Grounded's mission for this project, I see the potential to raise awareness about stormwater (erosion, etc.) and how Perry Hilltop residents can be involved in the process. Moreover, I like providing service to my community in meaningful ways!

What are ways that you are currently involved in your neighborhood?

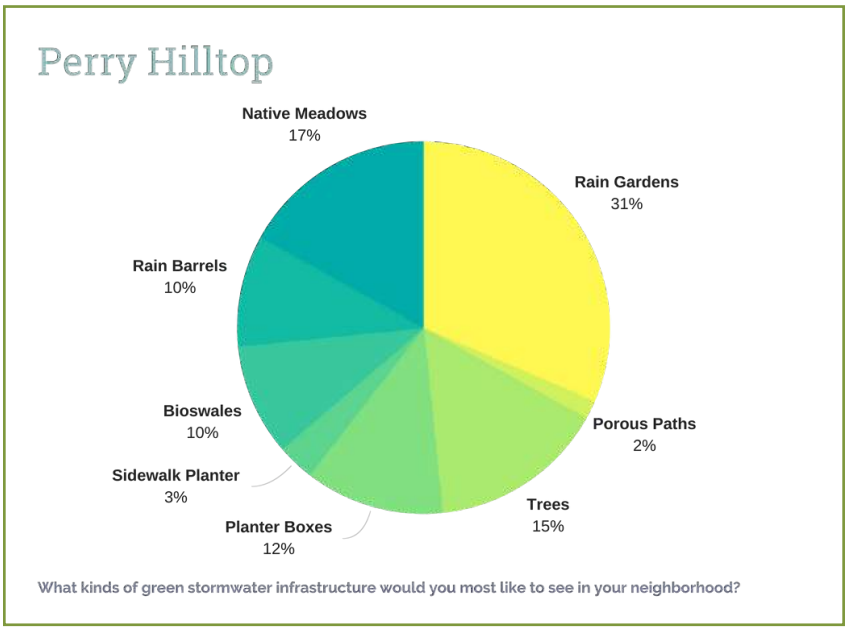
I'm involved in many aspects of education and politics. My husband and I are committee people in our community. I work closely with the Pittsburgh Public School District on equity. I also do community activism work through philanthropic initiatives (Heinz Endowments, Buhl Foundation, Sprout Fund). I am a youth and parent organizer. Finally, I work as a consultant with the PA Department of Education to promote parent engagement in more meaningful ways in Pittsburgh and throughout the state.

Perry Hilltop (also known as Perry South) is a neighborhood on Pittsburgh, Pennsylvania's North Side.
The neighborhood takes its name from Perrysville Avenue, which "was a part of the Venango trail, an Indian path leading north of 'Allegheny Town'. Commodore Perry used the Trail to carry supplies from Pittsburgh to Erie for his lake battle against the British during the War of 1812." Perrysville Avenue is an extension of Federal Street, the main north-south thoroughfare of old Allegheny City. Federal Street ends, and Perrysville Avenue begins, where the flat river plain gives way to a steep hill. Perry South is thus a hilltop neighborhood that runs along Perrysville Avenue from the river plain (on the south) to Riverview Park (on the north). The hill on which the neighborhood is built provides natural borders to the west (the Charles Street valley), to the east (the East Street valley), and to the south (Pleasant Valley). The neighborhood was developed as a streetcar suburb, so it consists almost exclusively of residential housing, with a small business district at the intersection of Perrysville Avenue and Charles Avenue. It experienced white flight after 1960: from 1960 to 1970, the neighborhood's total population declined from 16,000 people to 13,000, while its African-American population, which had formerly been located almost exclusively in the Charles Street valley, increased from 15% to 20%.

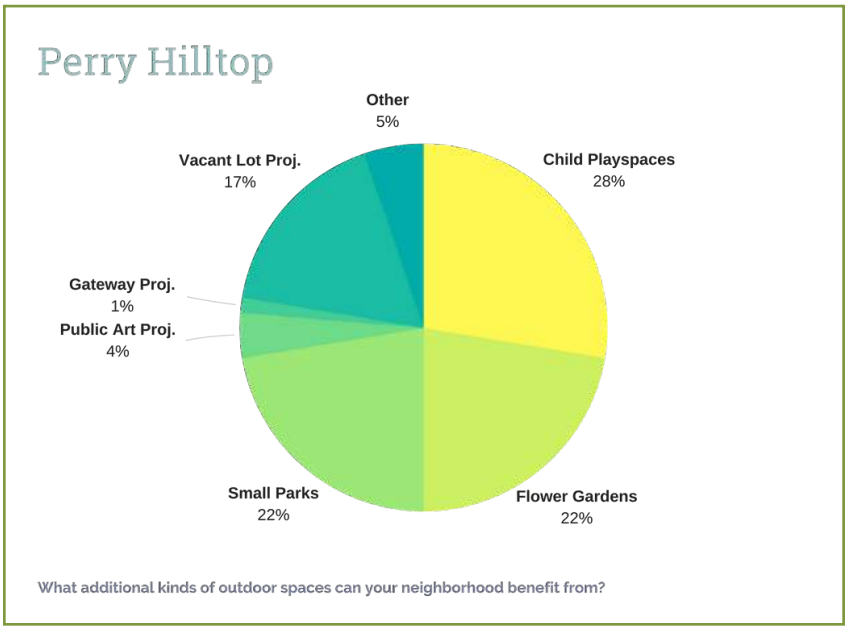
"Perry South (Pittsburgh)." Wikipedia, Wikimedia Foundation, 15 Aug. 2018, en.wikipedia.org/wiki/Perry_South_(Pittsburgh).

Maria Searcy

Grounded GSI Liaison - PERRY HILLTOP



- 31% of Perry Hilltop respondents prefer rain gardens over other forms of GSI.
- Native meadows and trees ranked second and third respectively.



- Places for children to play was ranked as the type of open space most needed in the Perry Hilltop community.

PERRY HILLTOP

LOCATION:

Neighborhood Resident Homes

COMMUNITY PARTNERS:

Pennsylvania Resources Council

Riverview United Presbyterian Church

HARD COSTS:

$4,000

GALLONS OF STORMWATER CAPTURED ANNUALLY:

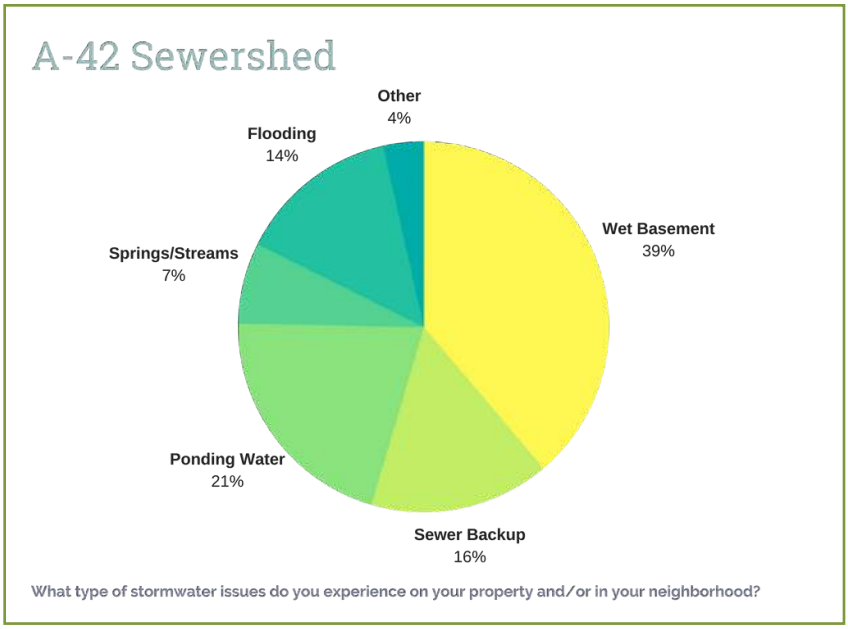
123,750 gallons*

PROJECT DESCRIPTION:

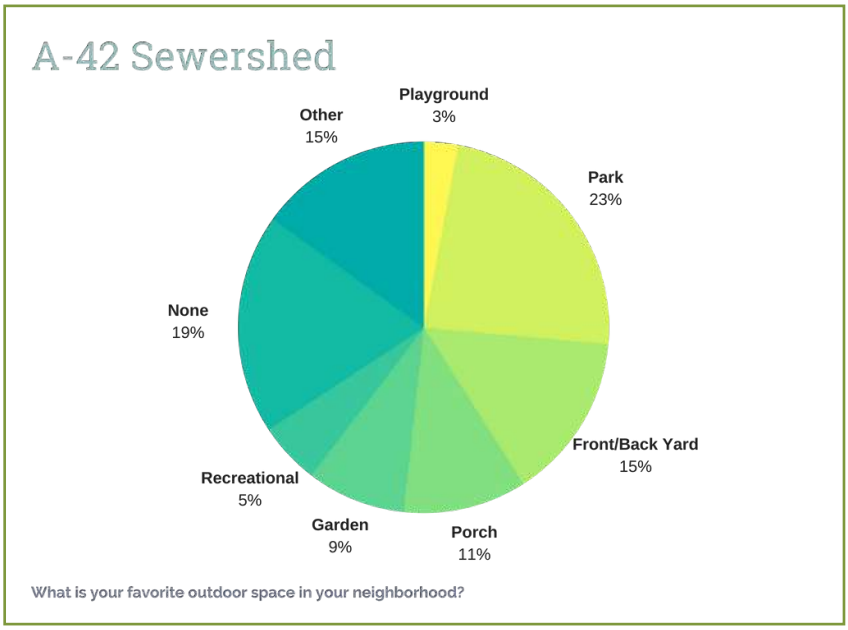
In Perry Hilltop, Grounded's outreach and implementation project took the form of a free Rain Barrel Workshop. Grounded provided rain barrels and training on stormwater best practices to 50 community residents of the Perry Hilltop neighborhood. The Rain Barrel Workshop was hosted in July 2017 in partnership with the Pennsylvania Resources Council (PRC). Riverview United Presbyterian offered to host the workshop in their community hall.

Workshop participants learned how to harvest rainwater from their roofs, store it, and use it in the landscape. They also learned how to reduce their contribution to combined sewer overflow (CSO), flooding, and polluted urban runoff by practicing watershed protection and conservation in their own backyards.

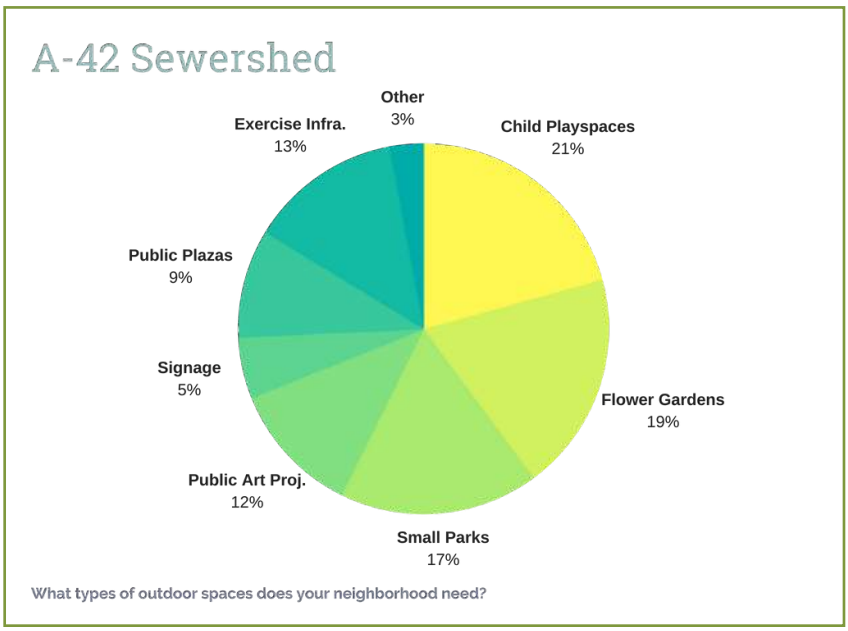
At the end of the workshop, all participants were equipped to install and use their new 55-gallon rain barrel. Combined, all 50 rain barrels have capacity to capture and store 2,750 gallons of rainwater.



- 39% of all A42 respondents said that they experience issues with wet basements during storm events.
- 21% of all A42 respondents have issues with ponding water on their property or close to their homes.



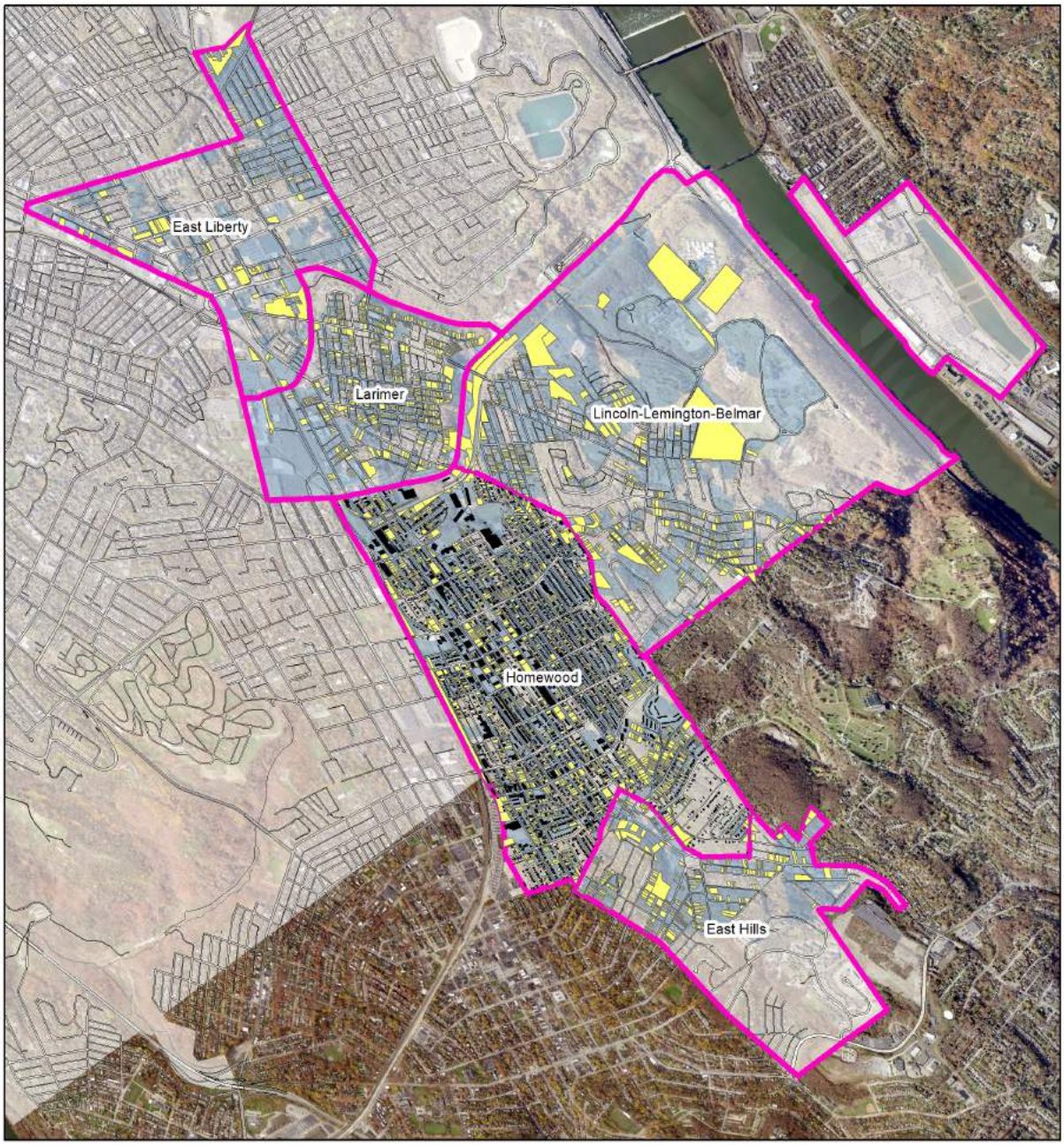
- One (1) out of every five (5) A42 survey respondents said that they do not have a favorite outdoor space in their neighborhoods
- Those who reported that their yard was their favorite space often noted safety and feelings of belonging as the reasoning.



- For A42 survey respondents, the biggest open space priorities are spaces for children to play, flower gardens, and small parks.
- Respondents specifically mentioned safety, maintenance, and aesthetics as important factors.

A42 Sewershed

The A42 sewershed is comprised of the neighborhoods of East Hills, East Liberty, Homewood, Larimer, and Lincoln Lemington Belmar. The PWSA priority capture area in the A42 sewershed covers 1,432 acres of land. There are 3,241 vacant lots within this priority area totaling 353 acres. Ultimately, 25% of the PWSA Priority Area in these project communities are vacant lots. A42 Grounded GSI Liaisons collected 362 community surveys throughout the sewershed. Results from these surveys are included on the following pages.



Legend

- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods
- Vacant Lots in PWSA Priorty Area (A42 Sewershed)

1 inch = 2,750 feet
1 inch = .52 miles

A42 Sewershed

3,241

Vacant Lots in PWSA Priority Area

353

Acres of Vacant Land in PWSA Priority Area

32%

Proportion of City-Owned Vacant Lots in PWSA Priority Area

EAST HILLS

East Hills has four borders, including Penn Hills to the north and northeast, Wilkinsburg to the east, south and southwest, and the Pittsburgh neighborhoods of Homewood South to the west and Homewood North to the northwest. East Hills is home to the Imani Christian Academy which is based in the former East Hills Elementary school building. In 1960, East Hills Shopping Center was built on Robinson Boulevard. Anchored by a Joseph Horne Company store, the mall became largely vacanvt in the 1980s and was ultimately demolished.

Total
Surveys
Collected

59

Favorite Thing About Neighborhood:

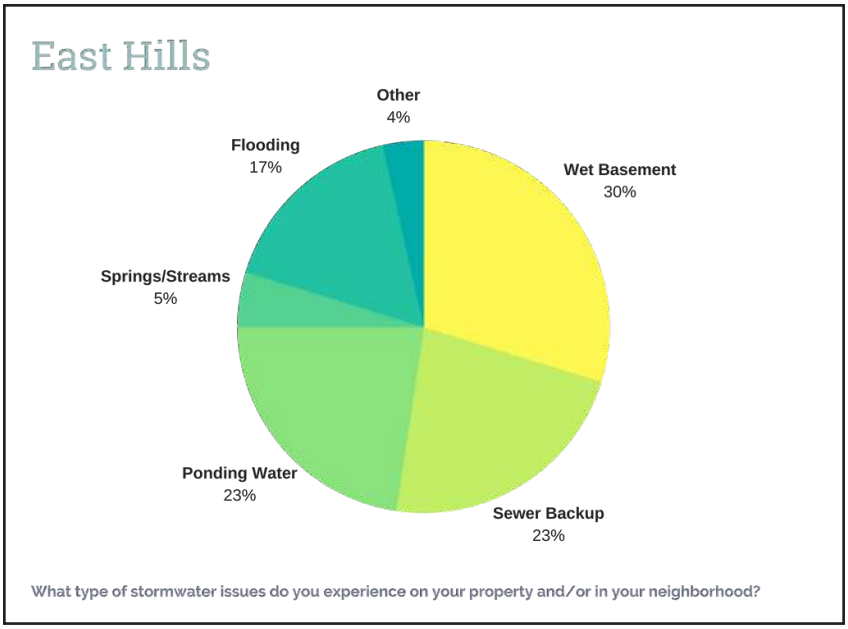
Besides the 2 entertainment businesses, this is a pretty quiet neighborhood. You usually see the same people passing back and forth on a daily basis.

