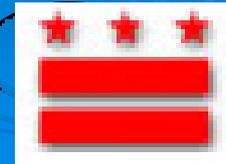


Generation and Certification of Stormwater Retention Credits



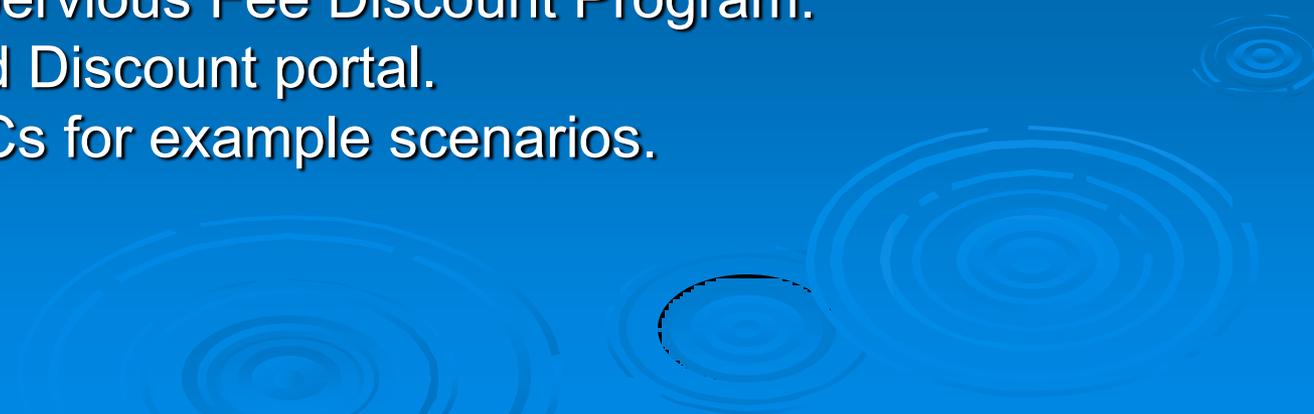
Presented by:
Evan Branosky
District Department of the Environment
Greg Hoffman, P.E.
Center for Watershed Protection



Training Objective

- To provide an overview of new stormwater management regulations and the use of off-site retention by regulated sites.
- To provide practical guidance on how property owners and aggregators can generate DDOE-certified Stormwater Retention Credits for their own use or to sell to regulated sites.
- Not meant to go into detail on DDOE's rationale for the program design, including impacts on District waterbodies.

Training Outline

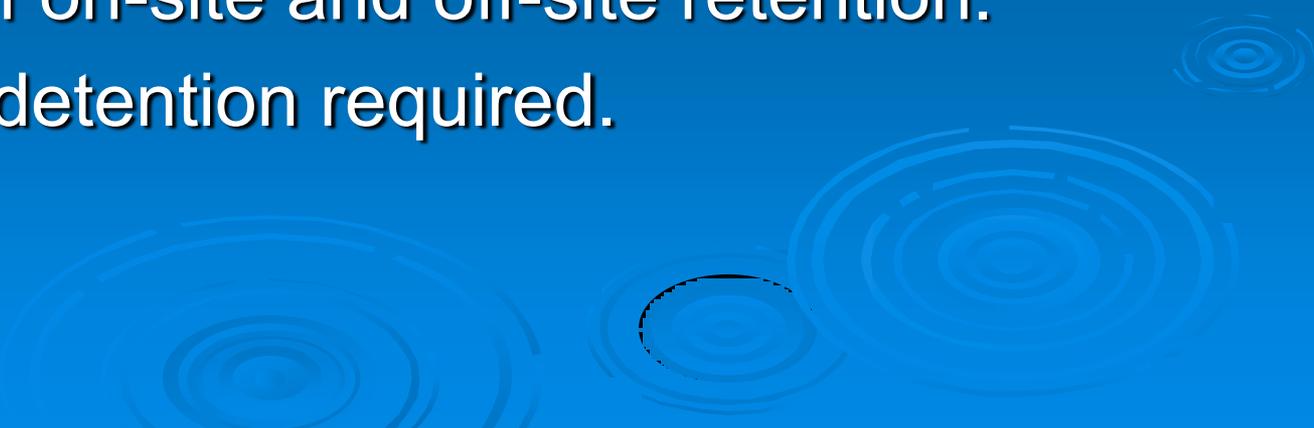
- Basics of new stormwater retention standards.
 - Overview of how regulated sites use off-site retention.
 - Generation & certification of Stormwater Retention Credits:
 - Eligibility requirements.
 - Maintenance requirements.
 - Overview of SRC certification process.
 - Eligibility for BMPs installed before January 15, 2014.
 - SRC serial numbers.
 - Process for buying and selling SRCs.
 - Stormwater Impervious Fee Discount Program.
 - Online SRC and Discount portal.
 - Calculating SRCs for example scenarios.
 - Questions.
- 

New District Stormwater Retention Performance Standards

Major land-disturbing activity

- Retain the first 1.2” of rainfall on site or through a combination of on-site and off-site retention.

Major substantial improvement activity

- Retain the first 0.8” of rainfall on site or through a combination of on-site and off-site retention.
 - No additional detention required.
- 

Calculating Required Retention Volume

$$\text{SWR}_v = P (Rv_I * \%I + Rv_C * \%C + Rv_N * \%N) * SA * 7.48 / 12$$

- SWR_v = Volume required to be retained (gal)
- P = 1.2 inches (90th percent rainfall event for the District)
- Rv_I = 0.95 (runoff coefficient for impervious cover)
- Rv_C = 0.25 (runoff coefficient for compacted cover)
- Rv_N = 0.0 (runoff coefficient for natural cover)
- $\%I$ = % of site in impervious cover
- $\%C$ = % of site in compacted cover
- $\%N$ = % of site in natural cover
- SA = Surface area (square feet)

