

*Briefing on:*

# *Green Infrastructure in Action at DC Water*

*Briefing for:*

*Reinvesting in Urban Water Infrastructure  
Combined Sewer Overflow Long Term Control Plans  
NJ Department of Environmental Protection*

January 8, 2015

# Agenda

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- DC Water and DC Clean Rivers Project
- Long Term Control Plan Modification
- DC Water's Green Infrastructure

# DC WATER AND DC CLEAN RIVERS PROJECT (DCCR)

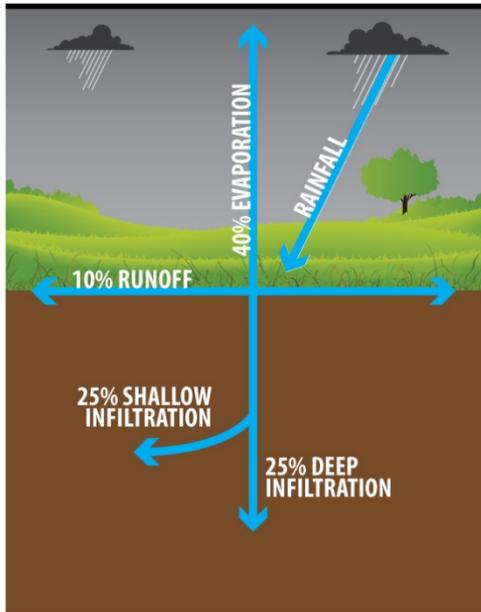


Green Roof at Fort Reno Reservoir



# Background: Comparing Natural vs. Built Environment

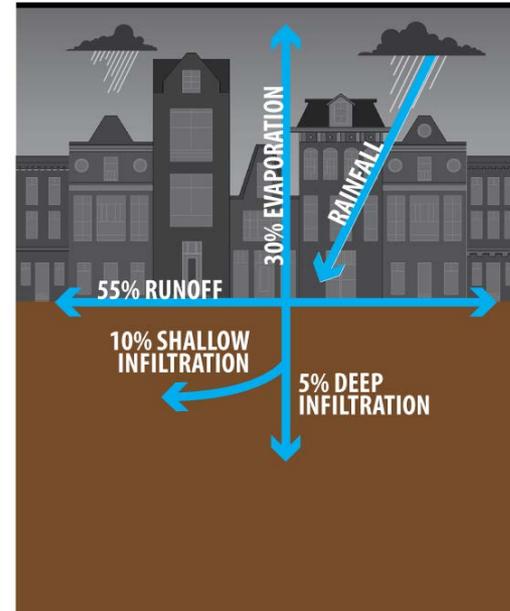
NATURAL ENVIRONMENT  
(natural ground cover)



Natural Environment:

0% Impervious  
Surface

URBAN ENVIRONMENT  
(75% - 100% impervious cover)

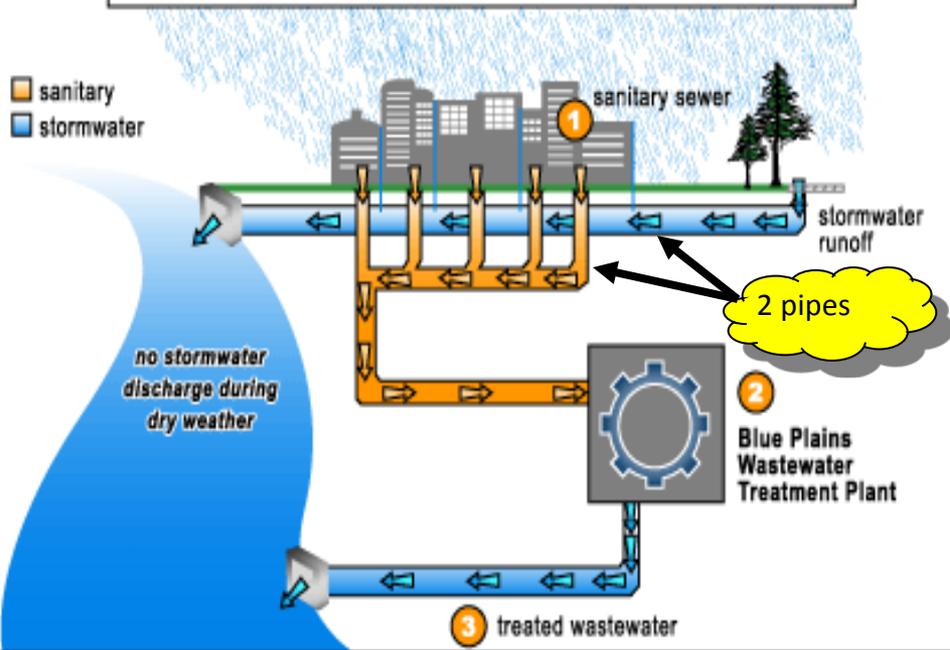


Built Environment:

75-100% Impervious  
Surface

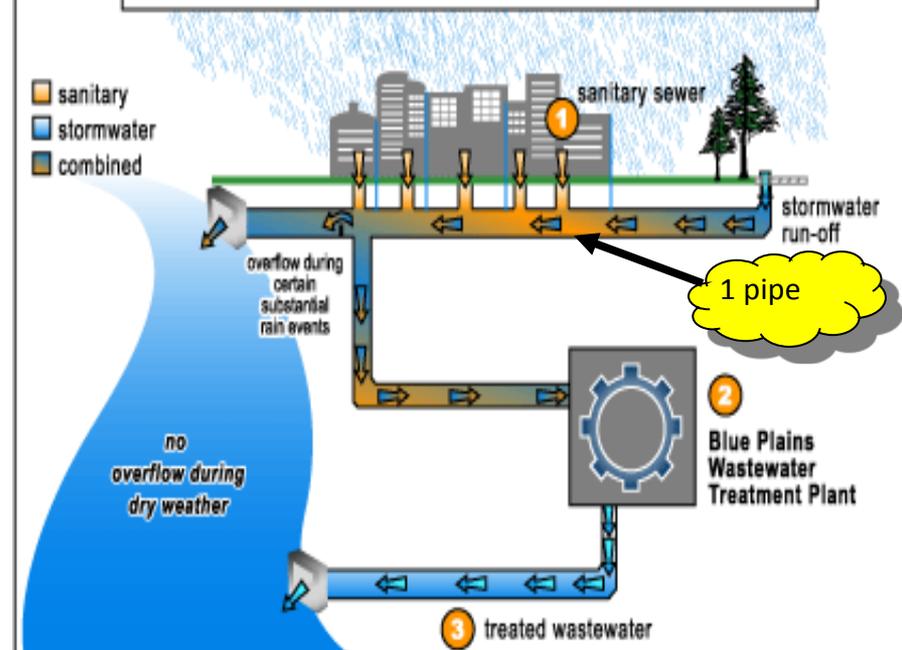
# Background: Separate and Combined Sewer Systems

## SEPARATE SANITARY & STORMWATER SEWER SYSTEMS



100% of suburbs  
67% of D.C.

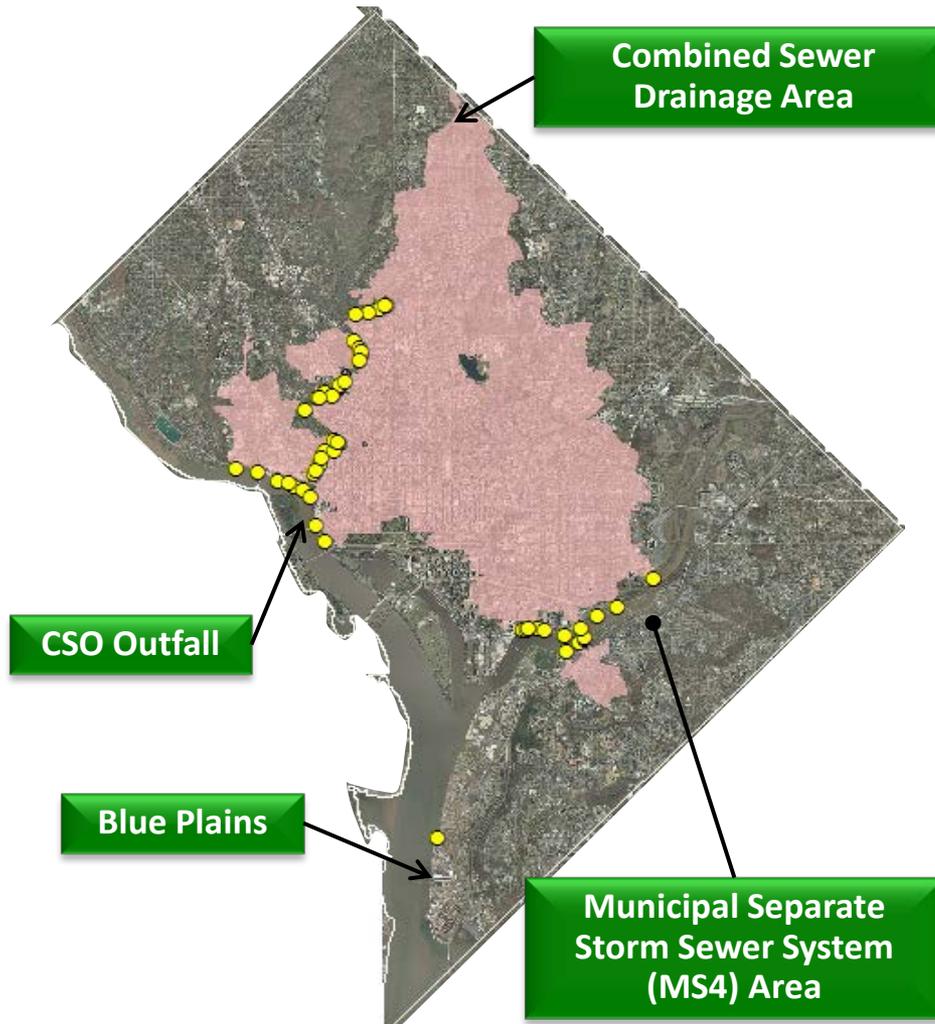
## COMBINED SEWER SYSTEMS



0% of suburbs  
33% of D.C.