What are you looking to gain as a community liaison?

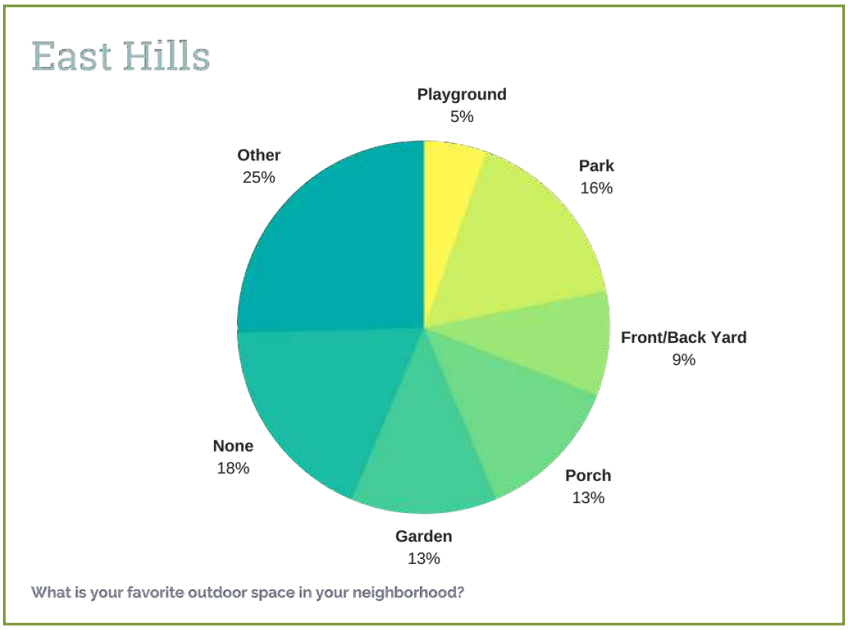
To bring more awareness of the importance of clean water and how we in the community can help in the process to clean up and beautify the neighborhood while conserving and reclaiming the runoff water.

Thom Watkins

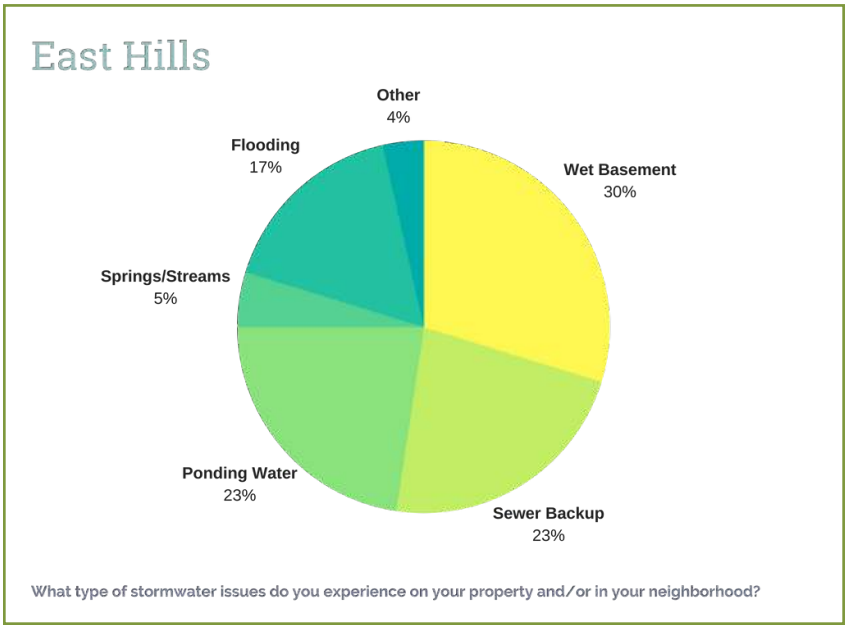
Grounded GSI Liaison - East Hills



- 30% of East Hills respondents have issues with wet basements during storm events.
- Sewer basement backups is the second most reported issue in East Hills with important implications for public health.



- 25% of East Hills respondents gave unique answers for their favorite outdoor spaces. Responses ranged from specific streetscapes to rooftop hangouts.



- Wet basements, sewer basement backups and ponding water are the top three stormwater issues experienced by East Hills survey respondents.

Legend

- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

1 inch = 1,000 feet
1 inch = .19 miles

N

Legend

- Resident Stormwater Issues (East Hills)
- A42 Neighborhoods
- PGH Neighborhoods

1 inch = 1,000 feet
1 inch = .19 miles

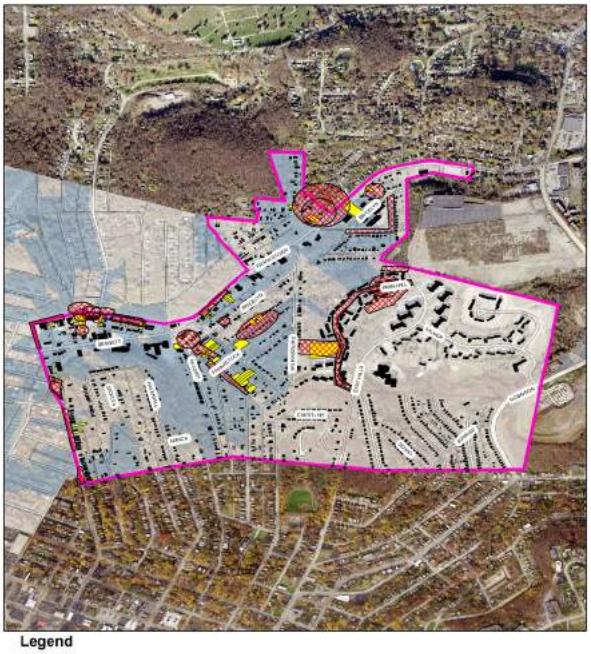
N

Legend

- Resident Stormwater Issues (East Hills)
- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

1 inch = 1,000 feet
1 inch = .19 miles

N



Legend

- Vacant Lots in PWSA Priorty Area/Resident Stormwater Issue Area (East Hills)
- Resident Stormwater Issues (East Hills)
- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

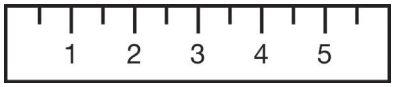
1 inch = 1,000 feet
1 inch = .19 miles

N

EAST HILLS

52

Vacant Lots in PWSA & Resident Priority Area



6.34

Acres of Vacant Land in PWSA & Resident Priority Area

12%

Proportion of City-Owned Vacant Lots in PWSA & Resident Priority Area

EAST HILLS

LOCATION:

Park Hill Drive -
Community Owned Open Space

COMMUNITY PARTNERS:

East Hills HOA
East Hills Consensus Group
Hilltop Rising

HARD COSTS:

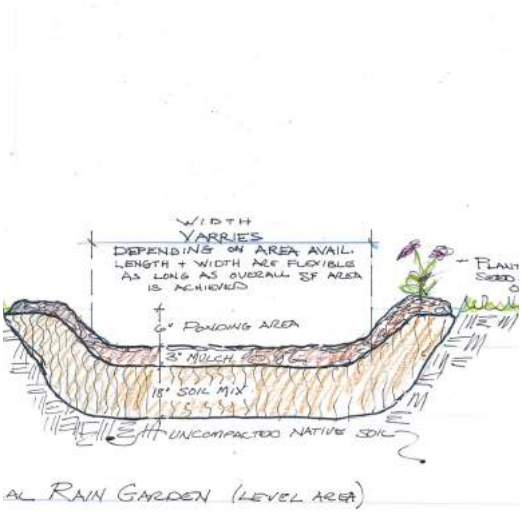
$25,000

GALLONS OF STORMWATER CAPTURED ANNUALLY:

308,000 gallons

PROJECT DESCRIPTION:

The East Hills demonstration project was completed in partnership with the East Hills Consensus Group and the East Hills Homeowners Association. The East Hills HOA represents a collection of town homes along Park Hill Drive in East Hills. This community, once well-known and revered as a forward-thinking garden community design, has seen a decline in homeownership and increases in property vacancy and blight. The HOA owns a community commons area situated at the base of a hill below the residential community. The field is often overgrown and takes costs a considerable amount of money for the HOA to maintain. Grounded engaged this community in order to design and implement a GSI project that could help remove a number of the homes and a large parking lot from the combined sewer system while also serving as a catalyst for community change.



The Grounded GSI East Hills design takes a systems approach to stormwater management. Grounded worked with the community to install a series of large linear rain gardens along the edge of the community common area.

Grounded worked with individual homeowners to disconnect the downspouts of 15 town home units and to channel that flow underground and into the newly constructed rain gardens. Runoff from an adjacent parking lot is also redirected to the rain gardens via an underground pipe.

Grounded seeded the ground areas disturbed by the heavy machinery and excavation equipment. Come spring, the new rain gardens should seamlessly blend into the surrounding landscape.

HOMEWOOD

Homewood is a predominantly African American neighborhood of Pittsburgh, Pennsylvania, United States. Homewood is bordered on the southwest by the Martin Luther King Jr. East Busway which follows the old Pennsylvania Railroad line toward downtown Pittsburgh. Homewood was founded in 1832 by Judge William Wilkins.[3] It was later annexed by the city of Pittsburgh on December 1, 1884. Homewood in the beginning held mainly estates for the wealthy; Homewood was also the Pittsburgh residence of industrialists Andrew Carnegie and Thomas M. Carnegie until the late 1880s. In the 1950s the city claimed land in the Lower Hill District for the Civic Arena, and in the process, displaced 8,000 people. Most of them were less affluent blacks who then settled in rental apartments in Homewood, creating a large disparity in the number of blacks to whites in the region. This sudden influx of black residents caused a lot of the white middle class to move away from Homewood, creating a population shift from 22% black in 1950 to 66% black in 1960. As a result of the area being predominantly African-American, it was greatly affected by the assassination of Dr. Martin Luther King Jr. on 4 April 1968, whose murder caused riots in Homewood. The riots caused great damage to local businesses, severely crippling the business district there.

"Homewood (Pittsburgh)." Wikipedia, Wikimedia Foundation, 15 Aug. 2018, en.wikipedia.org/wiki/Homewood_(Pittsburgh).

Total Surveys Collected

116

Favorite Thing About Neighborhood:

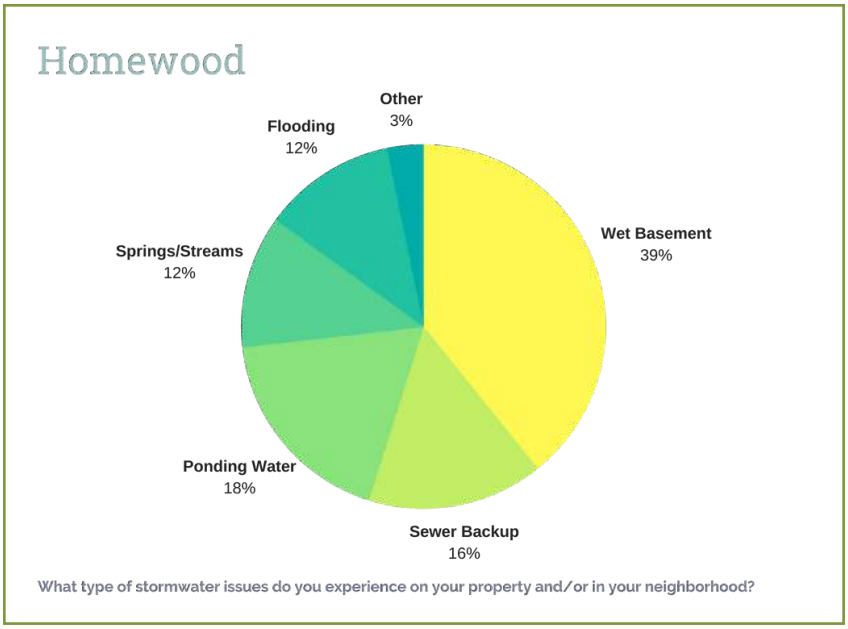
I love the character of the community, because it represents the traditional industrial landscape. There is a rustic charm accentuating the style of the landscape and people who live there. The people are diverse and as "common "as the COMMONWEALTH..

What are you looking to gain as a community liaison?

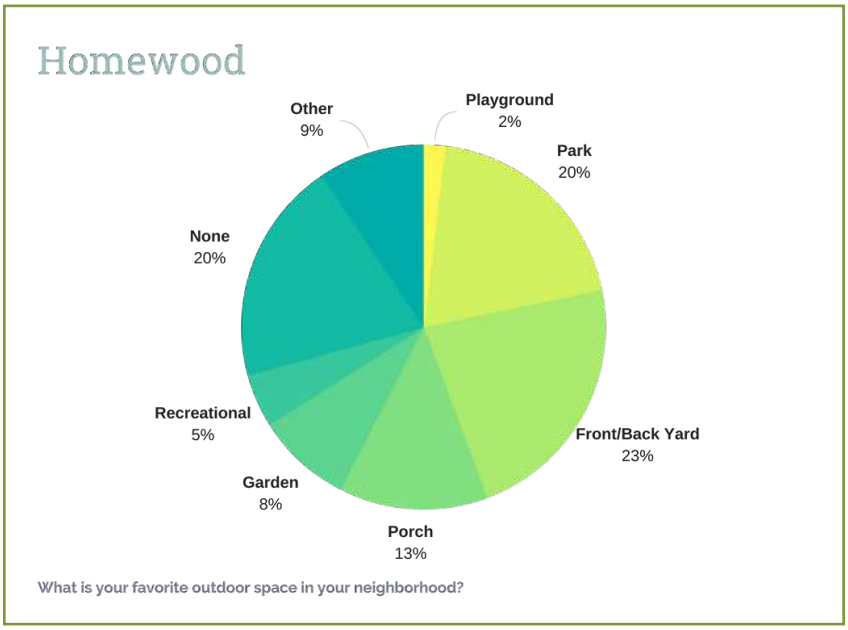
The community needs a GREEN revitalization plan from underground to the surface for a sustainable future.

Jacqueline Bey

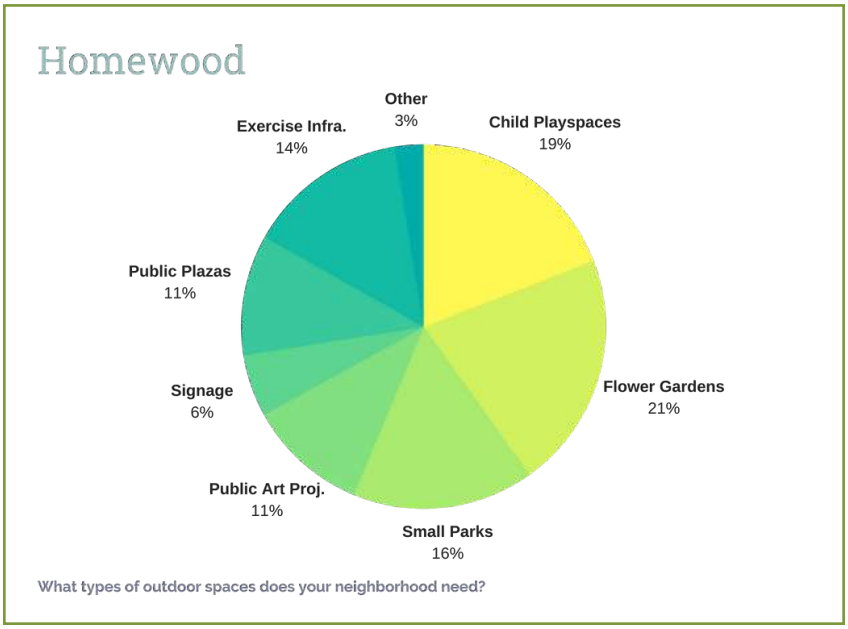
Grounded GSI Liaison - HOMEWOOD



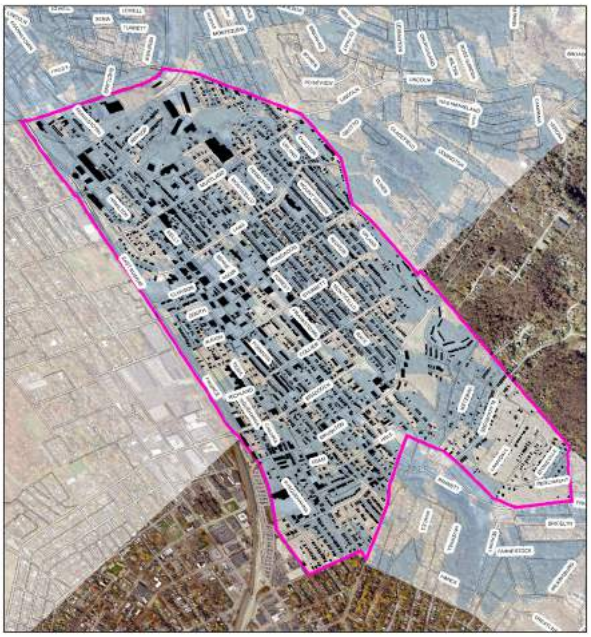
- Nearly 40% of Homewood respondents experience a wet basement during storm events.
- 18% of respondents notice ponding water in their communities, most often at poorly graded intersections.



- 23% of Homewood respondents reported that their front or back yard was their favorite outdoor space in the neighborhood. When asked why, respondents noted issues of safety, saying that their own yards were the safest place in Homewood to enjoy the outdoors.



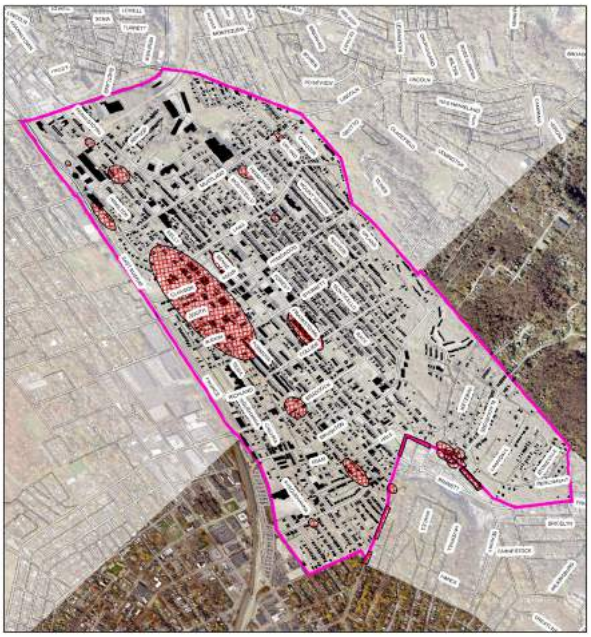
- 21% of Homewood respondents said that the type of open spaces most needed in their community are flower gardens. Similar to other communities, respondents are quite concerned about well landscaped and regularly maintained open spaces.



