

John Marshall Drive Storm Sewer Capacity & Green Street Meeting

October 2, 2012



Agenda

1. Storm Sewer Capacity Project – Elizabeth Thurber
2. Background on Green Streets & Rain Gardens- Jennifer McDonnell
3. John Marshall's Median Rain Garden Project – Christin Jolicoeur

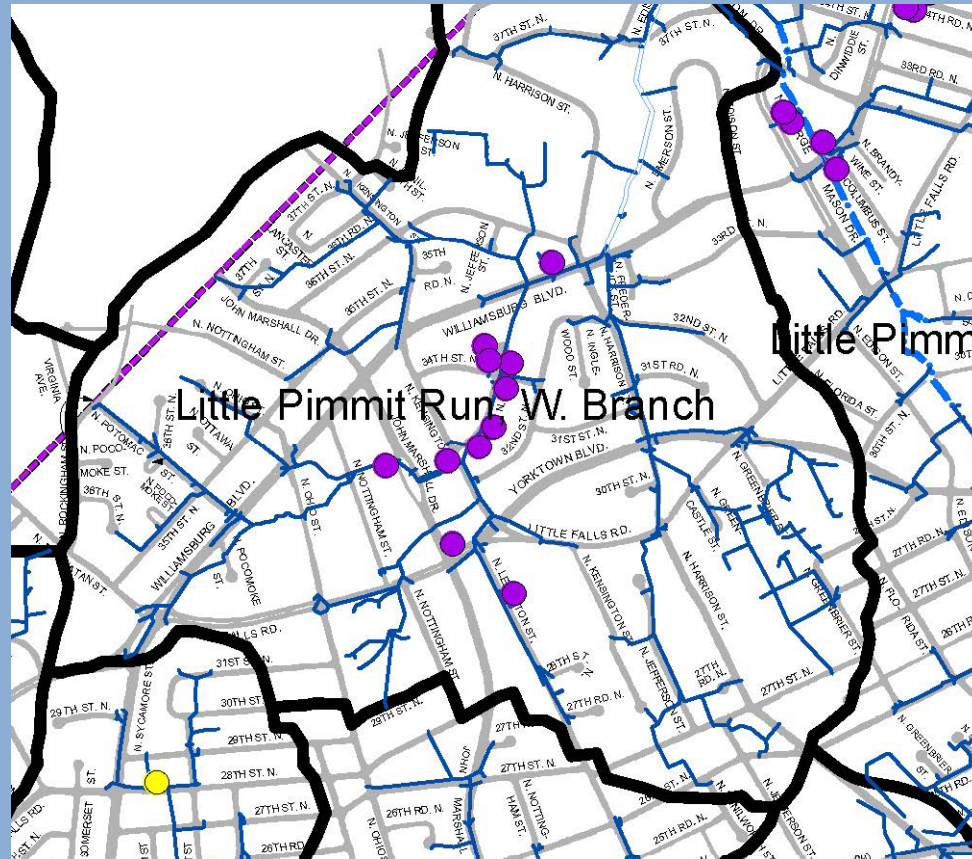


Ground Rules

- We will all be active and respectful participants.
 - Active listeners.
 - Respectful language and behavior.
- We will hold only one conversation at a time.
 - Refrain from side conversations and take phone conversation outside of the room.
 - Silence cell phones.
- We will focus on the two projects during the meeting – the Green Street and the storm sewer capacity projects.
 - Other topics will be held until after the meeting or for another time.
- County staff commits to recording questions that cannot be answered tonight.
 - They will be addressed in a *Response to Questions* document. *Some answers may require more time than others for response.*
- County staff commits that before the meeting adjourns, questions to be included in the *Response to Questions* document will be reviewed and agreed upon by the group.
- County staff commits that the document will be e-mailed to tonight's participants and posted on the John Marshall Project page on the County site.



Flooding from June 2006 Storm



High Water Marks at
5510 N. 33RD St. after
June 2006 Storm



Google Earth Photo with Flood Level Marked





**ARLINGTON**
11960 010

DEPARTMENT OF ENVIRONMENTAL SERVICES

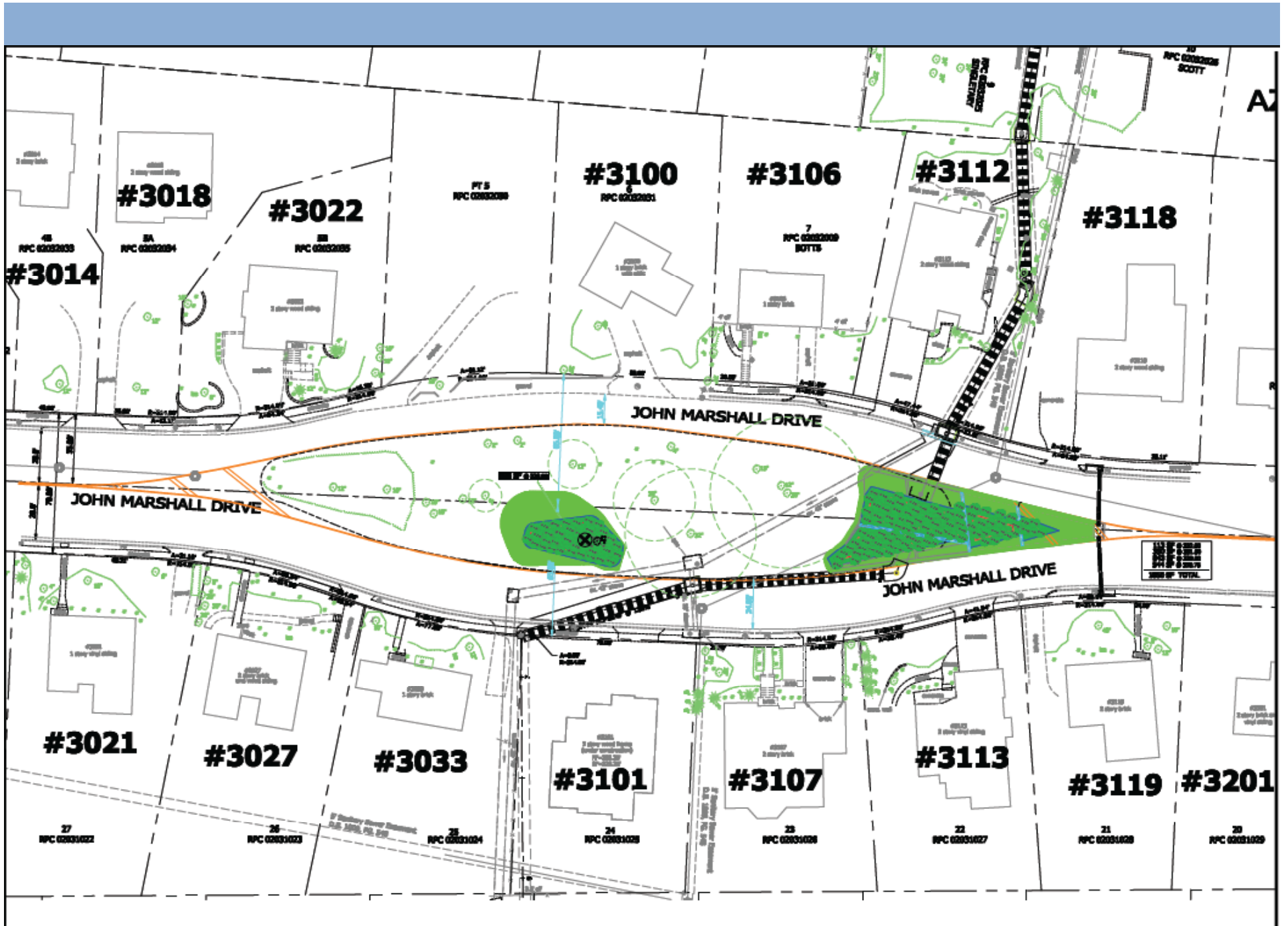
Engineering & Construction
11960 010
11960 010
11960 010

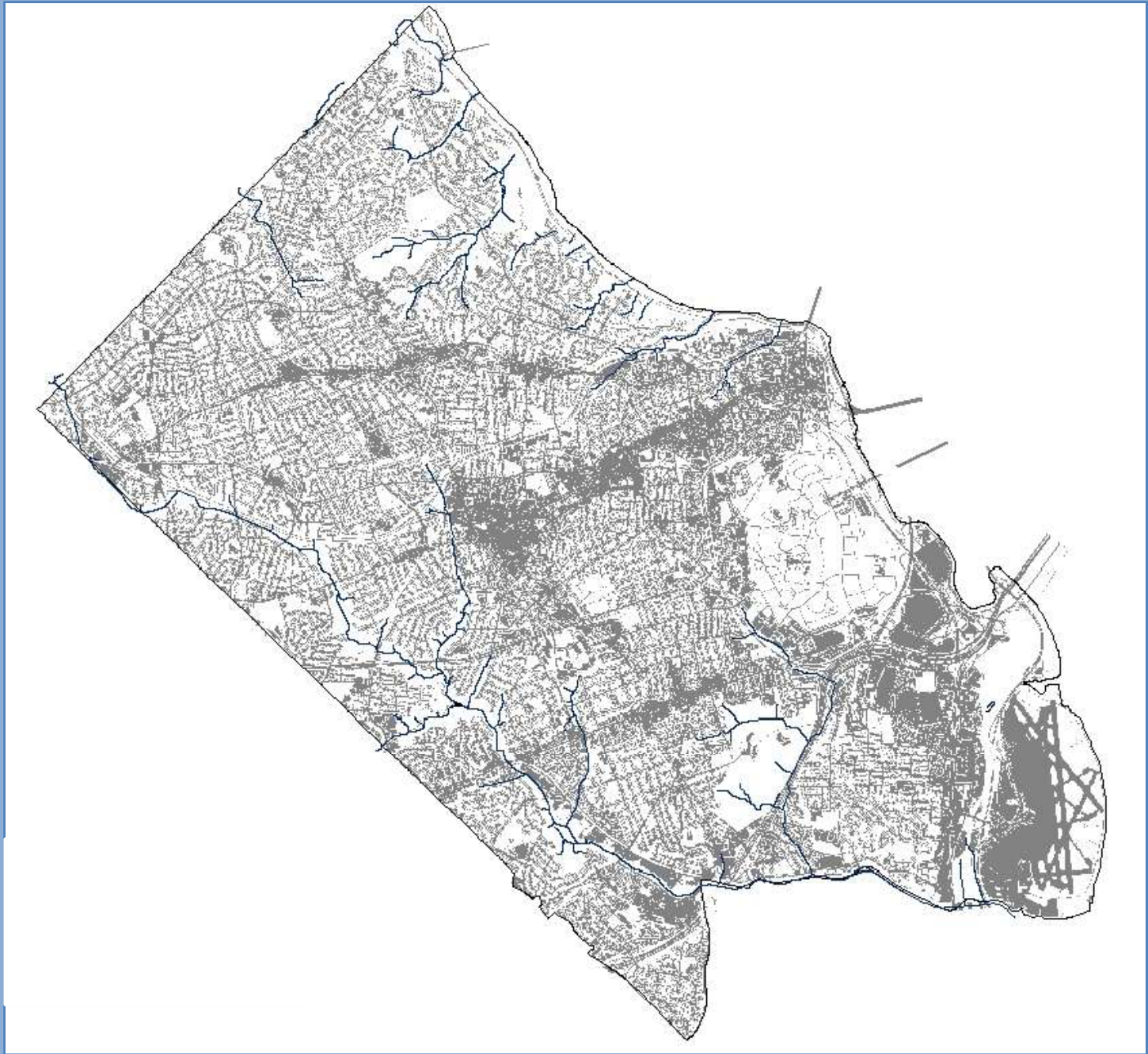
Project Name and Location
West Pimmit Run Phase I
Proposed Borewater Sub
Adrian Marshall Drive

