DISTRICT DEPARTMENT OF THE ENVIRONMENT

CONSOLIDATED TMDL IMPLEMENTATION PLAN & REVISED MONITORING FRAMEWORK

MEETING MINUTES

Meeting Date: March 12, 2014

Meeting Location: DDOE

Approval: FINAL

1 ATTENDANCE

Name	Organization	Present
Jeff Seltzer	DDOE	Y
Jonathan Champion	DDOE	Y
Brian Van Wye	DDOE	Y
Martin Hurd	DDOE	Y
Mary Searing	DDOE	Y
Collin Burrell	DDOE	Y
Sarah Bradbury	DDOE	Y
George Onyullo	DDOE	Y
Mohsin Siddique	DC Water	Y
Anouk Savineau	Limnotech	Y
Dan Herrema	Limnotech	Y
Mike Sullivan	Limnotech	Y
Veronica Davis	Nspiregreen	Y
Chancee` Lundy	Nspiregreen	Y
Ryan Campbell	Michael D. Baker	Y
Hye Yeong Kwon	Center for Watershed Protection	Y
Becky Hammer	NRDC	Y
Kaitlyn Bendik	EPA Region 3	Y
Meredith Upchurch	DDOT	Y
Ross Mandel	ICPRB	Y
Jenny Molloy	EPA	Y
Sarah Rispin	Potomac Riverkeeper	Y
Kate Rice	DC BIA	Y

Attendance sheet is attached (Attachment A – Sign in Sheet)

2 MEETING PURPOSE

The purposes of this Stakeholder Group meeting were to review comments regarding the draft methodology document and provide an overview of the modeling approach.

3 MEETING LOCATION

Building: District Department of Environment

Conference Room: 612

Conference Line: Call In #: 877 929 9264 Participant code: 5908558

Web Address: NA

4 MEETING START

Meeting Actual Start: 1:00 PM

5 AGENDA

- **Welcome**
  Jonathan Champion, DDOE, welcomed everyone. He stated the purpose of the meeting was to provide an overview of comments from members of the stakeholder group and walk through the methodology for the modeling.

  - **Introductions**
    Everyone stated their name, title and the organization they represent.

  - **Overview of the Agenda**
    Dan Herrema from LimnoTech provided an overview of the agenda. (included in presentation)

- **Overview**
  Dan stated the project team is working through some administration approvals to create the website. Once the website is developed, all of the stakeholder meeting materials and project information will be posted.

  There were no questions or comments.

- **Summary of Comments on the Methodology**
  Mr. Champion stated the project team received comments from NRDC, ICPRB, and DC Water. Jenny Molloy from EPA stated they did not provide comments because they will approve or disapprove of the plan. EPA's role is to provide feedback throughout the process. Mr. Champion provided a summary of the comments.
  - **NRDC**
    First Comment: Mr. Champion stated that NRDC had concerns regarding the legal requirements section of the methodology. As written, the methodology's description of the applicable legal requirements for the municipal separate storm sewer system (MS4) implicates the timeframes and schedules to be established in the plan. Mr. Champion stated DDOE would remove the language and focus on the specific components of the Waste Load Allocations (WLA) language, but this step did not constitute agreement with the NRDC comment. The consolidated TMDL implementation plan and revised monitoring framework needs to conform to the permit. Ms. Molloy stated that although EPA's role is to provide feedback, she concurs with NRDC's comments.

    Second comment: NRDC commented the methodology should clarify whether the plan will address the TMDL WLAs that are recommended for withdrawal. Mr. Champion clarified the implementation schedule will include all TMDLs on the list as of 2015.

    Third comment: NRDC requested more detail regarding the calculation of the pollutant load reductions. Mr. Champion stated the next item in the agenda was a discussion of the calculations. The project team will provide clarity on how the pollutant load reductions will be calculated.

Fourth comment: The fourth comment from NRDC was the methodology should describe whether non-water quality considerations, such as environmental justice, should be a variable for selection of best management practices (BMPs) locations. Mr. Champion stated that this was a very fair comment and DDOE would be happy to accommodate it. He noted that water quality considerations are the main driver, however, there may be instances where the use of non-water quality considerations is appropriate. Meredith Upchurch from DDOT stated that DDOT is required to spread their work (in reference to BMPs citywide). DDOT also has to meet political equality. Jenny Molloy stated that all things being equal, other non-water variables should be considered, and that such an approach would be consistent with the District's MS4 Permit.

Fifth comment: NRDC stated that the methodology should include outfall monitoring in the list of potential monitoring strategies. Mr. Champion stated that it was an oversight. The methodology will be updated to include outfall monitoring.