Legend

- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

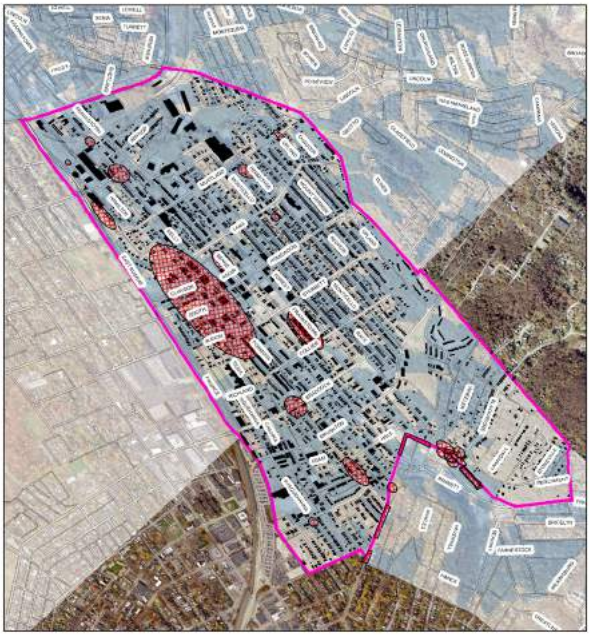
1 inch = 1,250 feet
1 inch = .24 miles



Legend

- Resident Stormwater Issues (Homewood)
- A42 Neighborhoods
- PGH Neighborhoods

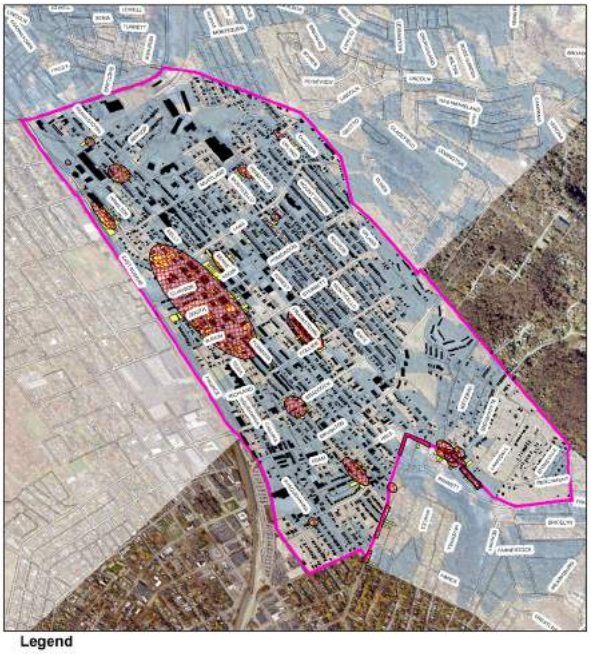
1 inch = 1,250 feet
1 inch = .24 miles



Legend

- Resident Stormwater Issues (Homewood)
- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

1 inch = 1,250 feet
1 inch = .24 miles



Legend

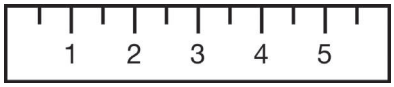
- Resident Stormwater Issues (Homewood)
- Vacant Lots in PWSA Priority Area/Resident Stormwater Issue Area (Homewood)
- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

1 inch = 1,250 feet
1 inch = .24 miles

HOMEWOOD

196

Vacant Lots in PWSA & Resident Priority Area



16.23

Acres of Vacant Land in PWSA & Resident Priority Area

33%

Proportion of City-Owned Vacant Lots in PWSA & Resident Priority Area

HOMEWOOD

LOCATION:

Corner of Rosedale & Hill Across from Wilkinsburg Park-And-Ride

COMMUNITY PARTNERS:

Operation Better Block

HARD COSTS:

$13,000

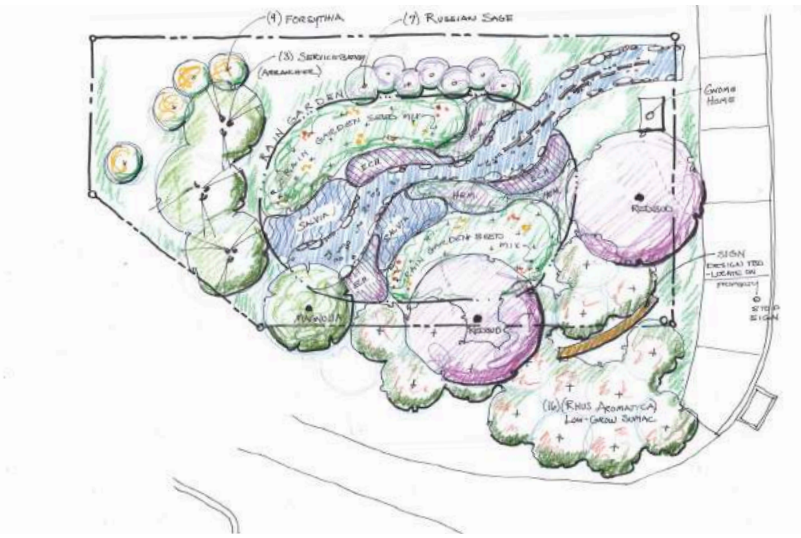
GALLONS OF STORMWATER CAPTURED ANNUALLY:

15,000 gallons* (128,552)

PROJECT DESCRIPTION:

The Grounded GSI demonstration project in southeast Homewood is sited at the corner of Rosedale Street and Hill Street. Situated across from a large park-and-ride, Homewood stakeholders envision the project as a passive greenspace serving as a neighborhood gateway welcoming visitors into the community from Wilkinsburg. The rain garden was designed to be expanded to accept street flow following the installation of a curb cut adjacent to the site. Site selection for this project was completed in alignment with the Homewood Cluster Plan, which specifically calls out optimal locations for GSI.

Before the rain garden could be installed on the site, Grounded worked with residents and volunteers to undertake extensive site clearing work.



The rain garden design concentrates overground flows into a centralized rock channel in the center of the site. The design allows for the feature to be expanded to capture additional 100,000 gallons of street flow via a curb cut.

The rain garden is comprised of a special soil mix that will allow for maximum infiltration and storage of stormwater within the feature. Operation Better Block intends to add additional features to the site including a small retaining wall and seating.

LARIMER

Larimer is a neighborhood in the East End of the City of Pittsburgh, Pennsylvania in the United States. The neighborhood takes its name from William Larimer, who grew up in nearby Westmoreland County and, after making a fortune in the railroad industry, built a manor house overlooking East Liberty along a path that came to be called "Larimer Lane" and later Larimer Avenue. Larimer was originally settled by Germans in the later half of the 19th century. By the early 1900s Italians from Abruzzi, Calabria, Campania, Sicily and Northern Italians became the dominant ethnic group. Before long, Larimer residents had built and were running concrete foundries and commercial bakeries along Lincoln Avenue towards Two-Mile Run (some of which still exist today), and a successful commercial district at the intersection of Larimer Avenue and Meadow Street, near the community's spiritual home of Our Lady Help of Christians Catholic Church (1898). In 1928, the Italian Sons and Daughters of America was founded in the neighborhood. Larimer was Pittsburgh's Little Italy until the 1960s. As with other neighborhoods in Pittsburgh's East End, the 1960s were a turning point for Larimer. Some residents began to move to the suburbs in the early part of the decade, and this process was hastened by the urban renewal of East Liberty and the construction of a 320-unit housing project on Larimer Avenue near the entrance to Larimer from East Liberty. The once-proud brick houses are now either abandoned or neglected by absentee landlords, and the residents, largely African-American, are among the poorest in Pittsburgh.

"Larimer (Pittsburgh)." Wikipedia, Wikimedia Foundation, 15 Aug. 2018, en.wikipedia.org/wiki/Larimer_(Pittsburgh).

Total Surveys Collected

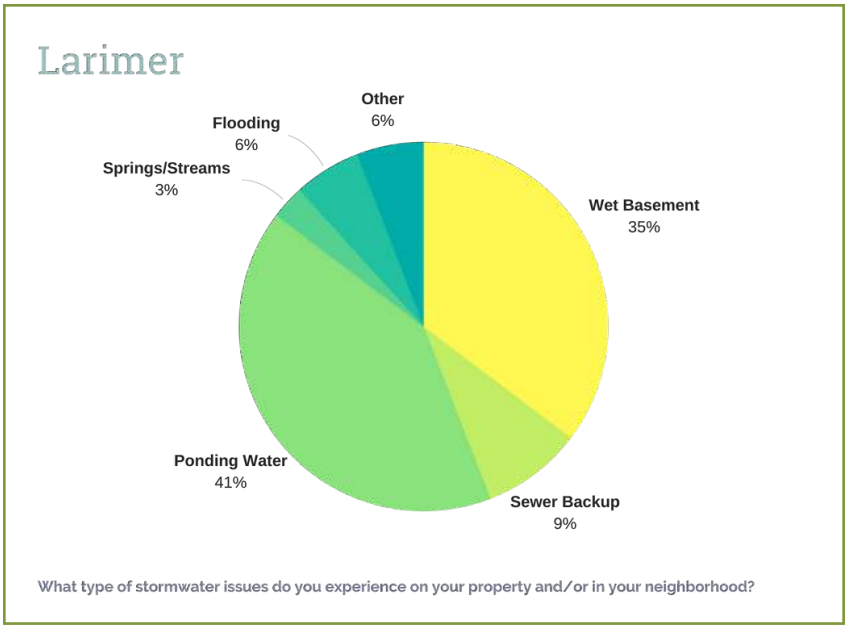
28

Favorite Thing About Neighborhood:

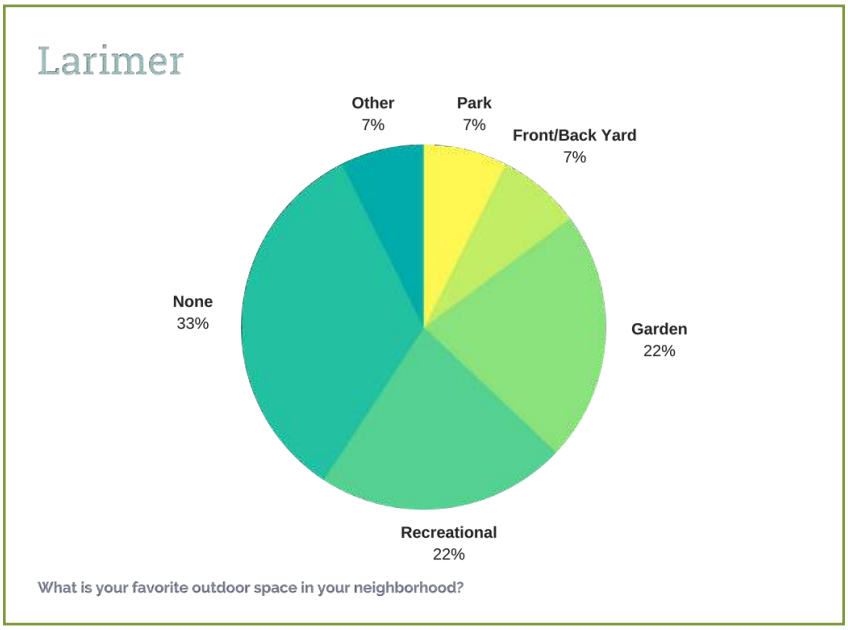
The people living in the community is my interest. I know the community residents, and their daily growth is exciting from where we have come from to now, and the struggle continues. The love for my people is with an attitude of "let's get to it!" and make our living conditions within the community the key statement. We intend to make Larimer "The Community of Living in the Most Liveable City.

Ronald Garland, Sr.

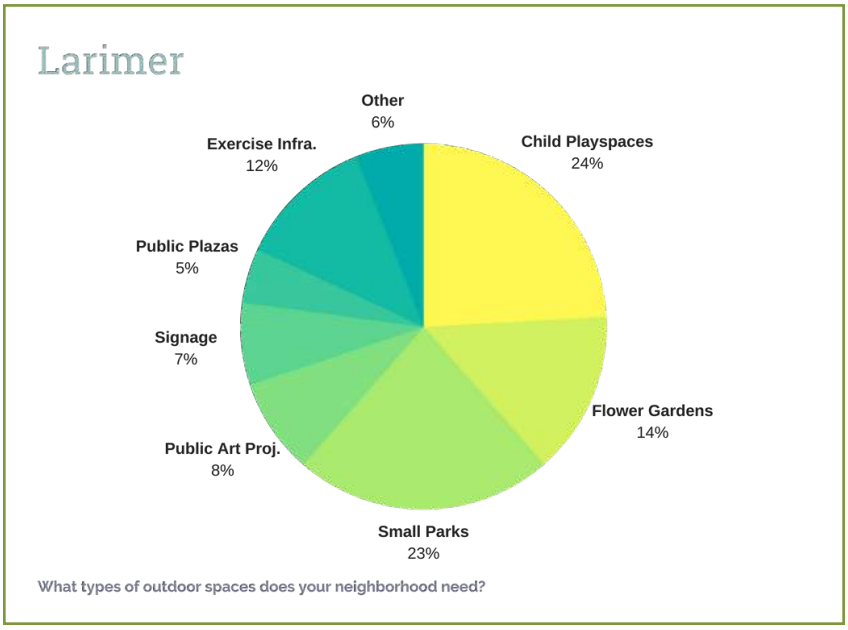
Grounded GSI Liaison - LARIMER



- Wet basements continue to dominate as the most prevalent stormwater issue experienced by project communities. In Larimer, 35% of respondents deal with wet basements as a result of stormwater.



- In Larimer, 33% of survey respondents said they do not have a favorite outdoor space in the neighborhood.



- Spaces for children to play and additional small parks nearly tied as the type of open spaces most needed in the Larimer neighborhood.

Legend

- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

1 inch = 750 feet
1 inch = .14 miles

Legend

- Resident Stormwater Issues (Larimer)
- A42 Neighborhoods
- PGH Neighborhoods

1 inch = 750 feet
1 inch = .14 miles

Legend

- Resident Stormwater Issues (Larimer)
- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

1 inch = 750 feet
1 inch = .14 miles

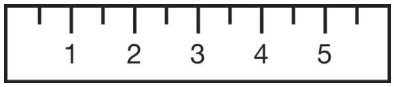
Legend

- Resident Stormwater Issues (Larimer)
- Vacant Lots in PWSA Priorty Area/Resident Stormwater Issue Area (Larimer)
- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

1 inch = 750 feet
1 inch = .14 miles

14

Vacant Lots in PWSA & Resident Priority Area



1.85

Acres of Vacant Land in PWSA & Resident Priority Area

7%

Proportion of City-Owned Vacant Lots in PWSA & Resident Priority Area

LARIMER

LOCATION:

New Jerusalem Holiness Church (NJHC)

COMMUNITY PARTNERS:

Larimer Consensus Group
EECO Center
Chatman Properties

HARD COSTS:

$13,000

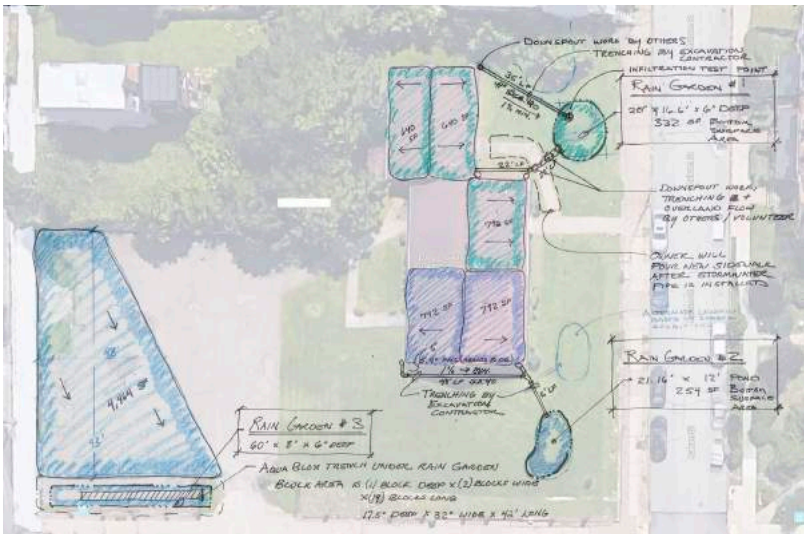
GALLONS OF STORMWATER CAPTURED ANNUALLY:

211,000 gallons

PROJECT DESCRIPTION:

NJHC is a community landmark in the community and is located directly across the street from the Environment and Energy Community Outreach Center (EECO). Grounded also worked with the Larimer Consensus Group, housed in the EECO, to imagine how the project site could fit into their existing community microshed planning efforts. Microsheds represent smaller, community scale watersheds presenting opportunities for neighbors to work together to divert and convey their stormwater runoff into a central community feature. Sited at the corner of Auburn street, the EECO has an existing rain garden feature capturing stormwater. With the installation of a second rain garden system across the street at NJHC, the future Auburn street microshed now has a centralized location to collectively channel and collect their stormwater as a community.

The Grounded GSI project at NJHC consists of two large rain gardens and a rock swale. The two rain gardens receive water from the freshly disconnected downspouts collecting water from the church roof.



Grounded worked with a local Larimer contractor to excavate the heavy earth moving tasks for this project. The Larimer GSI contractor was referred to the project through URA Land Care program, and regularly maintains other lots in the community.

The rock swale on the opposite side of the property was constructed to accept sheet flow from the church's parking lot, diverting it from a nearby storm drain. Collectively, Grounded GSI features at NJHC capture and manage 211,000 gallons of stormwater annually.

LINCOLN LEMINGTON BELMAR

Lincoln and Lemington were former neighborhoods in the northeastern section of the city. Lincoln-Lemington-Belmar is a predominantly black neighborhood[3] that was once a white neighborhood from the early 1920s until the early 1970s. Belmar was a neighborhood atop a steep hill that overlooked the city on Tilden Street. Lincoln–Lemington–Belmar is generally subdivided at Lemington Ave into two parts, "Upper Lincoln" and "Lower Lincoln". Lincoln–Lemington–Belmar is one of the steepest neighborhoods in Pittsburgh, with Downtown Pittsburgh (8 miles (13 km) away) visible from many parts of Upper Lincoln. The Veterans Hospital and the Shuman Juvenile Detention Center sit off Highland Drive in the northern part of the neighborhood. Larimer borders Lincoln–Lemington–Belmar to the west and is connected by the Lincoln Avenue Bridge and the Larimer Avenue Bridge. Homewood borders Lincoln–Lemington–Belmar to the south and is connected by Upland Street, Apple Avenue off Lincoln Avenue, and by Stranahan Avenue from atop Belmar. Penn Hills lies east of Lincoln–Lemington–Belmar, and is reached via Lincoln and Lemington avenues, and also by Brushton Avenue streaming in from Homewood. Highland Park is separated by Washington Boulevard to the west. Part of the neighborhood extends across the Allegheny. Lincoln–Lemington contains the Waterworks Mall and St. Margaret Hospital, which is part of the UPMC health system.

