FAIRFAX COUNTY PLANNING COMMISSION
ENVIRONMENT COMMITTEE
THURSDAY, FEBRUARY 3, 2011

COMMITTEE MEMBERS PRESENT:
Frank A. de la Fe, Hunter Mill District
Jay P. Donahue, Dranesville District
Earl L. Flanagan, Mount Vernon District
James R. Hart, At-Large, Chairman
Kenneth A. Lawrence, Providence District

COMMITTEE MEMBERS ABSENT:
Walter L. Alcorn, At-Large
Timothy J. Sargeant, At-Large

COUNTY STAFF PRESENT:
Randy Bartlett, Director, Stormwater Management Division, Department of Public Works and Environmental Services (DPWES)
Lynn S. Green, Management Analyst II, Stormwater Planning Division, DPWES
Pamela Nee, Chief, Environment and Development Review Branch (EDRB), Planning Division (PD), Department of Planning and Zoning (DPZ)
Noel H. Kaplan, Senior Environmental Planner, EDRB, PD, DPZ
Mary Ann Welton, Environmental Planner, EDRB, PD, DPZ
S. Robin Ransom, Assistant Director, Planning Commission Office
Kara A. DeArrastia, Clerk to the Planning Commission

ENVIRONMENTAL QUALITY ADVISORY COUNCIL MEMBER PRESENT:
Robert McLaren, At-Large

OTHERS PRESENT:
Michael Rolband, President, Wetland Studies and Solutions, Inc.

ATTACHMENT:
"Understanding Stormwater Part 2" PowerPoint presentation

//

Chairman James R. Hart called the meeting to order at 7:03 p.m., in the Board Conference Room, 12000 Government Center Parkway, Fairfax, Virginia 22035.

//

Commissioner Flanagan MOVED THAT THE ENVIRONMENT COMMITTEE MINUTES OF DECEMBER 2, 2010 BE APPROVED.

Commissioner Lawrence seconded the motion which carried unanimously.

//

Randy Bartlett, Director, Stormwater Management Division, Department of Public Works and Environmental Services (DPWES), delivered the second part of his PowerPoint presentation on understanding stormwater with a focus on stream protection and water quality, as shown in the attachment. He responded to questions from Committee members regarding stormwater management retrofit projects in the County; removal of trees during stream restoration to reconnect the floodplain; construction and operation/maintenance costs associated with the projects; weeding and re-vegetation; sediment removal; and pervious pavers.

Chairman Hart thanked Mr. Bartlett for his informative presentation.

Commissioner Lawrence noted that the Comprehensive Plan for Tysons Corner addressed the potential for the coordination of stormwater management controls among multiple development sites to achieve stormwater management goals in an efficient manner. He suggested that before he met with the applicants to negotiate proffers to incorporate stormwater management measures in their redevelopment projects in Tysons Corner, he meet first with DPWES staff to discuss the available measures. Mr. Bartlett pointed out that the Plan also recommended that detailed site analysis occur early in the development process to plan for sufficient stormwater infrastructure.

Replying to a question from Commissioner Flanagan, Noel Kaplan, Senior Environmental Planner, Environment and Development Review Branch, Planning Division, Department of Planning and Zoning, indicated that the LEED for New Construction Rating System (LEED-NC) offered two points for stormwater design, but developers might be able to earn additional points through the use of innovative stormwater management design practices. Mr. Bartlett said DPWES staff was not considering the LEED criteria in stormwater management retrofit projects. He noted that the Comprehensive Plan for Tysons addressed the provision of stormwater management measures that were sufficient to attain both the stormwater design-quantity control and stormwater design-quality control credits of the most current version of the LEED-NC or LEED for Core & Shell rating systems, or the equivalent of these credits. Commissioner Flanagan requested that Mr. Bartlett provide him with information about the relationship between LEED and stormwater management. Mr. Bartlett agreed with this request.

Michael Rolband, President, Wetland Studies and Solutions, Inc., recommended that DPWES consider providing stormwater credit to developers for stream restoration to entice them to restore streams.

Chairman Hart suggested that a field trip be scheduled for Committee members to visit a stormwater management retrofit project, stream restoration project, or stormwater management techniques as part of a redevelopment or a new development so they could learn more about it. He also suggested that the Committee re-examine this topic prior to the advertisement of the proposed changes to the Public Facilities Manual and Comprehensive Plan to bring them into compliance with the new State stormwater regulations.

Commissioner Lawrence commented that it would be beneficial if he was more educated about the types of stormwater management practices used in retrofit projects so he would know what to search for on a Final Development Plan or a Conceptual Development Plan to verify that they would satisfy the applicable requirements.

Chairman Hart said it would be helpful for DPWES staff to call attention to any items in an application that were expected to be affected by pending regulations so the Commissioners were made aware.

Commissioner Lawrence commented that staff presentations were also very helpful and he looked forward to more in the future. Chairman Hart concurred and said he greatly appreciated the information that staff members provided him and the other Commissioners.

Commissioner Lawrence pointed out that another benefit of Commissioners visiting the sites of retrofit projects both under construction and after completion would be the opportunity to provide actual examples to citizens to explain that once the replaced trees began to regenerate and grow, it was better for the trees, wildlife, and environment in the long run.

//

Chairman Hart announced that the following Committee meetings would be held at 7:00 p.m., in the Board Conference Room:

- Thursday, February 24, 2011 – Line-by-line review of the first draft of the Green Building Comprehensive Plan Policy Review Strawman;
- Thursday, March 10, 2011 – Topic to be determined (continuation of strawman review if needed or discussion of solid waste and recycling).

//

The meeting was adjourned at 8:14 p.m.
James R. Hart, Chairman

An audio recording of this meeting is available in the Planning Commission Office, 12000 Government Center Parkway, Suite 330, Fairfax, Virginia 22035.

Minutes by: Kara A. DeArrastia

Approved: February 24, 2011

_____

Kara A. DeArrastia, Clerk to the
Fairfax County Planning Commission

Environmental Committee Update

January, 2011

- Brief Recap
- Regulatory Update
- Strategies for Moving Forward
- Retrofits – County Projects
- Modeling – Numbers Game
- Development/Redevelopment Standards

Cheat Sheet

- MS4 – Municipal Separate Storm Sewer System
- TMDL – Total Daily Maximum Load
- WIP – Watershed Implementation Plan
- E3 – Everything by Everyone Everywhere
- N – Nitrogen
- P – Phosphorous
- DCR –Dept. of Conservation and Recreation

Stormwater Words

- Quality – Nutrient Removal; Bacteria; Other Pollutants
- Quantity – Peak Flow; Total flow
- Detention – Flood Control & Stream Protection
- Retention – Water Quality – Some Stream Protection
- Erosive Potential=flow*quantity- stream protection
- BMP-best management practice – traditional quantity
- LIDs – low impact development – new quality
- Design Year storm
  - 100 yr means 1% chance
  - 2 yr means 50% chance
  - Basin Size ?
  - 2 yr 24 hr(3.2”) vs 2 yr 30 min (1.3”)
  - 10 yr 24 hr(5.2”) vs 10 yr 30 min (2.0”)
  - 95%ile event – 1.7”

Missions

- Flood Protection – Protect Property and Life
  - 10 year and greater storms – over 3”
- Stream Protection – Habitat & Property Protection
  - Peak Flow rates & Duration of High Flows
- Water Quality
    - First 1-2”
  - Local Health & Habitat
    - Fecal Coli form
    - Floatables & Suspended Solids
    - Contaminants
  - Chesapeake Bay
    - Nutrients
    - Suspended solids

Closing

- Competing Missions
- Evolving Science
- Emerging Regulations
- Lack of Funding
- Will Require a Cultural Shift
  - No longer Free
  - Will Require O&M commitment
  - STW will become a resource, not waste product

Accotink Update

- Met with EPA 10/28
  - EPA believes this supports Bay TMDL
  - Willing to allow credit for Stream Restoration
  - Removing references to Development and Redevelopment Standards.
  - Removing Watershed Construction Cap
  - Time to Implement – Multiple Permit Cycles
  - TMDL will be established for Flow Rate but intention is to control Volume
  - Will likely be in Permit
  - Plan to use flow approach for other Benthic Impairments
- Next Issues to Work
  - Different Standards for Accotink Watershed ?
  - Focus Retrofits in Accotink Watershed ?

Bay TMDL - Update

- EPA Basically Accepted Va. Watershed Improvement Plan
  - Non Retrofit strategies with 90% compliance by 2017(certified nutrient management plans for all public land)
  - Reduce Loads by 5% by 2017
  - Retrofit 23% of Impervious areas by 2025
  - If non MS4 urban stormwater loads not reduced require more from existing MS4s and/or issue more MS4 permits
- Trading ??
- Phase 2 WIP Due in 2011

Fairfax County Urban Stormwater Costs associated with Chesapeake Bay TMDL

Category	Row	Item	DEQ WIP Assumptions in Table 6-4.1(1)	Reductions to Meet WLA in WIP Table 2.2 (Without Urban Nutrient Management)
Estimated Costs	A	Estimated Capital Cost (Millions)	$651	$845
	B	Estimated Annual Cost (Millions per year)	$70	$91
Estimated Average Annual Stormwater Bills	C	Residential House ($/yr)	$160	$200
	D	Convenience Store/ Gas Station ($/yr)	$1,400	$1,800
	E	Neighborhood Shopping Center ($/yr)	$9,600	$12,000
	F	Church ($/yr)	$3,200	$4,000
	G	Regional Mall ($/yr)	$145,000	$181,000
Census Households & Population	H	2009 Household Estimate	384,242	384,242
	I	2009 Population Estimate	1,037,605	1,037,605
	J	Total Annual Fee Per Household(2) ($/yr) (Row "B" / Row "H")	$180	$240
	K	Total Annual Fee Per Person(2) ($/yr) (Row "B" / Row "I")	$70	$90
Financial Burden	L	2009 Medium Household Income Estimate	$104,158	$104,158
	M	Residential House Stormwater Fee as Percentage of MHI (Row "C" / Row "L")	0.2%	0.2%
	N	Total Household Stormwater Fee(2) as Percentage of MHI (Row "J" / Row "L")	0.2%	0.2%

Note: (1) Include performance of urban nutrient management
(2) Simulates stormwater costs passed on to consumer by retail stores, gas stations, etc.