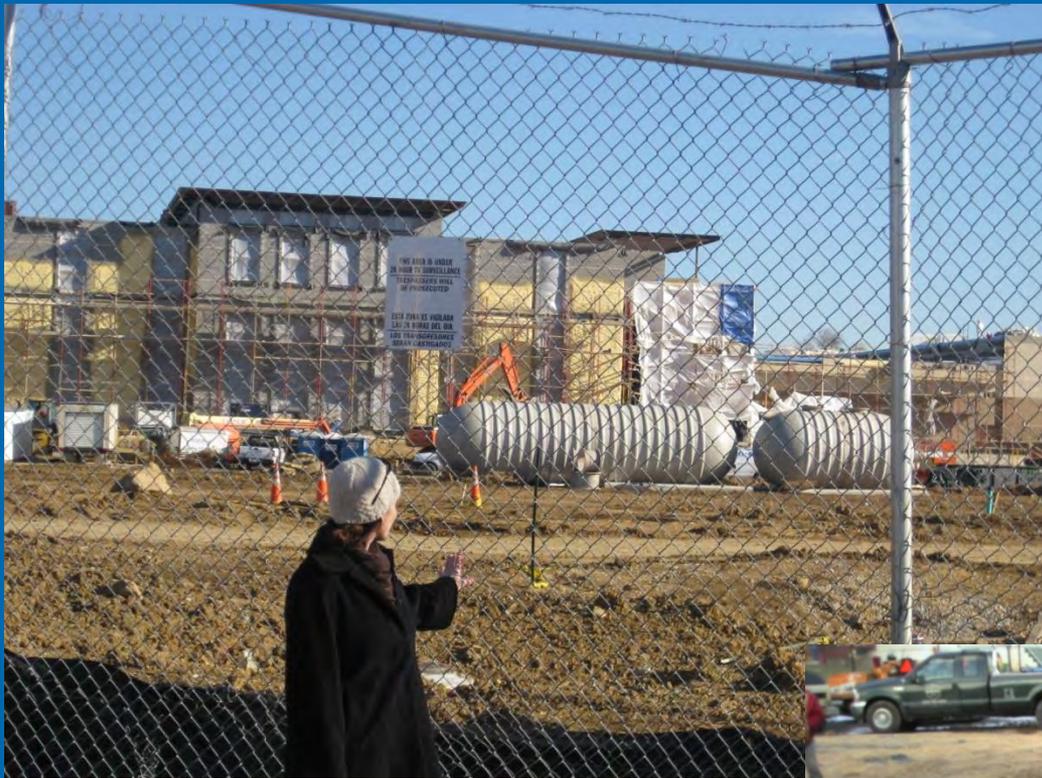
Green Roofs



Stormwater Tree and LID Boxes



Rainwater Harvesting for Non-potable Uses



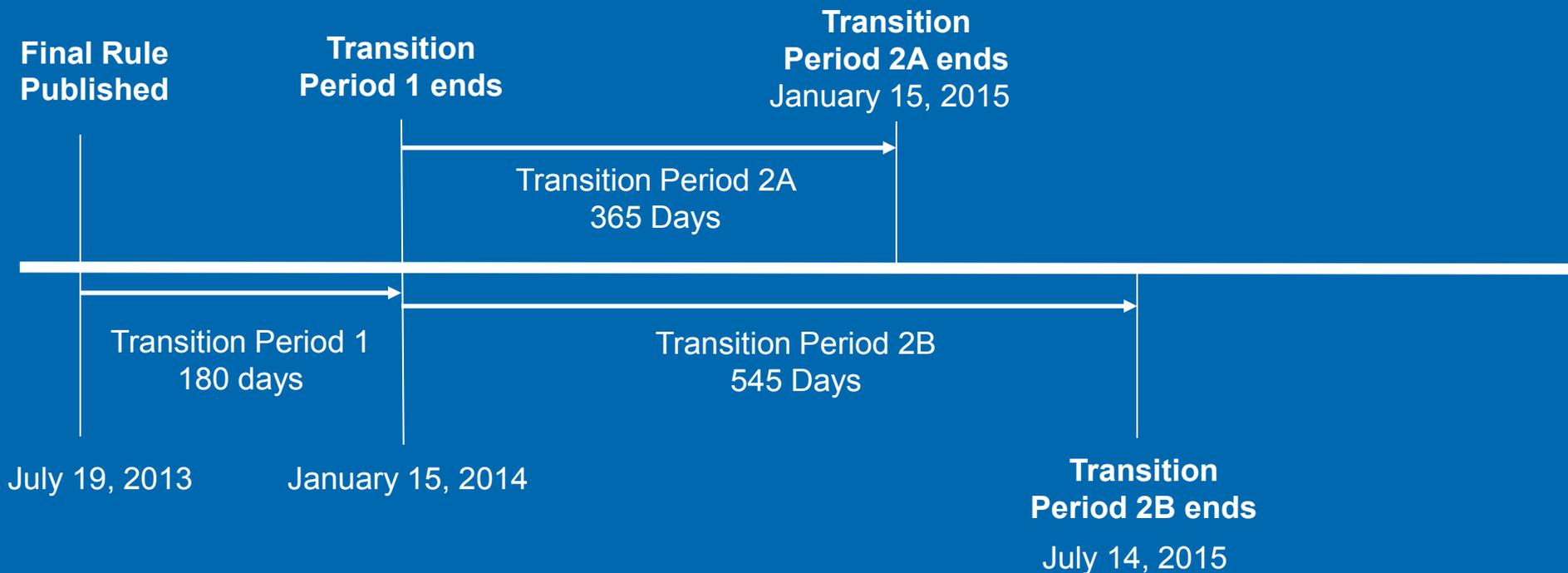
Transition Plan



Transition Period 1

- Regulated projects comply with existing regulations.
- Tied to submittal of first SW Management Plan as part of building permit application process.

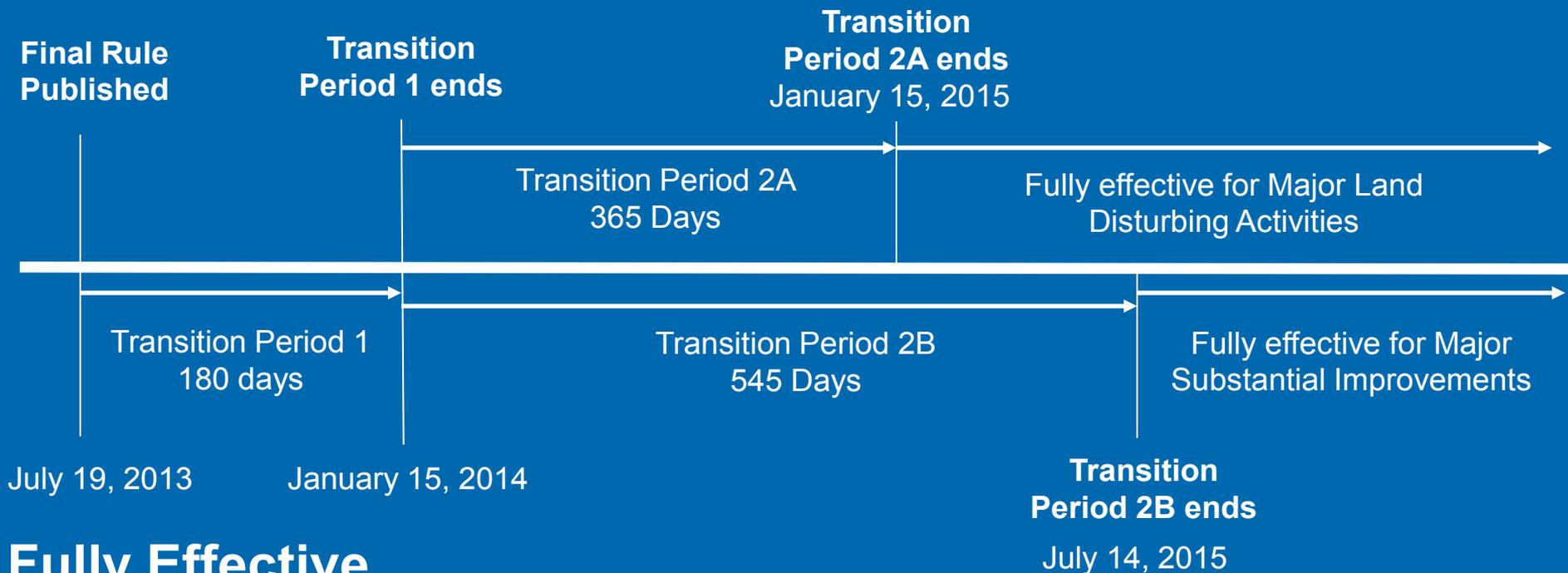
Transition Plan



Transition Period 2A and 2B

- Minimum on-site retention requirement waived.
- Entire retention volume may be achieved off site.

Transition Plan



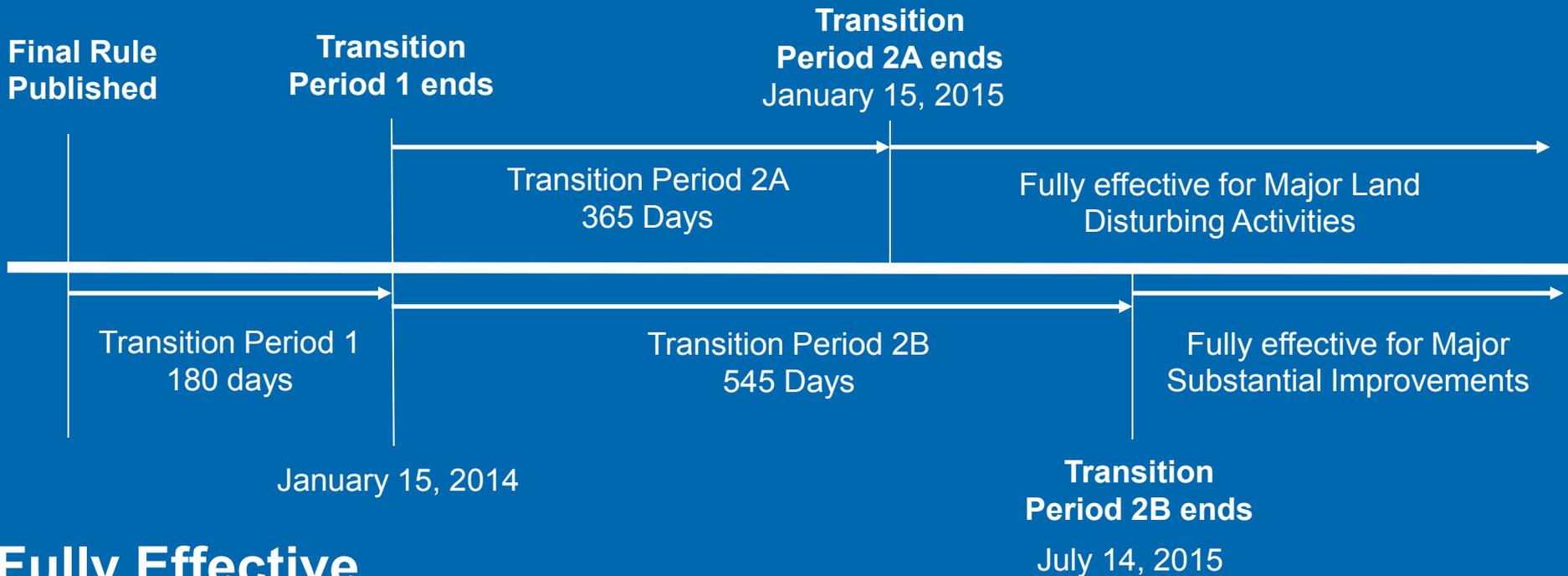
Fully Effective

1) Exceptions for projects grandfathered under a previous period:

* Projects that have submitted an Advanced Design to a reviewing body, and subsequent approval has not expired.