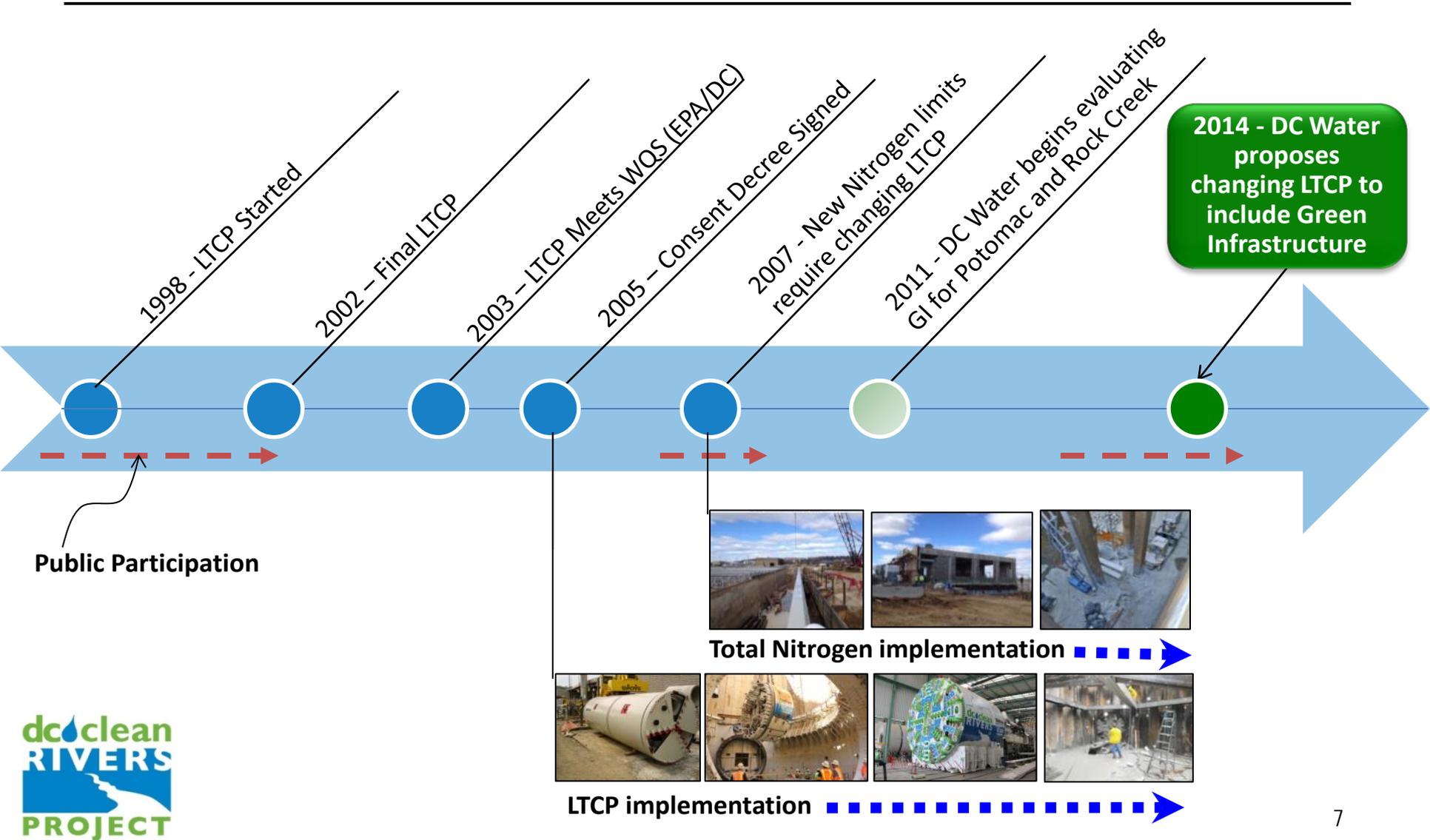
# Background: Where are Combined Sewers Located?

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- 1/3 area is combined (12,478 acres)
- 53 CSO outfalls
  - 15 to Anacostia
  - 10 to Potomac
  - 28 to Rock Creek
- Three receiving waters
  - Anacostia River
  - Potomac River
  - Rock Creek