MS4 Permit - Update

- Base Line - + $1,000,000
  - More Reporting/Housekeeping –
  - More Monitoring –
- EPA Commented to State in December
  - EPA wants targets/measurable goals everywhere –
    - enforceable vs. flexibility
  - EPA wants Specific Retrofit goals
  - EPA wants Bay TMDL included
  - EPA wants Specifics on Accotink
- Major Issues to Work
  - Land Area Regulated by Permit
  - Cost and Funding
  - Development and Redevelopment Standards
  - TMDLs and Impaired Waters (gets ahead of the TMDL process)
  - Relationships between interconnected MS4s
  - Appropriateness of Specific Retrofit Goals
- State wants to advertise in Feb for Public comment

Strategies

- **Engage in Phase 2 of the State WIP**
  - Draft in June 2011 Final in November 2011
  - Anticipated to make allocations by community
  - Anticipated to provide more specifics and details

- **Develop new Standards**
  - Will State Standards meet our needs?
  - County wide vs WS specific
  - Redevelopment – Definition - Density based?
  - Refine Retrofit Definition

- **Continue Evolving Management Practices and Monitoring**

Strategies

- Develop Trading Schemes
  - State wide Nutrient exchange is an example
  - Watershed Plans provide projects and strategies
  - County Wide Pro-Rata Program
  - Trade with our Wastewater program
  - Trade with County Ag programs
- Keep Options Open - Position ourselves shall Legal Action be Required
- Funding
  - Explaining and Highlighting Potential costs to Local Governments
  - Monitoring approached taken by other Communities
  - Some thoughts –
    - Continue the gradual ramp up
    - Eventually Re-evaluate the Utility approach

How do we do It?

- **Education/Culture**
  - Deliver Successful Projects – Find Willing Partners
  - Partnering with Schools
  - Providing Objective Estimates
  - Providing Different Perspectives on Costs
  - Involve Others - Builders

- **Regulatory – Modeling vs. Visual**
  - Exiting Ponds & Lakes
  - Reuse
  - Track Projects
  - Revise Standards

- **Ramp Up Management Stuff**
  - Managing Permit Conditions
  - GIS -
  - Asset Management
  - Monitoring -

- **Provide Funding Ideas –**
  - Compare to other Communities
  - Prepare for Tax vs Utility Discussion
  - Show existing Conditions
  - Trading/offsets – Prorata –

Strategies

- Retrofit
  - Add BMP/LID to Existing Develop
  - Modify Existing Dry Pond
    - Nutrient Removal
    - Sediment removal
    - Peak Shaving

Cinnamon Oaks Dry Pond Retrofit Project
SULLY DISTRICT, TAX MAP# 35-2
CONTRACT NO. CN10316072-01
PROJECT NO. HC8001-HC002

Project Overview:

1- Remove the existing concrete ditch.

2- Retrofit existing pond for improved water quality and retention by re-grading and adding four micro-pools.

3- Improving the outfalls by adding rock steps.

4- Seeding and planting the site.

Description:

The proposed project site is a retrofit on Cinnamon Oaks detention basin (1072DP) located at Ashburton Avenue and Saffron Drive. The primary goals of this project were to improve water quality by increasing on-site retention of storm water runoff and eventually will positively impact the down stream channel by retaining a portion of the upstream runoff. The project will treat 11 acres of the upstream watershed and will be able to remove 8.54 lbs/yr of phosphorus, 64.74 lbs/yr nitrogen, and 2.12 tons/yr of sediment from the runoff leading to Cedar Run.


Ashburton Ave
Saffron Dr
Saffron Dr

Existing Site Conditions

Completed – new outfall into basin

Completed Project


Pictometry


Ashburton Ave
Saffron Dr

Sycamore Ridge Section 1 & 2 Parcel B & C Water Quality BMP Retrofit Project

TAX MAP# 25-1, HUNTER MILL DISTRICT

CONTRACT NO. CN103160072-01, PROJECT NO. HC8001-HC002

Project Overview:

1- Remove the existing concrete ditch.

2- Retrofit of a stormwater facility for improved water quality and detention by adding two Micro- Pools.

3- Improve the outfalls.

4- Restore the site with Seeding and Planting.

Description:

This project retrofitted an existing stormwater management facility (09149DP) located on an out lot of the Park Authority property at Frying Pan Park. This facility drains about 72.5 acres of onsite and offsite area and provided detention only. The primary goals of this project were to retrofit the site with micro-pools to provide extended detention capability and to improve water quality. More specifically, this project provides for the treatment of the entire 72.5 acres of watershed and an estimated removal of 202 lbs/yr of nitrogen, 38 lbs/yr of phosphorus and 9.4 tons/yr of sediments from the runoff leading to the Horsepen Creek.

Pre-construction Existing Conditions

Final Restoration

Completed Project


Sept. 28, 2010


2010 4 20


2010 8 3

Strategies

- Restore
  - Typically Streams
    - Re-connect Flood Plain
    - Create Habitat
    - Reduce Sediments
    - Protect Property
    - Dissipates Energy

Post Construction- 06/2008

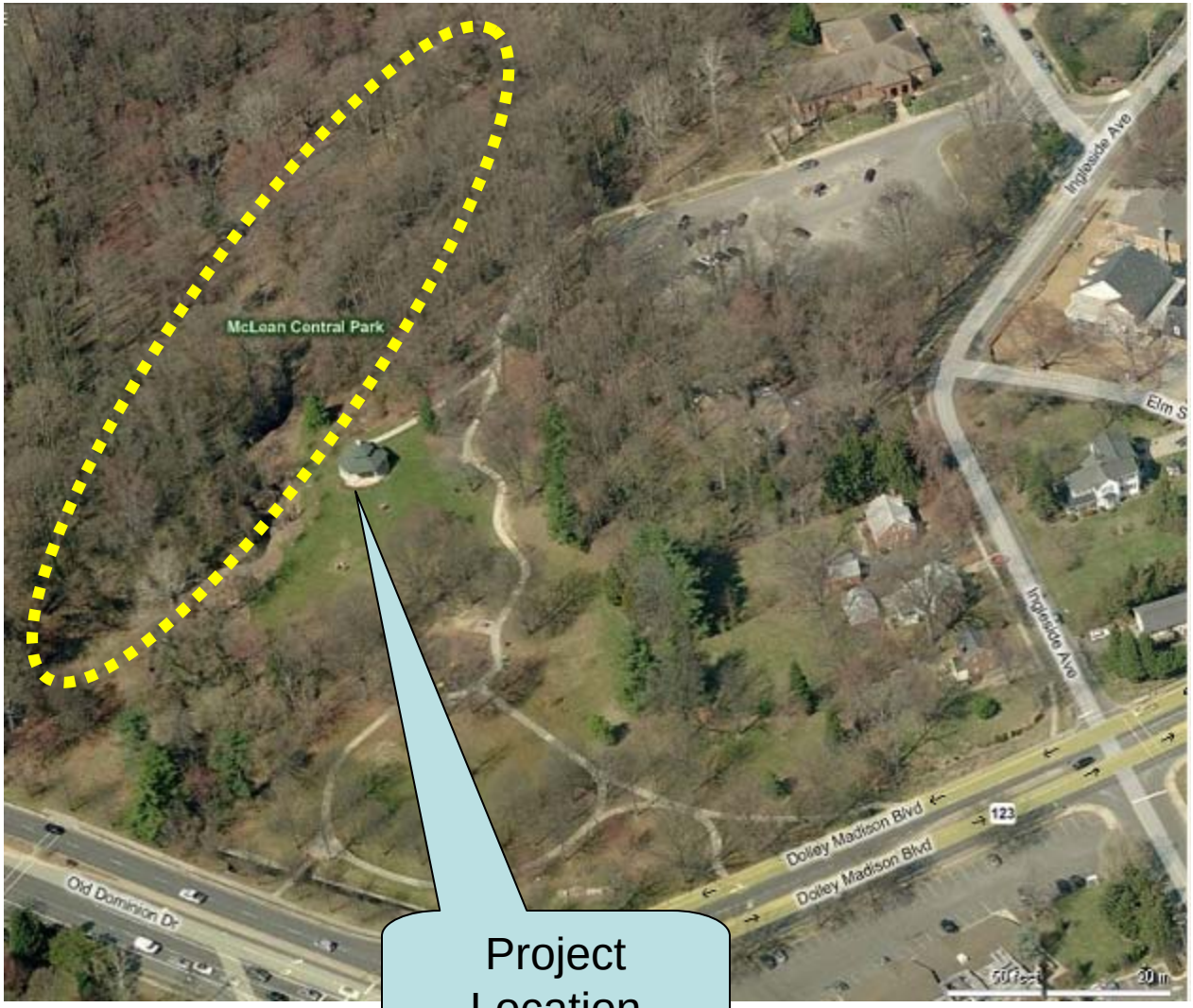

17/11/2009 23:53


18/11/2009 00:16

Dolley Madison Library – Dead Run Stream Improvements

Tax Map No. 30-2 - Dranesville District

Contract CN07302855, Project DE8000-DE003



<u>Project Overview</u>:

This project included restoration of approximately 1,400 of Dead Run stream running through McLean Central Park utilizing encapsulated soil lifts, toe protection, stone vanes, compost berms, and fiber log rolls. The stormwater outfall from Dolley Madison library was restored to include a sand filter step-pool system and wetland feature. The entire site was re-vegetated with extensive native plantings of trees, shrubs, grass and wildflowers. This restoration will substantially mitigate bank erosion and improve water quality.