"Lincoln–Lemington–Belmar (Pittsburgh)." Wikipedia, Wikimedia Foundation, 15 Aug. 2018, en.wikipedia.org/wiki/Lincoln%E2%80%93Lemington%E2%80%93Belmar_(Pittsburgh).

Total Surveys Collected

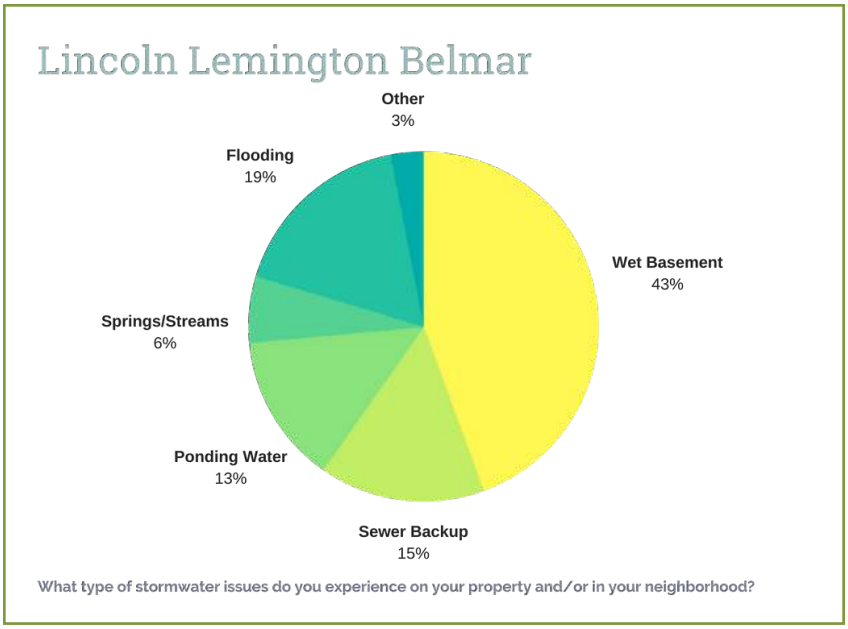
66

Favorite Thing About Neighborhood:

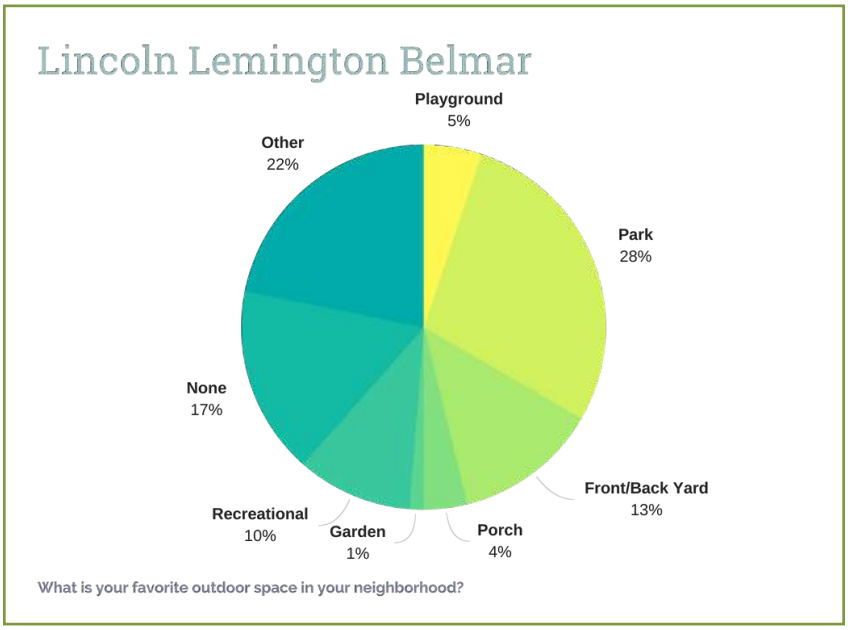
I have grown up in this neighborhood since I was a child. I have love from my neighbors and friends that have also grown-up or are still living here. In this community, we are still very passionate about our community, although it is in need of TLC (Tender Love And Care)

Dana Fowler

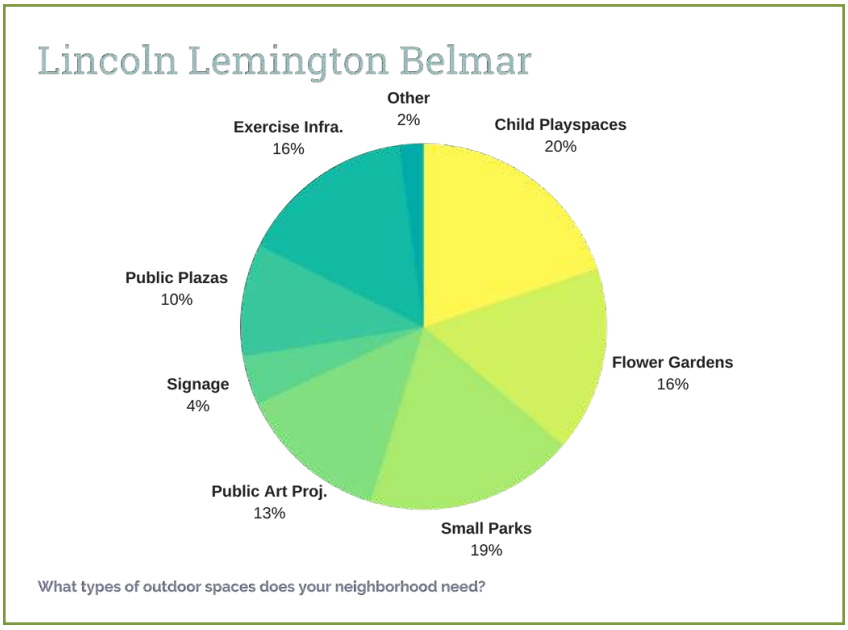
Grounded GSI Liaison - LINCOLN LEMINGTON BELMAR



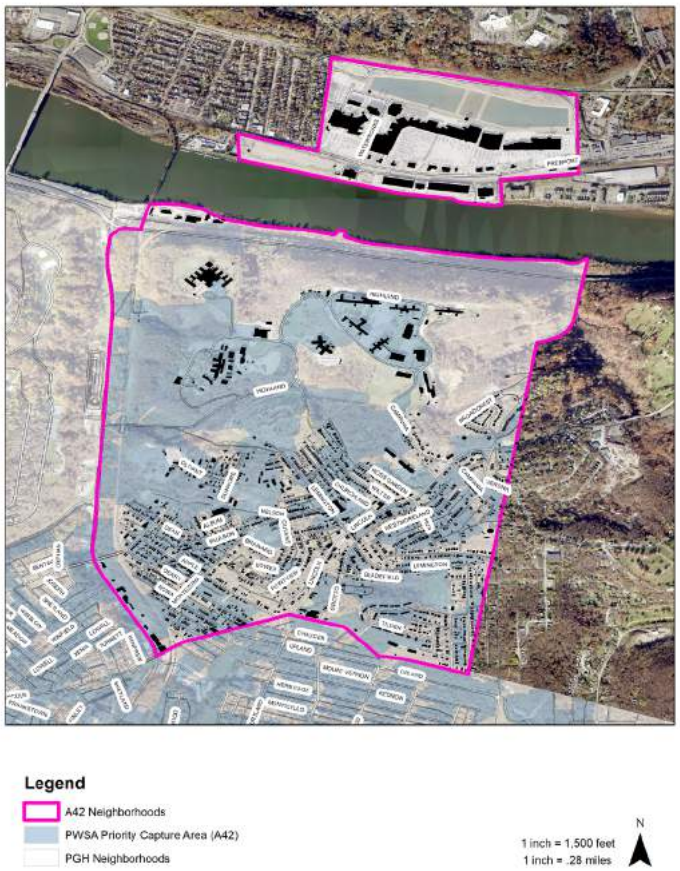
- Nearly half of all Lincoln Lemington Belmar respondents have issues with wet basements after storm events.

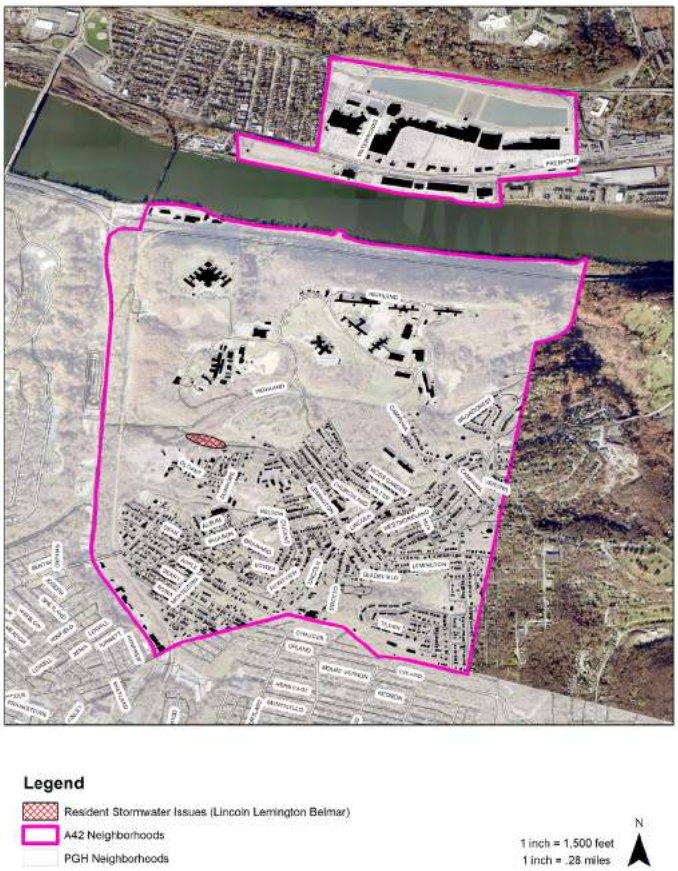


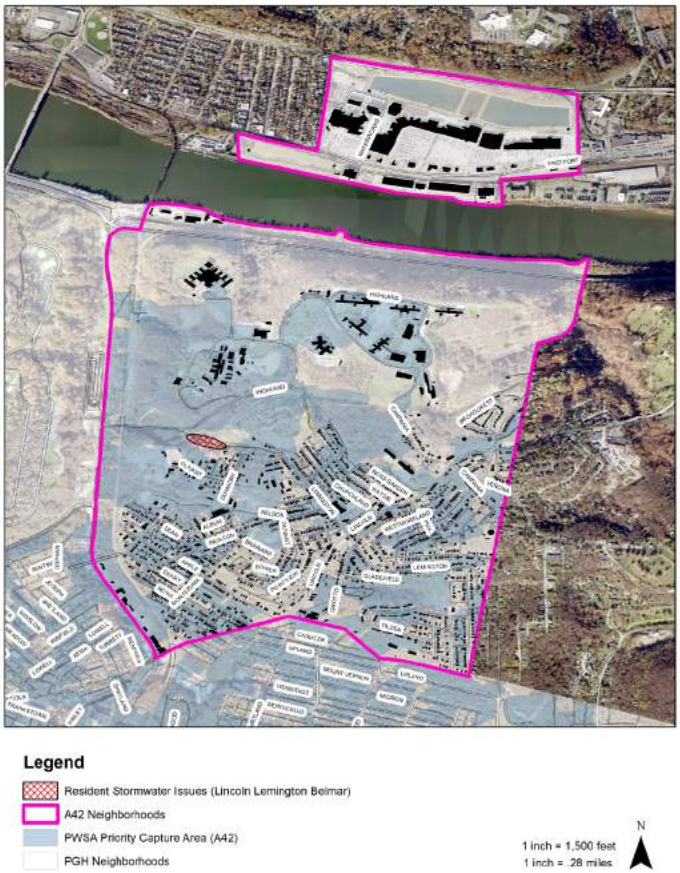
- Parks emerged as the most valued type of open space in the Lincoln Lemington Belmar neighborhood. Proximity to Highland Park may help to explain this trend.



- Spaces for children to play, small parks, and flower gardens came in as the top three most needed types of outdoor space in the Lincoln Lemington Belmar neighborhood.







There were no vacant lots in Lincoln Lemington Belmar that fell within both PWSA and Resident Priority Areas. This is possibly because much of the land in LLB is part of the VA Complex.

LINCOLN-LEMINGTON-BELMAR

Concept Design Only

LOCATION:

Chadwick Park

COMMUNITY PARTNERS:

City of Pittsburgh - DPW
City of Pittsburgh - Parks
City of Pittsburgh - DOMI
Lincoln Lemington Belmar Consensus Group

HARD COSTS:

Project Included in Design Capture

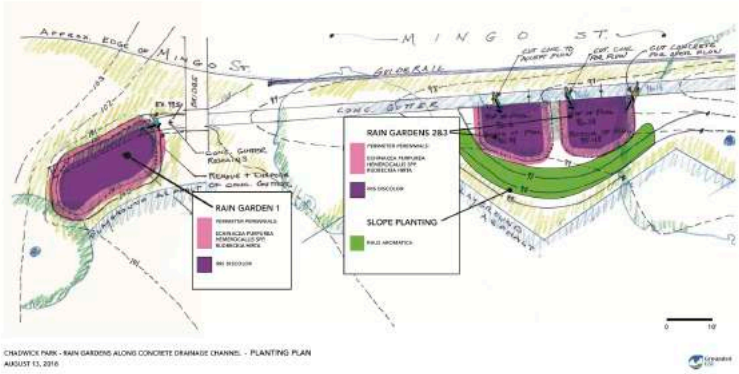
GALLONS OF STORMWATER CAPTURED ANNUALLY:

100,000 gallons

PROJECT DESCRIPTION:

Grounded worked with the City of Pittsburgh DPW and City Parks to design and plan a GSI feature on city property in Chadwick Park. The project is slated to capture 100,000 gallons of stormwater annually. However, the multi-month project approval process was stalled in the end over uncertainty of maintenance capacity and policy on the behalf of DPW, as authorities requested that an outside group take responsibility for the maintenance of the project on city property in perpetuity. After experiencing great difficulty in identifying a group with the appropriate resources to commit to maintaining the GSI feature for free, Grounded was forced to enter this project as design capture due to the approval process extending beyond the grant period. This experience highlights the importance of clear, consistent GSI execution policies across city agencies and the need for municipal authorities to create a multi-year strategy to fund the maintenance and upkeep of GSI features as more and more of them are installed on city property.

Chadwick park sits downhill from the adjacent roads and homes. This topography causes street flow to come down the hill towards the park, and is currently channeled by a concrete swale directly into a combined sewer system storm drain.



Grounded worked with DPW and City Parks to design two rain gardens adjacent to the concrete swale. The design includes plans to remove concrete to open up channels in the hardscape swale, allowing water to escape and to be diverted into the newly planted rain gardens. If executed, the Grounded GSI project at Chadwick Park would divert and removes 100,000 gallons of stormwater from the combined sewer system annually.

EAST LIBERTY

East Liberty is a culturally diverse neighborhood in Pittsburgh, Pennsylvania's East End. One of the most notable features in the East Liberty skyline is the East Liberty Presbyterian Church, which is an area landmark. Around the time of the American Revolution, East Liberty was a free grazing area in Allegheny County located a few miles east of the young, growing town called Pittsburgh. East Liberty truly began to develop as a commercial area in 1843, when Jacob's daughter Sarah Jane Negley married the ambitious lawyer Thomas Mellon. Thomas Mellon worked to make East Liberty a transportation hub: Mellon convinced some of Pittsburgh's first trolley lines to pass through East Liberty. East Liberty's decline was precipitated by a series of explicitly racist government policies relating to the underwriting of mortgages for homes commonly referred to as redlining. Urban Renewal had devastating consequences for the neighborhood. There were some 575 businesses in East Liberty in 1959 but only 292 in 1970 and just 98 in 1979. The businesses that remained tended not to serve the majority of nearby Pittsburghers, but only the captive audience that remained in what was now an urban ghetto. Steep population decline followed Urban Renewal. East Liberty became a segregated neighborhood with high poverty rates, low rates of homeownership, and a legacy of disinvestment that continued well after the Community Reinvestment Act eliminated redlining. In the past 20 years, the population fell from 7,973 in 1990, to 6,871 in 2000, and 5,698 in 2016.

"East Liberty (Pittsburgh)." Wikipedia, Wikimedia Foundation, 15 Aug. 2018, en.wikipedia.org/wiki/East_Liberty_(Pittsburgh).

Total Surveys Collected

93

Favorite Thing About Neighborhood:

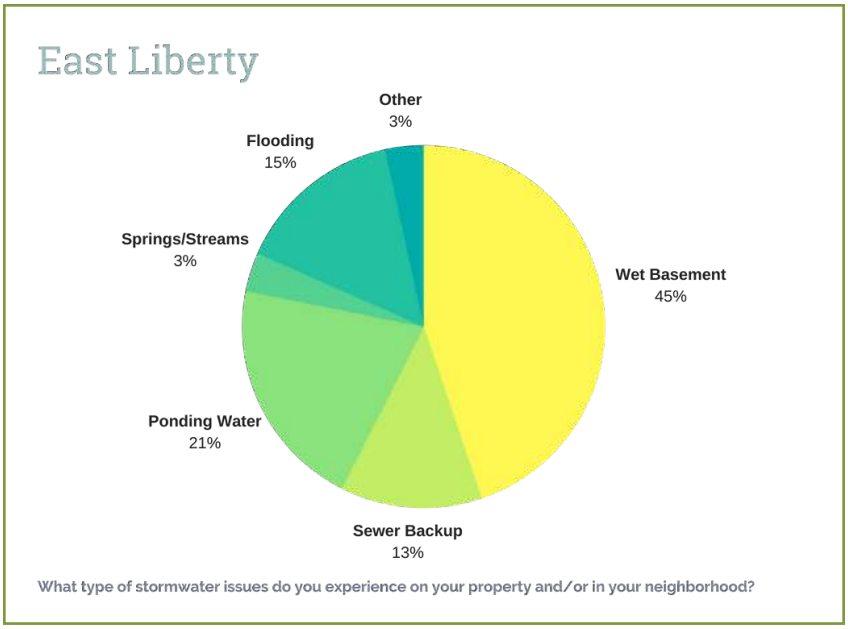
Some people have lived here 50 years, some just moved here. It is very diverse.

What are you looking to gain as a community liaison?