# DC Water and DCCR: How was the Long Term Control Plan Developed?



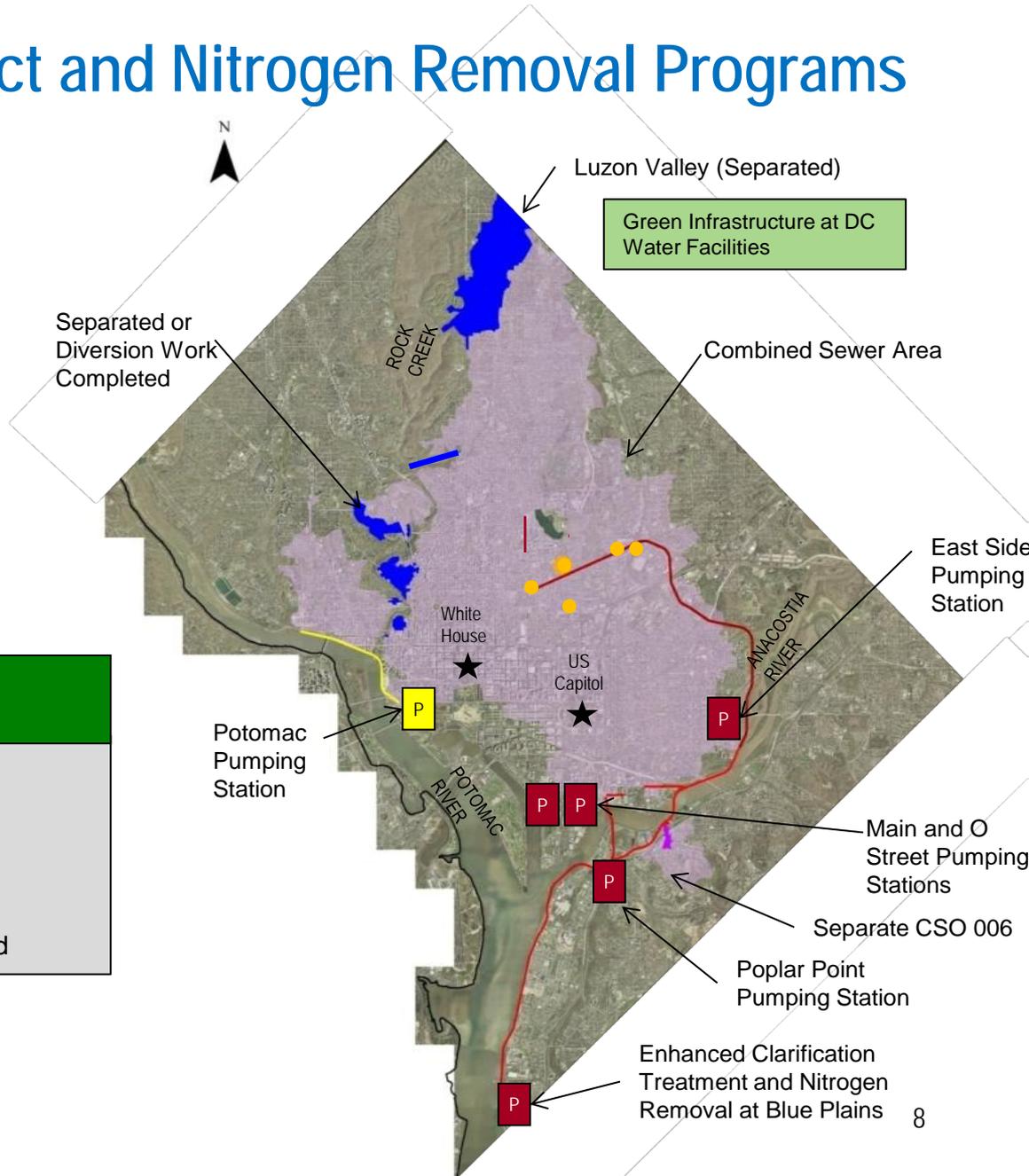
# DC Water and DCCR: DC Clean Rivers Project and Nitrogen Removal Programs

**LEGEND**

-  Anacostia River Tunnel System
-  Potomac River Tunnel
-  Piney Branch Tunnel
-  Pumping Station Rehabilitation
-  Known Flood Area

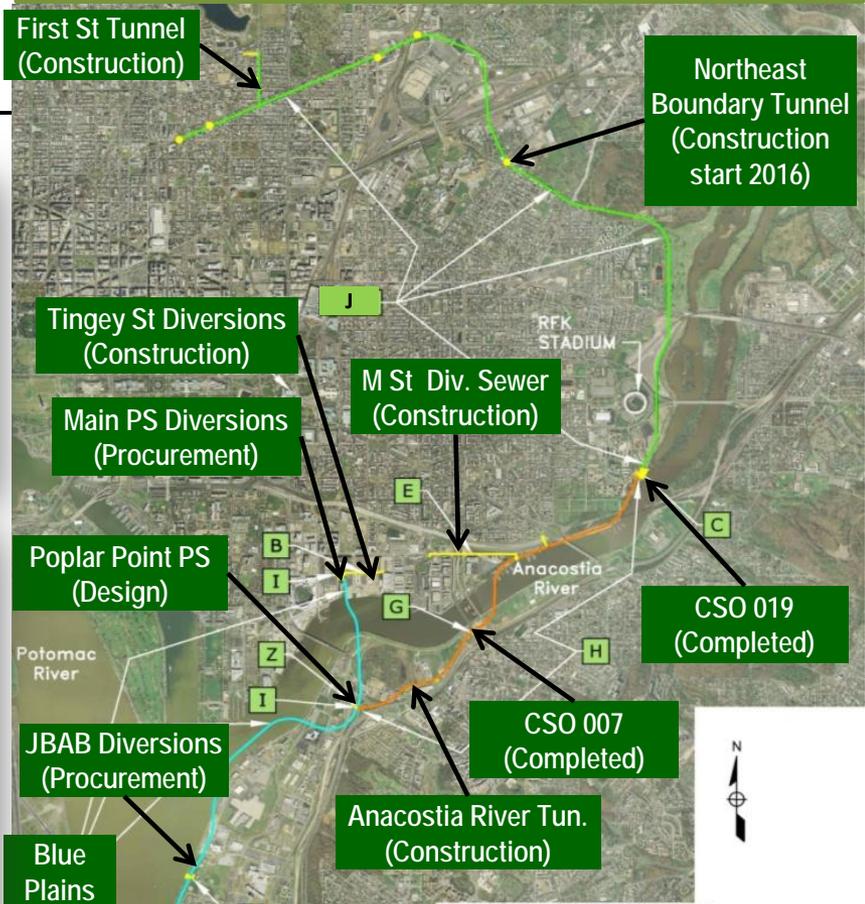
**DC CLEAN RIVERS PROJECT AND NITROGEN REMOVAL PROGRAMS**

- DC Clean Rivers Project: \$2.6 Billion
- Nitrogen Removal: \$950 Million
- Total > \$ 3.5 Billion
- 20 yr implementation (2005 – 2025)
- 96% reduction in CSOs & flood relief in Northeast Boundary
- Approx 1 million lbs/yr nitrogen reduction predicted