Existing Conditions – Severe Streambank Erosion

Completed Streambank Stabilization


Cub Run ReCenter
Drainage Area
42,733 ft²
Stormwater Retrofit
9,278 ft²

Construction (2006)

$45,000 - MSMD

Post Construction

Annual Maintenance -- NA

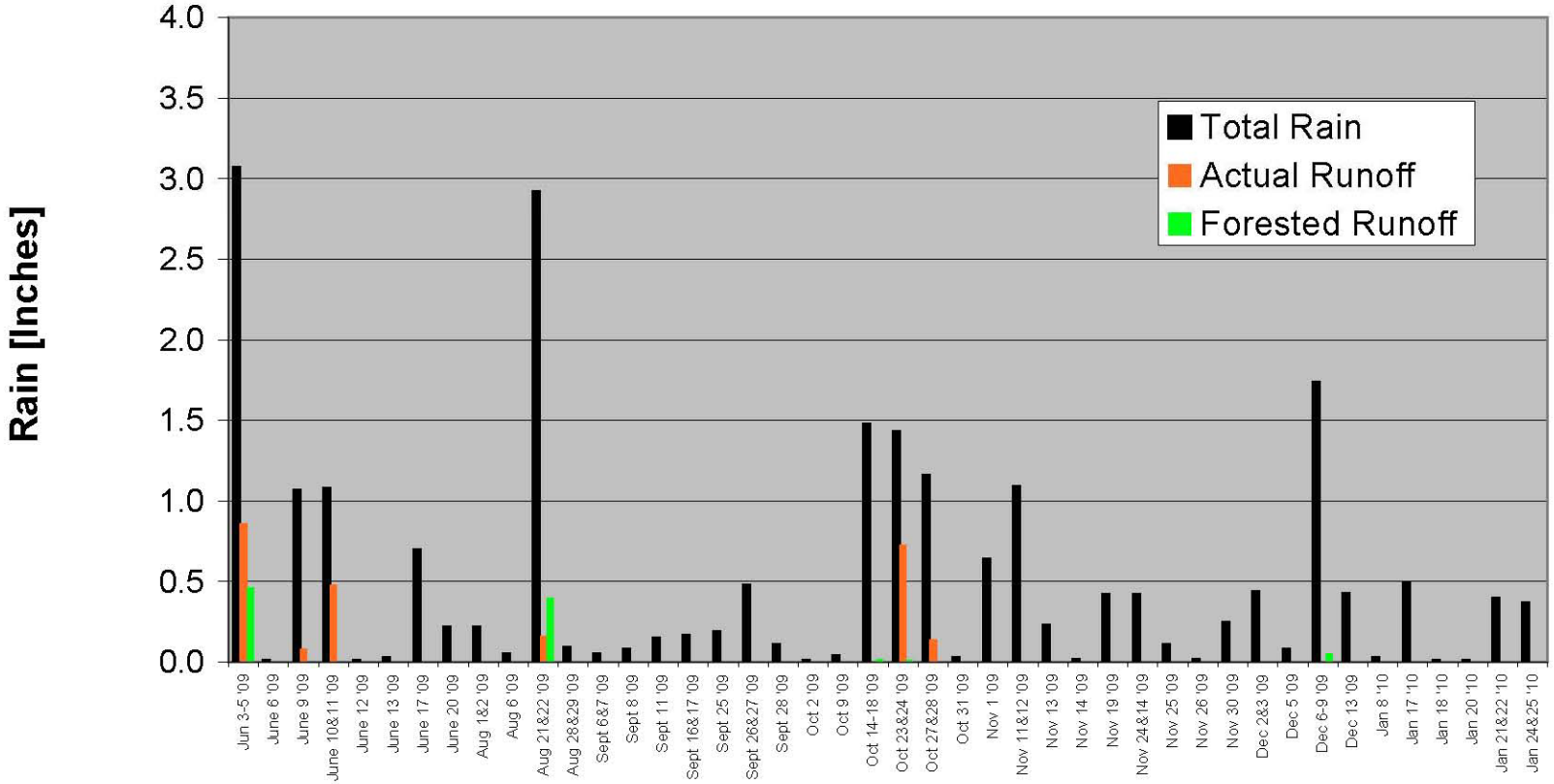
Cub Run ReCenter Retention System
Summary of 46 Events - June '08 to Jan '10

Rain =	29.56	Inches
Actual Runoff =	5.38	Inches
Rain Retained in System =	24.18	Inches

82 % of Rain was retained

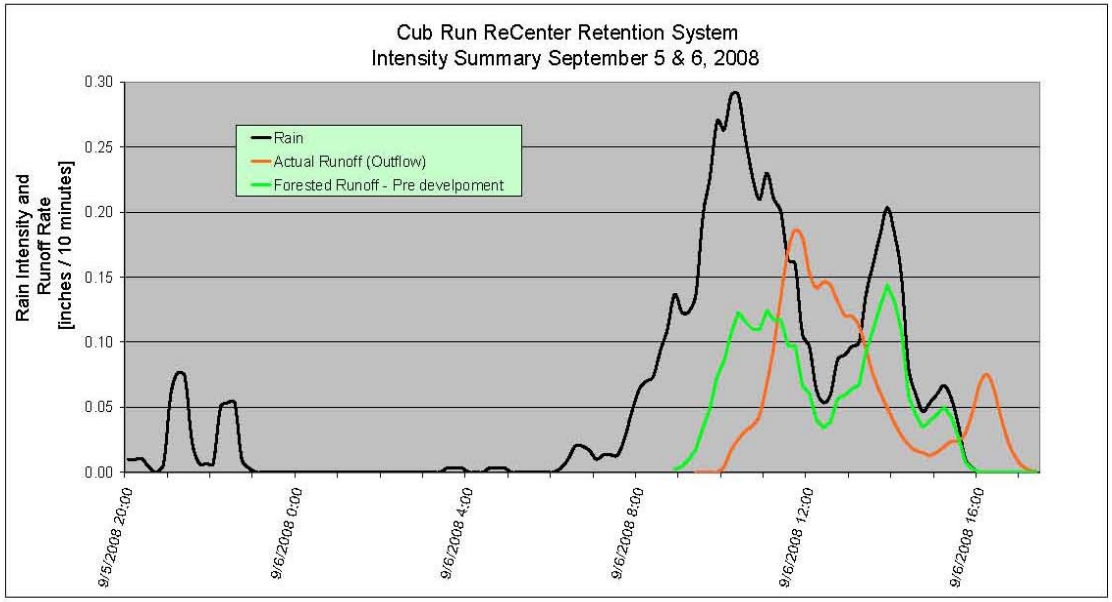
Approximate runoff from a rainfall event using
SCS Runoff Curve Number (CN)

Forested Condition Runoff =	3.83	inches



Rainfall = 29.56 inches (46 events) **Actual Runoff = 5.38 inches**

82% of Rainfall Retained

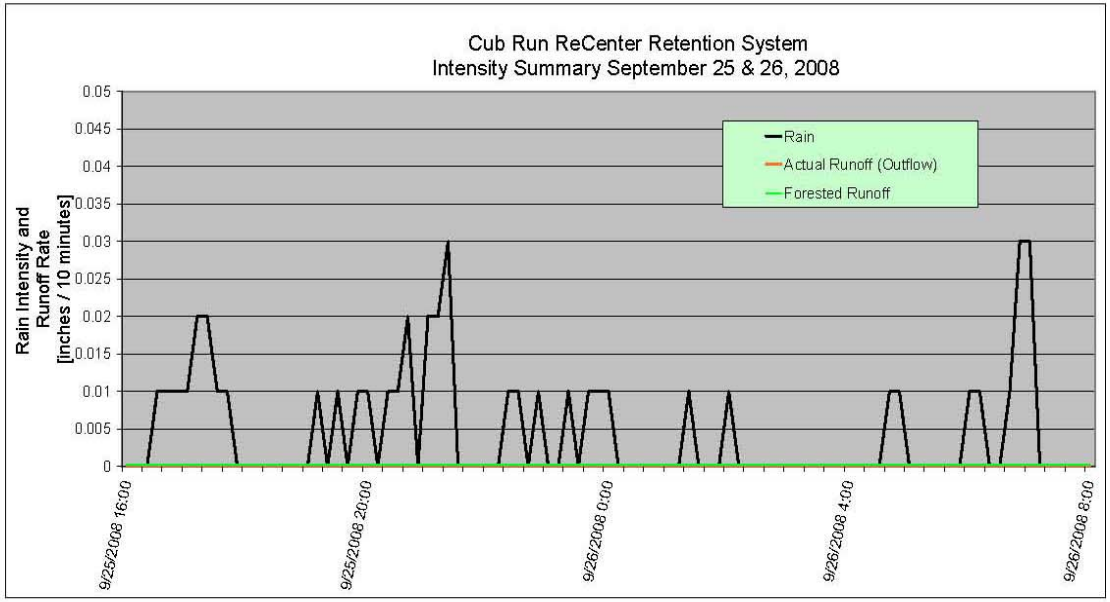


Total Rain = 7.06 Inches
Actual Runoff = 2.93 Inches
Rain Retained in System = 4.13 Inches