Reviewed: 4/10/20
Drawn: 4/10/20
Checked: 4/10/20
Map Scale: 1" = 100' (Horizontal) or 1" = 50' (Vertical)

Client: 11960 010
File: 11960 010
Date: 4/10/20
Scale: 1" = 100'

of

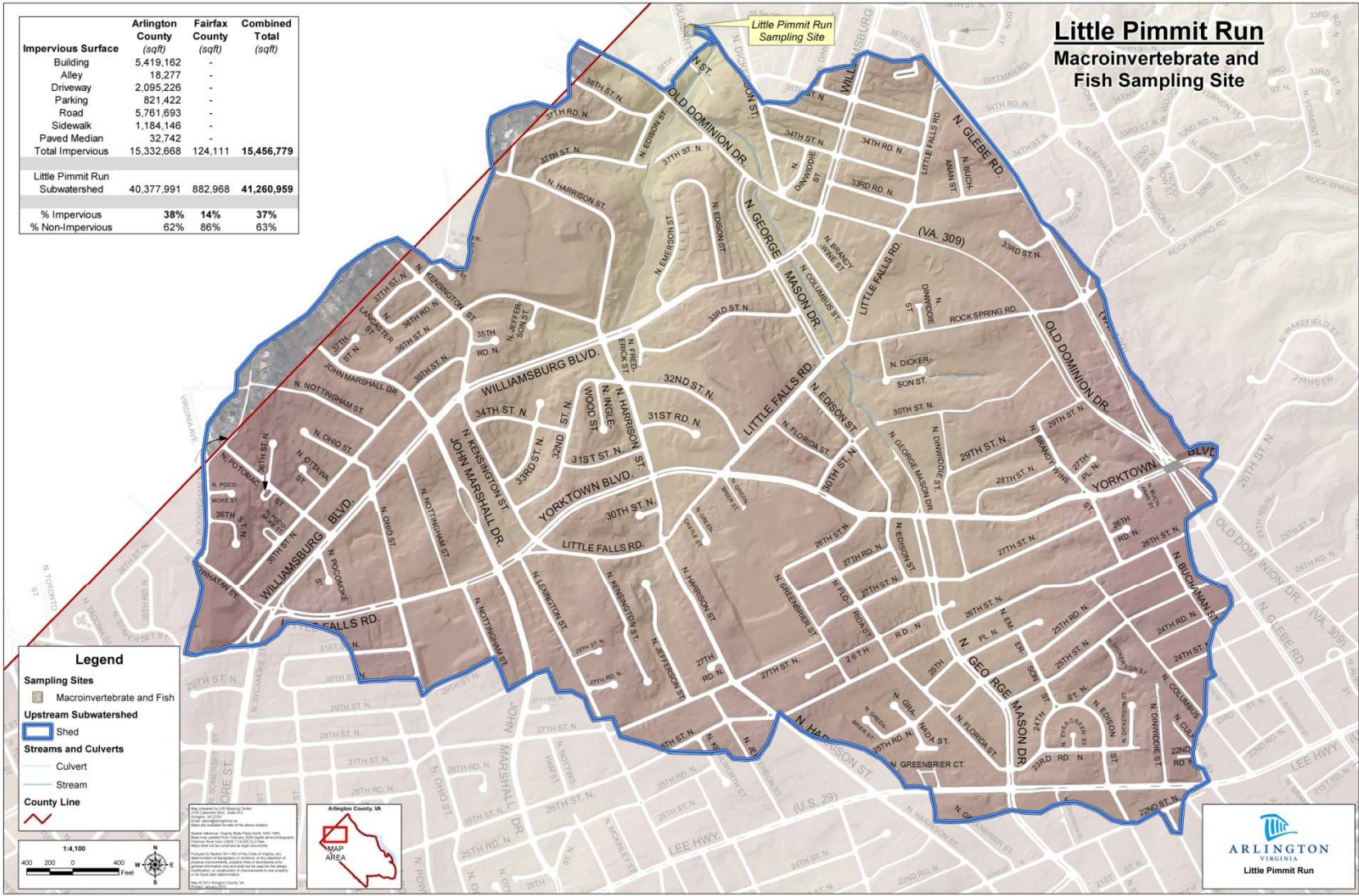




ARLINGTON
VIRGINIA

	Arlington County (sqft)	Fairfax County (sqft)	Combined Total (sqft)
Impervious Surface			
Building	5,419,162	-	
Alley	18,277	-	
Driveway	2,095,226	-	
Parking	821,422	-	
Road	5,761,693	-	
Sidewalk	1,184,146	-	
Paved Median	32,742	-	
Total Impervious	15,332,668	124,111	15,456,779
Little Pimmit Run Subwatershed			
	40,377,991	882,968	41,260,959
% Impervious	38%	14%	37%
% Non-Impervious	62%	86%	63%

Little Pimmit Run Macroinvertebrate and Fish Sampling Site



Legend

- Sampling Sites
 - Macroinvertebrate and Fish
- Upstream Subwatershed
 - Shed
- Streams and Culverts
 - Culvert
 - Stream
- County Line

1:4,100

This document is the property of the City of Arlington, Virginia. It is loaned to you for your use only. It is not to be distributed, copied, or otherwise used without the express written permission of the City of Arlington, Virginia. All rights reserved. © 2010 City of Arlington, Virginia. All rights reserved.



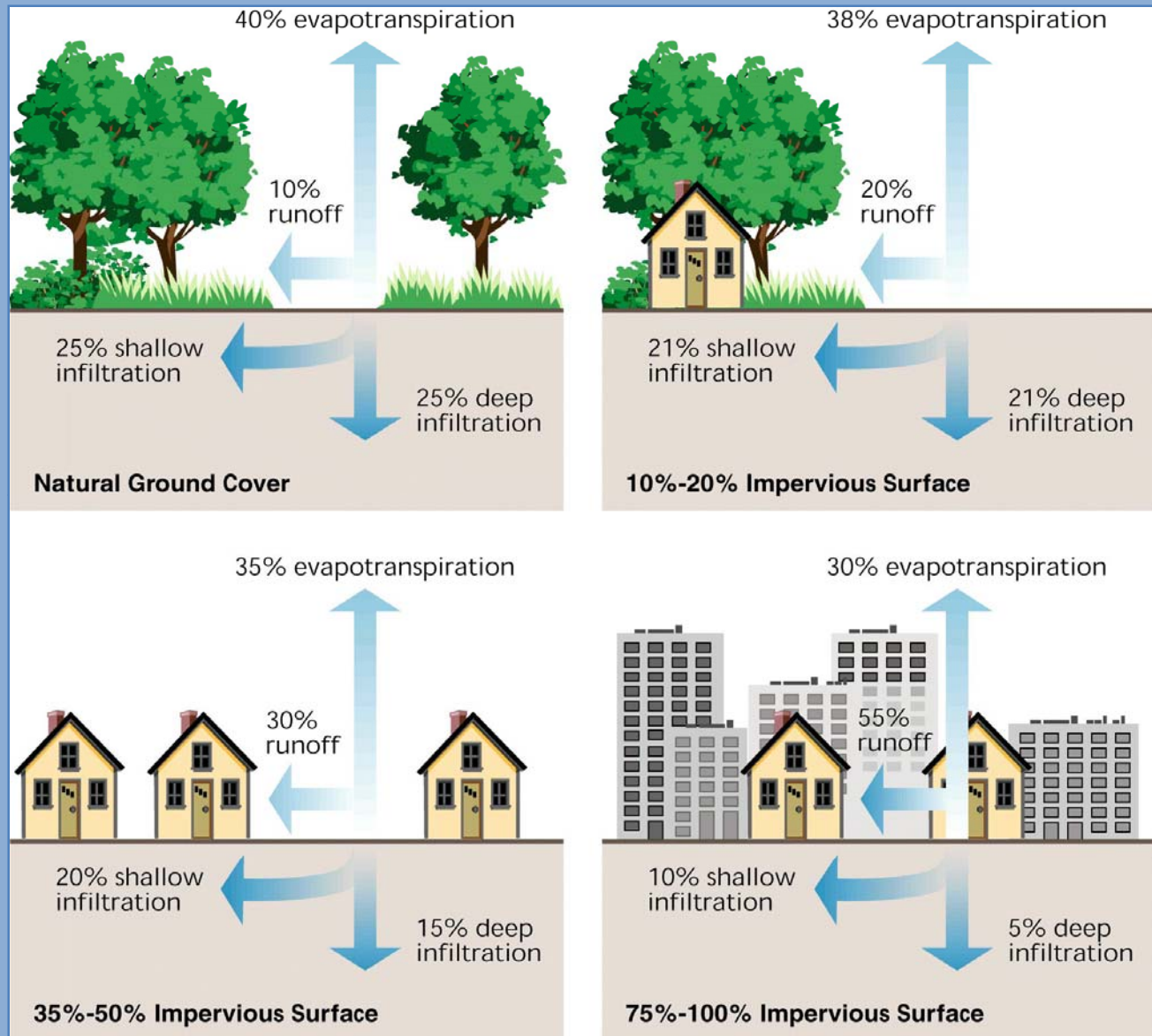


Fig. 3.21 -- Relationship between impervious cover and surface runoff. Impervious cover in a watershed results in increased surface runoff. As little as 10 percent impervious cover in a watershed can result in stream degradation.
 In Stream Corridor Restoration: Principles, Processes, and Practices (10/98).
 By the Federal Interagency Stream Restoration Working Group (FISRWG) (15 Federal agencies of the U.S.)