- Stage 2 PUD application
- Application for Design Review under Capital Gateway Overlay
- Final design submission to NCPC

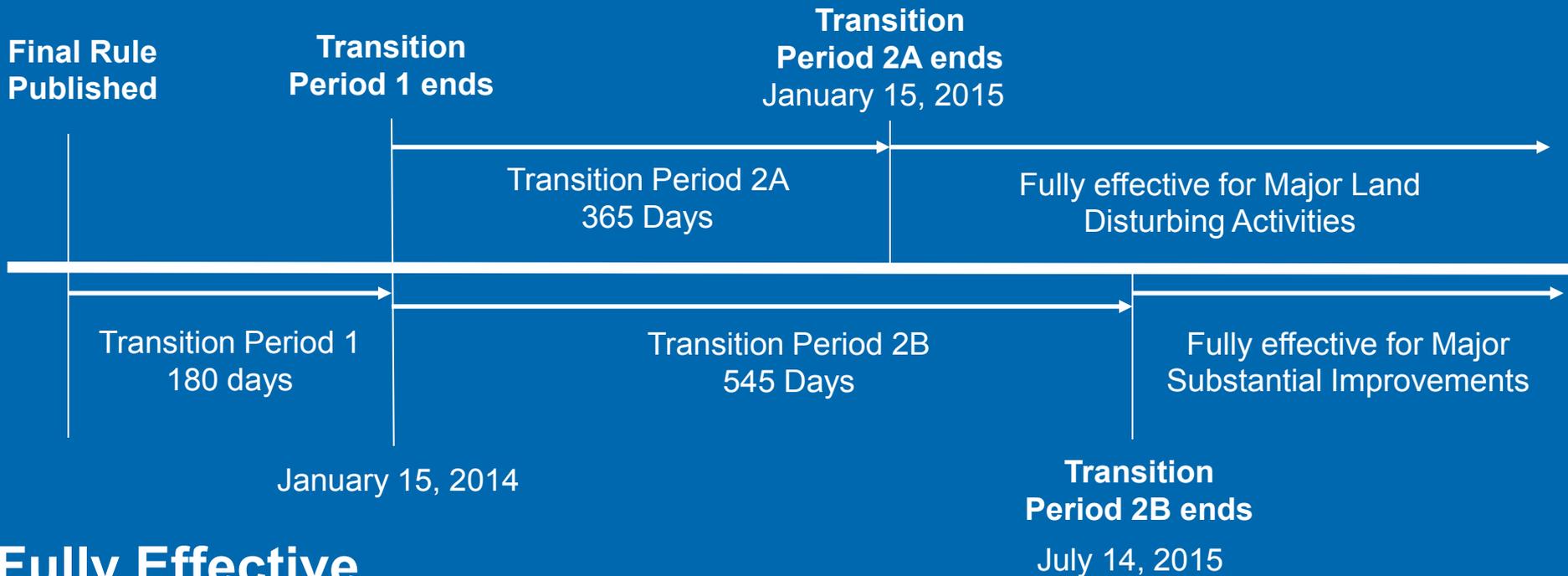
Transition Plan



Fully Effective

- 1) Exceptions for projects grandfathered under a previous period:
 - * Projects that have submitted an Advanced Design to a reviewing body, and subsequent approval has not expired.
 - * Multi-phased projects submitting SWMP with SW BMPs/ infrastructure for entire site being installed in initial phase.

Transition Plan



Fully Effective

2) Exception - grounds for on-site relief when unexpired approval of:

- Concept review by HPRB or CFA.
- Design submission to NCPC.
- Variance from BZA.
- Large tract review by DCOP.

Allowable Use of Off-Site Retention

On-site retention $\geq 50\%$ of SWR_v.

- Free to go off site.



On-site retention $< 50\%$ of SWR_v.

- Must prove that on-site retention is technically infeasible or environmentally harmful.



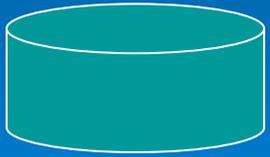
Impervious surface =
14,000 sf

SWR_v = 10,000 gal.

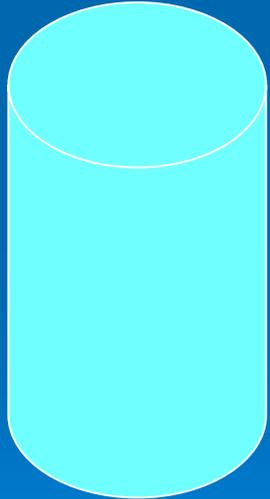
On-site minimum = 5,000 gal.

Off-Site Retention Volume (Offv)

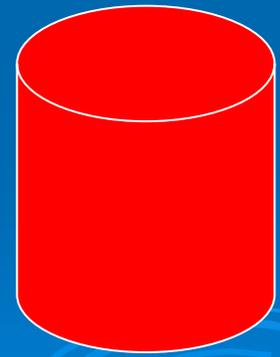
$$\text{Offv} = \text{SWRv} - \text{On-Site Retention Volume}$$