59 % of Rain was retained

Approximate runoff from a rainfall event using SCS Runoff Curve Number (CN)

Forested Condition Runoff = 2.95 inches

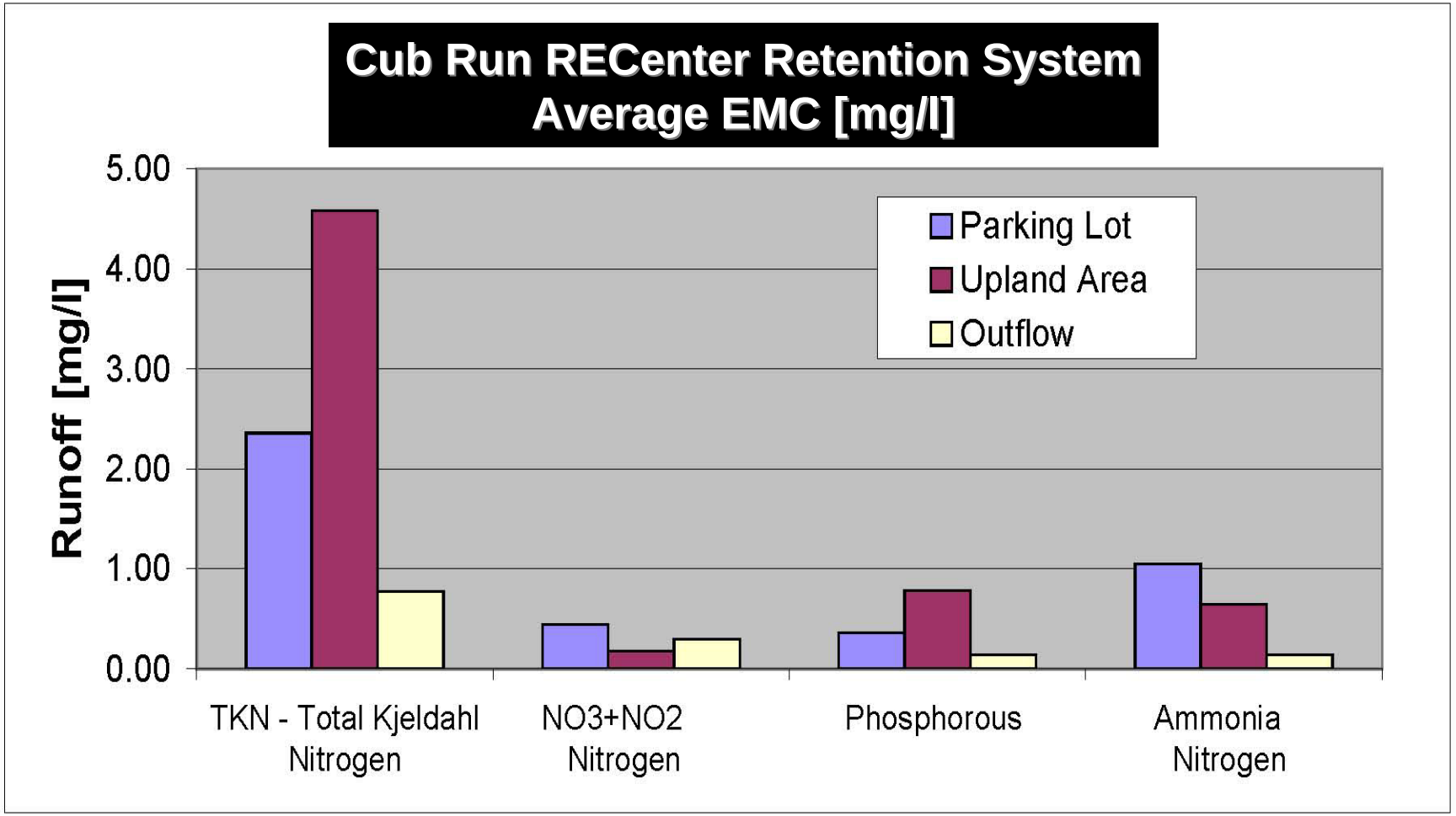


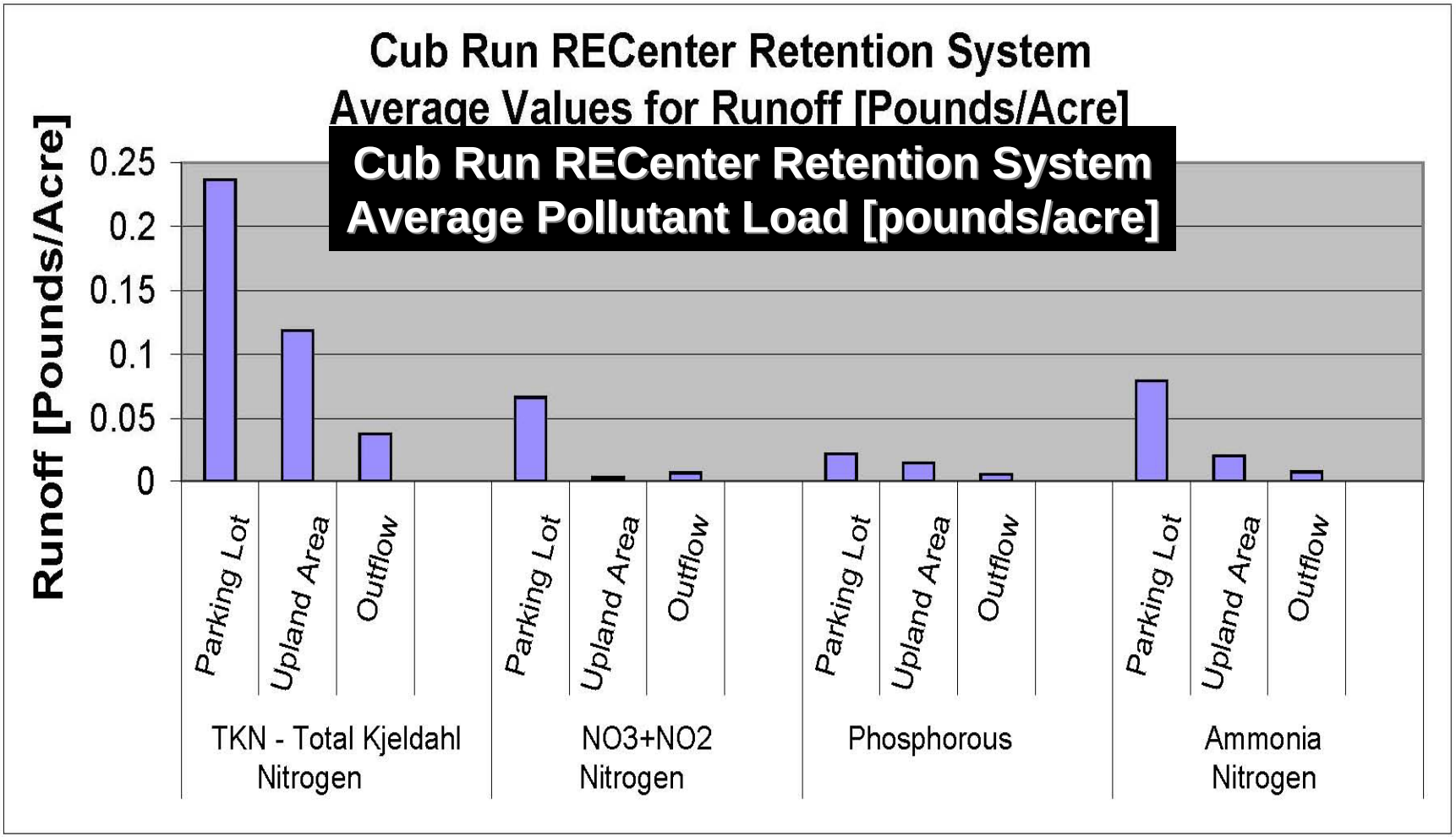
Total Rain = 0.45 Inches
Actual Runoff = 0.00 Inches
Rain Retained in System = 0.45 Inches