Stormwater Challenges

Volume: Significant quantities of stormwater enter Arlington's stream during storms, causing erosion that exposes our infrastructure and undermines trees along our streams.

Pollutants: Stormwater washes pollutants like nutrients (nitrogen and phosphorus), sediment, bacteria, and litter into our streams. This causes poor water quality in our streams.

Regulations: Arlington's Municipal Separate Storm Sewer Permit (MS4 Permit) and the Chesapeake Bay Total Maximum Daily Load (TMDL) require Arlington to address the volume and pollutant loads in our stormwater.





ARLINGTON
VIRGINIA









Stormwater Challenges

Volume: Significant quantities of stormwater enter Arlington's stream during storms, causing erosion that exposes our infrastructure and undermines trees along our streams.

Pollutants: Stormwater washes pollutants like nutrients (nitrogen and phosphorus), sediment, bacteria, and litter into our streams. This causes poor water quality in our streams.

Regulations: Arlington's Municipal Separate Storm Sewer Permit (MS4 Permit) and the Chesapeake Bay Total Maximum Daily Load (TMDL) require Arlington to address the volume and pollutant loads in our stormwater.



A Green Street is a street with a vegetated area in the public right-of-way that reduces the volume of stormwater and stormwater pollutants that enter our local streams, the Potomac River, and the Chesapeake Bay.



stormwater management for clean rivers

Green Streets

Urban stormwater runoff that isn't properly managed can pollute rivers and streams and contribute to combined sewer overflows (CSOs) to the Willamette River. Green Streets reduce the negative impacts of stormwater runoff. They mimic natural conditions by using soil and vegetation to manage runoff on the surface, at the source.



Green Streets transform impervious street surfaces into landscaped green spaces that capture stormwater runoff and let water soak into the ground as plants and soil filter pollutants. Green Streets convert stormwater from a waste directed into a pipe, to a resource that replenishes groundwater supplies. They also create attractive streetscapes and urban green spaces, provide natural habitat, and help connect neighborhoods, schools, parks, and business districts.




**ENVIRONMENTAL SERVICES
CITY OF PORTLAND**
working for clean rivers

Sam Adams, Commissioner
Dean Marriott, Director

Portland has been designing and building Green Streets for years. Ongoing monitoring proves they effectively reduce peak stormwater flows and runoff volume. Keeping stormwater runoff out of sewer pipes reduces sewer backups in basements, street flooding and combined sewer overflows (CSOs) to the Willamette River.



ENVIRONMENTAL SERVICES
CITY OF PORTLAND
working for clean rivers
Sam Adams, Commissioner
Dean Marriott, Director



Search Home Glossary Contact Log In Log Out

Philadelphia Water Department



Reveal banner highlights

YOUR WATERSHED
WATERSHED ISSUES
WHAT WE'RE DOING
WHAT'S IN IT FOR YOU

- Green Stormwater Infrastructure
 - Tools
 - Programs
 - Green Parks
 - Green Streets
 - Project Map
 - Source Water Protection
 - Traditional Infrastructure
 - Waterways Restoration
 - Community Partnerships
-
- Waterways Assessment
 - Research and Planning
 - Policy and Regulations
 - Documents and Data
 - Maps

Green Streets Program

A green street uses a combination of vegetated and engineered strategies to manage rain or melting snow (runoff), allowing it to soak into soil, filtering it, reducing the amount of stormwater making its way into Philadelphia's combined sewer pipes and reducing CSOs.

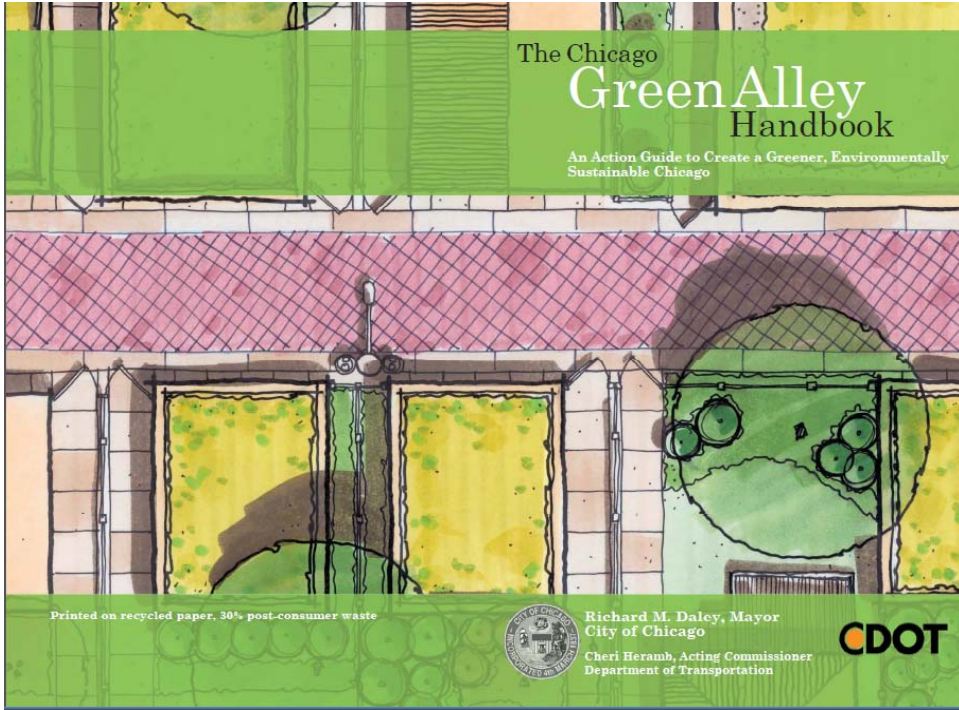


Rain Gardens:

Public Involvement
for Water Quality

Scott Cahail
Water Services Department
Kansas City, Missouri





The Chicago Green Alley Handbook

An Action Guide to Create a Greener, Environmentally Sustainable Chicago

Printed on recycled paper, 30% post-consumer waste



Richard M. Daley, Mayor
City of Chicago

Cheri Heramb, Acting Commissioner
Department of Transportation



Green Streets

Environmentally Friendly Landscapes
for Healthy Watersheds

Green Streets in Your Neighborhood



Department of Environmental Protection
Green Streets in Your Neighborhood

Franklin Knolls & Clifton Park

page 1 of 6

drainage
reduce impervious surfaces by narrowing the roadway and creating more space for vegetation and soil to absorb rain water

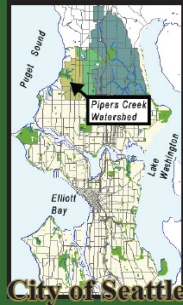
water quality
utilize a combination of soils, plants, and infrastructure to clean and filter rainwater as it washes off parking spaces and the roadway

landscaping
use natural materials—vegetation and soils—to slow, filter, and infiltrate stormwater runoff... all within the space of the public right-of-way

mobility
calm traffic by narrowing and curving the roadway; ensure safe access for emergency vehicles, bicycles, and pedestrians

community
bring life to the street by constructing sidewalks, gardening with neighbors, and promoting watershed stewardship

education
set an example for future alternative streets projects; monitor changes in water quality and drainage; share ideas with watershed neighbors and other cities