# DC Water and DCCR: DC Clean Rivers Project has let more than **\$1.2 Billion** in Construction & Engineering Contracts

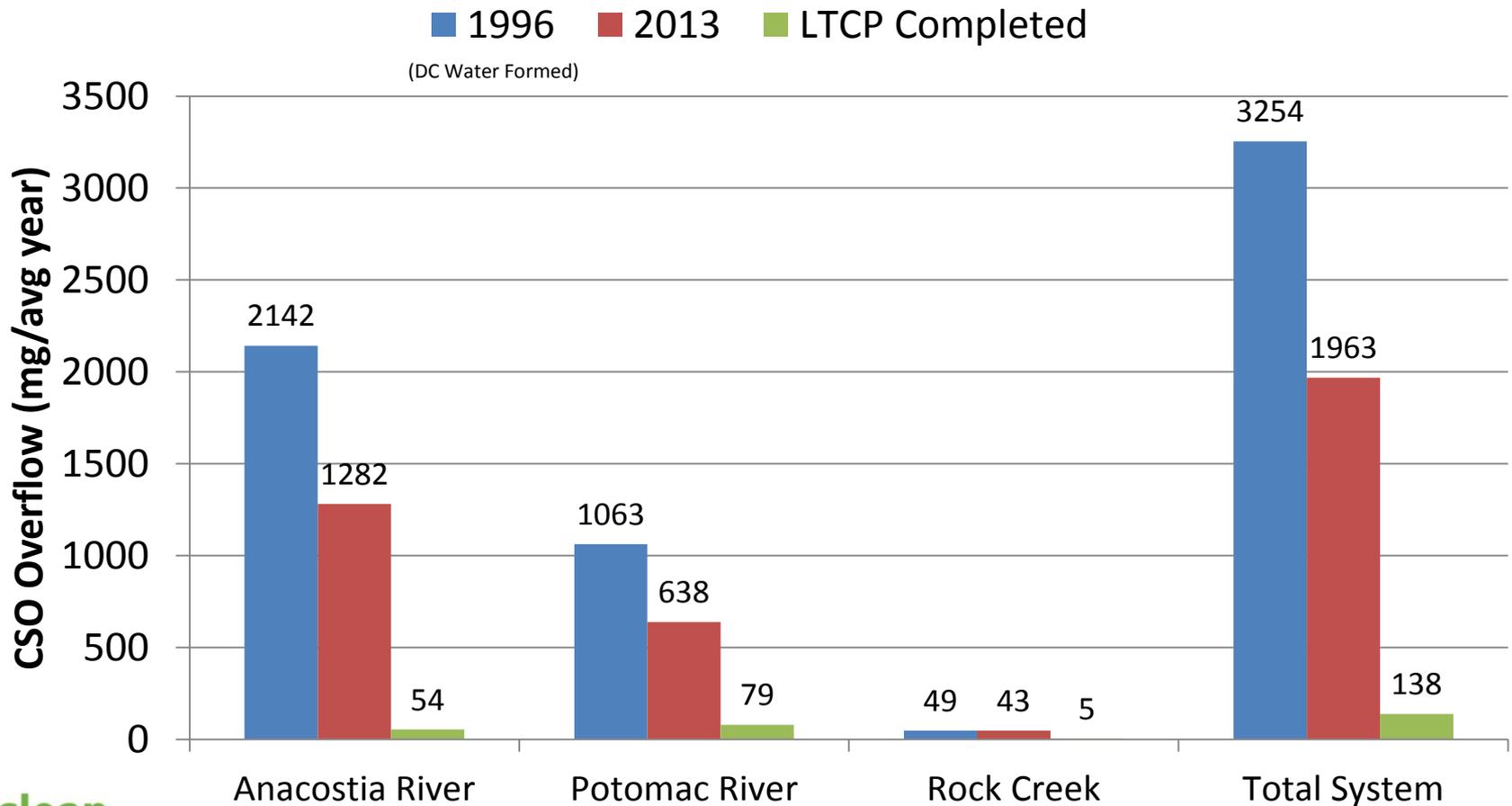
See the 'First Lady of Clean Rivers' at  
<http://www.youtube.com/watch?v=se5YebfWfkw>



- A Blue Plains Tunnel
- B Tingey Street Diversions
- C CSO 019 Overflow and Diversion Structures
- D JBAB Overflow and Potomac Outfall Sewer Diversion
- E M Street Diversion Sewer (CSOs 015, 016 and 017)
- G CSO 007 Diversion Structure and Diversion Sewer
- H Anacostia River Tunnel
- I Main Pumping Station and Tingey Street Diversions
- J Northeast Boundary Tunnel
- Y Blue Plains Dewatering Pumping Station and ECF
- Z Poplar Point Pumping Station Replacement



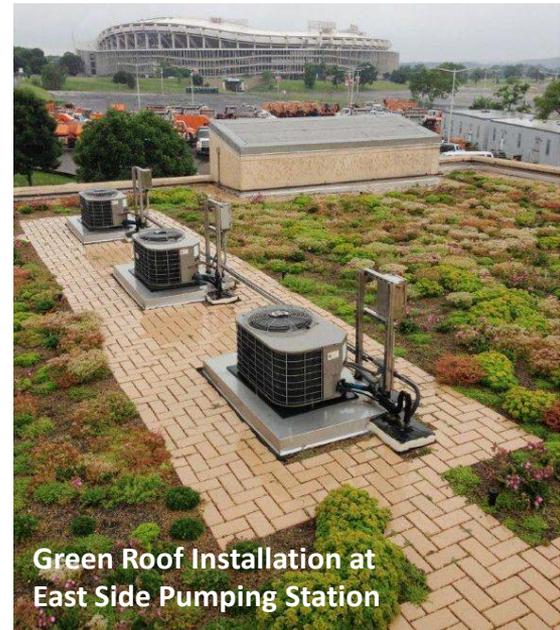
# DC Water and DCCR: Progress to Date Controlling CSOs