100 % of Rain was retained

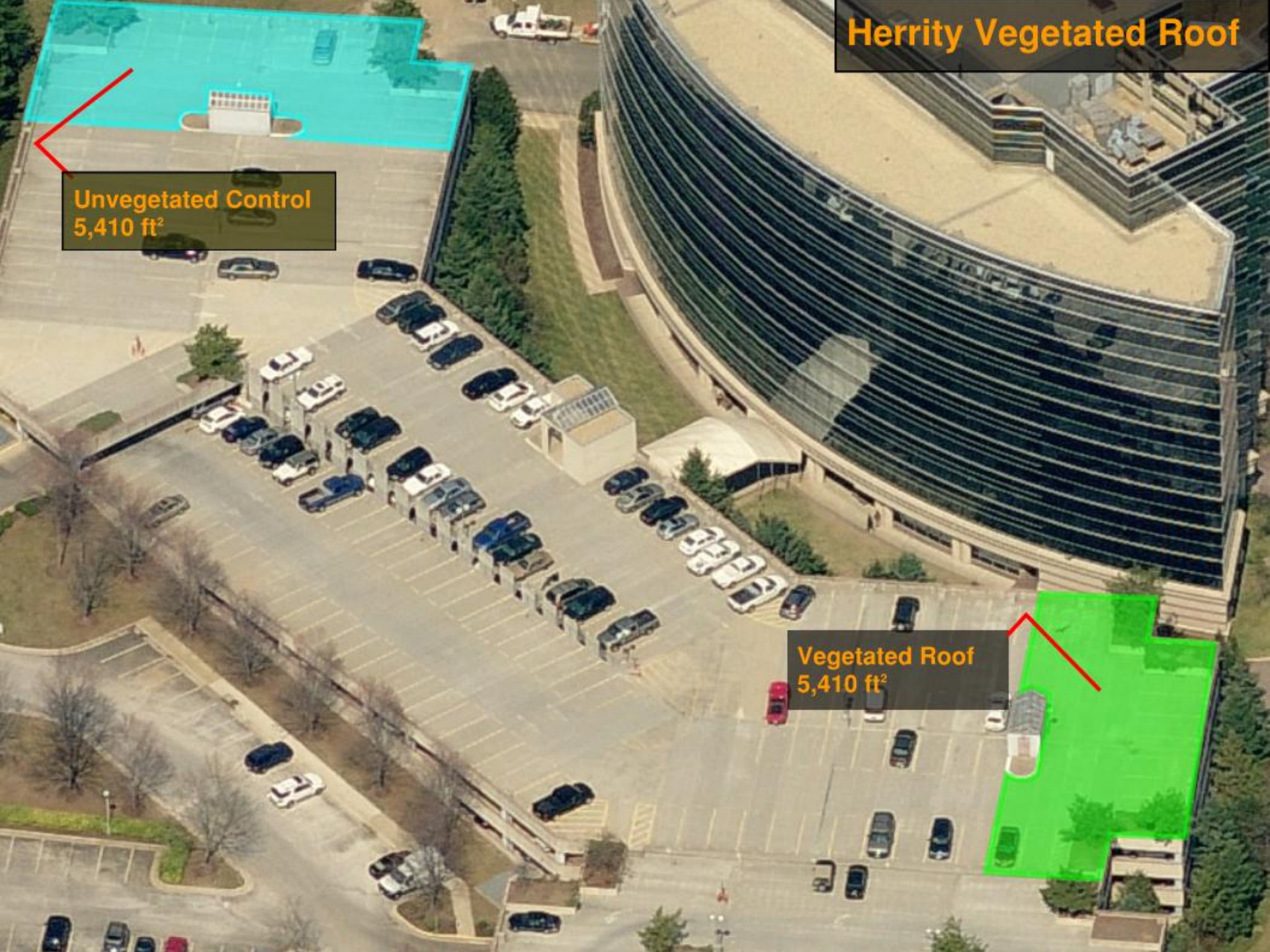
Approximate runoff from a rainfall event using SCS Runoff Curve Number (CN)

Forested Condition Runoff = 0.00 inches


Cub Run RECenter Retention System
Average EMC [mg/l]
Runoff [mg/l]
5.00
4.00
3.00
2.00
1.00
0.00
Parking Lot
Upland Area
Outflow
TKN - Total Kjeldahl Nitrogen
NO3+NO2 Nitrogen
Phosphorous
Ammonia Nitrogen



11 Storms 13.5 inches of Rain


Herrity Vegetated Roof
Unvegetated Control
5,410 ft²
Vegetated Roof
5,410 ft²

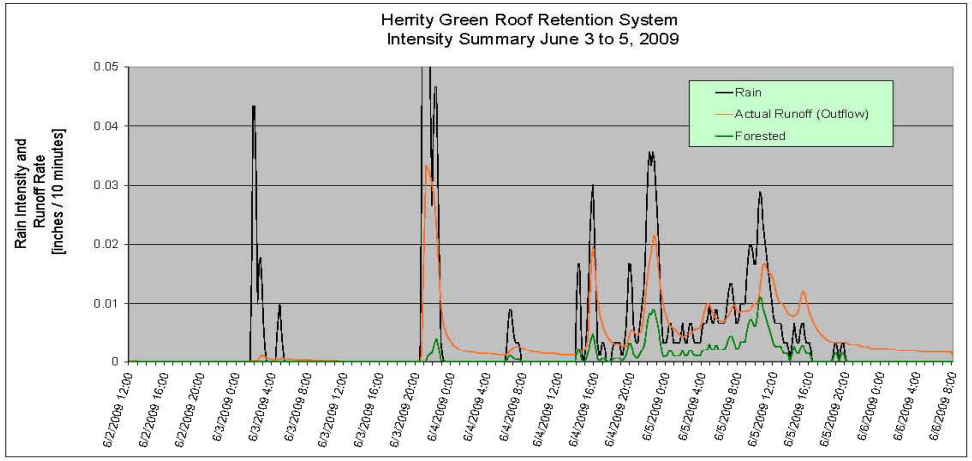
Herrity Green Roof Retention System
Summary of 32 Storms - July '08 to Dec '09

Rain =	27.98	Inches
Actual Runoff =	17.37	Inches
Rain Retained in System =	10.61	Inches

37.92 % of Rain was retained

Approximate runoff from a rainfall event using
SCS Runoff Curve Number (CN)

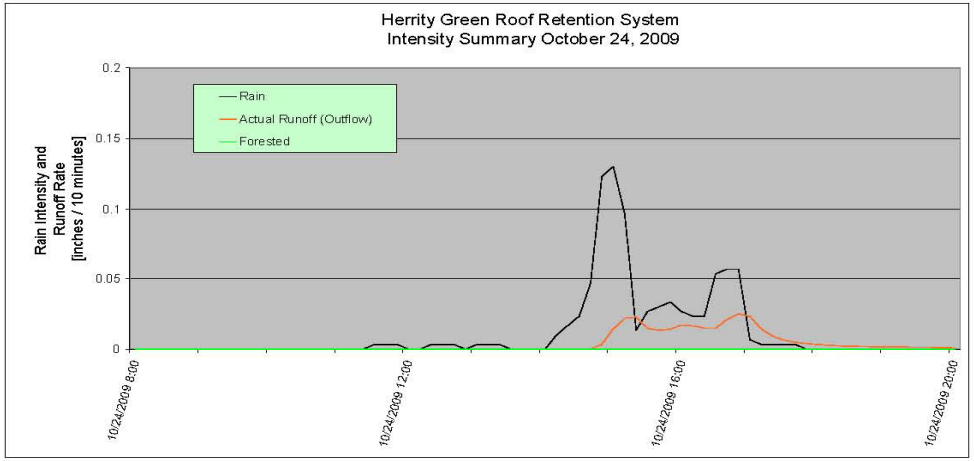
Forested Condition Runoff =	3.87	Inches



Total Rain =	3.08	Inches
Actual Runoff =	2.09	Inches
Rain Retained in System =	0.99	Inches
32	% of Rain was retained	

Approximate runoff from a rainfall event using SCS Runoff Curve Number (CN)

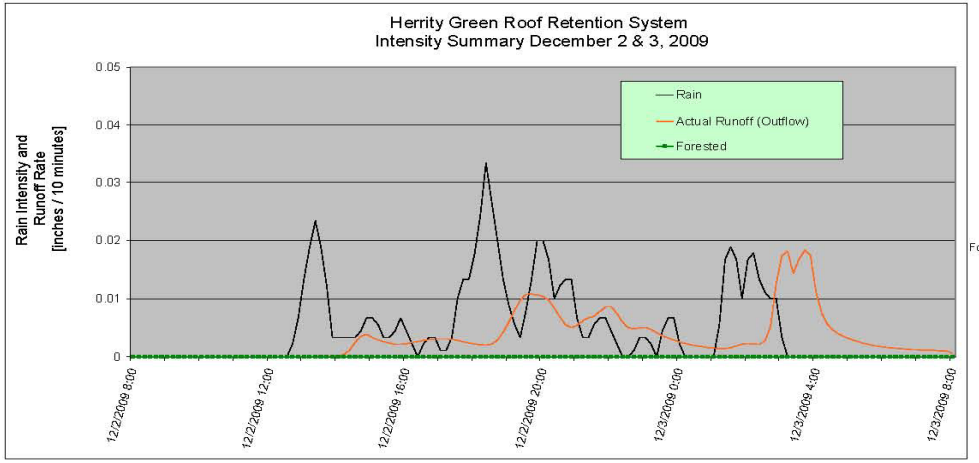
Forested Condition Runoff =	0.47	Inches



Total Rain =	0.84	Inches
Actual Runoff =	0.30	Inches
Rain Retained in System =	0.54	Inches
64	% of Rain was retained	

Approximate runoff from a rainfall event using SCS Runoff Curve Number (CN)