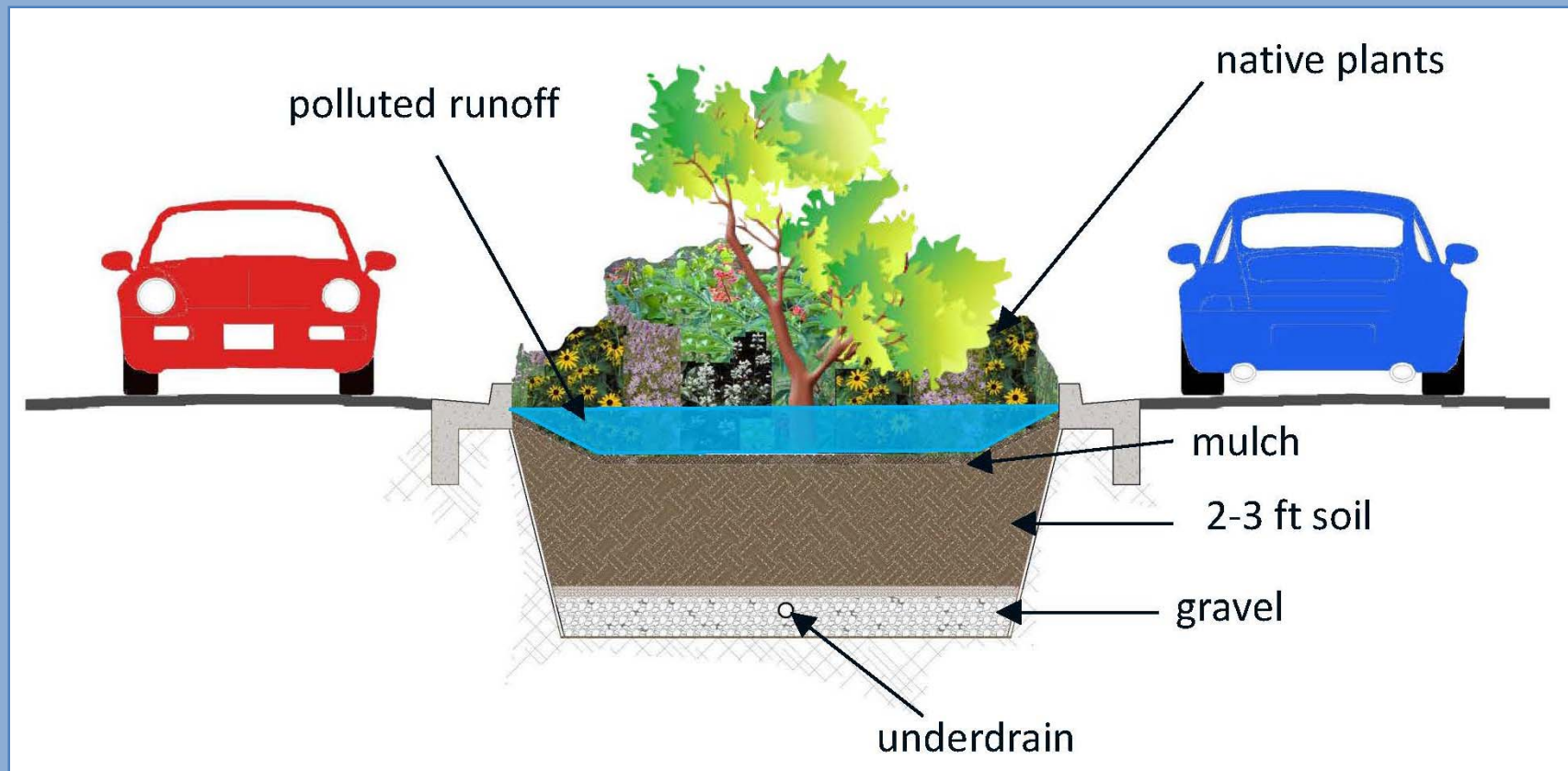


The Cascade in Context

The 110th Cascade is a Natural Drainage Systems (NDS) project in Seattle's Pipers Creek watershed. The project spans multiple blocks of 110th Street, between two main traffic arterials: Greenwood Ave. N and 3rd Ave. NW. The right-of-way has been designed to meet transportation requirements, while improving drainage and water quality functions.

The "cascades" within this project are a design and engineering solution for the steep downhill slopes of NW 110th St.

The vegetated areas in a Green Street are **rain gardens**.