3,000
gallons



10,000
gallons



7,000
gallons

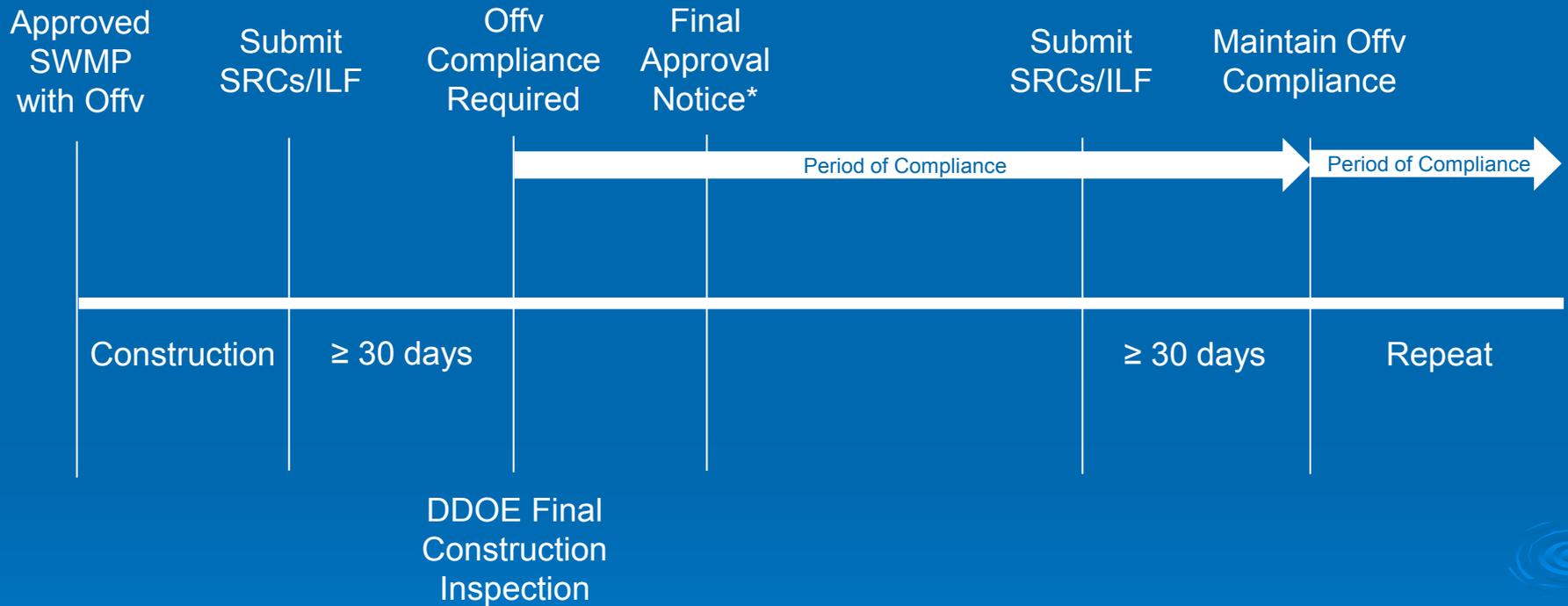
Two Options to Achieve Offv

- In-lieu fee (ILF) payment = \$3.50
 - Paid to DDOE.
 - Corresponds to 1 gallon of retention for 1 year.
 - Achieves 1 gallon of Offv for 1 year.
 - Inflation adjusted annually.
- Stormwater Retention Credits
 - Privately tradable.
 - 1 SRC corresponds to 1 gallon of retention for 1 year.
 - 1 SRC achieves 1 gallon of Offv for 1 year.

Achieving Offv

- Offv stated on SW Management Plan (SWMP).
- How Offv will be met is not stated on SWMP.
- Offv must be met as of DDOE final construction inspection.
- Offv is an ongoing obligation that can be:
 - Met on yearly or multi-year basis.
 - Met with a mix of ILF & SRCs and mix can change.
 - Reduced in the future by increasing on-site retention.
- If a regulated site lapses in compliance with Offv:
 - DDOE automatically assesses ILF and late fee (10%).
 - DDOE will take enforcement action as necessary.

Timeline for Achieving Offv



* To receive a Final Approval Notice, regulated sites must submit an As-Built SWMP and proof of meeting any Offv obligation.

Calculating Cost to Achieve Offv

Impervious surface =
14,000 sf

SWR_v = 10,000 gal.
On-site minimum = 5,000 gal.
Off_v = 3,000 gal.

Calculating Cost to Achieve 3,000 gal Off_v

	In-Lieu Fee	SRCs
Annual	$= \$3.50 * 3,000$ $= \$10,500$	$= \text{SRC Market Cost} * 3,000$ $= \$3,000 (?)$
5 years	$= 5 * \$3.50 * 3,000$ $= \$52,500$	$= 5 * \text{SRC Market Cost} * 3,000$ $= \$15,000 (?)$

Use of Stormwater Retention Credits

- Clock starts on 1-yr. lifespan when used for Offv.
- SRCs can be banked indefinitely.
- Use of SRCs generally not limited by watershed, except trading ratios for AWDZ sites.
- Maintenance failure at SRC-generating site does not invalidate SRCs purchased from that site.
- An SRC owner can retire SRCs without using.

Generation of Stormwater Retention Credits

- DDOE is sole SRC-certifying authority.
- Retention capacity must be located in the District.
- DDOE will certify up to 3 years' worth of SRCs every 3 years for eligible retention capacity.

Example SRC Transaction

- Grocery parking lot voluntarily retrofits w/4,000 gal BMP to generate 3 years of SRCs or 12,000 SRCs.
- Church parking lot voluntarily retrofits w/2,000 gal BMP to generate 3 years of SRCs or 6,000 SRCs.
- Regulated site has 3,000 gal Offv and purchases total of 18,000 SRCs to achieve Offv for 6 years.
- By end of 6-year period, regulated site purchases additional SRCs.

SRCs: Remaining Topics

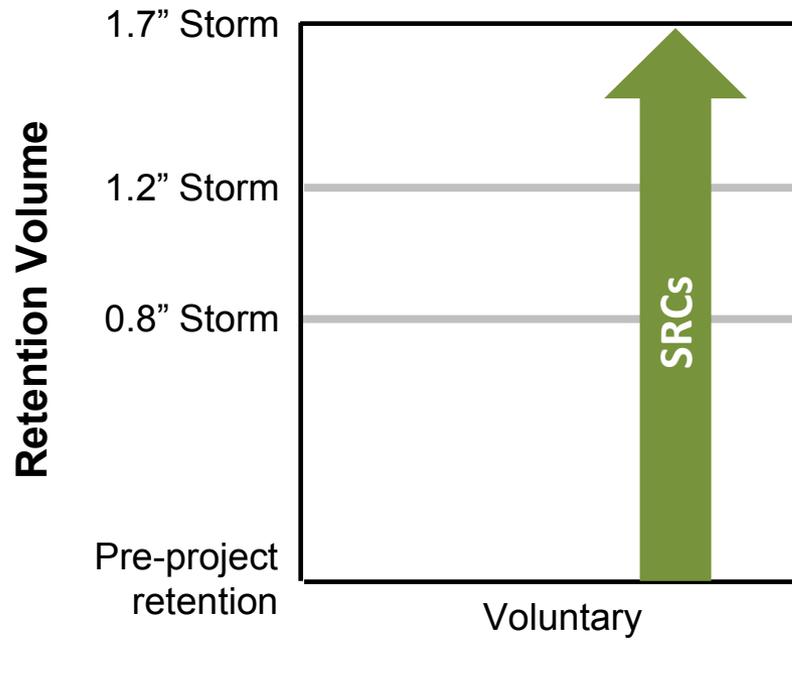
- Eligibility requirements.
- Maintenance requirements.
- Overview of SRC certification process.
- Eligibility for BMPs submitted before Jan.15, 2014.
- SRC serial numbers.
- Process for buying and selling SRCs.
- DDOE efforts to encourage trades.
- Calculating SRCs for example scenarios.

Eligibility for SRC Certification

Eligible BMPs & land cover changes must:

- 1) Achieve retention above existing retention or regs.

Retention Volume Eligibility: Stormwater Retention Credits (SRCs)



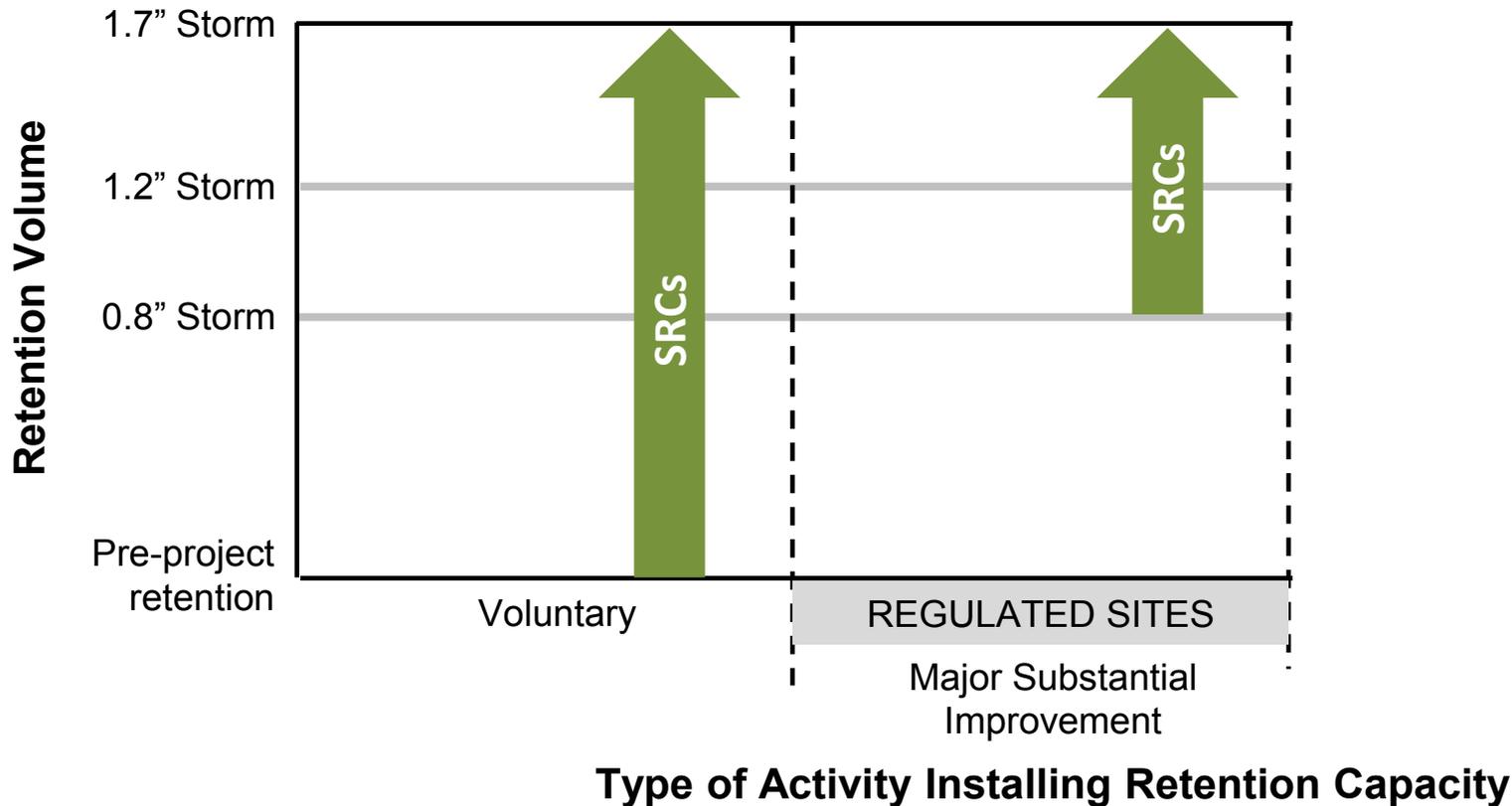
Type of Activity Installing Retention Capacity