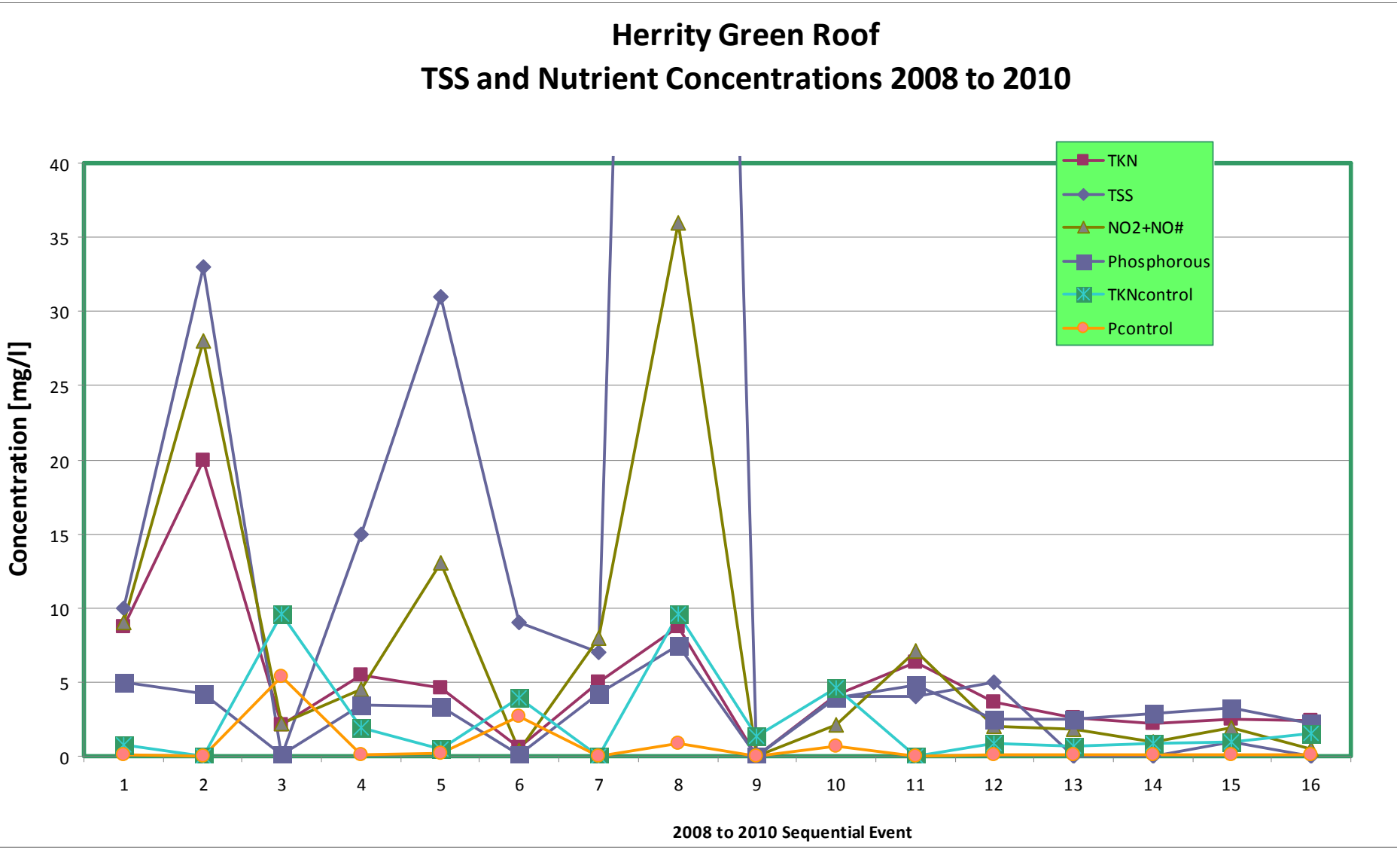
Forested Condition Runoff =	0.00	Inches

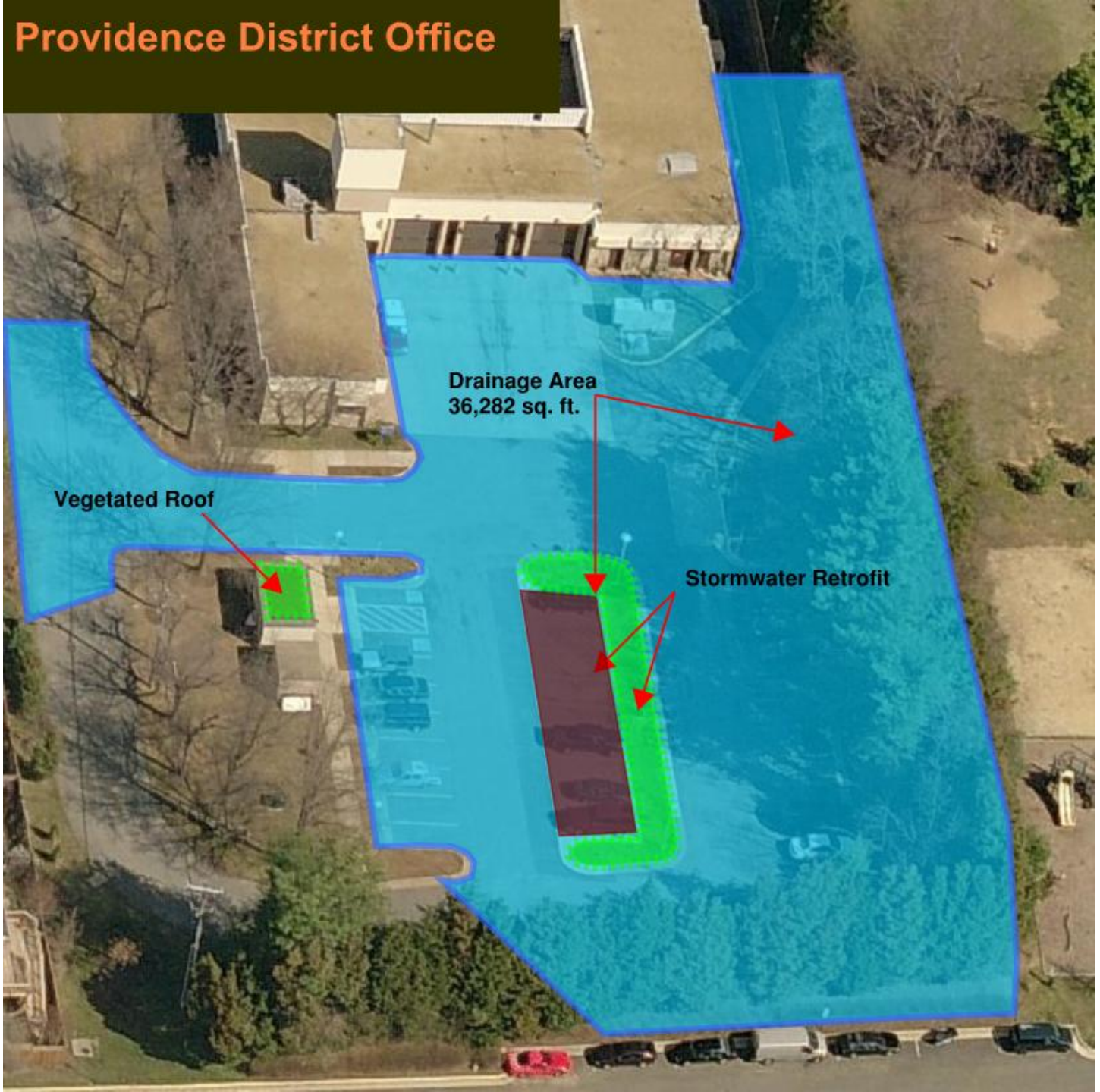


Total Rain =	0.71	Inches
Actual Runoff =	0.50	Inches
Rain Retained in System =	0.21	Inches
30	% of Rain was retained	

Approximate runoff from a rainfall event using SCS Runoff Curve Number (CN)

Forested Condition Runoff =	0.00	Inches


Herrity Green Roof
TSS and Nutrient Concentrations 2008 to 2010
Concentration [mg/l]
40
35
30
25
20
15
10
5
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
2008 to 2010 Sequential Event
TKN
TSS
NO2+NO#
Phosphorous
TKNcontrol
Pcontrol


Providence District Office
Drainage Area
36,282 sq. ft.
Vegetated Roof
Stormwater Retrofit

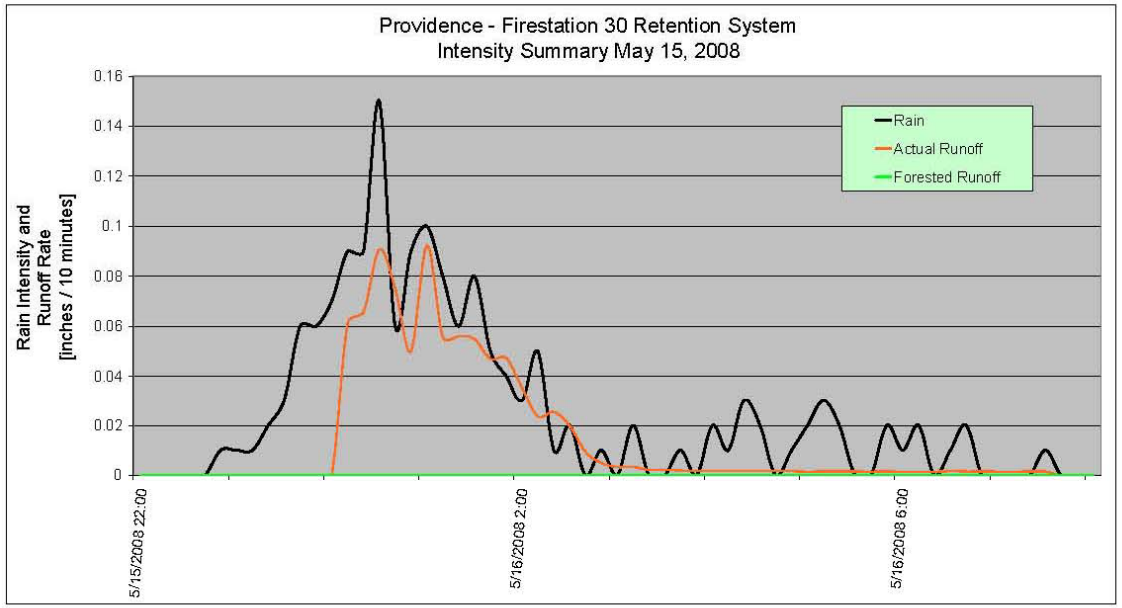
Providence - Fire Station 30 Retention System
Summary of 45 Events - June '08 to May '09