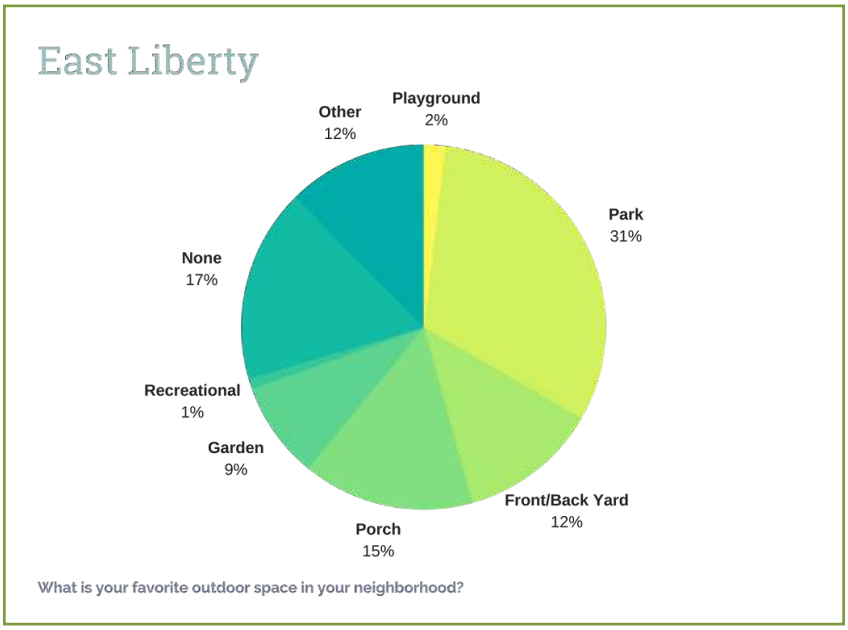
Ways to connect with folks in my neighborhood who care about the environment. It connects them with each other.

Elizabeth Urbatis

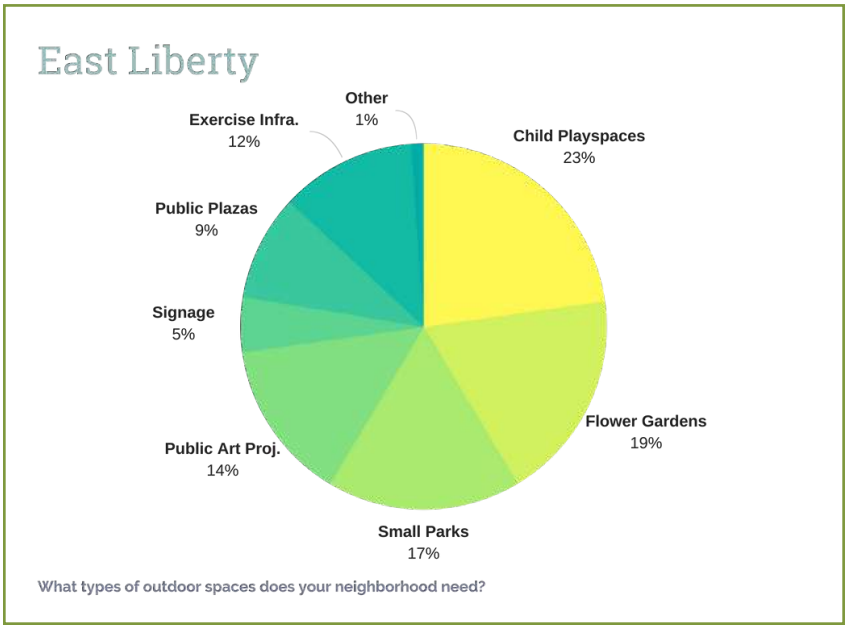
Grounded GSI Liaison - East Liberty



- Wet basements continue to dominate as one of the most common stormwater problems experienced by residents. Almost half of East Liberty respondents experience issues with wet basements during storm events.



- 1/3 of East Liberty respondents said that their local parks were their favorite outdoor open spaces.
- 17% of East Liberty respondents said that they do not have a favorite outdoor space.



- East Liberty respondents think their community is most in need of playspaces for children, flower gardens, and additional park space.

Legend

- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

1 inch = 950 feet
1 inch = .18 miles

N

Legend

- Resident Stormwater Issues (East Liberty)
- A42 Neighborhoods
- PGH Neighborhoods

1 inch = 950 feet
1 inch = .18 miles

N

Legend

- Resident Stormwater Issues (East Liberty)
- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

1 inch = 950 feet
1 inch = .18 miles

N

Legend

- Resident Stormwater Issues (East Liberty)
- Vacant Lots in PWSA Priorty Area/Resident Stormwater Issue Area (East Liberty)
- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

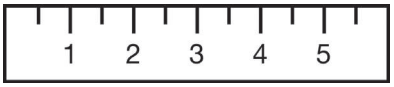
1 inch = 950 feet
1 inch = .18 miles

N

EAST LIBERTY

15

Vacant Lots in PWSA & Resident Priority Area



9

Acres of Vacant Land in PWSA Priority Area

71%

Proportion of City-Owned Vacant Lots in PWSA & Resident Priority Area

Conclusions & Recommendations

The Grounded GSI project represented a hefty yet successful undertaking for Grounded and our partners. Throughout the project implementation process, Grounded learned a number of valuable lessons that have been outlined below.

Conclusions

Project Partner & Site Selection: A Lengthy & Intricate Process

When siting GSI demonstration projects, Grounded prioritizes project partners owning land within PWSA and resident reported priority stormwater capture areas. Grounded also prioritizes non-profit partners or locations that are open and accessible to the public. However, once potential partners have been identified, the successful execution of a demonstration project becomes dependent on other uncontrollable factors such as site layout, roof type, site topography, stormwater access points, and downspout locations. Once the site has been analyzed for stormwater capture potential, various concept designs are developed to show how runoff can be addressed on site. The variety of solutions possible on a site depends on budget restrictions, permitting timeliness, intensity of work, and material availability and costs. After scope finalization and signing the MOU, other factors can continue to complicate project executions, such as weather, volunteer turnout, and contractor availability. While working with the community to execute cherished community GSI projects, timelines should allow a considerable amount of time plus a healthy contingency for final site selection, logistics planning, relationship building, and project completion.

Site Character

Once a site was selected, potential GSI features to be installed on GSI demonstration sites were designed to be integrated into the existing site character. Buildings, entryways, parking, utilities, and site topography all play a role in shaping the types of GSI features that are deemed viable for the site. Therefore, the total annual capture rate is dependent of the range of GSI options available for a site, the results of a community design process and final design approval by the site owner. At our sites, GSI feature selection limitations included the absence of curb cuts, the difficulty of altering internal building systems, and the difficulty of coordinating with adjacent property owners on to fully build out GSI features.

Project Scale

A final limiting factor to reaching our annual capture goal is the implementable scale of individual GSI installations. For example, significant earthwork is an expensive activity often required to install features with higher capture rates. In turn, Grounded GSI features are limited in scope by their project budgets (avg. $10K). Additionally, Grounded GSI features are intended to provide more than stormwater capture. Sites are meant to improve community health and provide additional co-benefits by activating spaces, incorporating desired community amenities, and contributing to the beautification of surrounding areas. All of these goals must be accounted for in the project budgets, further limiting how much is spent purely on stormwater management.

Sustainable Maintenance Is the Highest Priority

Through engagements with residents, design discussions with project partners, and approval processes with the City of Pittsburgh DPW and City Parks, Grounded has observed that sustainable, multi-year maintenance planning is the keystone to successfully executing community scale GSI projects, and arguably, GSI projects of any scale. At a time when municipal resources must stretch across a variety of important infrastructure needs, residents and authorities alike are wary of installing new infrastructure without clear commitments and guidelines for maintenance. The fear is that what was once a celebrated project might just as well become a community nuisance or liability. Grounded works with project partners to select low-maintenance GSI solutions, provides custom care plans, and helps to coordinate supporting resources such as reserving the PGH Mobile Toolbox for community maintenance days.

Everyone Has A Stormwater Story

Many of our outreach efforts resulted in rich stories about the ways individuals deal with stormwater daily. These powerful stories provide a conversation starter for deeper knowledge sharing, allow residents to find empathy with one another, and combined make up a more holistic and human-centric understanding of regional stormwater issues.

GSI As A Catalyst

The Grounded GSI project aims to use stormwater infrastructure as a medium to create community cohesion and to empower residents to be key decision makers about infrastructure investments in their communities. Following the successful completion of two rounds of the GSI Neighborhood Liaison Program, Grounded has found that when given the information, the know-how, and the personal reasons to care, residents will take up the fight for equitable development and sustainable infrastructure and run with it. For example, two Grounded GSI Liaisons have testified before the board of ALCOSAN to advocate that more resources be put towards GSI than is already allocated

in future budgets. Another Liaison went on to participate in the Sustainability Working Group of Homewood's most recent Community Comprehensive Plan. Stories like these show how residents can successfully act on their passion and love for their neighborhoods, especially when they appropriately equipped with the tools, resources, and access.

Balancing Good Data Collection & Community Connections

With the help of two cohorts of neighborhood stormwater liaisons, Grounded collected over 700 community surveys. Survey questions asked residents about their preferences for GSI features and about issues they experience with stormwater in their everyday lives. While liaisons did an amazing job reaching so many people, there were instances where the paper surveys were illegible or incomplete. Using digital data collection methods would help to avoid incomplete cases and to instantly aggregate information. However, these tools tend to have a steep learning curve. Many of the applicants to and participants in the liaison program are older and retired Pittsburgh's who may or may not be familiar with data collection software an digital tools. This is the issue of balancing data collection and complete data sets with the challenge of assembling a resident cohort with deep community roots, and possibly without strong tech skills. Grounded has found that the Liaison program can be a great introduction to online tools, such as the Google suite, and that customized help and office hours work well for trouble shooting.

Who's Pays?

The inescapable question after most engagements with residents is "who pays"? After learning about CSOs and green stormwater infrastructure, residents begin to ask questions about how green solutions can be implemented and who is going to pay for execution and maintenance of these projects. Once residents understand that Grounded GSI projects are demonstration projects,

Recommendations

GSI Policy Clarity is Key

During the course of the our GSI work in the O27 and A42 sewersheds, Grounded encountered a number of road blocks resulting from a lack of clear policy guiding the execution of community scale GSI installations by non-governmental organizations. Examples include inappropriately scaled community GSI review processes often designed for large scale constructions projects, shifting departmental responsibilities and confusion about agency responsibilities and jurisdiction, and uncertain maintenance commitment requirements and unavailable resource support from municipal authorities. In order to bring value to communities struggling with poor stormwater infrastructure, agencies such as PWSA, DPW, DOMI, and City Parks must work to develop a unified policy on GSI

siting, installation, and maintenance enforcement.

Personalized Information & Solutions

During our outreach activities and community events, Grounded staff and partners continuously fielded requests to provide guidance and advice on stormwater management issues on personal property. When possible, we were able to pull up Google earth to do a table top analysis of the issue but ultimately were only able to provide a basic level feedback and advice. Organizations working in this space should continue to expect requests for customized support with stormwater mitigation plans on private property.

Big Maps

When hosting community events, Grounded always provided large scale printed aerial maps overlayed with the PWSA priority areas. This allowed residents to get a better reference about where they sit, literally, relative to regional stormwater management issues.

Fellowship Over Lecture, Always

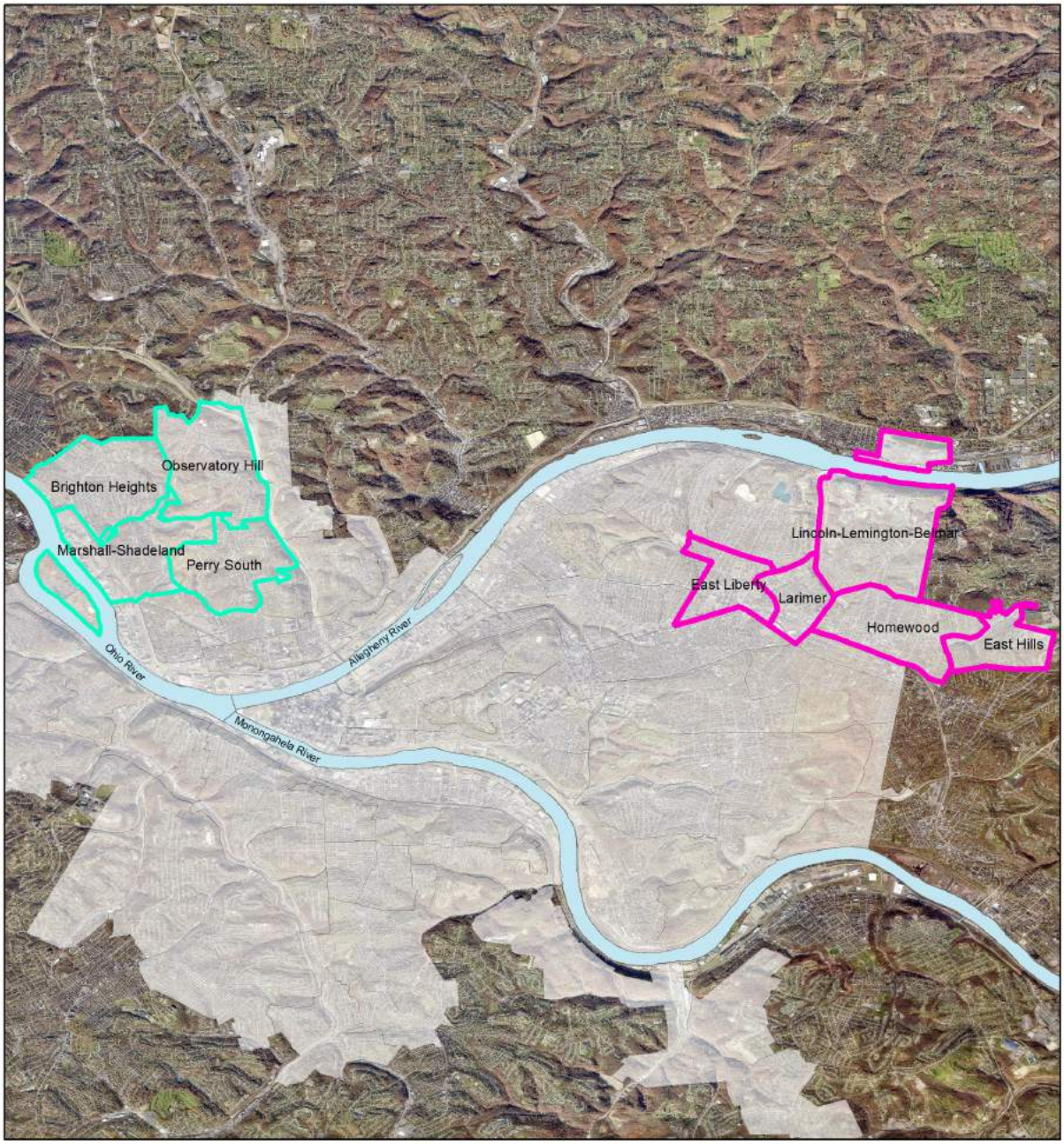
Grounded has found that outreach events structured as community gatherings are much more effective than a lecture styled meeting. Key ingredients for success are providing complete meals, budgeting time for general discussion and fellowship, and printed copies of materials for all participants.

Next Steps

Using the hyper-local data gleaned through resident surveys and the the geo-spatial analysis of stormwater problems presented in this report, the Grounded is poised to:

- Utilize the PWSA priority area vacant lot locational data for the O27 and A42 to identify and select parcels to undergo site specific suitability analysis for GSI feature installation;
- Pursue the execution of additional Grounded GSI demonstration projects on priority parcels;
- Launch the Grounded GSI project in other Pittsburgh priority sewersheds as identified by PWSA;
- Share survey data analysis with municipal authorities and work to provide insights into GSI execution and maintenance policy development;
- Pursue the full execution of Grounded GSI demonstration projects to bring all projects full on-line and obtain total design capture; and
- Work with PWSA to site, design, and execute new Grounded GSI demonstration projects.