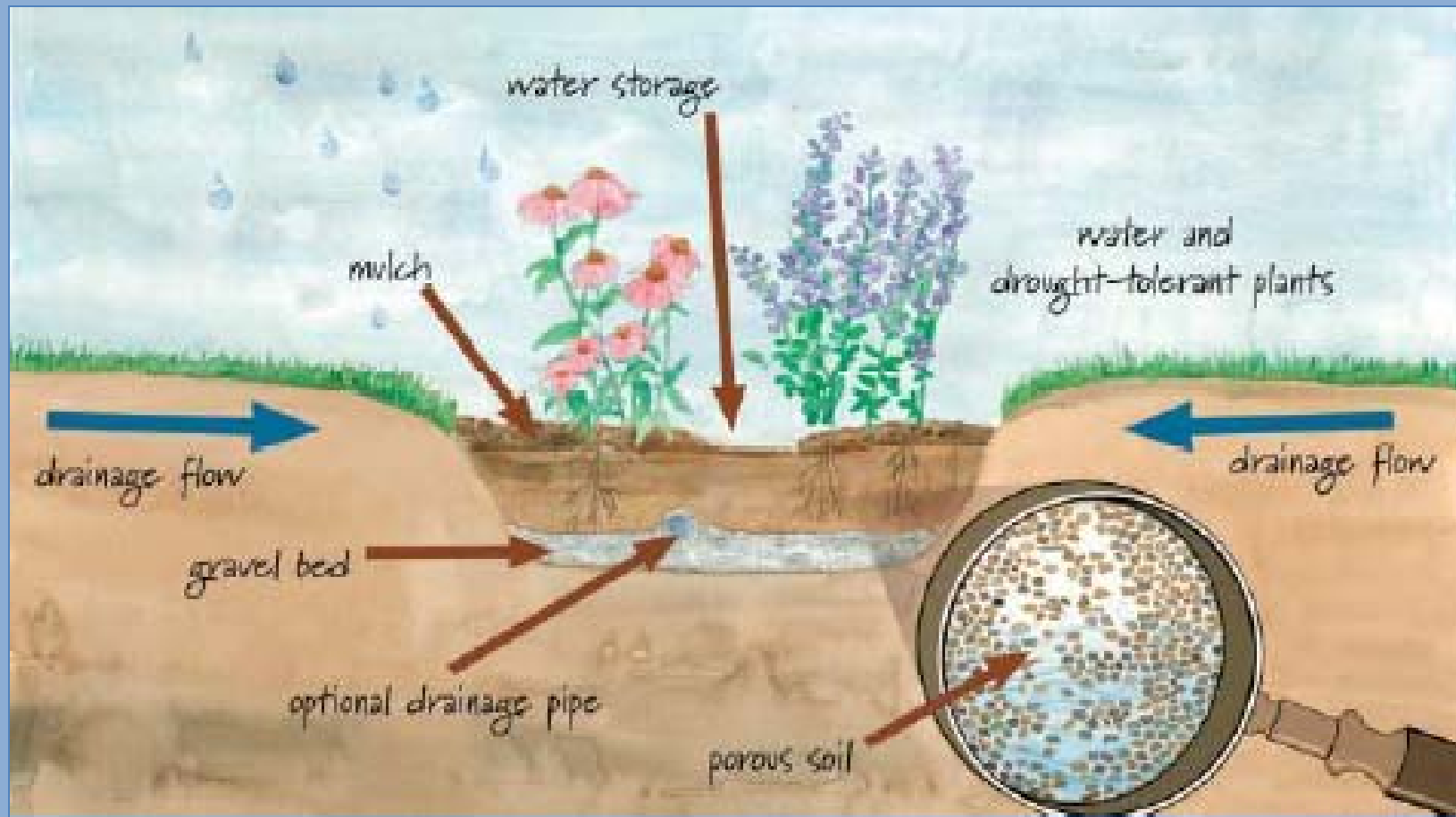
ARLINGTON
VIRGINIA

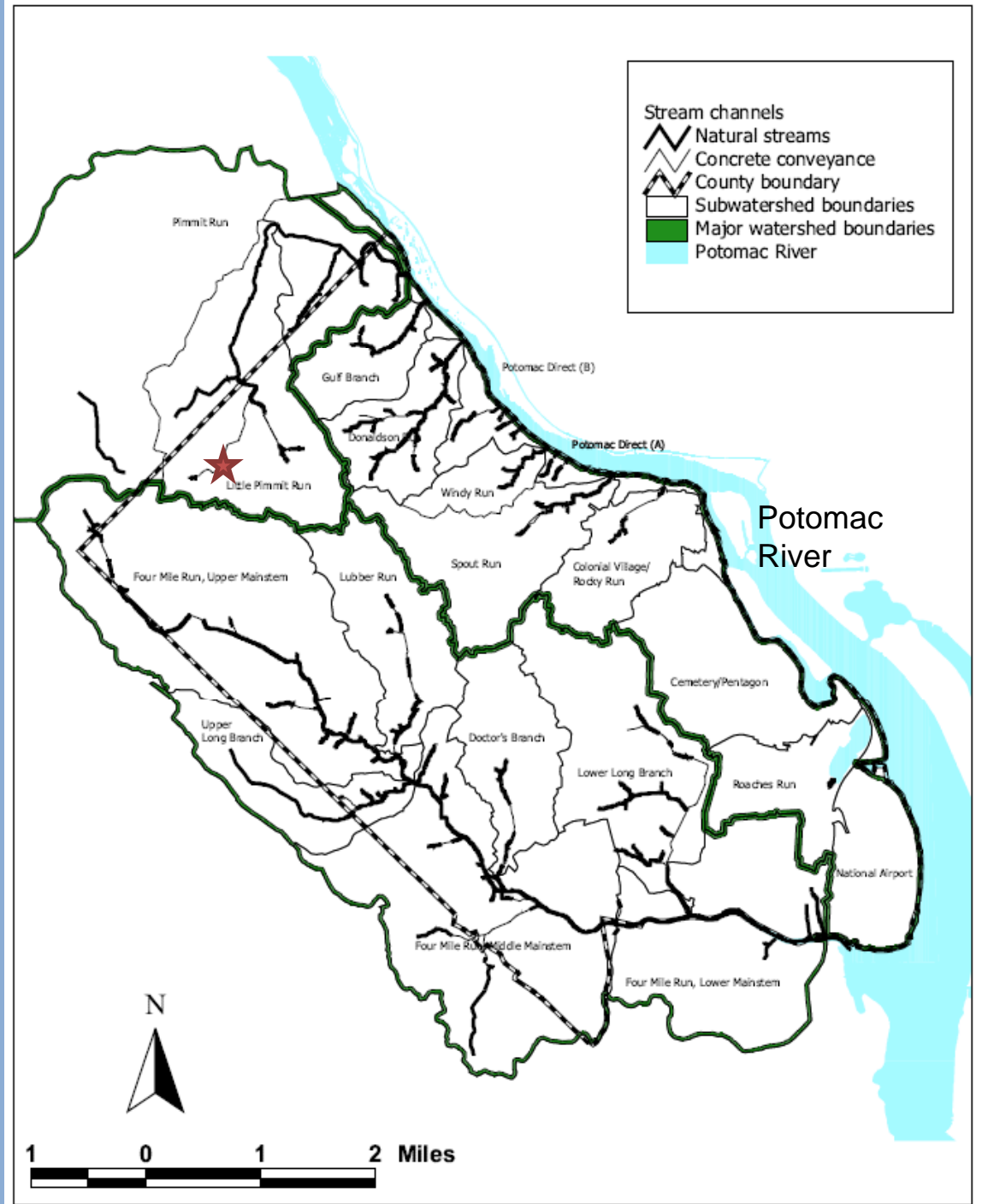


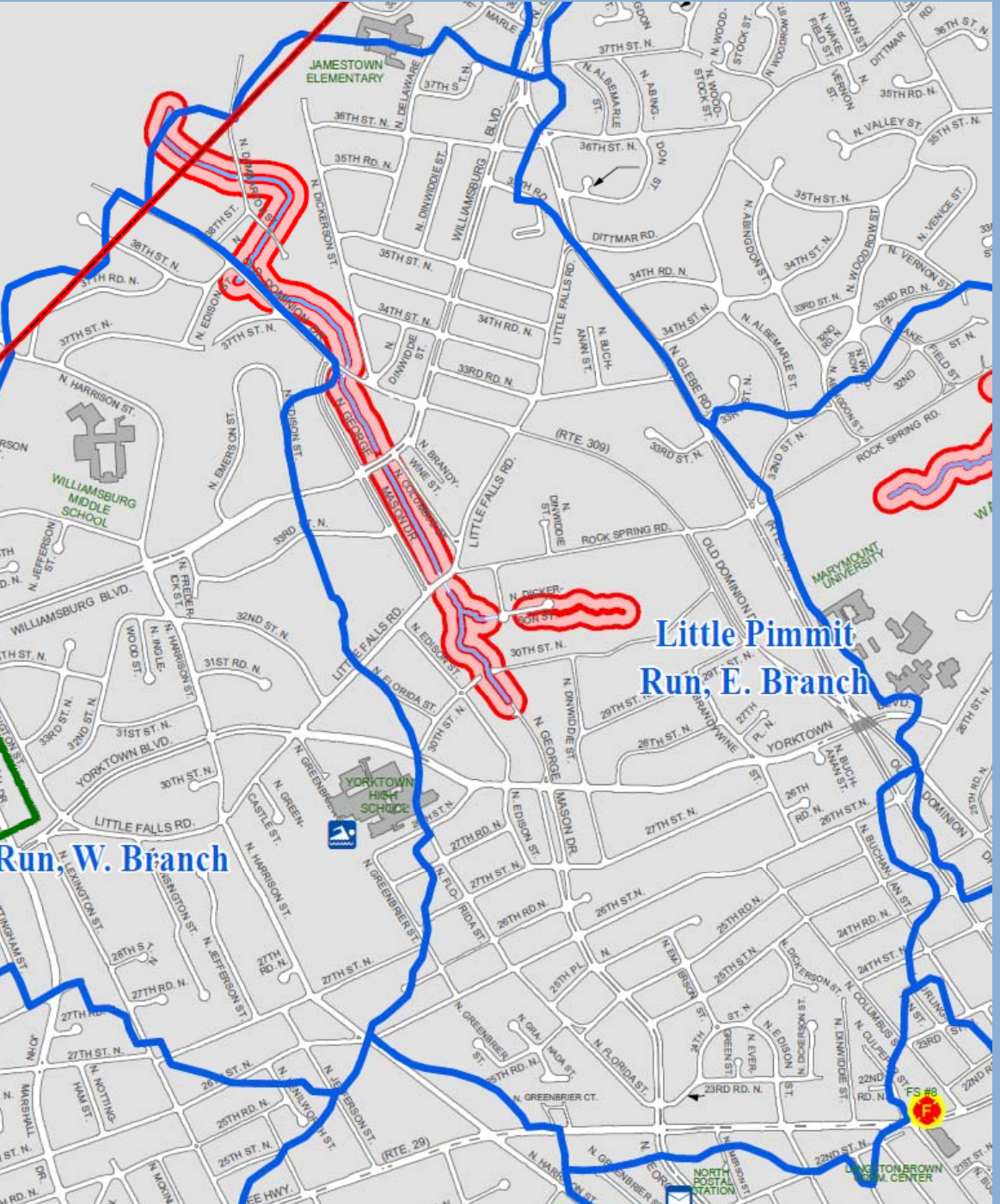
07/13/2011



ARLINGTON
VIRGINIA







Little Pimmit Run, W. Branch

Little Pimmit Run, E. Branch

Watershed Retrofit Planning

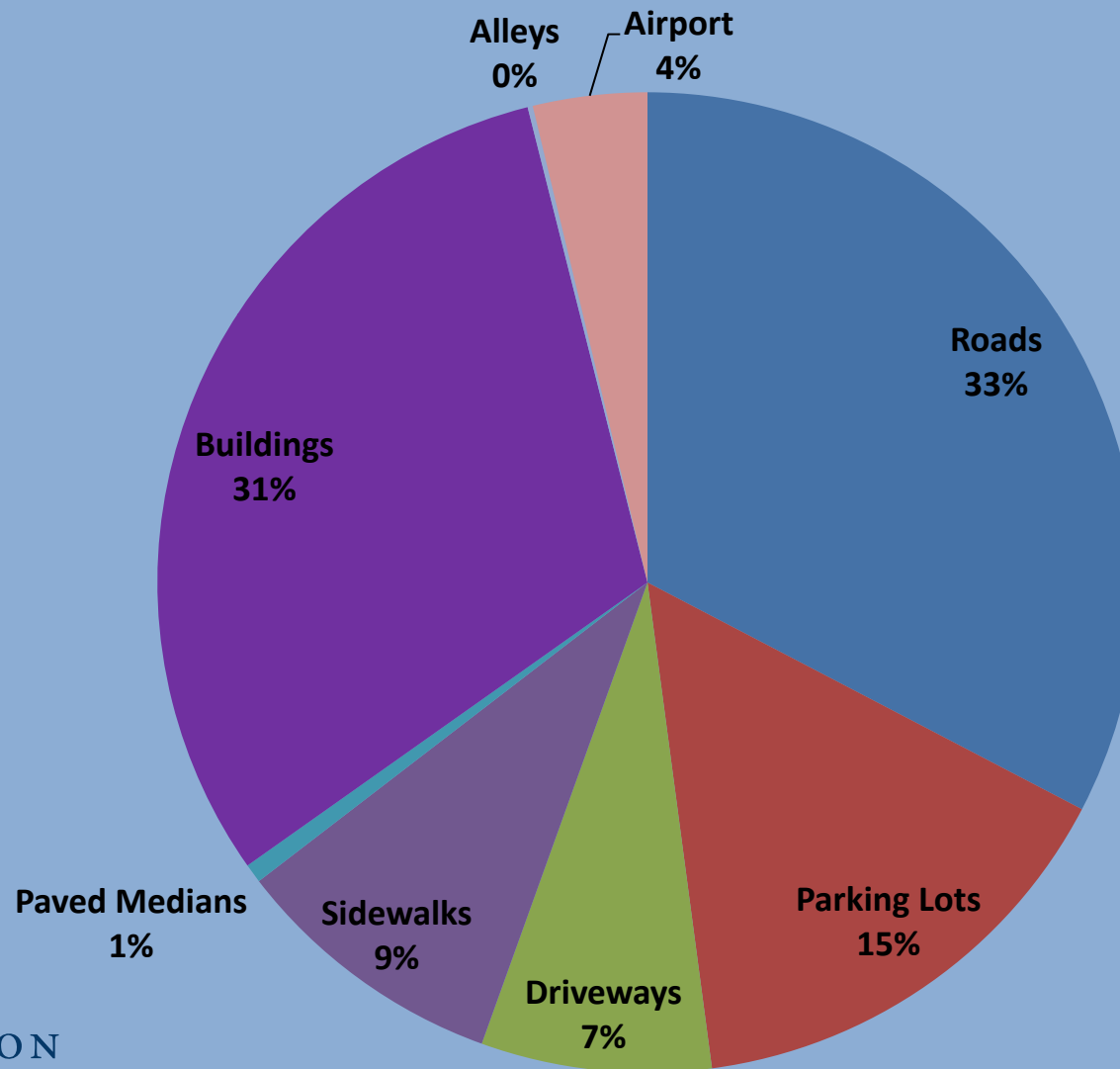
- **Watershed retrofit plans** identify locations where stormwater treatment can be added to decrease the volume of and remove pollutants from stormwater runoff.
- Each plan contains a ranked inventory of projects.
 - Rain gardens
 - Removing pavement/impervious surface
- John Marshall Green Street project ranked 1 of 83 projects in Little Pimmit Run