Rain =	45.43	Inches
Actual Runoff =	7.32	Inches
Rain Retained in System =	38.11	Inches

84 % of Rain was retained

Approximate runoff from a rainfall event using SCS Runoff Curve Number (CN)

Forested Condition Runoff = 5.43 inches

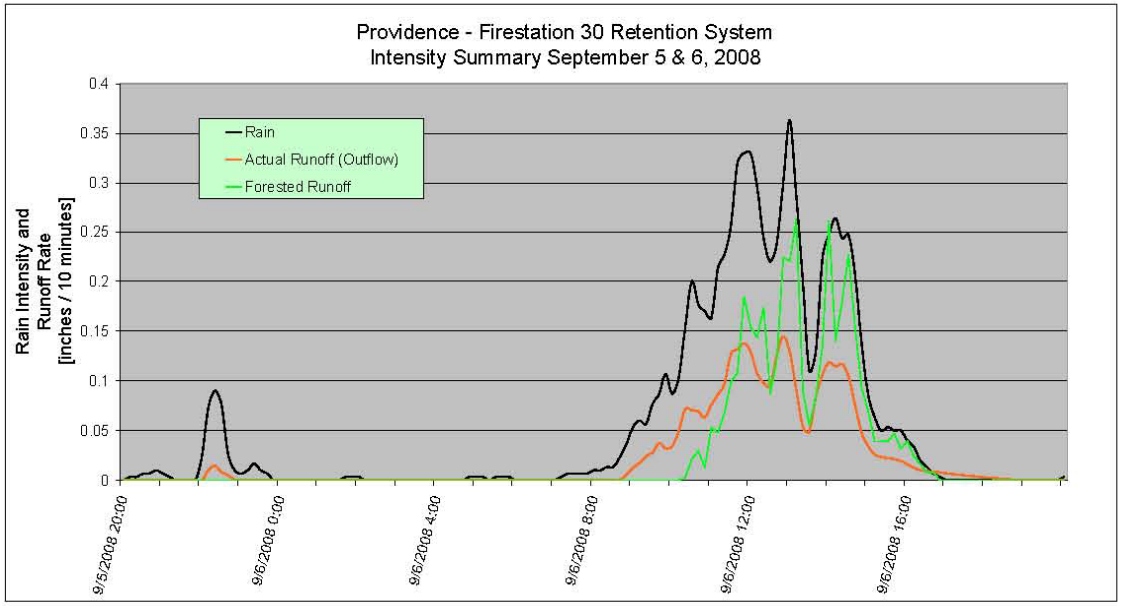


Total Rain =	1.56	Inches
Actual Runoff =	0.86	Inches
Rain Retained in System =	0.70	Inches

45 % of Rain was retained

Approximate runoff from a rainfall event using SCS Runoff Curve Number (CN)

Forested Condition Runoff = 0.02 inches

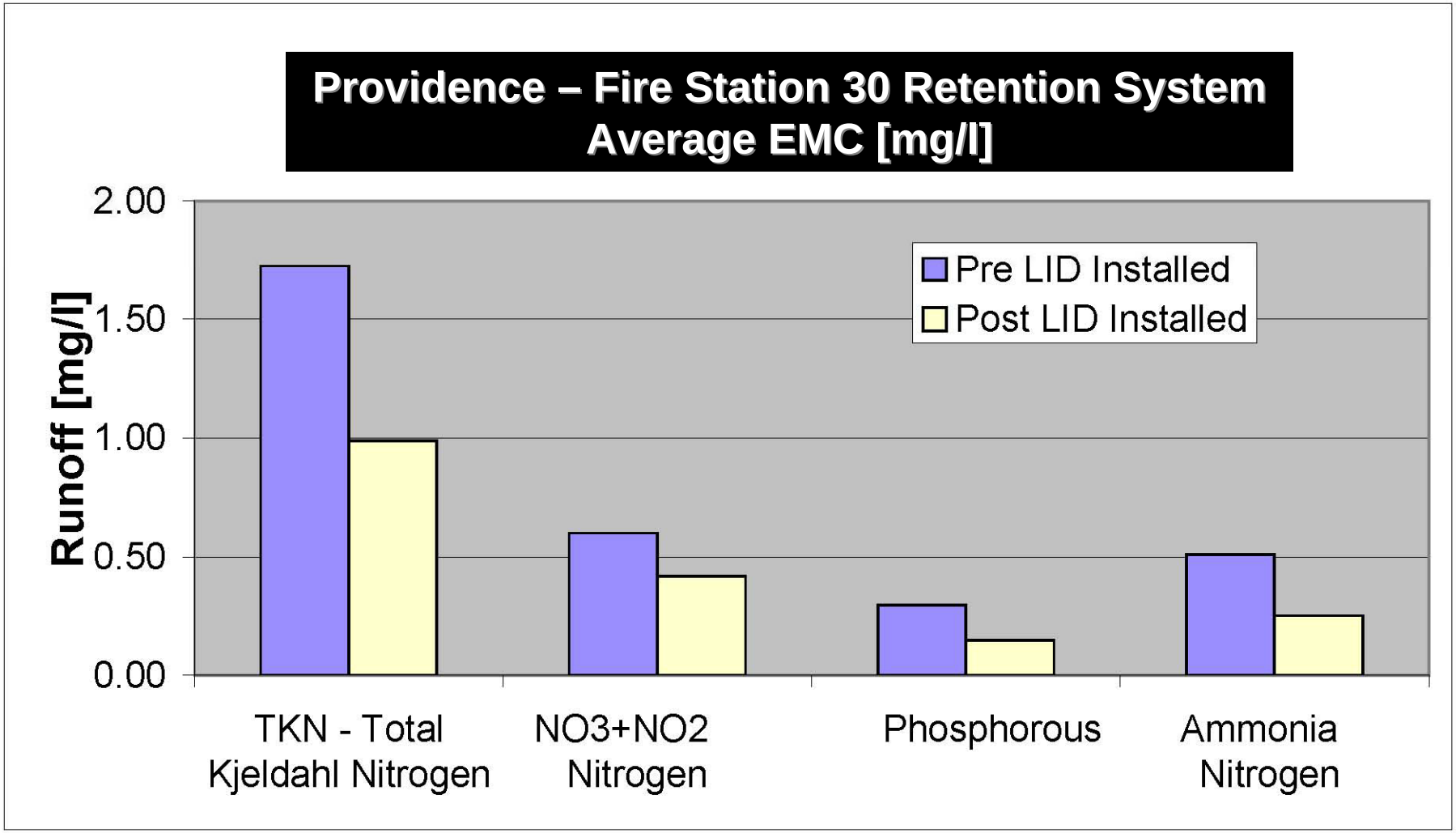


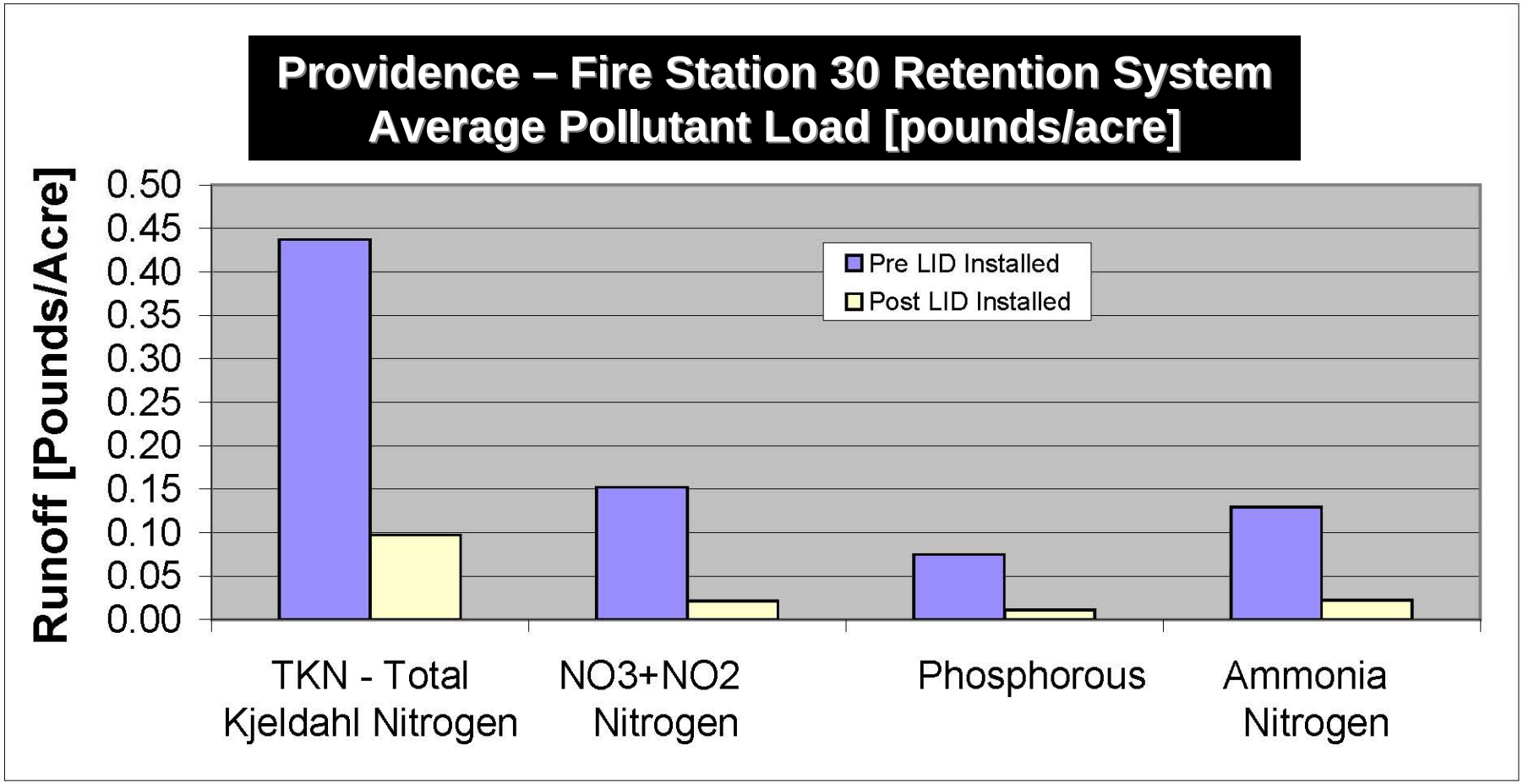
Total Rain =	8.16	Inches
Actual Runoff =	3.25	Inches
Rain Retained in System =	4.91	Inches