Appendix

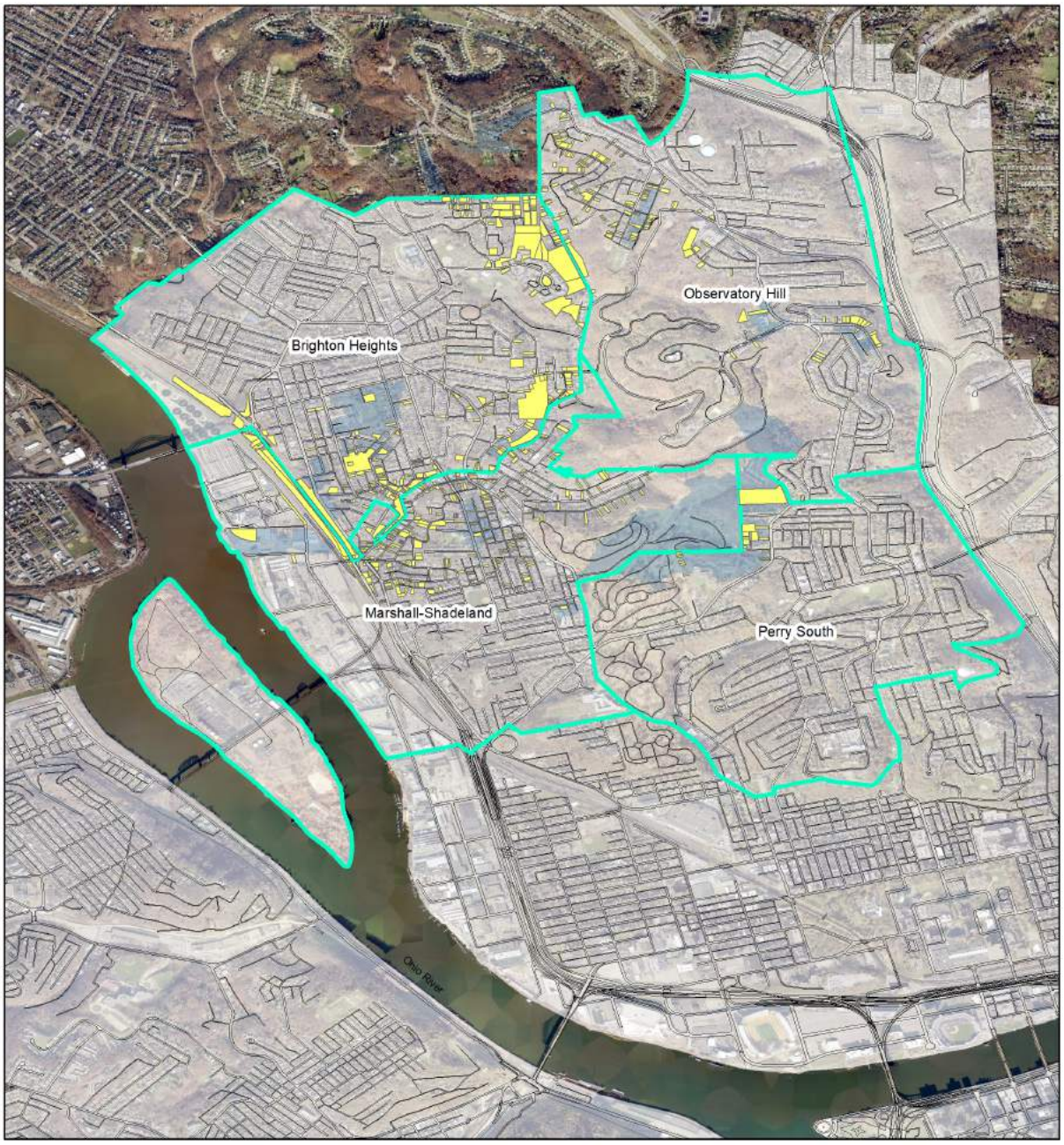


Legend

- A42 Neighborhoods
- O27 Neighborhoods
- PGH Neighborhoods
- Rivers

1 inch = 8,539 feet
1 inch = 1.62 miles

N

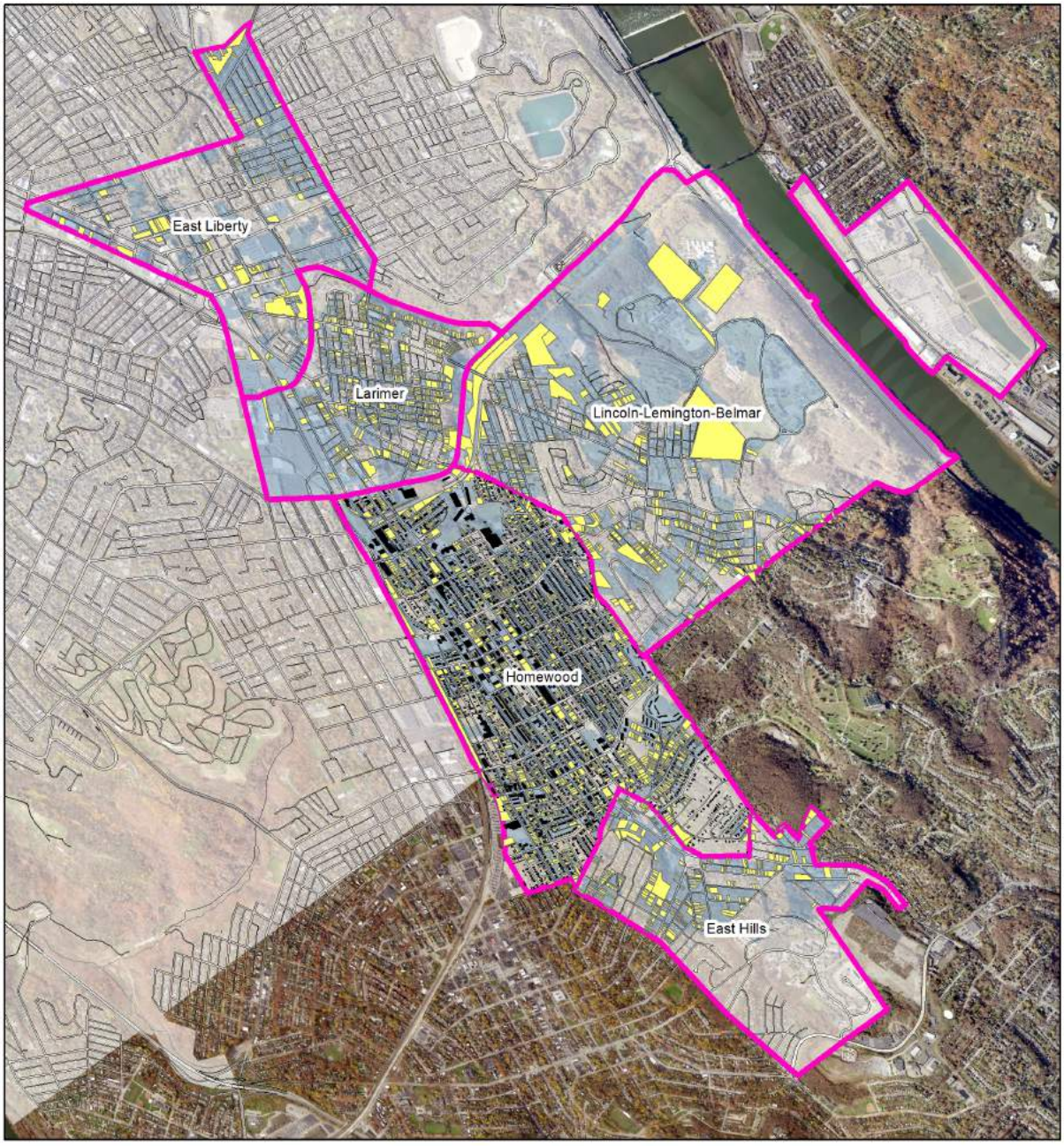


Legend

- O27 Neighborhoods
- PGH Neighborhoods
- Vacant Lots in PWSA Priorty Area (O27 Sewershed)

1 inch = 2,500 feet
1 inch = .47 miles

N

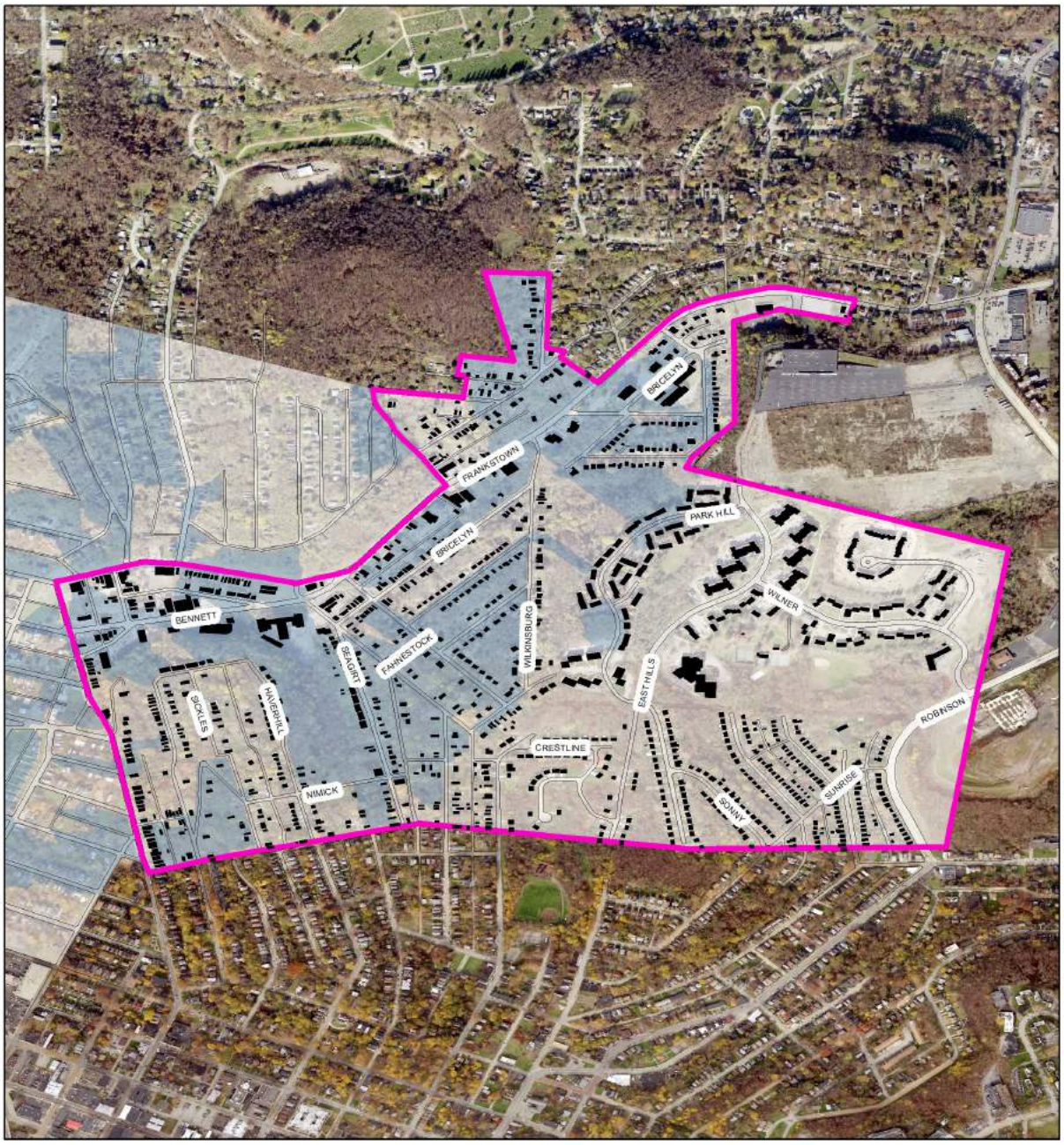


Legend

- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods
- Vacant Lots in PWSA Priorty Area (A42 Sewershed)

1 inch = 2,750 feet
1 inch = .52 miles

N

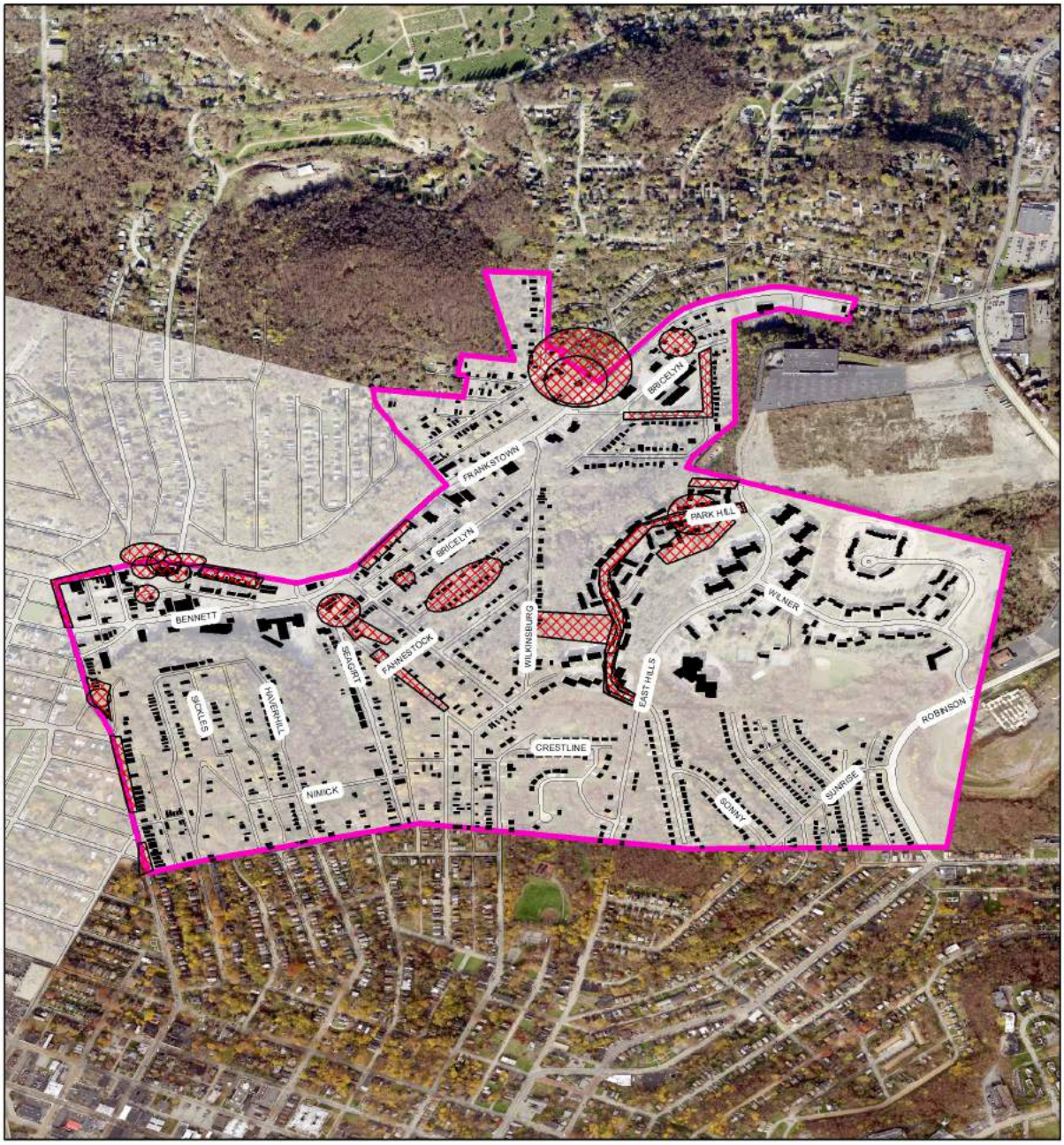


Legend

- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

1 inch = 1,000 feet
1 inch = .19 miles

N

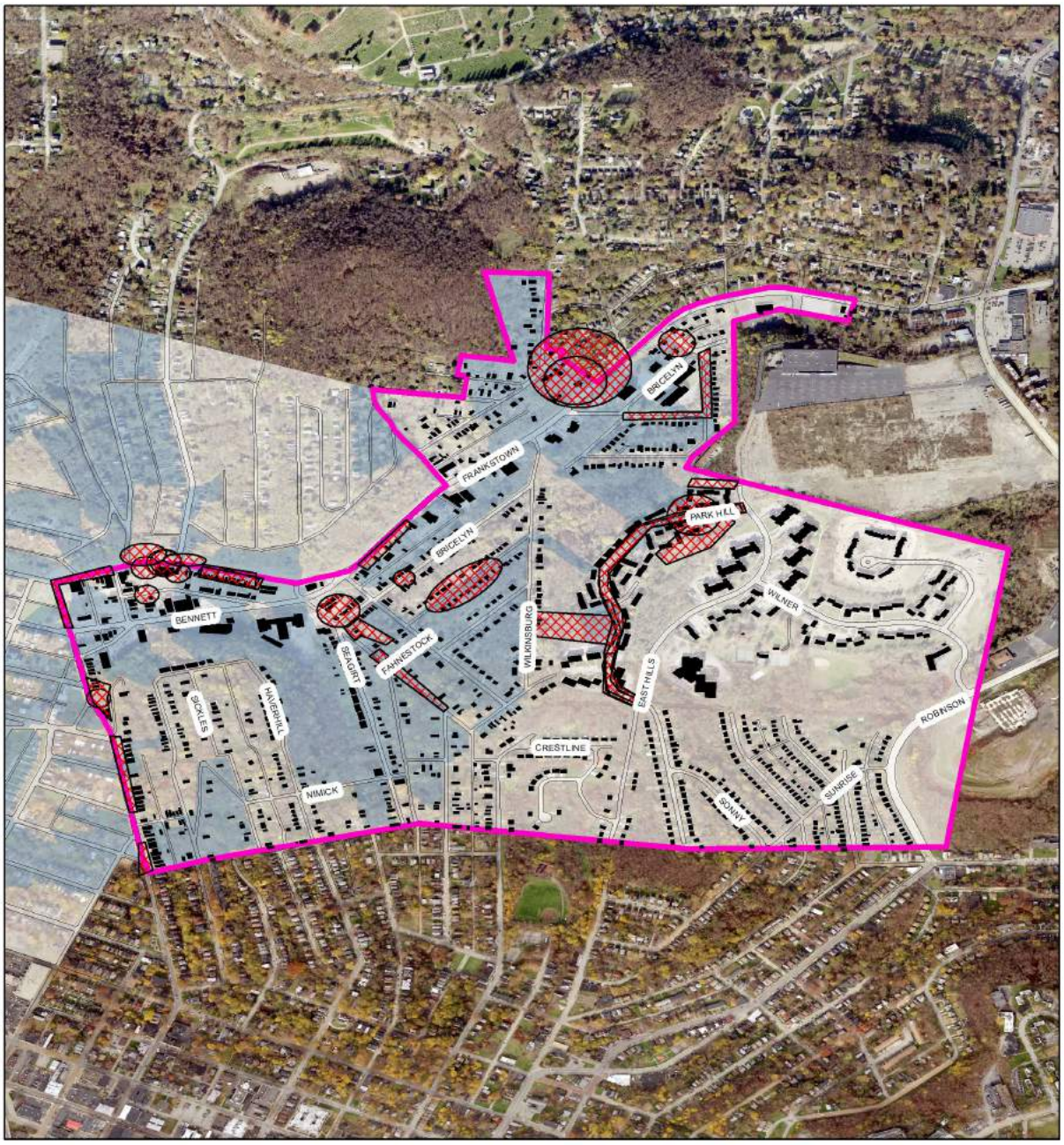


Legend

- Resident Stormwater Issues (East Hills)
- A42 Neighborhoods
- PGH Neighborhoods

1 inch = 1,000 feet
1 inch = .19 miles

N

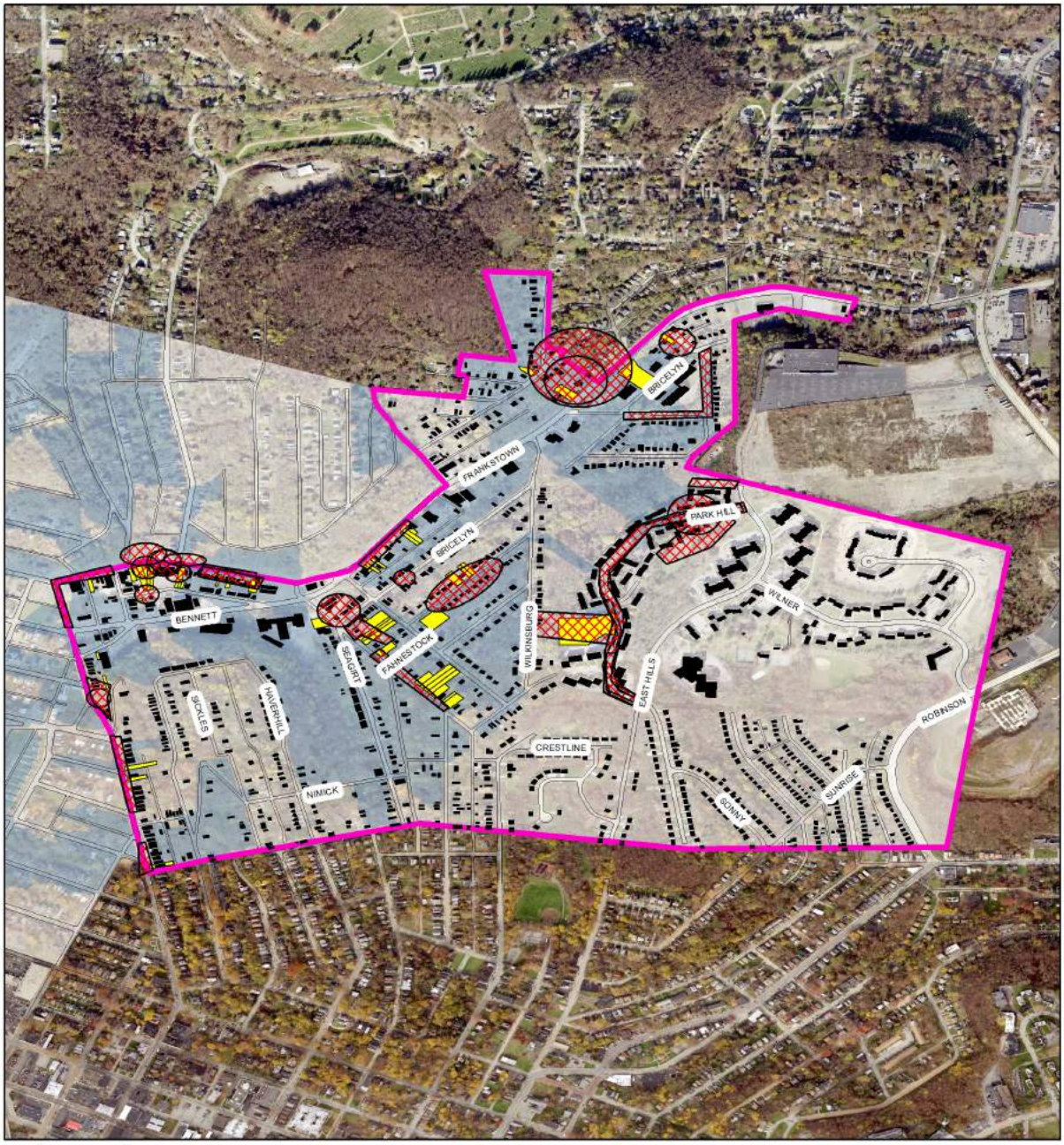


Legend

- Resident Stormwater Issues (East Hills)
- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