Little Pimmit Run Watershed Retrofit Plan

www.arlingtonva.us/departments/EnvironmentalServices/cpe/page75627.aspx

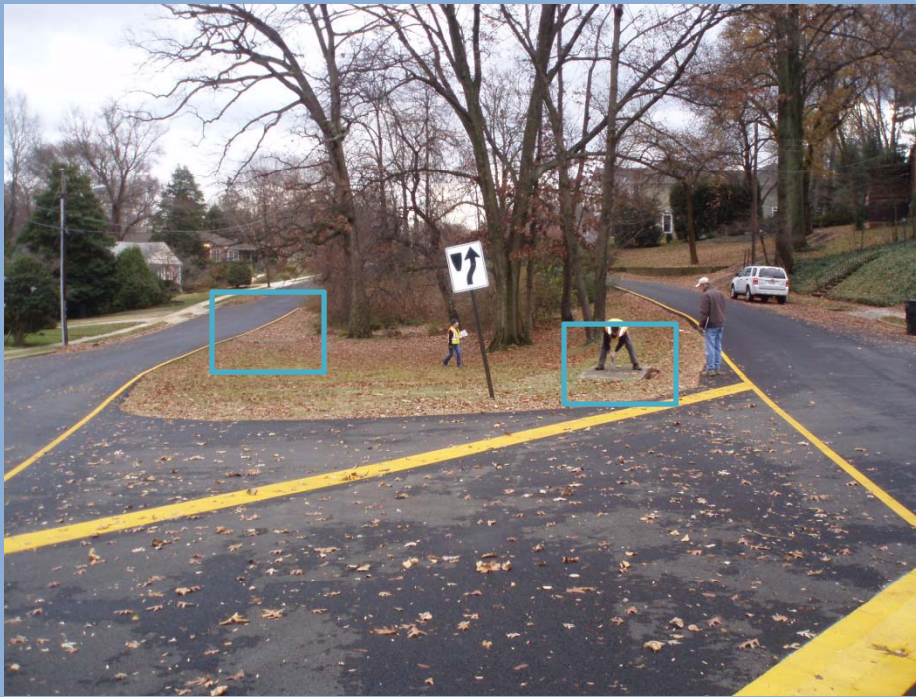


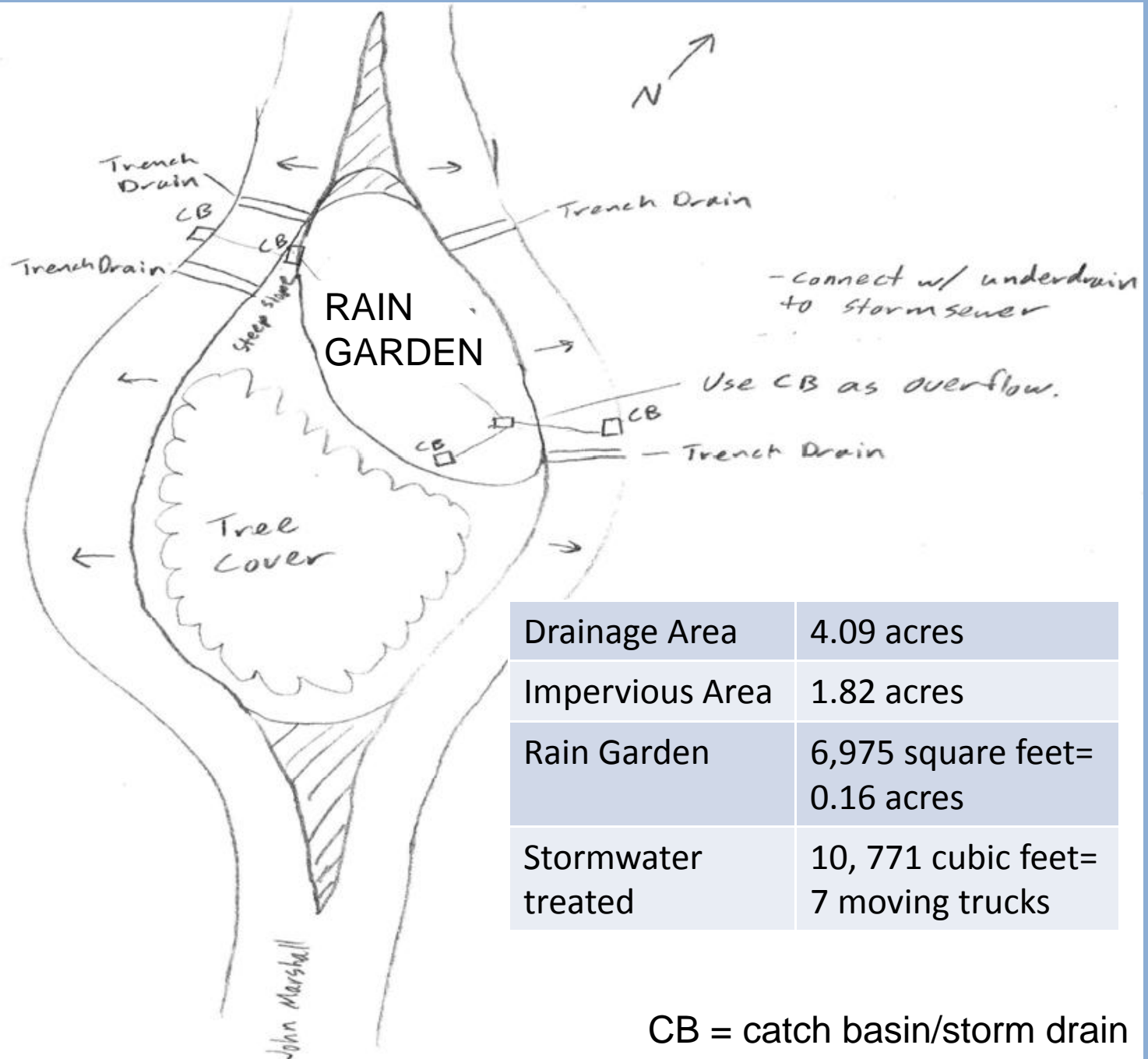
Arlington's Impervious Surfaces



For a Watershed Retrofit You Need...

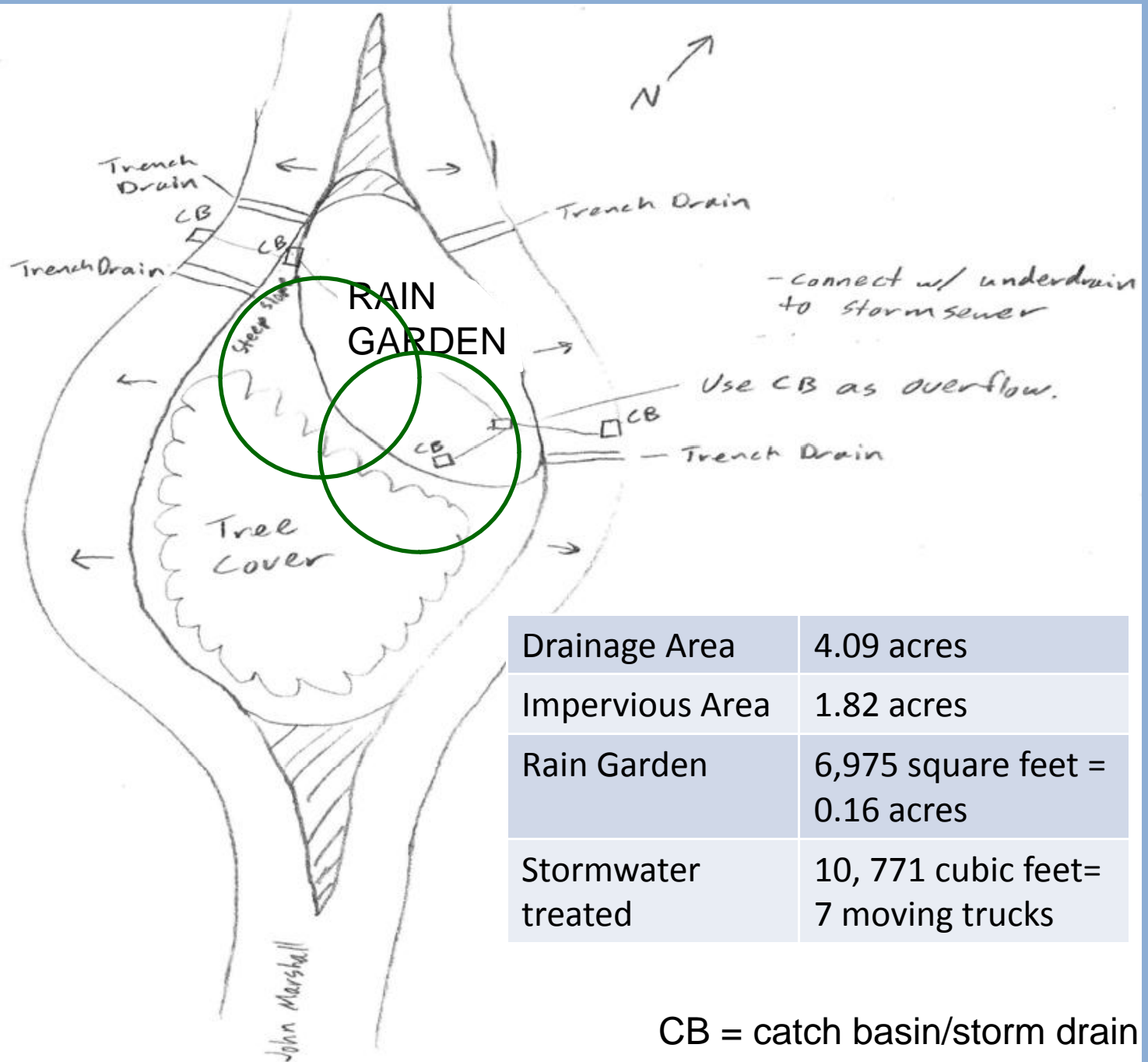
- Stormwater coming to the retrofit
- A place to treat it
- A connection to the storm drain system