# LONG TERM CONTROL PLAN MODIFICATION



Bioretention Installation  
at Irving ST NW



Green Roof Installation at  
East Side Pumping Station

# Proposed GI Plan: DC Water's Approach to CSO Control

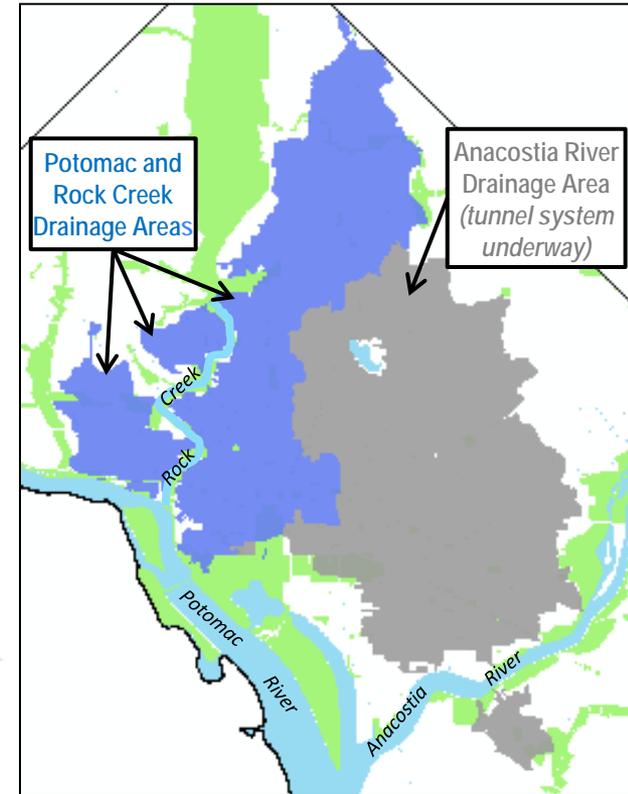


## Anacostia River Projects

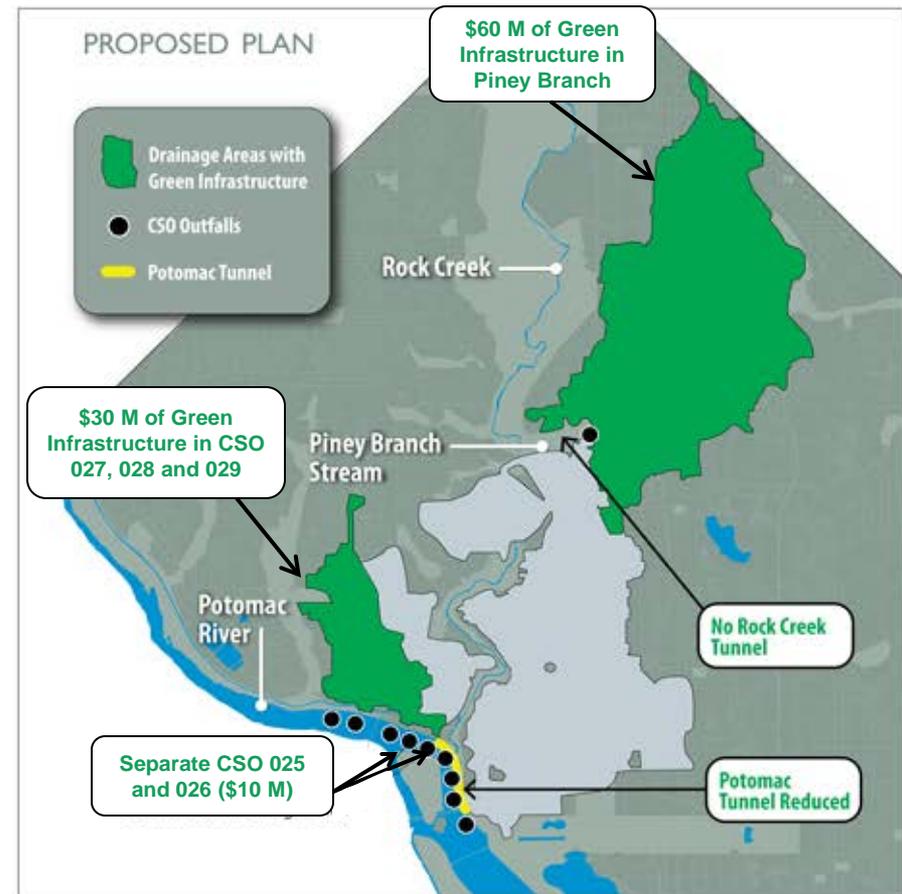
- DC Water is implementing tunnels
- Most severely impacted by CSOs
- GI will provide additional control

## Potomac & Rock Creek Projects

- There is time to consider new approaches



# Proposed GI Plan: What is Proposed for Potomac and Rock Creek?



# Proposed GI Plan: Predicted CSO Performance is Comparable to LTCP

Parameter	1996 (DC Water Formed)	LTCP	Hybrid GI Plan
Potomac River			
No. Overflows (#/avg yr)	74	4	4
Overflow Volume (mg/avg yr)	1063	79	59
% Reduction from Before LTCP	--	92%	≥92%
Rock Creek (Piney Branch CSO)			
No. Overflows (#/avg yr)	25	1	1
Overflow Volume (mg/avg yr)	49	5	0.6
% Reduction from Before LTCP	--	90%	>90%