1 inch = 1,000 feet
1 inch = .19 miles

N

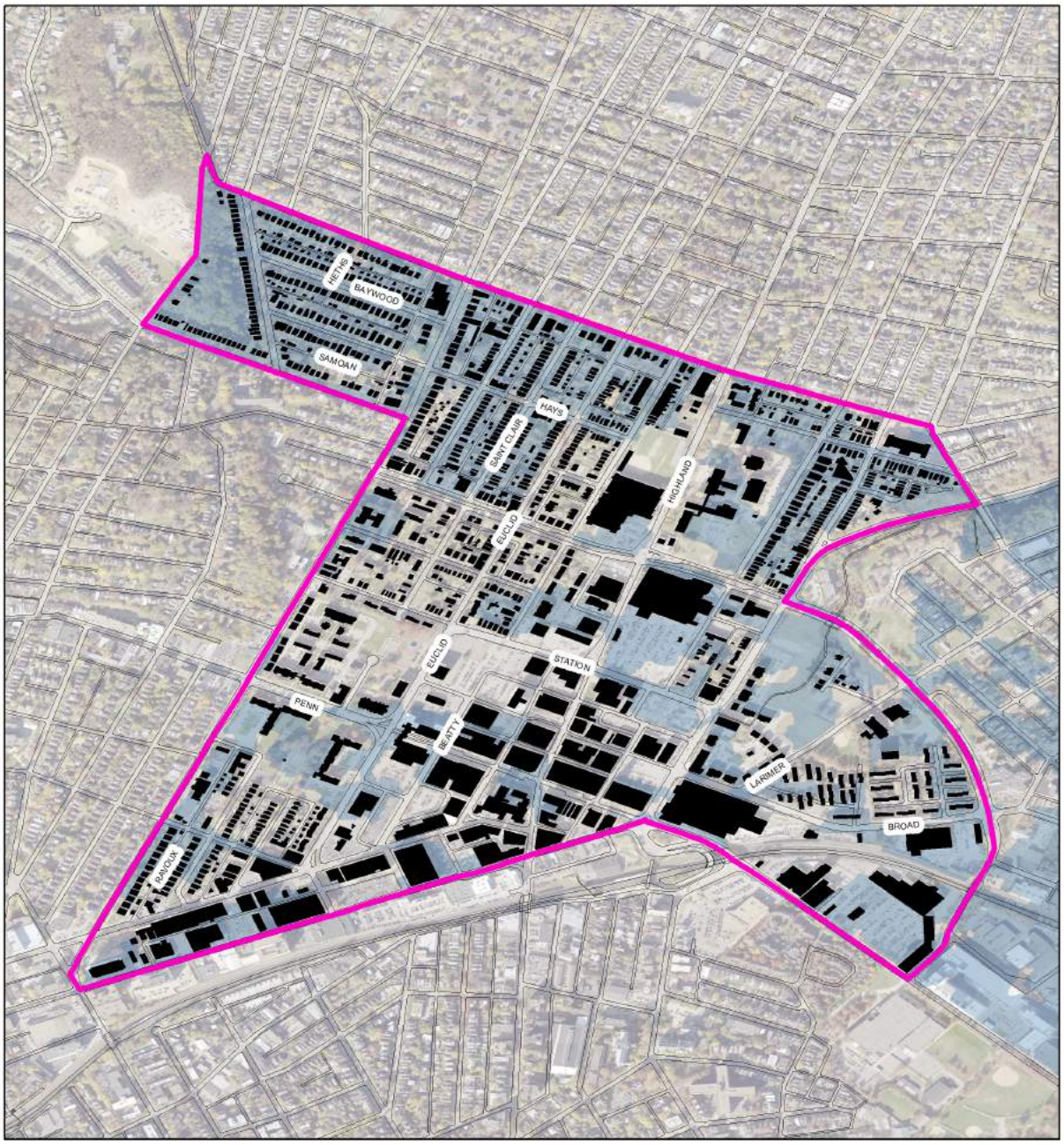


Legend

- Vacant Lots in PWSA Priorty Area/Resident Stormwater Issue Area (East Hills)
- Resident Stormwater Issues (East Hills)
- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

1 inch = 1,000 feet
1 inch = .19 miles

N

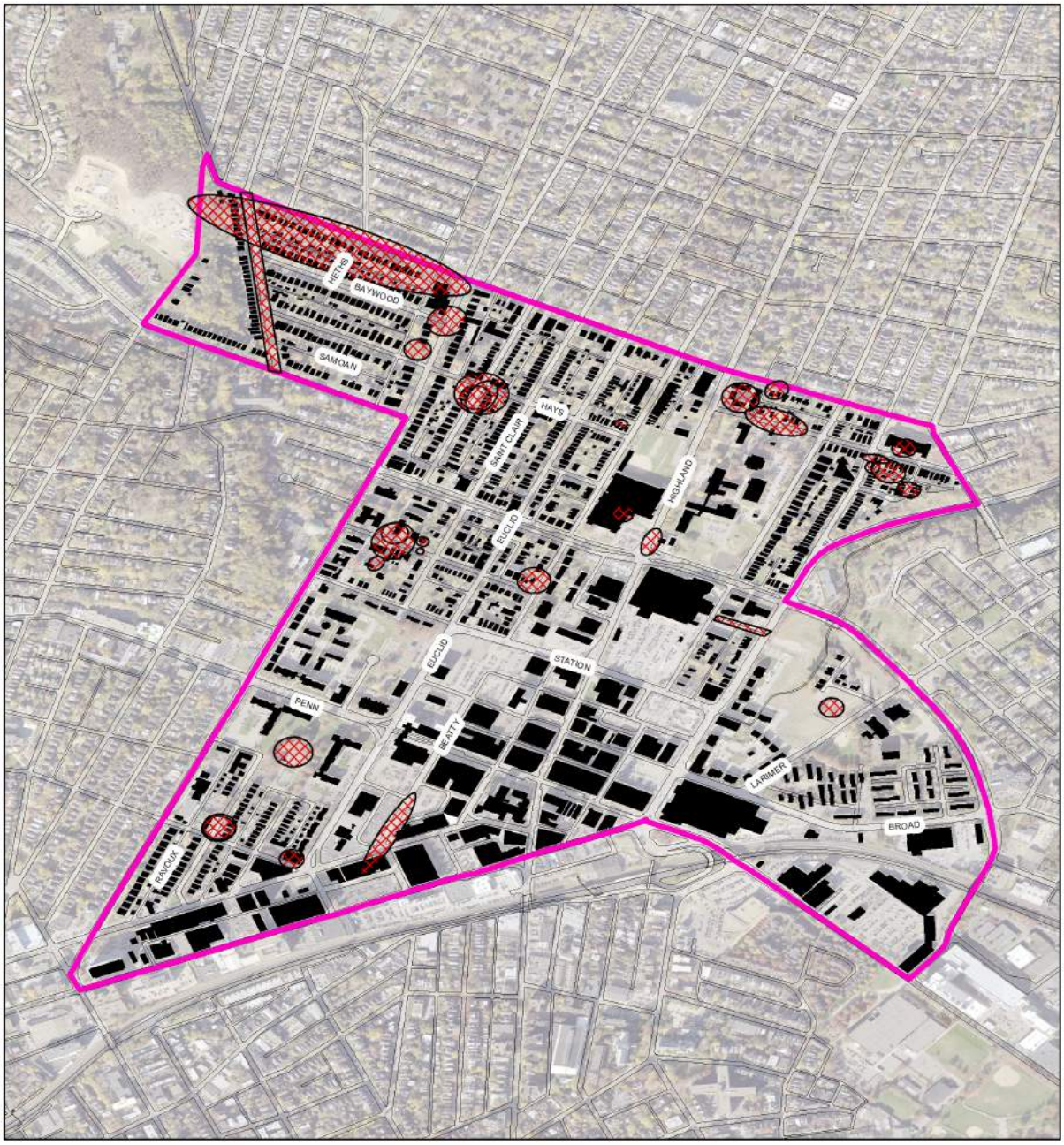


Legend

- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

1 inch = 950 feet
1 inch = .18 miles

N

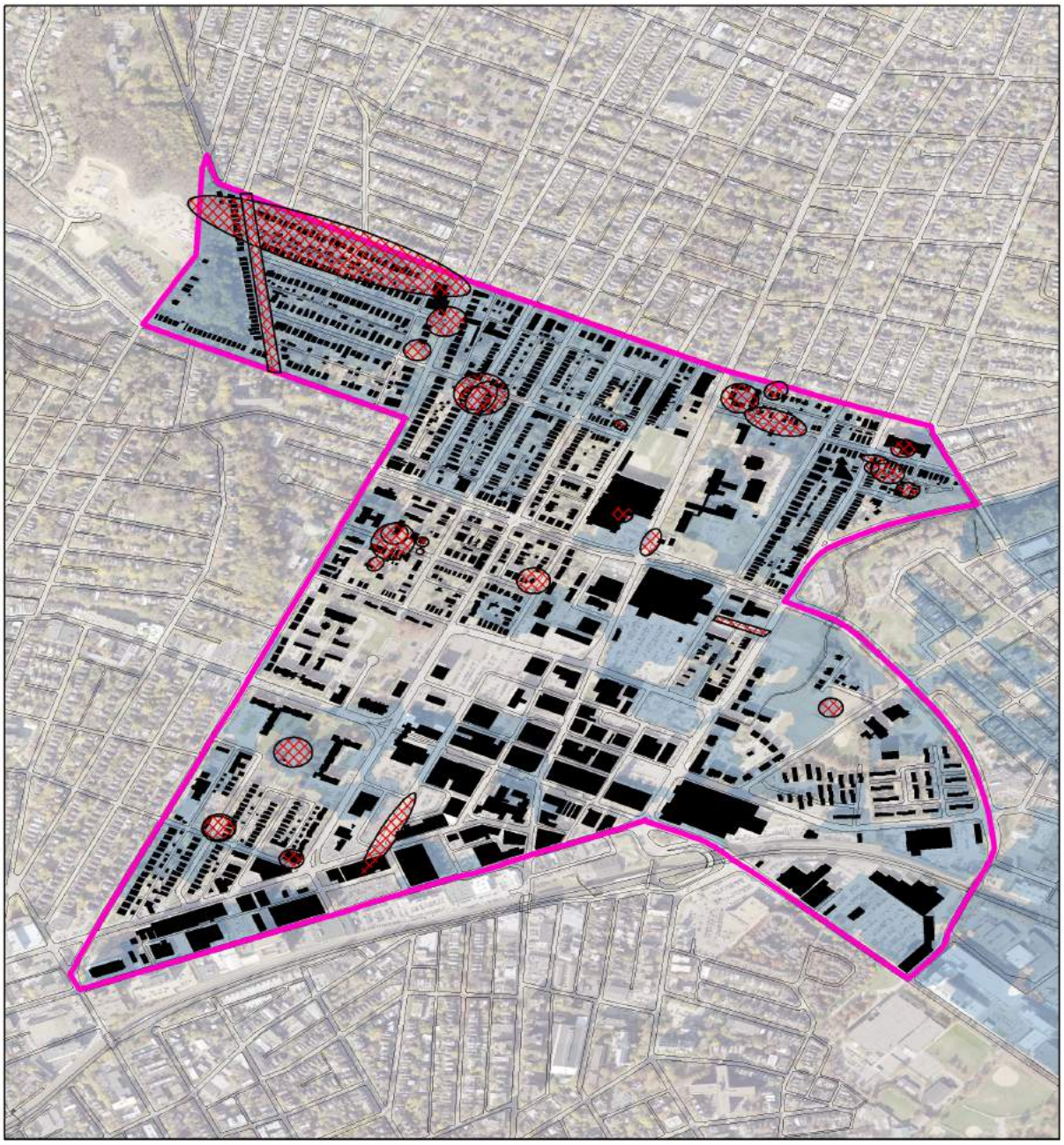


Legend

- Resident Stormwater Issues (East Liberty)
- A42 Neighborhoods
- PGH Neighborhoods

1 inch = 950 feet
1 inch = .18 miles

N

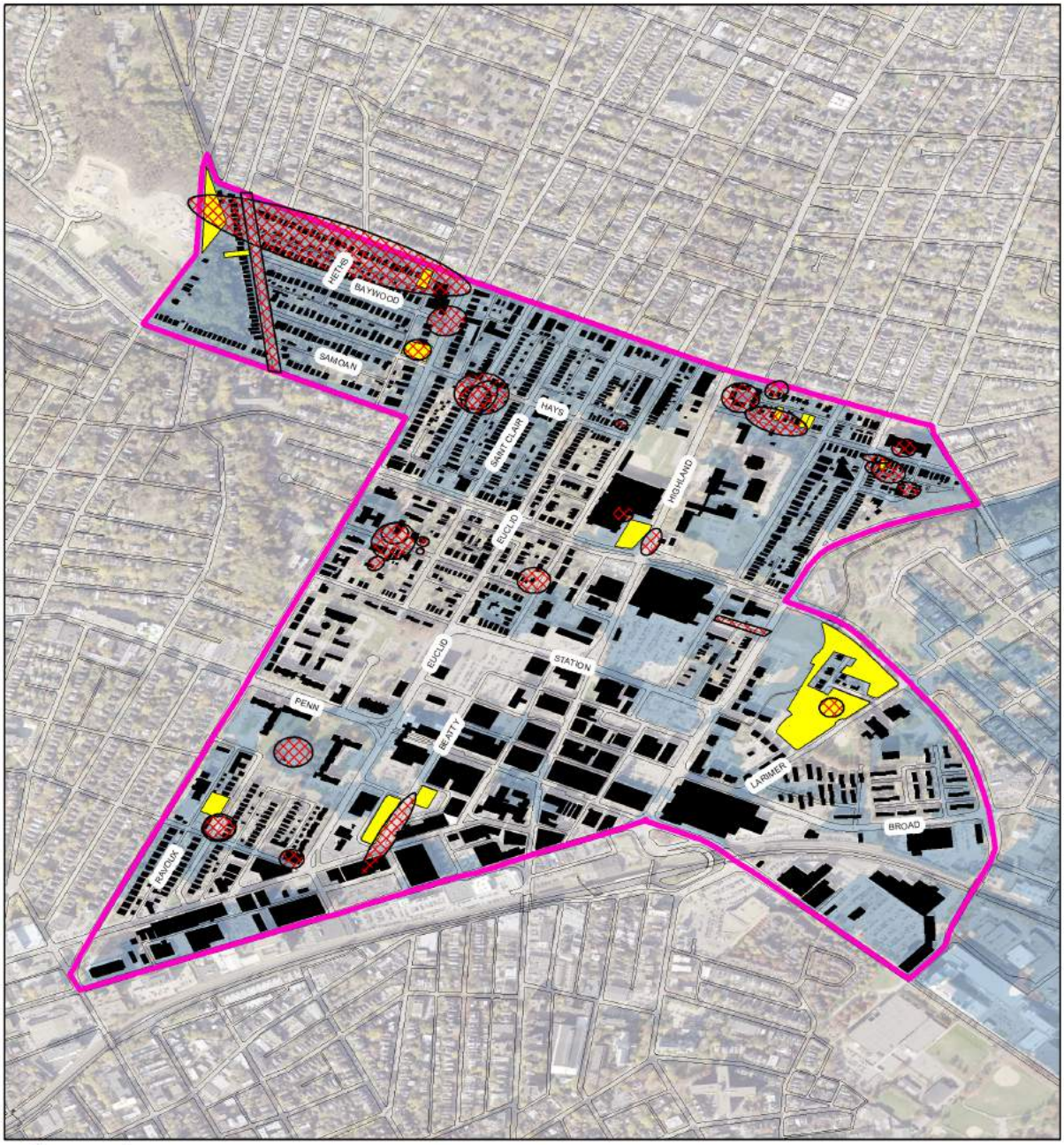


Legend

- Resident Stormwater Issues (East Liberty)
- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

1 inch = 950 feet
1 inch = .18 miles

N

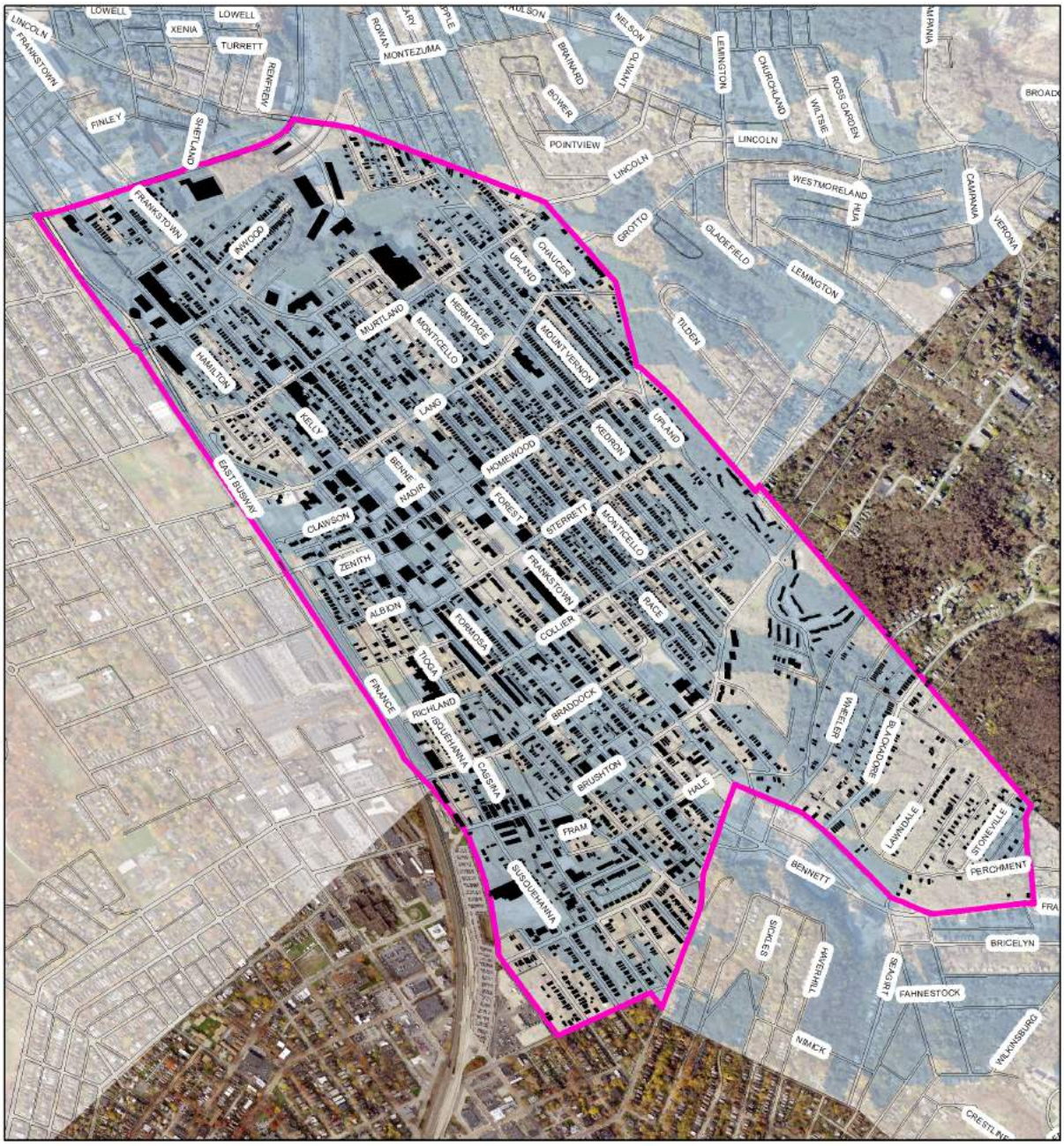


Legend

- Resident Stormwater Issues (East Liberty)
- Vacant Lots in PWSA Priorty Area/Resident Stormwater Issue Area (East Liberty)
- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