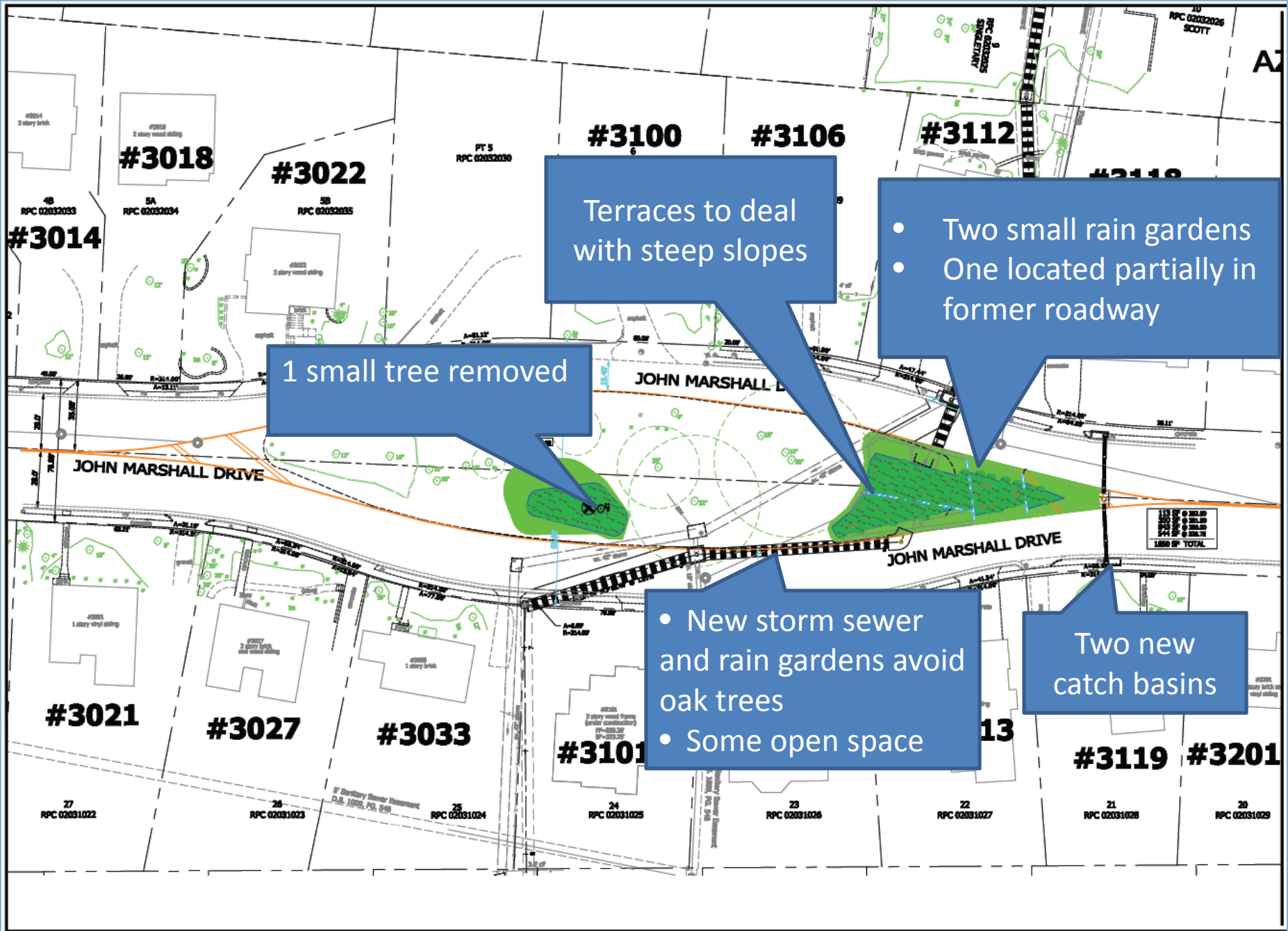
Drainage Area	4.09 acres
Impervious Area	1.82 acres
Rain Garden	6,975 square feet= 0.16 acres
Stormwater treated	10, 771 cubic feet= 7 moving trucks

CB = catch basin/storm drain



Drainage Area	4.09 acres
Impervious Area	1.82 acres
Rain Garden	6,975 square feet = 0.16 acres
Stormwater treated	10,771 cubic feet = 7 moving trucks

CB = catch basin/storm drain



1 small tree removed

Terraces to deal with steep slopes

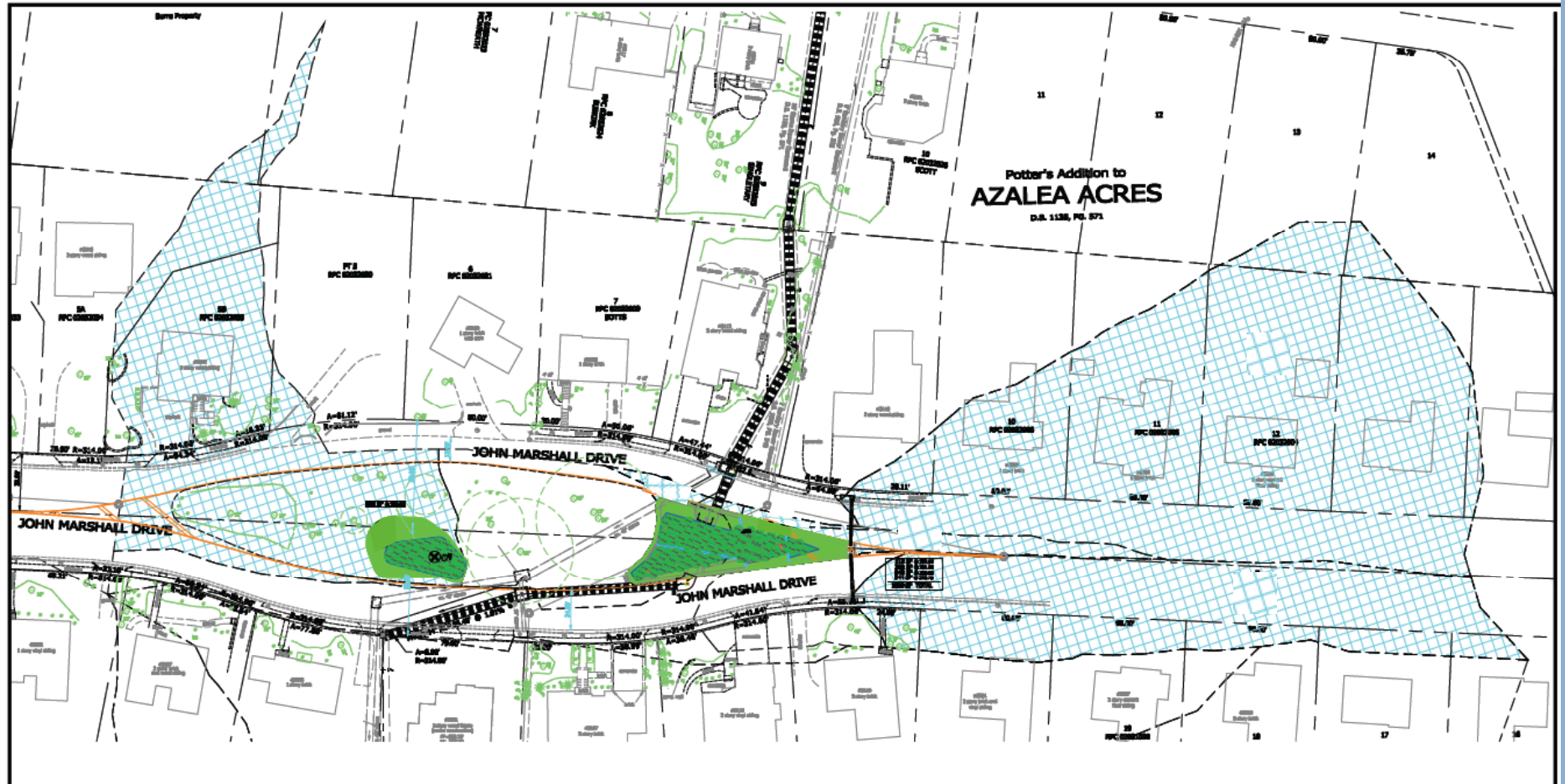
- Two small rain gardens
- One located partially in former roadway