Eligibility for SRC Certification

Eligible BMPs & land cover changes must:

- 1) Achieve retention above existing retention or regs.

Retention Volume Eligibility: Stormwater Retention Credits (SRCs)

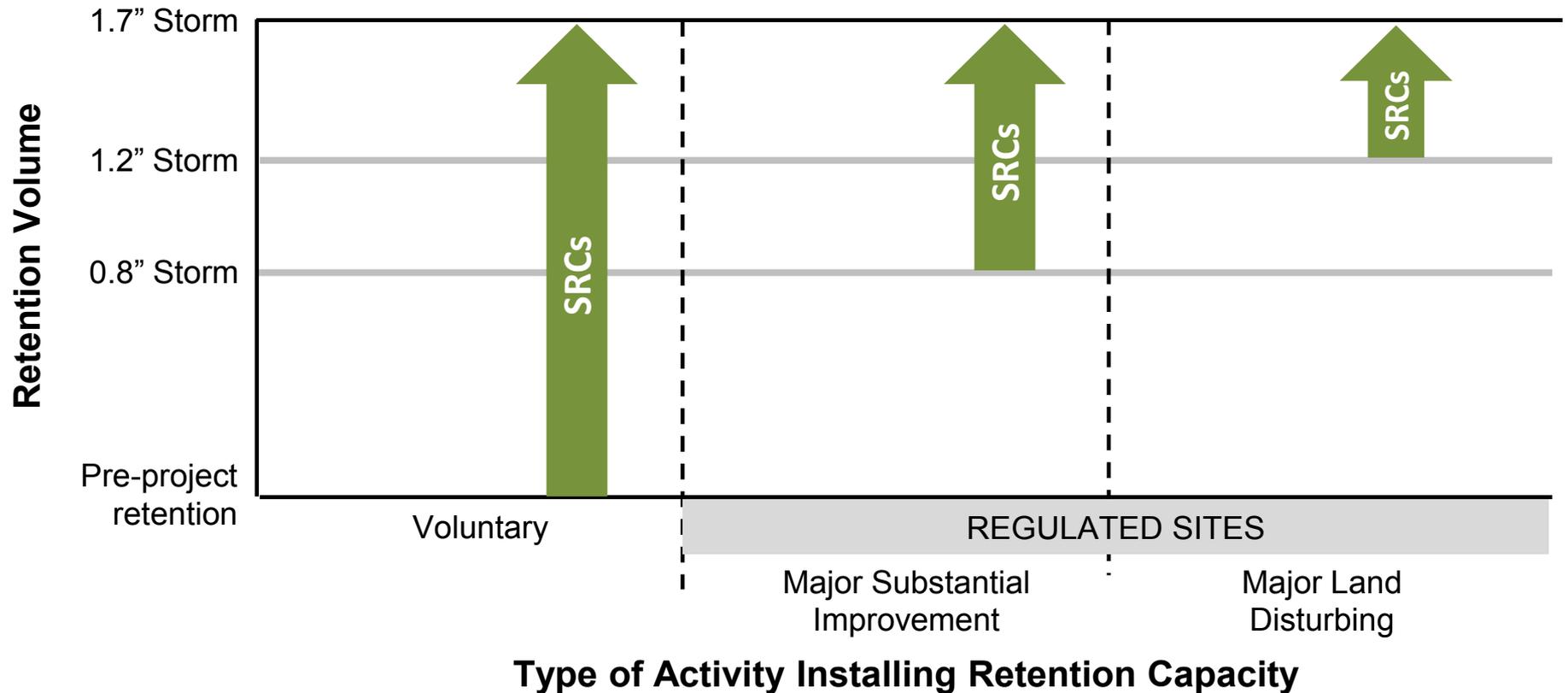


Eligibility for SRC Certification

Eligible BMPs & land cover changes must:

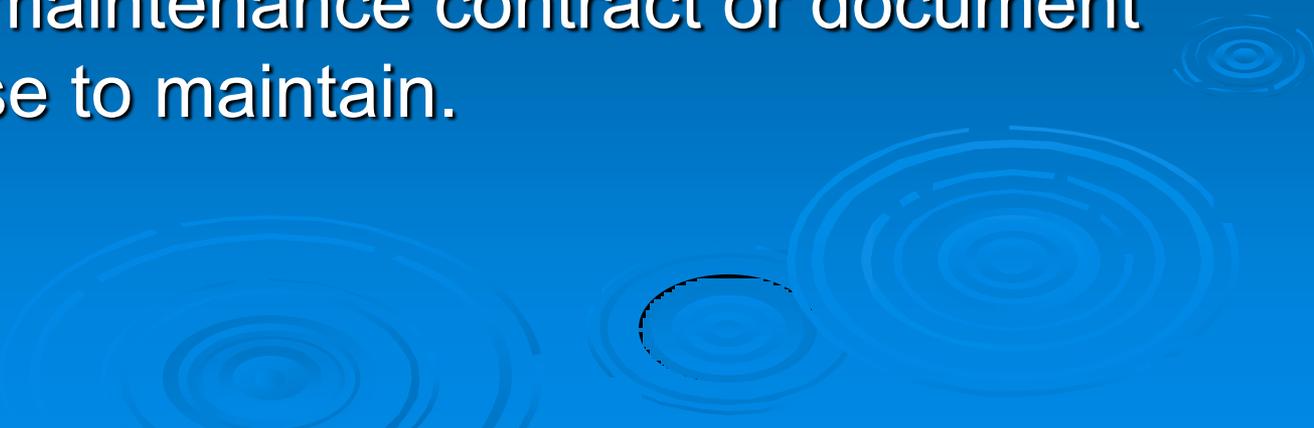
- 1) Achieve retention above existing retention or regs.

Retention Volume Eligibility: Stormwater Retention Credits (SRCs)



Eligibility for SRC Certification

Eligible BMPs & land cover changes must:

- 1) Achieve retention above existing retention or regs.
 - 2) Be designed and installed in accordance with DDOE-approved SW Management Plan (SWMP).
 - 3) Successfully complete final DDOE construction inspection and ongoing inspections by DDOE.
 - 4) Have current maintenance contract or document ability/expertise to maintain.
- 

Maintenance Requirements

- Property used for SRC-retrofits not permanently obligated to that use:
 - No maintenance covenant required for SRC-generating retention capacity.
 - Retention capacity must be maintained for time period for which DDOE certifies SRCs.
 - Maintenance obligation can be ended by forfeiting SRCs or purchasing SRCs for DDOE to retire or paying ILF.
- Failure to maintain retention capacity for time of SRC certification results in:
 - DDOE requires retention volume to be compensated for.
 - DDOE may take enforcement action.
 - No additional certification of SRCs.