Comparable  
to LTCP

- Additional improvements being undertaken by DC Water exceed the schedule and water quality goals of the LTCP
  - Early completion of the Northeast Boundary Tunnel (2022)
  - Early completion of the First Street Tunnel (2016)
  - McMillan Stormwater Storage project (2014)
  - Irving Street GI project (2014)

# Proposed GI Plan: Added Environmental, Social, and Economic Benefits

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## Environmental

- Reduce runoff
- Improve air quality
- Reduce summer temperatures
- Reduce energy usage
- Offset climate change
- Habitat improvement



## Social

- Enhance aesthetics
- Improve liveability through green space
- Reduce scope and duration of disruption during construction

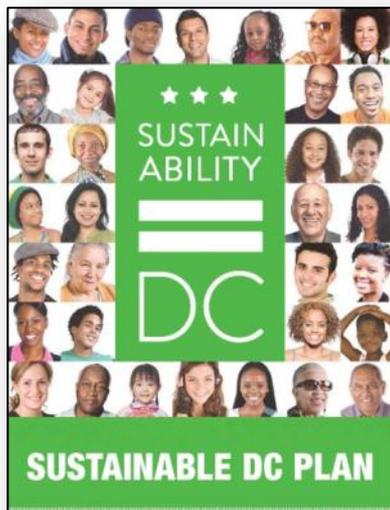


## Economic

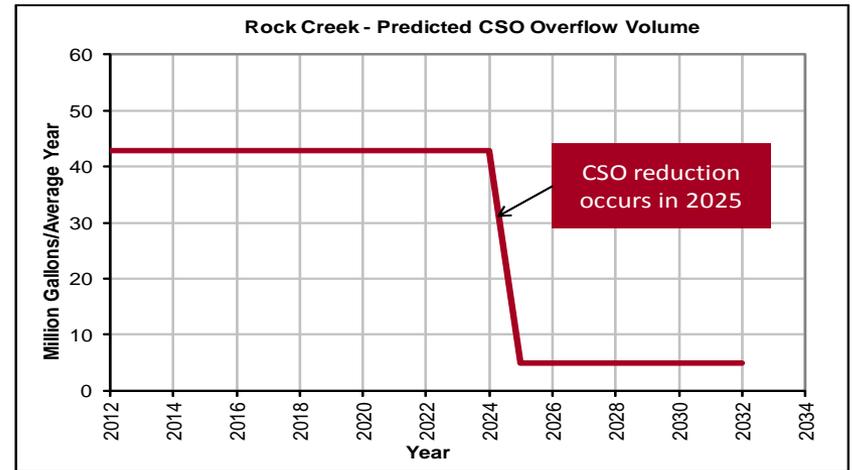
- Create green jobs
- Enhance property values
- Improve quality of life

# Proposed GI Plan: Benefits

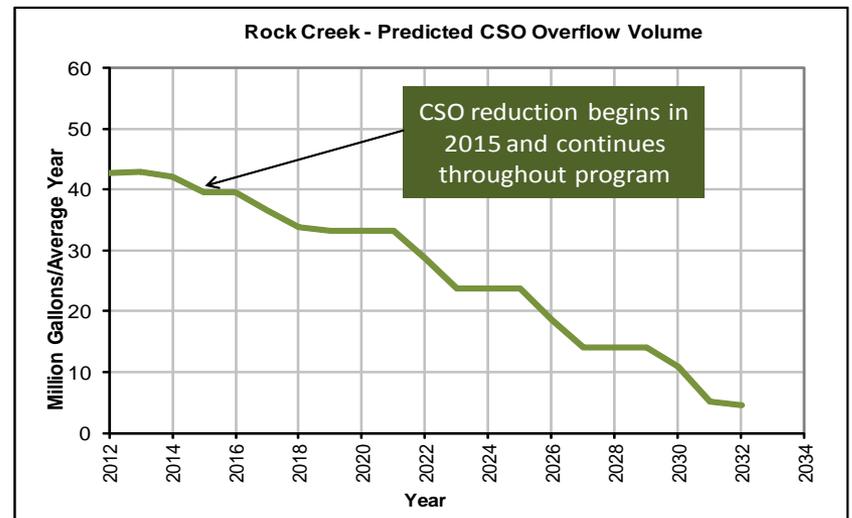
- Added environmental, social and economic benefits
- Timing of CSO reduction
- Reduced financial impact on ratepayers by spreading out construction
- Supports Mayor's Sustainable DC Plan
- Opportunity for local, green jobs



## Current Plan



## Proposed Plan



# Proposed GI Plan: Green Infrastructure for CSO Control is a Proven Technology

City	LTCP Time Frame (years)	Consent Decree w/ Green?	Annual Overflow Volume (Million Gallons)		
			Before LTCP	After LTCP	% Reduction
Kansas City (WSD)	25	Yes; 2010	6,400	768	88%
Cleveland (NEORSO)	25	Yes; 2010	4,500	500	89%
New York (DEP)	25	State approved; 2012	30,000	TBD – City wide LTCP due 2017	TBD – City wide LTCP due 2017
Philadelphia (PWD)	25	State approved (State – 2011) (EPA Admin order – 2012)	10,307 to 15,873	5,100 to 7,900	50% ±

Other cities with Consent Decrees that include Green Infrastructure:

Atlanta    St. Louis    Louisville    Cincinnati    Onondaga County, NY



# PROGRESS TO DATE



# Progress to Date: DC Water has Invested more than \$12.5 M in GI

Planted more than 5500 trees via UFA, rain garden at Irving & North Capitol St.