60 % of Rain was retained

Approximate runoff from a rainfall event using SCS Runoff Curve Number (CN)

Forested Condition Runoff = 3.79 inches


Providence – Fire Station 30 Retention System
Average EMC [mg/l]
Runoff [mg/l]
2.00
1.50
1.00
0.50
0.00
Pre LID Installed
Post LID Installed
TKN - Total Kjeldahl Nitrogen
NO3+NO2 Nitrogen
Phosphorous
Ammonia Nitrogen



9 Storms 21.09 inches of Rain

FY09 Nutrient Removal

FY09 Completed Projects Benefits									
Project	**Project Type**	**Area Treated**	**Total Project Cost**	**Phosphorous Removal**	**P-cost/#**	**Nitrogen Removal**	**N-cost/#**	**Sediment Removal**	**S-cost/#**
		Acres	$	#/Year	$	#/Year	$	#/Year	$
Seven Woods Dr Outfall Improvement	Outfall Improv.	0	$4,312	3	$1,437	61	$71	1	$4,312
Pinecrest Golf Course	BMP/LID Retrofit	1.4	$169,634	1	$169,634	1	$169,634	0	$0
Walt Whitman School Retrofit	BMP/LID Retrofit	1.3	$130,740	2	$65,370	4	$32,685	2	$65,370
Fort Hunt Elementary School	BMP/LID Retrofit	0.68	$64,281	1	$64,281	6	$10,714	1	$64,281
Hybla Valley Elementary School	BMP/LID Retrofit	1.4	$124,214	2	$62,107	3	$41,405	1	$124,214
Bucknell Manor Park Retrofit	BMP/LID Retrofit	7.9	$87,052	2	$43,526	11	$7,914	1	$87,052
Collingwood Park Retrofit	BMP/LID Retrofit	1.7	$92,333	2	$46,167	6	$15,389	1	$92,333
Poplar Spring Court	Stream Restoration	0	$298,183	7	$42,598	141	$2,115	1	$298,183
TOTALS		**14**	**$970,749**	**20**	**$48,537**	**233**	**$4,166**	**8**	**$121,344**

FY10 Nutrient Removal

FY10 Completed Projects Benefits									
Project	**Project Type**	**Area Treated**	**Total Project Cost**	**Phosphorous Removal**	**P-cost/#**	**Nitrogen Removal**	**N-cost/#**	**Sediment Removal**	**S-cost/#**
		Acres	$	#/Year	$	#/Year	$	#/Year	$
Sycamore Ridge	Pond Retrofit	78	$462,611	38	$12,174	202	$2,290	9	$49,214
Fair Ridge Pond A	Pond Retrofit	65	$366,782	40	$9,170	47	$7,804	2	$183,391
Fair Ridge Richmond American	Pond Retrofit	42	$390,386	26	$15,015	30	$13,013	2	$195,193
Foxfield Pond D	Pond Retrofit	111	$271,805	49	$5,547	383	$710	14	$19,415
Willoughby's Ridge	Pond Retrofit	7	$277,081	1	$277,081	14	$19,792	0	$0
Franklin Middle School	Pond Retrofit	56	$628,479	9	$69,831	102	$6,162	1	$628,479
Cinnamon Oaks	Pond Retrofit	11	$158,342	9	$17,594	65	$2,436	2	$79,171
Englewood Mews	Pond Retrofit	6	$297,261	1	$297,261	20	$14,863	0	$0
Burke Centre	Dam Safety	11	$246,156	9	$28,824	65	$3,787	2	$123,078
Kings Park West	Dam Safety	4	$372,433	5	$74,487	19	$19,602	1	$372,433
Dolley Madison Library	Stream Improv.	2	$594,356	3	$198,119	16	$37,147	1	$594,356
West Ox Regional Pond	Dam Safety	96	$140,692	4	$35,173	68	$2,069	1	$140,692
Vine Street, Phase I	Pond Retrofit	228	$686,240	21	$32,678	81	$8,472	5	$137,248
Big Rocky Tributary	Stream Improv.	96	$191,620	4	$47,905	68	$2,818	1	$191,620
TOTALS		813	$5,222,081	219	$23,895	1180	$4,425	41	$126,137

RUNOFF VOLUME

	Design Storm	Requirements	Comments
Draft Virginia Stormwater Regulation	1-Year 24-Hour Storm	If the site is disturbing less than one acre, the post-development product of (peak flow rate)*(runoff volume) must be at least 10% less than the pre-development product of (peak flow rate) *(runoff volume). If the site is disturbing greater than or equal to one acre, the post development product of (peak flow rate)*(runoff volume) must be at least 20% less than the predevelopment product of (peak flow rate)*(runoff volume).	To accomplish this requirement, both the peak flow rate and the runoff volume for the post development site will most likely need to be reduced.
Draft Accotink TMDL	1-Year 24-Hour Storm	Retain 55.4% runoff under existing conditions on-site.	Depending on the existing site conditions, this may be more stringent than the state stormwater regulation. Under the state regulations in other instances, a developer may have to retain more than 55.4% on-site in order to release the remaining runoff at a practical peak flow rate.
Tysons Corner Comprehensive Plan	2-Year 24-Hour Storm	Retain the first inch of runoff on site. For sites with greater than 50% existing impervious cover, reduce the peak flow rate and runoff volume for the existing condition by 25%. For sites with 50% or less existing impervious cover, the runoff volume and peak flow rate should be equal to or less than the existing condition.	More stringent than for sites with greater than 50% existing impervious cover but less stringent for sites with less than 50% existing impervious cover.
Fairfax County Public Facilities Manual	2-Year and 10-Year 2-Hour Storms	No volume reduction. Under the detention method, to compensate for the increase in runoff volume, the post development peak runoff rates shall be reduced below the respective peak runoff rates for the site in good forested condition. The reduction of peak flow is calculated as the percent difference between the post development runoff volume and the good forested runoff volume.	If a downstream drainage system is determined to be inadequate, it shall be shown that there is no adverse impact to the downstream system as well as the proportion improvement of the predevelopment conditions. While the PFM does not contain any volume requirements, the proportional improvement for peak flow rates for development under the Detention method can be significant.

	Requirements	Comments
Draft Virginia Stormwater Regulation	For redevelopment of a site that is disturbing less than one acre with no net increase of impervious cover, the total P load shall be reduced to at least 10% below pre-development total P load. For redevelopment of a site that is disturbing greater than or equal to one acre with no net increase in impervious cover, the total P load shall be reduced to at least 20% below the pre-development P load. If the site has a net increase in impervious cover, follow new development requirements. For new development, the total P load shall not exceed 0.36 lb/acre/year.	For redevelopment, the state regulations require a reduction in predevelopment total P loads. For new development, the regulations present a not-to-exceed total P load.
Draft Accotink TMDL	The on-site retention of the 55.4% of the 1-year 24-hour storm runoff for the site in existing conditions will automatically address water quality concerns.	By addressing stormwater volume, the Draft Accotink TMDL also addresses water quality.
Tysons Corner Comprehensive Plan	The first inch of runoff should be treated such that 80% of the average annual post development total suspended solids are removed.	Unlike the rest of the regulations, Tysons Corner Comprehensive Plan looks at total suspended solids. Research has shown that if you reduce total suspended solids, in turn, your reduce phosphorus and nitrogen.
Fairfax County Public Facilities Manual	For new development, the total P load for proposed development shall be reduced by no less than 40% compared to total P loads for development without BMPs. For redevelopment of a property not currently served by BMPs with 18% or greater added impervious- %P Removal=[1-0.9(predevelopment impervious area/post development impervious area)]*100	For new development, the PFM provides a minimum reduction while the state regulations state a maximum P load.

Conclusions – Next Steps

- Regulations – County Wide vs. Watershed Specific
- Redevelopment – What is Affordable ?
- Science and Regulations are Still Emerging
- Stormwater Needs to be Considered Early in Project Development
- How Can We Help You ?