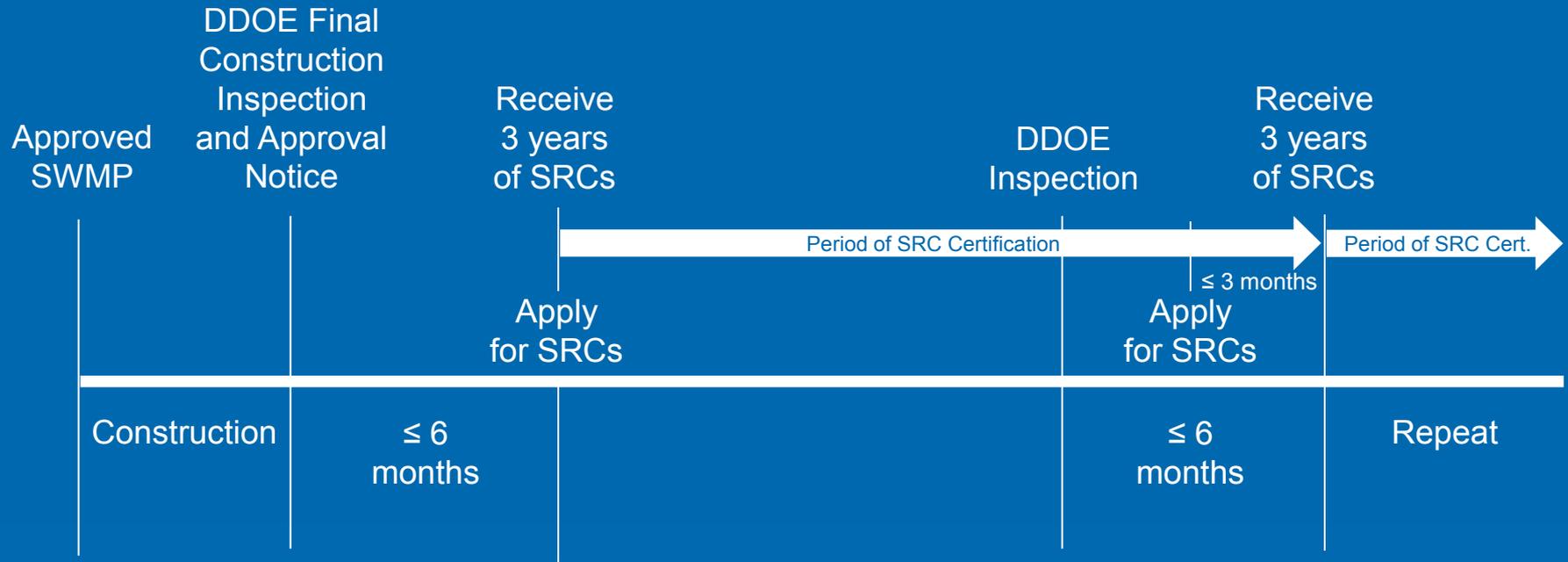
Overview of SRC Certification Process

- 1) Design and receive DDOE approval of SWMP.
- 2) Install retention capacity.
- 3) Pass DDOE final construction inspection.
- 4) Apply for DDOE certification of SRCs, including:
 - As-built SWMP.
 - For period of certification, submit maintenance contract or documentation of ability/expertise.
- 5) Receive up to 3 years' worth of SRCs.
- 6) Maintain retention capacity and pass inspections.
- 7) After 3 years, apply for additional SRCs, including
 - Current maintenance agreement or contract for period.
- 8) Receive up to 3 years' worth of SRCs.
-----Repeat 6-8 indefinitely-----

SRC Certification Process Cont'd

- DDOE is now accepting applications.
- DDOE will certify SRCs as of the date that DDOE receives a complete application for SRC certification.
- Retention capacity after May 1, 2009, may be eligible.

Timeline for Generating SRCs

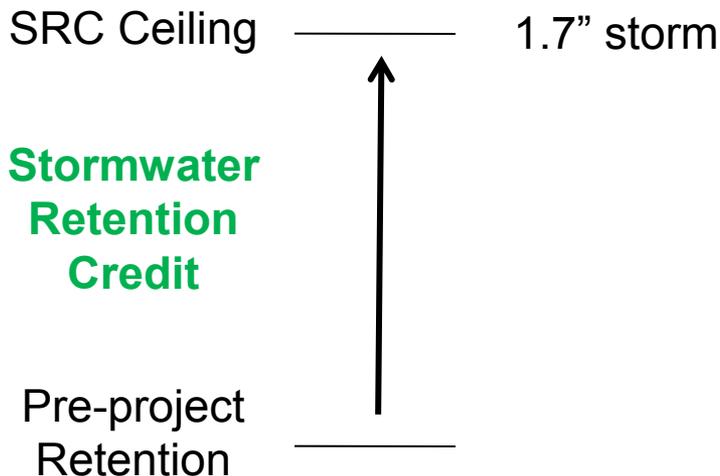


* To receive a Final Approval Notice, SRC-generating sites must submit an As-Built SWMP.

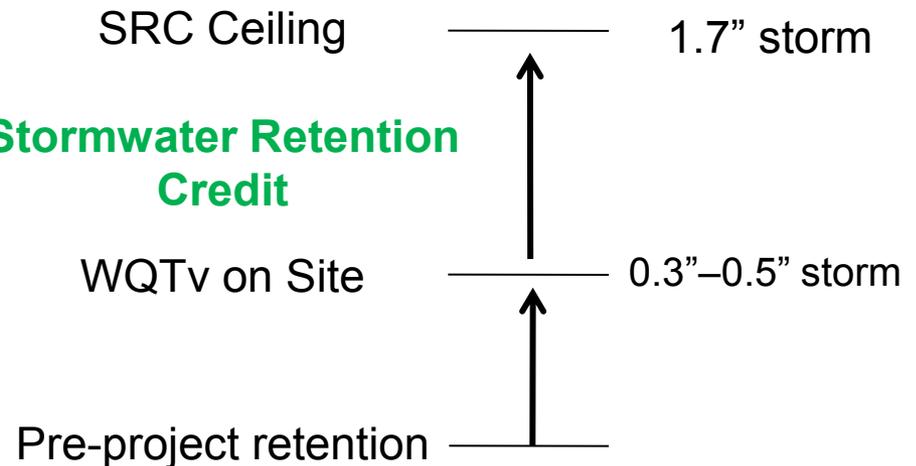
Eligibility for BMPs Submitted Before 1/15/14

- May be eligible if installed after May 1, 2009.
- Eligibility requirements largely the same:
 - 1) Achieve retention in excess of regulatory requirements or existing retention (must document).

Unregulated Retrofit Sites



Regulated Sites Exceeding WQTV



Eligibility for BMPs Submitted Before 1/15/14

- May be eligible if installed after May 1, 2009.
- Eligibility requirements largely the same:
 - 1) Achieve retention in excess of regulatory requirements or existing retention (must document).
 - 2) Be designed and installed consistent with DDOE specifications – As-built Stormwater Management Plan.
 - 3) Successfully complete DDOE final construction inspection and ongoing inspections by DDOE.
 - 4) Have current maintenance contract or document ability/expertise to maintain.

Unique Serial Number for Each SRC

Beginning of certification year (yyyymmdd)

Major & Sub drainage (A,R,P & 2 digits)

SWMP number (5 digits)

Individual gallon of capacity (6 digits)

Example: Application submitted Feb. 5, 2014 for 3,000 SRCs for:

- 1,000 gallons of retention capacity installed:
 - In Watts Branch sub-drainage of Anacostia watershed.
 - In accordance with SWMP # 1400.

➤ DDOE issues:

Year 1	1,000 SRCs	20140205-A19-01400-000001-	20140205-A19-01400-001000
Year 2	1,000 SRCs	20150205-A19-01400-000001-	20150205-A19-01400-001000
Year 3	1,000 SRCs	20160205-A19-01400-000001-	20160205-A19-01400-001000

Process for Buying and Selling SRCs

- 1) Negotiate terms of transfer/contract between buyer and seller.
 - 2) Submit application for transfer of SRC ownership.
 - 3) Receive DDOE confirmation of transfer of SRC ownership.
- One of purposes of this process is to collect and share price information, without violating confidentiality.