Sixth comment: NRDC stated the methodology should describe a plan for seeing additional sources of implementation funding if current funding is inadequate. Mr. Champion stated the plan would identify the funding needs. However, funding is subject to public input. He noted that they could not provide detail that was beyond the scope of the project or beyond the scope of DDOE responsibilities

- **ICPRB**
  Mr. Champion stated that ICPRB is in agreement with the overall approach. They encourage incorporation of adaptive management. In addition, they requested several technical clarifications (See Appendix for Comments)

- **DC Water**
  Mohsin Siddique from DC Water stated that DDOE should have a parallel process to investigate if any of the pollutants that have an established TMDL were produced or used in large scale for commercial or domestic purposes. If there is no evidence that source is available, it should be removed from the TMDL list.

There were no additional questions or comments.

- **Modeling Methodology and Approach**
  Mr. Herrema provided an overview of the steps to address MS4 WLAs (Attachment C – Presentation)

  Mr. Herrema stated the overarching objective of the model is to provide the best possible representation of the MS4 areas and apply a consistent modeling approach. The team will start by calculating the baseline (circa 2000). He also emphasized that the team is not trying to recreate the WLAs. The objective is to create a model to have a consolidated approach moving forward.

He also stated the team anticipates completing the baseline by the spring. After that is complete, the team will start modeling the current conditions (2013) in the early summer. Simulation of future conditions will start in late summer 2014. A consolidated approach, pertaining to runoff volumes, will be used; literature reviews will occur and data and TMDLs for the Chesapeake Bay will be reviewed to begin the modeling and scenarios. Mr. Herrema stated that if anyone wants more details on the modeling approaches used to develop the historical TMDLs, the project team would convene a separate stakeholder meeting.

Anouk Savineau walked the stakeholders through the modeling tool, which includes components for runoff, pollutant load and BMPs.

- **Run Off Module**

  Mrs. Savineau stated the project team would apply the "Simple Method" to calculate runoff. The inputs for the "Simple Method" include area (land), runoff coefficient and precipitation. For the area, the project team will use the most recently delineated MS4 area. The runoff coefficient will be computed for each MS4 area based on land cover and soil type. For precipitation, the project team analyzed rainfall from the Ronald Reagan Washington National Airport from 1948-2013. The project team chose the rainfall period for 1988-1990, because it included a dry year, a wet year and an average year and represents a "typical" climate period for DC.

  Dr. Siddique stated that climate change may affect rainfall in the future. He stated the project team should look at rainfall in the future versus the past. Ms. Savineau stated that three-year period does include a wet year that had higher precipitation than normal. Mike Sullivan from LimnoTech stated that the project team could research five or six global climate change models to see what is predicted for DC. Mr. Siddique stated that would be sufficient. Ms. Molloy supported the suggestion to look at the potential impact of climate change. Ross Mandel stated that ICPRB might have some data he can share with the project team.

- **Pollutant Load Calculation**

  Ms. Savineau stated the project team would be using the "Simple Method" to calculate the pollutant load. The inputs for this method are runoff and the event mean concentration (EMC). The project team will base the EMCs off the current TMDLs and MS4 monitoring data. The land use based EMCs will be identified based on a literature review.

- **BMPs**

  Ms. Savineau stated the objectives of the BMP modeling will be to (1) account for the runoff volume and mass of pollutants reduced, (2) include structural and non-structural BMPs, and (3) apply a consistent approach for future BMPs. She walked through the approaches to determining efficiency, which includes traditional (accepted "average" pollutant removal) and runoff reduction capacity.

Mr. Mandel asked if the BMPs were geo-referenced. Ms. Savineau stated that the project team has geo-referenced all the BMPs, based on the information available. Ms. Upchurch requested an opportunity to review the BMPs list to ensure all of DDOT's BMPs are included. Mr. Herrema stated the project team could show the draft BMP database upon request. Jeff Seltzer stated that one of the final products be all the BMPs on a map.

Mohsin Siddique asked if the team would be looking at partitioning of pollutants because there is a part of the pollutants that binds with the BMP and the rest that runs off. In addition, Mohsin also inquired about maintenance. Collin Burrell of DDOE recommended that questions about maintenance and BMP enforcement be communicated to the Watershed Protection Division. The data is not yet collected to apply to non-compliance and new regulations.

Mr. Burrell suggested the project team reach out to experts and research organizations to get the best possible data on BMPs. He referenced New Jersey and Norm Goulet from the Northern Virginia Planning Commission.