- New storm sewer and rain gardens avoid oak trees
- Some open space

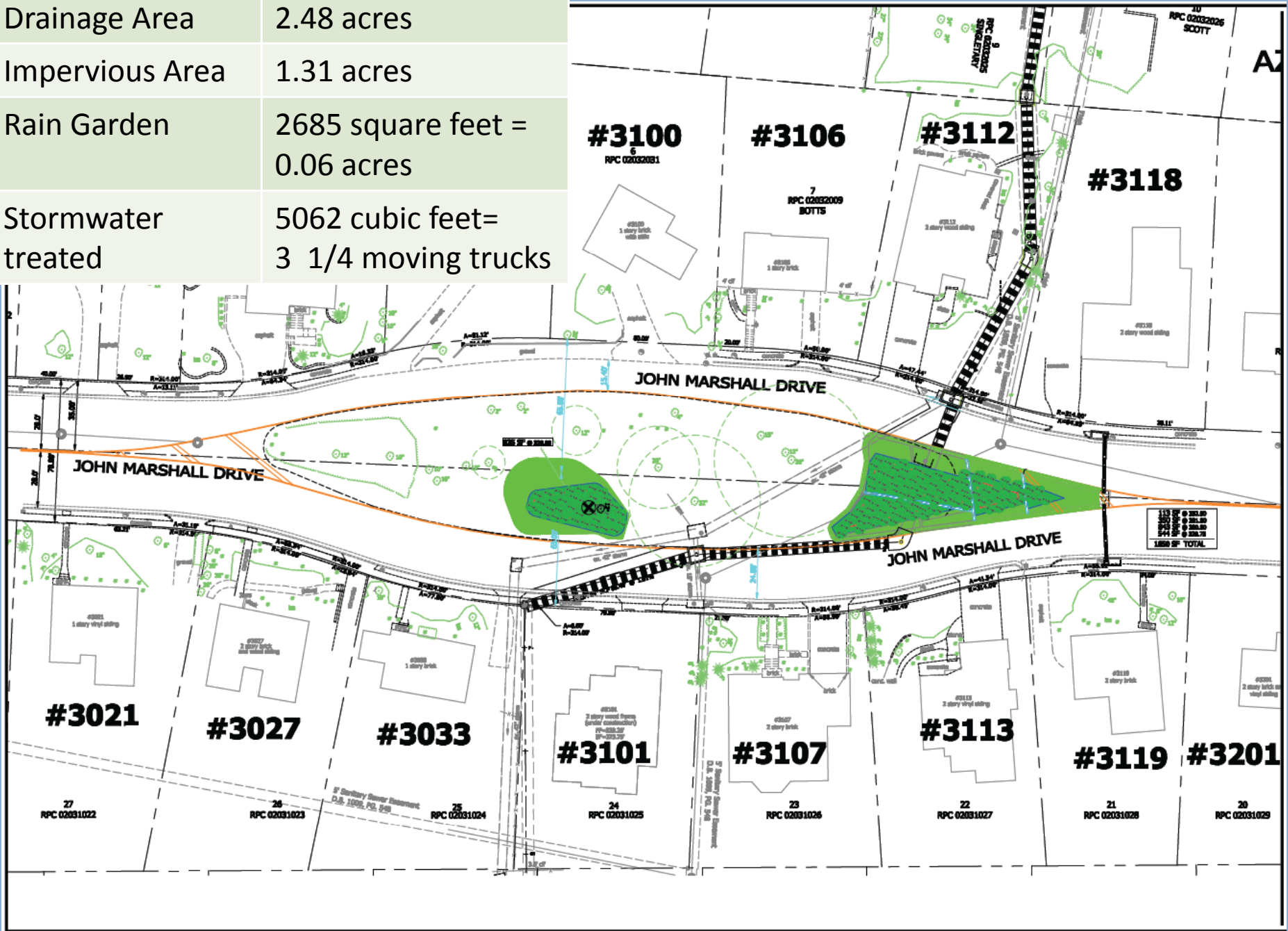
Two new catch basins

113 SF	• 20.00
270 SF	• 20.00
973 SF	• 20.00
574 SF	• 20.75
1830 SF TOTAL	

Drainage Area for Rain Gardens

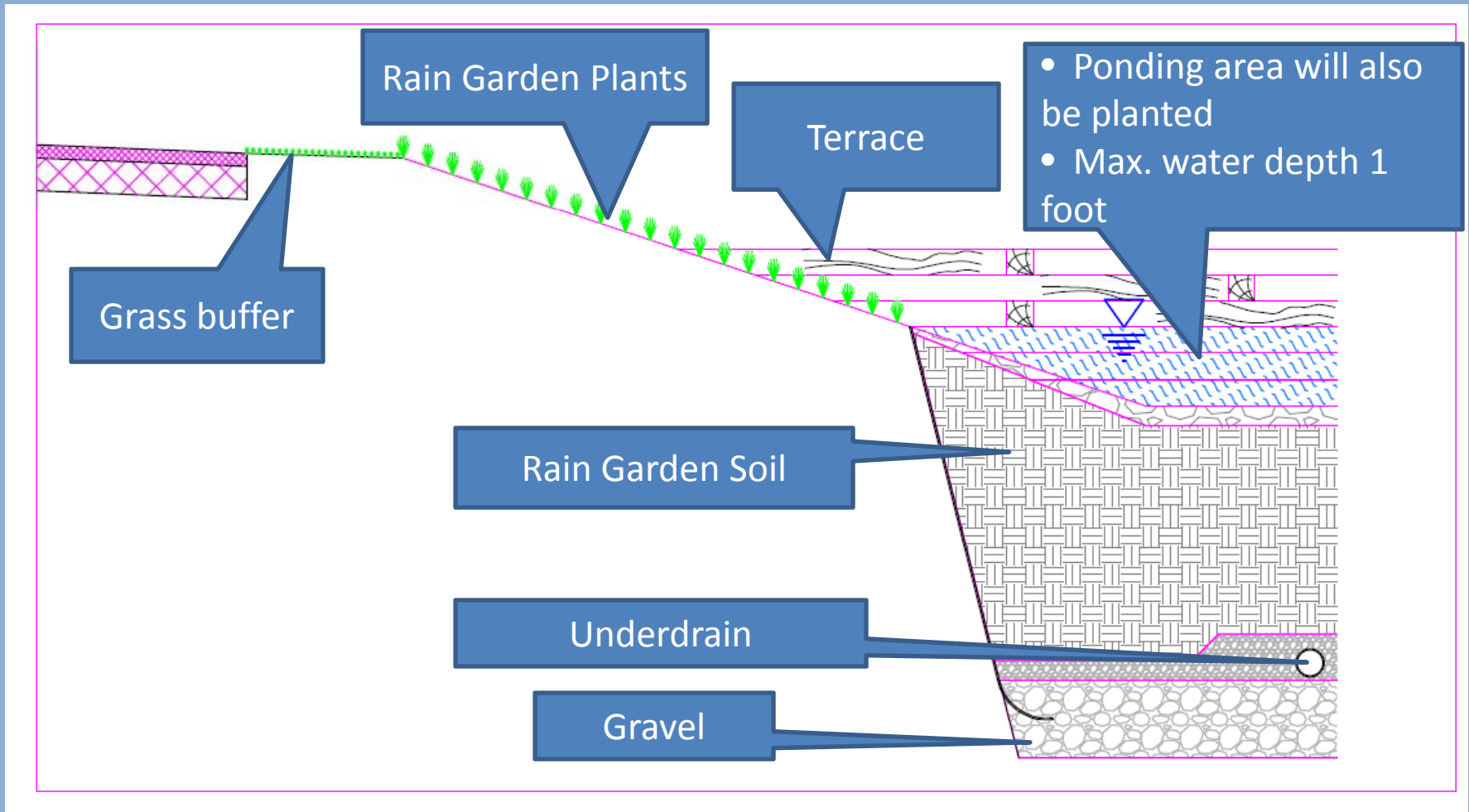


Drainage Area	2.48 acres
Impervious Area	1.31 acres
Rain Garden	2685 square feet = 0.06 acres
Stormwater treated	5062 cubic feet= 3 1/4 moving trucks





A Likely Cross-Section



Maintenance

- Initially, after any large storms
- Thereafter, quarterly
- Remove sediment
- Weed, inspect, replant, prune plants
- Remove trash
- Make sure underdrain, overflow, all pipes and catch basins working correctly







ARLINGTON
VIRGINIA

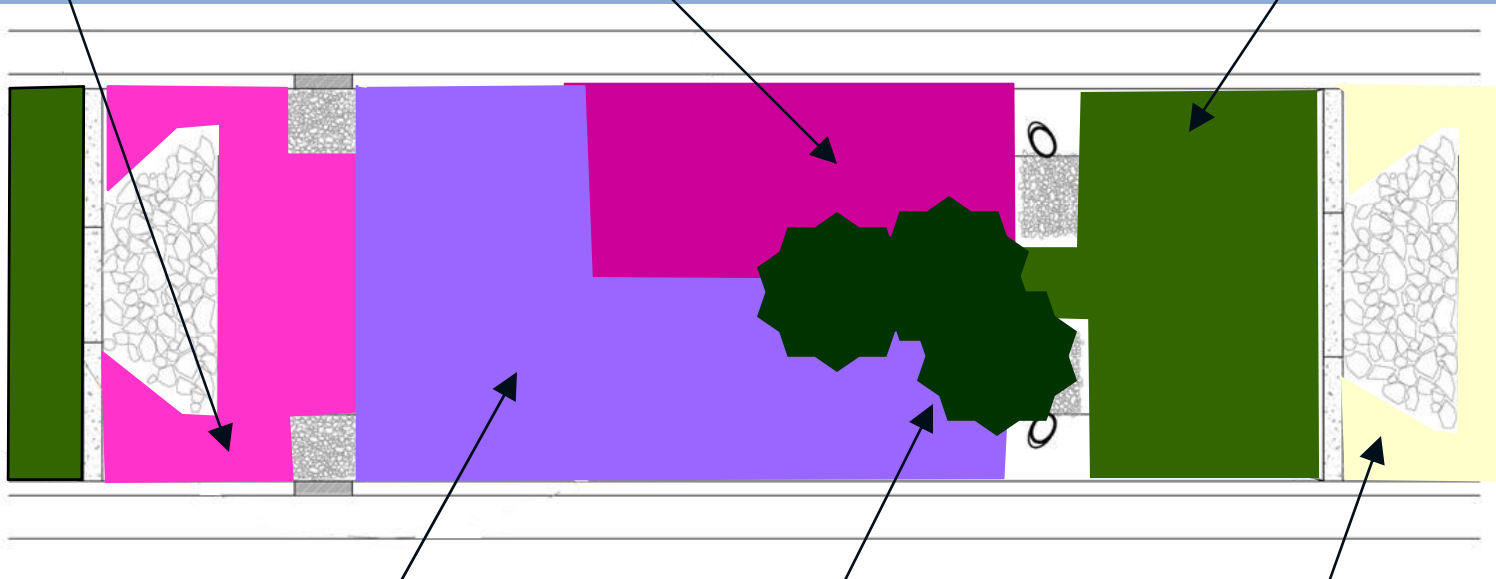
Obedient plant



Purple Coneflower



Sea Oats



Smooth blue aster



Winterberry



Beardtongue

Patrick Henry Green Street
JUNE 2011



SEPT 2011



09/19

MAR 2012



10.81
18.24
4-24

JUNE 2012



06/06/2012

SEPT 2012



09/13/2012

Albemarle Green Street
APRIL 2012



Albemarle Green Street
SEPT 2012



09/13/2012

Next Steps

- Create summary document of unanswered questions and answer as possible.
- County staff will work with its engineers to complete design of the rain garden.
- Next meeting is anticipated for 2012/2013 winter. Plant palette will be discussed then.
- Storm sewer construction summer/fall 2013.
- Green Street construction will coordinate with storm sewer construction.



Questions??

Christin Jolicoeur

(703) 228-3588

cjolicoeur@arlingtonva.us

Jen McDonnell

(703) 228-3042

jmcdonnell@arlingtonva.us

Liz Thurber

(703) 228-3363

ethurber@arlingtonva.us



Resources

John Marshall Drive Green Street

www.arlingtonva.us/departments/EnvironmentalServices/Sustainability/page87380.aspx

Green Streets

www.arlingtonva.us/departments/EnvironmentalServices/Sustainability/page81126.aspx

Little Pimmit Run Watershed Retrofit Plan

www.arlingtonva.us/departments/EnvironmentalServices/Sustainability/page75627.aspx