SRC Price Required to Cover Cost

- Actual price will depend on numerous market factors and be negotiated by buyers and sellers.

Estimate of SRC Price Required to Cover Cost to Generate							
(SRC = 1 gallon of retention capacity for 1 year)							
					Cost-Covering SRC Price		
	Capital cost per gallon of retention (Pv)	Land cost per gallon (PV)	Maint. Cost over Payback Period (Pv)	Sum of Pv Costs (cap. cost + land value + maint. cost)	5% ROI	7.16% ROI	12.61% ROI
10-year payback	\$4.00	\$4.85	\$1.67	\$10.52	\$1.36	\$1.51	\$1.91
20-year payback	\$4.00	\$4.85	\$2.87	\$11.72	\$0.94	\$1.12	\$1.63
10-year payback	\$6.00	\$4.85	\$2.51	\$13.36	\$1.73	\$1.92	\$2.42
20-year payback	\$6.00	\$4.85	\$4.31	\$15.16	\$1.22	\$1.45	\$2.11

DDOE Efforts to Encourage Trades

- Capturing anticipated Offv and SRCs from approved SWMPs.
 - Developing template trading contract for buyers and sellers.
 - Planning informal auctions to connect buyers with sellers and vice versa.
 - Planning discussion group of market participants.
- 

SW Impervious Fee Discount Program

- Two SW Impervious Fees:
 - DC Gov't (DDOE) Stormwater Fee (\$2.67/ERU for FY2013)
 - DC Water Impervious Area Charge (\$9.57/ERU for FY2013)
- Collected by DC Water on water bill.
- Two separate Discount rulemakings for each fee.
 - DDOE - 55% max discount for 1.2" retention from 1 ERU
 - DC Water – 4% max discount for 1.2" retention from 1 ERU

Potential 10-Year Financial Return on Retention BMP - SRC Revenue and Discount on Impervious Fees												
Assuming installation of BMP to retain 1.2" of stormwater from 1 Equivalent Residential Unit												
	Rate	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	10-Year Total
Max. Discount - DC Water IAC	4%	\$5	\$6	\$8	\$10	\$11	\$12	\$13	\$14	\$15	\$15	\$107
Maximum Discount - SW Fee	55%	\$18	\$18	\$26	\$26	\$26	\$26	\$33	\$33	\$33	\$33	\$273
Projected Value of SRCs (inflation-adjusted)	\$1.25	\$888	\$917	\$949	\$981	\$1,014	\$1,048	\$1,083	\$1,120	\$1,158	\$1,197	\$10,354
Total		\$910	\$941	\$983	\$1,017	\$1,051	\$1,086	\$1,129	\$1,167	\$1,206	\$1,245	\$10,734

SW Impervious Fee Discount Program

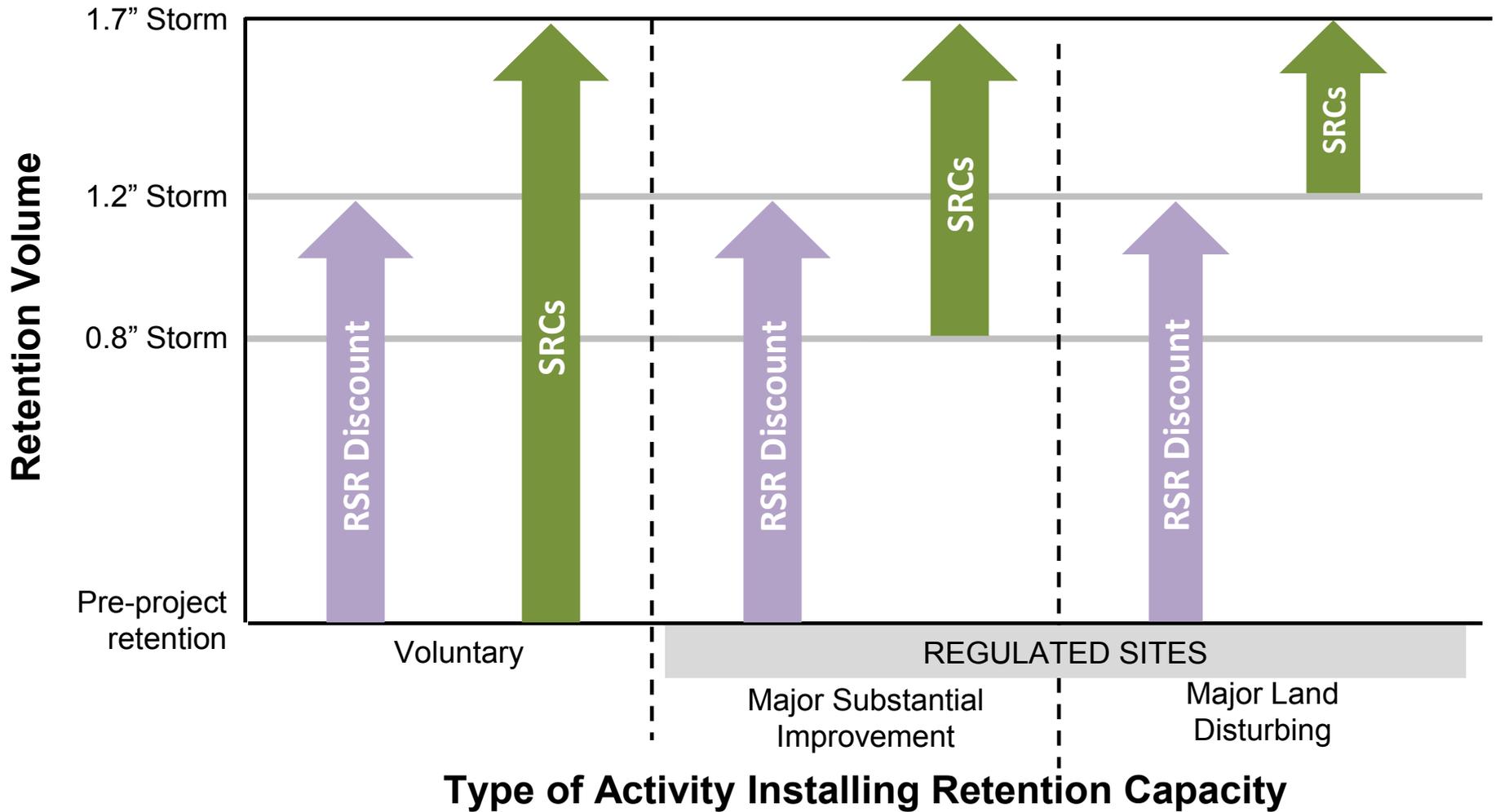
- Two SW Impervious Fees:
 - DC Gov't (DDOE) Stormwater Fee (\$2.67/ERU for FY2013)
 - DC Water Impervious Area Charge (\$9.57/ERU for FY2013)
- Collected by DC Water on water bill.
- Two separate Discount rulemakings for each fee.
 - DDOE - 55% max discount for 1.2" retention from 1 ERU
 - DC Water – 4% max discount for 1.2" retention from 1 ERU

-----Based on 1.7" storm-----

Potential 10-Year Financial Return on Retention BMP - SRC Revenue and Discount on Impervious Fees												
Assuming installation of BMP to retain 1.7" of stormwater from 1 Equivalent Residential Unit												
	Rate	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	10-Year Total
Max. Discount - DC Water IAC	4%	\$5	\$6	\$8	\$10	\$11	\$12	\$13	\$14	\$15	\$15	\$107
Maximum Discount - SW Fee	55%	\$18	\$18	\$26	\$26	\$26	\$26	\$33	\$33	\$33	\$33	\$273
Projected Value of SRCs (inflation-adjusted)	\$1.25	\$1,258	\$1,301	\$1,345	\$1,390	\$1,437	\$1,486	\$1,536	\$1,588	\$1,642	\$1,697	\$14,680
Total		\$1,281	\$1,325	\$1,379	\$1,426	\$1,474	\$1,524	\$1,582	\$1,635	\$1,690	\$1,745	\$15,061

Properties may receive discounts for retention up to the 1.2" storm and SRCs for retention up to the 1.7" storm.