\$1.7 M



Green Roofs, Pervious Pavement, and Bioretention at Three DC Water Facilities

>\$3.5 M



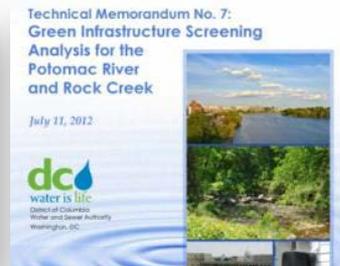
Funded RiverSmart Washington Demonstration Project

\$1 M



GI Challenge, LTCP Modification, and Early Action Projects

>\$4 M



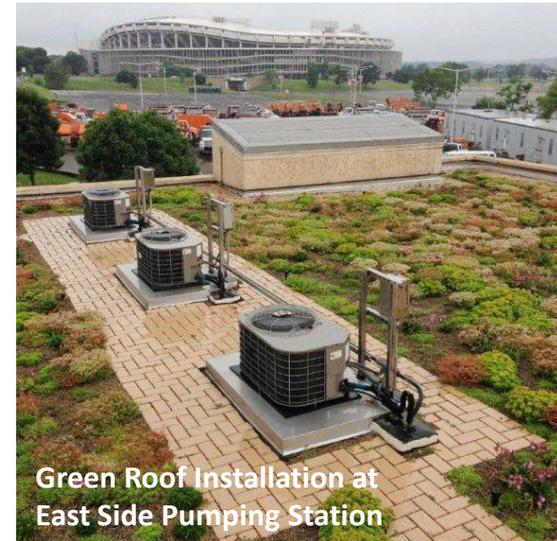
Irving Street Bioretention

>\$2.75 M

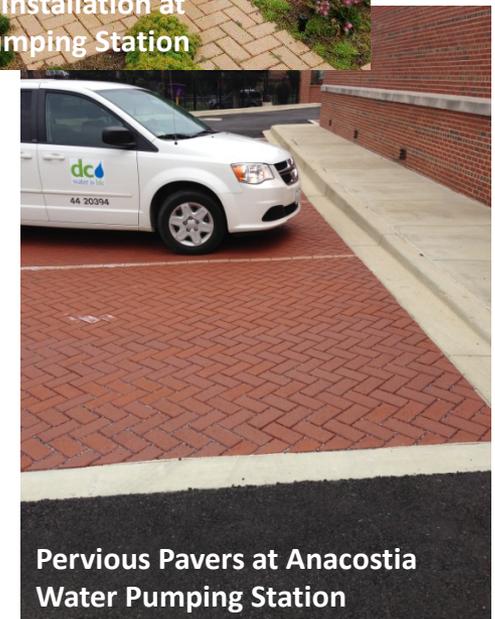


# Progress to Date: Low Impact Development Retrofit at DC Water Facilities

- Goal:
  - Demonstrate green infrastructure implementation at DC Water Facilities
- Scope:
  - East Side Pumping Station
    - 6,570 sf Green Roof
  - Fort Reno Reservoir
    - 42,400 sf Green Roof
    - 8,400 sf of Pervious Pavement
  - Anacostia Water Pumping Station
    - 1,000 sf of Pervious Pavement
    - 1,500 sf bioretention area
- Status:
  - Projects completed
  - 1 year of post-construction monitoring underway
  - 5 year initial maintenance (contractor-performed) underway



Green Roof Installation at East Side Pumping Station



Pervious Pavers at Anacostia Water Pumping Station

For more information please visit:

<http://www.dewater.com/giatdewater>

# Progress to Date: Irving Street Green Infrastructure Project

- Goal:
  - Built for flood mitigation as part of Mayor's Task Force on the Prevention of Flooding in Bloomingdale and LeDroit Park
- Scope:
  - 14 bioretention areas to capture runoff from roads and sidewalks
- Status:
  - Bioretention completed in 2014
  - 1 year initial maintenance period (contractor-performed) underway



For more information please visit: <http://dcwater.com/irvingstreet>

# Progress to Date: GI Challenge

- Goals:
  - Advance innovative technologies
  - Demonstrate cost effective solutions
  - Propose practical and implementable solutions that can be constructed
- Status:
  - Seven Planning Phase winning designs awarded in January 2014
    - 2 GI Streetscape Projects
    - 2 GI Park Projects
    - 3 GI Focus Projects
  - Final Design Phase winners to be announced early 2015



For additional information visit:  
<http://www.dwater.com/greenchallenge>

# Progress to Date: Green Jobs

- Goal:
  - Protect DC Water's proposed \$90M investment in GI by ensuring trained maintenance staff have skill sets required and are available
- 2014 Pilot Program Scope
  - Green Roof Focus
  - Program ran in summer 2014
  - Recruited 10 underemployed candidates from soft skills training programs (Sasha Bruce Youthwork, Jubilee Jobs, and AFL-CIO)
  - 4 in-class technical sessions led by DCG and UDC
  - 4 in-field sessions: DC Water Ft. Reno green roof and in-field "job shadowing" with Furbish and Capital Greenroofs
  - Online trainee database accessible to local green roof installation and maintenance companies at training completion (forthcoming)