1 inch = 950 feet
1 inch = .18 miles

N

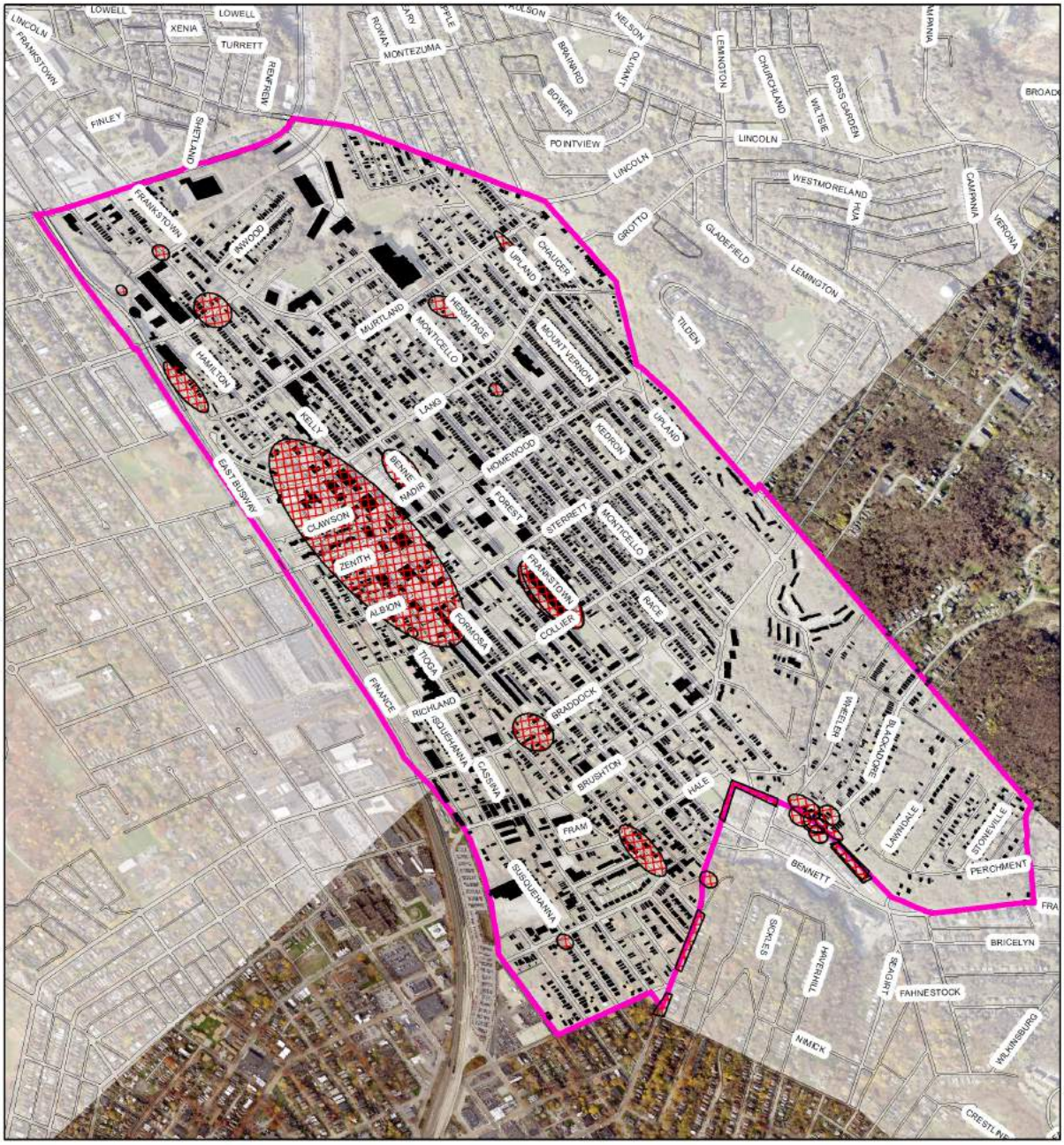


Legend

- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

1 inch = 1,250 feet
1 inch = .24 miles

N

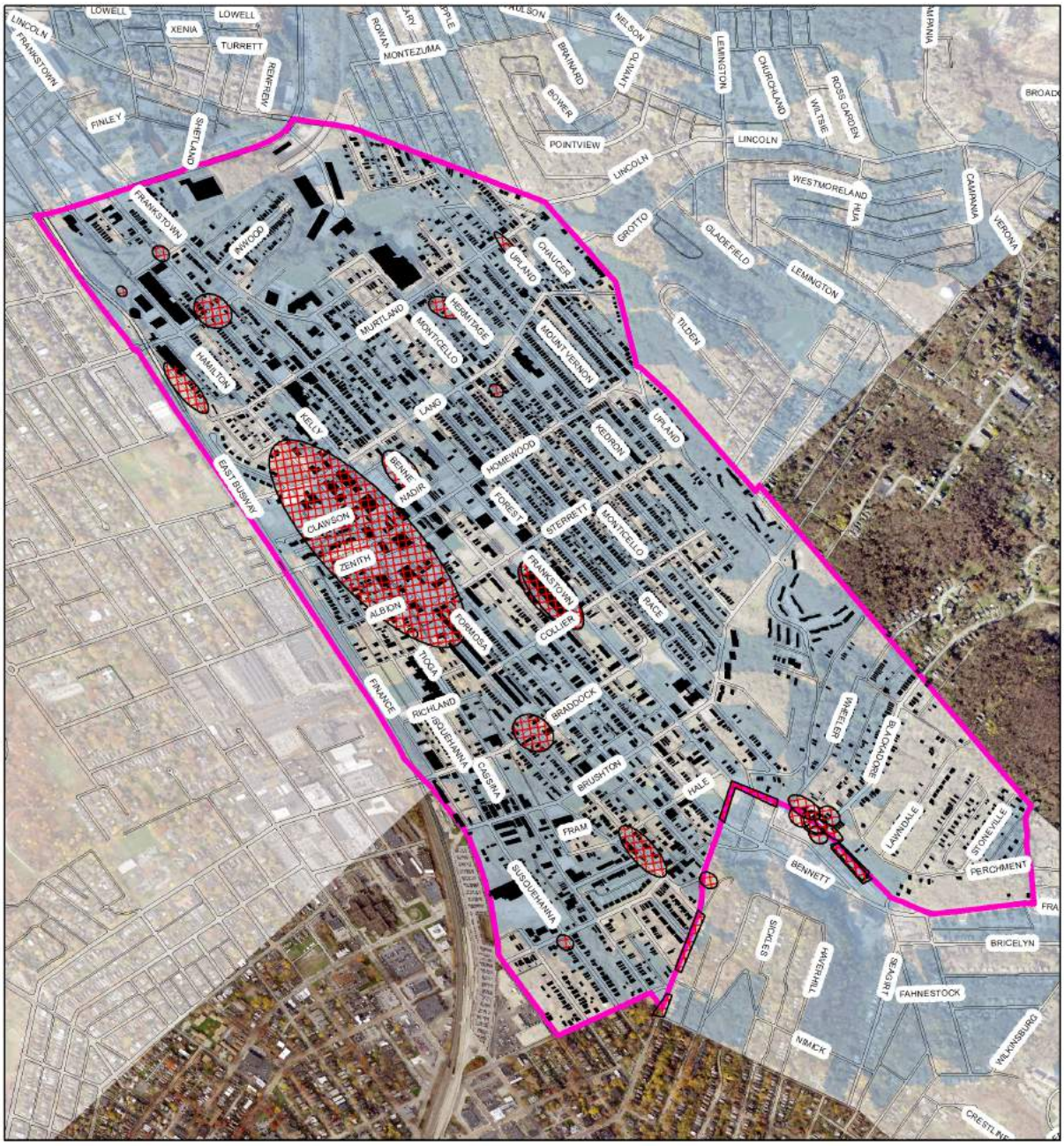


Legend

- Resident Stormwater Issues (Homewood)
- A42 Neighborhoods
- PGH Neighborhoods

1 inch = 1,250 feet
1 inch = .24 miles

N

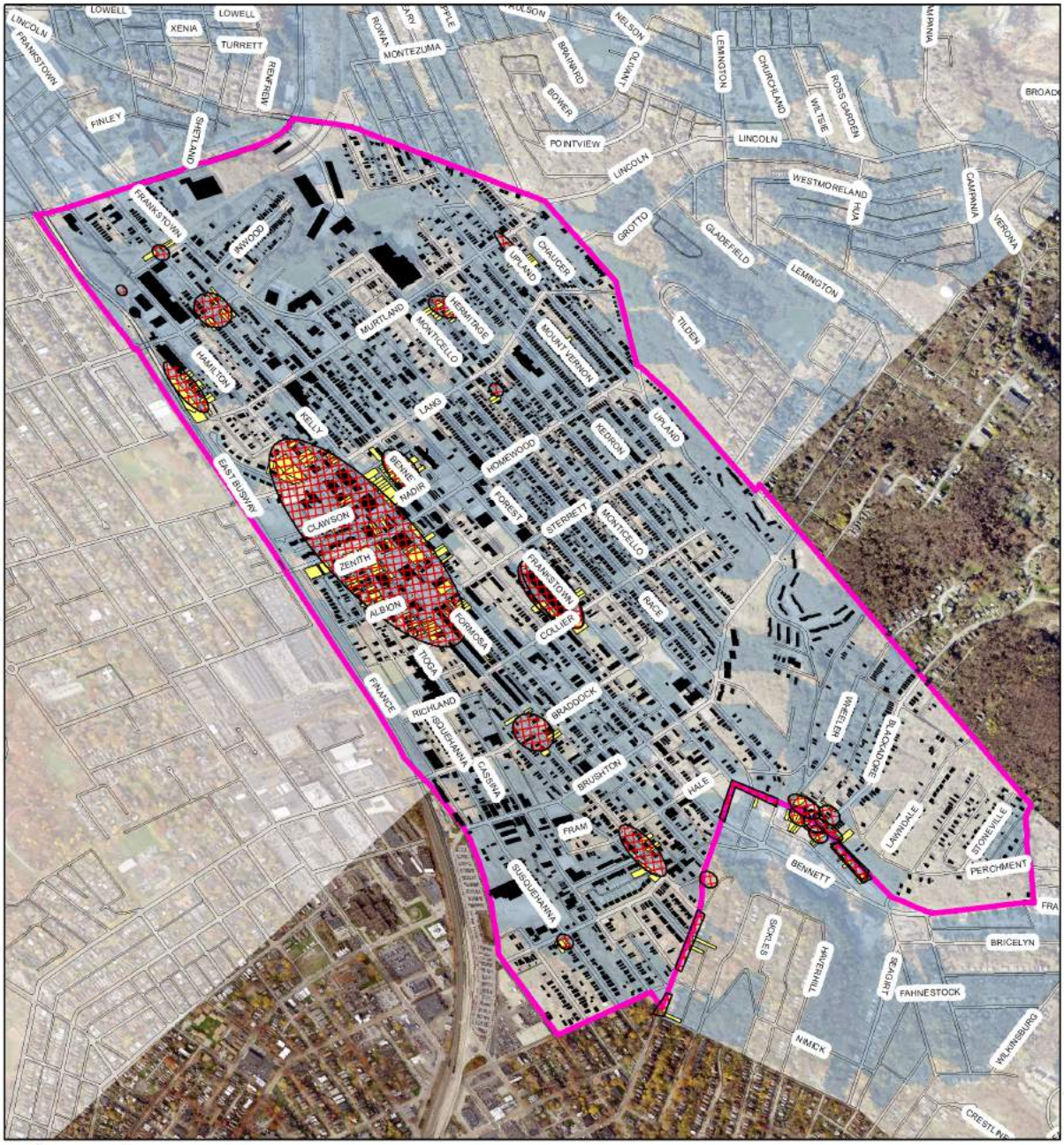


Legend

- Resident Stormwater Issues (Homewood)
- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

1 inch = 1,250 feet
1 inch = .24 miles

N



Legend

- Resident Stormwater Issues (Homewood)
- Vacant Lots in PWSA Priorty Area/Resident Stormwater Issue Area (Homewood)
- A42 Neighborhoods
- PWSA Priority Capture Area (A42)
- PGH Neighborhoods

1 inch = 1,250 feet
1 inch = .24 miles

N

Resident Suggestions

Have a great idea or specific issue? Tell us!

027 Sewershed

Brighton Heights

- Community garden, dog park
- Pave the street
- Plants for St. Johns
- Dog park
- There are a few houses that need some TLC
- Vegetable garden
- If we had more volunteers I would love for us to "pretty up" our bus stops. I have done a little of that on my own with the bus stop near Acacia and this year my garden committee will be doing that with some canna lilies.
- Bike infrastructure
- Forestry, we need to clean up fallen debris
- Repair/address vacant houses - plan to renovate them
- Rebuild the Davis Ave bridge to access the park

Marshall-Shadeland

- Field/School
- Little Free Library
- Baseball field
- Have neighbors responsible for cleaning debris from trees etc that are curbside causing sewer issues
- Clean-up, Trash removal @ Eckert + McClure, and Cit Steps
- Game space

Observatory Hill

- Bike lanes
- Trails in woods
- Green spaces
- Park improvements
- Sidewalks and other areas around houses w/ absentee owners
- Trails in woods
- Outdoor music venue
- Derelict abandoned houses on Perrysville Ave

- Urban wind farm
- Too many vacant lots with tons of garbage. No response from the City of Pgh when they are contacted.
- Just general better maintenance of the resources that we do have (Riverview Park, trails, street trees, etc.)

Perry Hilltop

- Bad neighborhood, empty houses, drug activity
- Rain barrels
- Vegetable garden, barrels
- Drug trafficking, police patrol

A42 Sewershed

East Hills

- Rain garden because it provides and outdoor space and beautifies the neighborhood
- I would love to a Spray Park in Homewood @ the Salvation Army
- 1. Rain garden, 2. tree pits, 3. flow through planters
- none at this point
- more project for children
- rain gardens, bioswales, nature meadows on common area property throughout East Hills Association property
- Could we turn some asphalt in ground/grass?
- rain gardens would be nice also
- fishing ponds - fish stores, teach fishing in schools
- I have rain barrel in my yard haven't touched it in a year, large garden
- veggie garden
- nope
- All neighborhoods should have rain gardens in areas permitted
- Build a new park and patrol the area for safety. Give loans for revitalization, other than to public officers. Redo sidewalks, make bike lanes for our community. Pest control (rodents), community tubs projects. Give out free materials to beautify to home owners!

- more parks in East Liberty for the young children to play
- not enough help
- There should be more rain gardens and flower meadows or beautify the neighborhoods
- All neighborhoods could benefit from dog parks or a place to curb your dog instead of on your neighbor's lawns
- There should be multiple educational sports, different activities for the youth to do outside of school to keep off the streets. Especially when their parents can't afford to pay a monthly membership fee.
- none
- no
- new home
- rain gardens, trees
- plants and flowers at every open space
- I think working on bettering the environment is a great thing

East Liberty

- We need solar energy solutions as well as recycling containers in each neighborhood
- We need a creative play space.
- More block parties and unity events
- More summer ecojustice programs for children coordinating with each other, preferably continuous through all grade levels
- Open Obama field for children in neighborhood.
- People not stopping at stop signs. there are at least 3 properties that look like a garbage dump (corner of Huntress and Moga, city-owned) 6216 St. Marie Street - car in backyard, 6226 St. Marie, 712 Collins - health hazard, boarded up
- Have education for the young people in school about water pollution and keeping the sewers and waters clean from any added chemicals and pesticides and polluting the water with anything
- I honestly don't know enough other than want to do anything we can to use less resources and channel water and solar most efficiently
- At the foot of Amber Street, opportunity to calm traffic and capture stormwater w/ bump-out/ raingarden
- More neighbor block watch
- Littering is an issue
- Have trees
- Heth's Run needs to be reworked

- Better Lights
- Have meetings for the residents to voice opinion about parks
- Fix the street and sidewalks
- More affordable housing is needed

Homewood

- Functional green space for Hamilton/Oakwood
- not sure yet
- I want a green zone/urban agro
- Fix the neighborhood period!
- Call Me!!!
- Live on Mt. Vernon over 50 years and always major problems. Problems with weather affecting property; washing down hill and flooding basements and getting worse as years go by. For myself, put mulch on sloped yard (8 bags) entire yard and it has helped holding it back.
- I want a green zone for the kids on Upland with flowers, trees, greenery.
- across street needs maintained
- business owner
- cut all the overgrown areas
- yes, but too many to write about at this time
- Question: Where does 9 mile watershed come into Homewood?
- City come out and cut some weed down and tree trim backs on Wheeler St. 19 homes ___ past
- fix the water problem on Standard Ave.
- Drain streets! Dry all in drains
- community day clean ups and movies in the park
- kids & elderly/retiree walks in nature and story-time
- Homewood
- clean the empty lots
- need more street cleaning 2x a month
- trees flower landscape plan I own
- can't think of anything at the moment
- plant up vacant lots!
- try some way to stop late 12am and over for motorcycle riding up the hill and down
- bioswales or trees
- rodents in alleys
- hire people from the community
- My issue is the mine water that is causing damage to Standard Ave. The condition of the road is

dangerous.

- erosion on side of our home from storm water run-off
- sinkhole in area
- I like the idea of the garden. We need more things like that. We also need more cleaning and maintaining of the streets.
- Would love to have a veg garden on the lot next door to my home.
- leaky bathroom
- Salt boxes for bad weather
- Farmer's market. Christmas trees. Plant seeds.

Larimer

No Written Responses

Lincoln Lemington Belmar

No Written Responses