Retention Volume Eligibility: RiverSmart Rewards (RSR) Discount and Stormwater Retention Credits (SRCs)



Online SRC/RSR Portal

- Provides users with online applications and other information on the SRC and RSR programs
- SRC Generators
 - Apply for SRC certification.



Online SRC/RSR Portal

➤ Sites with Offv

- Apply to Use SRCs for Offv.
- Notify DDOE of ILF payment to meet Offv.
- View Offv status.

Online SRC/RSR Portal

- Provides users with online applications and other information on the SRC and RSR programs
- Public users
 - View SRC account
 - Transfer SRCs
 - Retire SRCs

Online SRC/RSR Portal

➤ Everyone

- View the SRC registry.
- View existing applications.
- Apply for RiverSmart Rewards Discount.



Calculating SRCs for Example Scenarios

- Use DDOE's SRC calculator spreadsheet.



Scenario 1 (Existing Conditions)

5,000 square
foot parcel

Existing

1,000
square
foot
mowed
grass
area

4,000
square
foot
parking
lot

	Drainage Area				
Step 1: Pre-Project Retention	A	B	C	D	E
Impervious Area (ft ²)	4,000	0	0	0	0
Compacted Cover Area (ft ²)	1,000	0	0	0	0
Natural Area (ft ²)	0	0	0	0	0
Retention from Pre-Project Land Cover (gal)	1,007	0	0	0	0
Retention from Pre-Project Best Management Practice (BMP)					
BMP 1 (gal)	0	0	0	0	0
BMP 2 (gal)	0	0	0	0	0
BMP 3 (gal)	0	0	0	0	0
Add together BMP 4, 5, 6, etc.(gal)	0	0	0	0	0
Total Pre-Project Retention (gal)	1,007	0	0	0	0

Scenario 1 (Proposed Conditions)

1,000
square
foot
mowed
grass
area

1,000
square
foot
BMP

3,000
square
foot
parking
lot

Proposed

Step 2: Proposed Retention

Impervious Area (ft ²)	4,000	0	0	0	0
Compacted Cover Area (ft ²)	1,000	0	0	0	0
Natural Area (ft ²)	0	0	0	0	0
Retention from Proposed Land Cover (gal)	1,007	0	0	0	0
Retention from Proposed BMP - include BMPs retained from pre-project conditions					
BMP 1 (gal)	1,500	0	0	0	0
BMP 2 (gal)	0	0	0	0	0
BMP 3 (gal)	0	0	0	0	0
Add together BMP 4, 5, 6, etc.(gal)	0	0	0	0	0
Total Proposed Retention (gal)	2,507	0	0	0	0

Step 3: Calculate SRCs (internal calculation)

Total Additional Retention Proposed	1,500	0	0	0	0
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Step 4: Verify SRCs (internal calculation)

SRC Ceiling	4,292	0	0	0	0
Maximum SRCs (based on pre-project BMP)	4,292	0	0	0	0
SRC Eligible Volume (gal)	1,500	0	0	0	0
Site Total SRC Eligible Volume (gal)	1,500				

Scenario 1 Stormwater Fee Discount

- 1,000 sf = 1 ERU = 710.75 gallons of runoff
- 4 ERUs x \$2.67/ERU = \$10.68/mo.
 - Note: The number of ERUs on a property is determined by DC Water and specified on the property's water bill.

1. 1,500 gallons of retention added.
2. 1,500 gallons = 2.1 ERUs
3. 2.1 ERUs x 55% = 1.2 ERUs
4. 1.2 ERUs x \$2.67 = \$3.20
(monthly stormwater fee discount)

Scenario 1 IAC Reduction

- $1,000 \text{ sf} = 1 \text{ ERU} = 710.75 \text{ gallons of runoff}$
- $4 \text{ ERUs} \times \$9.57/\text{ERU} = \$38.28/\text{mo.}$

1. 1,500 gallons of retention added.

2. 1,500 gallons = 2.1 ERUs

3. $2.1 \text{ ERUs} \times 4\% = 0.1 \text{ ERUs}$

4. $0.1 \text{ ERUs} \times \$9.57 = \$0.96$

(monthly IAC reduction)

Scenario 2 (Existing Conditions)

5,000 square
foot parcel

400
square
foot
mowed
grass
area

100
square
foot
BMP

Existing

4,500
square
foot
parking
lot

Step 1: Pre-Project Retention	Drainage Area				
	A	B	C	D	E
Impervious Area (ft ²)	4,600	0	0	0	0
Compacted Cover Area (ft ²)	400	0	0	0	0
Natural Area (ft ²)	0	0	0	0	0
Retention from Pre-Project Land Cover (gal)	562	0	0	0	0
Retention from Pre-Project Best Management Practice (BMP)					
BMP 1 (gal)	1,000	0	0	0	0
BMP 2 (gal)	0	0	0	0	0
BMP 3 (gal)	0	0	0	0	0
Add together BMP 4, 5, 6, etc.(gal)	0	0	0	0	0
Total Pre-Project Retention (gal)	1,562	0	0	0	0

Scenario 1 (Proposed Conditions)

400 square foot BMP	1,000 square foot mowed grass area	3,500 square foot parking lot	Proposed
100 square foot BMP			

Step 2: Proposed Retention

Impervious Area (ft ²)	4,000	0	0	0	0
Compacted Cover Area (ft ²)	1,000	0	0	0	0
Natural Area (ft ²)	0	0	0	0	0
Retention from Proposed Land Cover (gal)	1,007	0	0	0	0
Retention from Proposed BMP - include BMPs retained from pre-project conditions					
BMP 1 (gal)	1,000	0	0	0	0
BMP 2 (gal)	1,500	0	0	0	0
BMP 3 (gal)	0	0	0	0	0
Add together BMP 4, 5, 6, etc.(gal)	0	0	0	0	0
Total Proposed Retention (gal)	3,507	0	0	0	0

Step 3: Calculate SRCs (internal calculation)

Total Additional Retention Proposed	1,945	0	0	0	0
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Step 4: Verify SRCs (internal calculation)

SRC Ceiling	4,737	0	0	0	0
Maximum SRCs (based on pre-project BMP)	3,737	0	0	0	0
SRC Eligible Volume (gal)	1,945	0	0	0	0
Site Total SRC Eligible Volume (gal)	1,945				

Scenario 2 Stormwater Fee Discount

- 1,000 sf = 1 ERU = 710.75 gallons of runoff
- Original Bill: $4.6 \text{ ERUs} \times \$2.67/\text{ERU} = \$12.28/\text{mo.}$
- Request re-calculation based on reduced impervious cover: $4.0 \text{ ERUs} \times \$2.67/\text{ERU} = \$10.68/\text{mo.}$

Scenario 2 Stormwater Fee Discount

- $1,000 \text{ sf} = 1 \text{ ERU} = 710.75 \text{ gallons of runoff}$
- $4.0 \text{ ERUs} \times \$2.67/\text{ERU} = \$10.68/\text{mo.}$

1. 2,500 gallons of retention on site
2. 2,500 gallons = 3.5 ERUs
3. $3.5 \text{ ERUs} \times 55\% = 1.9 \text{ ERUs}$
4. $1.9 \text{ ERUs} \times \$2.67 = \$5.07$

(monthly stormwater fee discount)

Scenario 2 IAC Reduction

- 1,000 sf = 1 ERU = 710.75 gallons of runoff
- Original Bill: 4.6 ERUs x \$9.57/ERU = \$44.02/mo.
- Request re-calculation based on reduced impervious cover: 4.0 ERUs x \$9.57/ERU = \$38.28/mo.

Scenario 2 IAC Reduction

- $1,000 \text{ sf} = 1 \text{ ERU} = 710.75 \text{ gallons of runoff}$
- $4.6 \text{ ERUs} \times \$9.57/\text{ERU} = \$44.02/\text{mo.}$

1. 2,500 gallons of retention on site.

2. 2,500 gallons = 3.5 ERUs

3. $3.5 \text{ ERUs} \times 4\% = 0.1 \text{ ERUs}$

4. $0.1 \text{ ERUs} \times \$9.57 = \$0.96$

(monthly IAC reduction)

Additional Information

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To download the 2013 SW Rule, 2013 SWMG, and related information, visit

ddoe.dc.gov/swregs

- Ch. 6 of 2013 SWMG – Use of Off-Site Retention
- Ch. 7 of 2013 SWMG – Generation & Trading of SRCs