- **Maintenance of BMPs:** Ms. Savineau discussed the challenge of modeling the maintenance of BMPs. Dr. Siddique stated that DC Water is working on developing a plan to make maintenance part of the permit requirement. Sarah Rispin from the Potomac Riverkeeper organization stated that even with requiring maintenance, BMPs will have an attenuation in performance over time. The current regulation states as long as the BMP is maintained it is performing. Brian Van Wye stated the DDOE Watershed Protection Division inspects for maintenance routinely. While there isn't performance and maintenance data from currently installed BMPs, the hope is that going forward there will be a program.
- EPA requested that fair assumptions be made when selecting BMPs. For some existing BMPs there are no maintenance data, and some assumptions will have to be made. Literature reviews show that BMPs do not always ensure 100% efficiency. Efficiencies will be assigned based on expected runoff volume reductions.
- **Non-Structural BMPs:** Ms. Savineau stated the challenges of quantifying pollutant reduction from non-structural BMPs, such as pet waste signage. Ms. Molloy stated although the sign may not work, there may be support BMPs such as pet waste bins. Hye Yeong Kwon suggested Keep America Beautiful for data on litter and reaching out to Karen Capiella who has done research on pet waste. George Onyullo stated the Chesapeake Bay Foundation has some data on stream restoration and street sweeping. Mr. Burrell noted that DDOE has an excellent IDDE program.

- **Discussion**

  Ms. Upchurch stated the Federal Highway Administration and the US Geological Survey developed a model to look at the impact of pollutant runoff from roads on water bodies. She stated there is in-person training on the model in DC in April.

Jonathan Champion stated the inconsistency in TMDLs might be a great topic for a Spring stakeholder meeting. Ms. Molloy stated if there are any fatally flawed TMDLs, DDOE should bring it to the attention of the stakeholders. It's better to revise them now than wait until the plan is finalized.

DDOT will research if a map exists of all DDOT BMPs installed in DC.

- **Next Steps**
  Mr. Herrema stated the project team would like to make a calendar for future meetings so that the stakeholders can have some consistency going forward.

6 POST MEETING ACTION ITEMS

Action	Assigned To	Deadline
Send the meeting minutes, presentation, and list of attendees out to participants	Chancee` Lundy	
Follow up with individual stakeholders who volunteered specific information or data	Anouk Savineau	
DDOT will research if a map exists of all BMPs within the District	Meredith Upchurch	

7 DECISIONS MADE

- Decisions were made on topics to present at the next meeting of the stakeholder group.
- The baseline and current conditions will be sent to DDOE in April

8 NEXT MEETING

Next Meeting: To Be Determined

9 MEETING END

Meeting End: 2:30 PM

10 ATTACHMENTS

- A – Sign-in Sheet
- B – Presentation with Agenda

TMDL Implementation Plan Stakeholder Group

Session Sign In Sheet

DATE: 3/12/14

Numb	Last Name	First Name	Agency	Telephone Number	Signature/Initials
1	Mallory	Jenny	EPA	202.564.1939	
2	Seltzer	Jeff	DDOE	202-535-1603	
3	Manali	Ross	ICPRB	301-984-1908 x.118	
4	Upchurch	Meredith	DDOT	202-671-4663	
5	Sullivan	Michael	LimnoTech	202 213-9939(M)	
6	Siddique	Mohsin	DC Water	—	—
7	Hereme	Daniel	LimnoTech	202 833 9140	
8	Sarineau	Anouk	LimnoTech	202 833 9140	
9	Kwon	Hye Yeong	Center for Watershed Protection	410 461-8323	
10	Hammer	Rebecca	NRDC	202 513 6254	
11	RISPIN	SARAH	Potomac Riverkeeper	202 554 2730	
12	Searing	Mary	DDOE	202-535-2990	
13	~~Etting Bidwell~~	Collin	DDOE	202-535-2255	
14	Badbury	Sarah	DDOE		
16	Onyullo	George	DDOE		
17	VanWye	Brian	DDOE	2741-2121	
18	Rice	Kate	Bonler/DCBIA	202 524 5700	
19	HUP	MARTIN	DDOE	202 399 4400	
20	Campbell	Ryan	MDB	202 331 0060	
21	Lundy	Chancee	Nspiregreen	202 434 8921	
22					
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27					

District Consolidated TMDL Implementation Plan and Monitoring Program

Stakeholder Meeting

March 12,2014

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Agenda

- Summary of Methodology Comments
- Modeling Methodology and Approach
- Next Steps
- Questions

Summary of Methodology Comments

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Comments on Methodology

Received from

- NRDC
- ICPRB

NRDC Comments

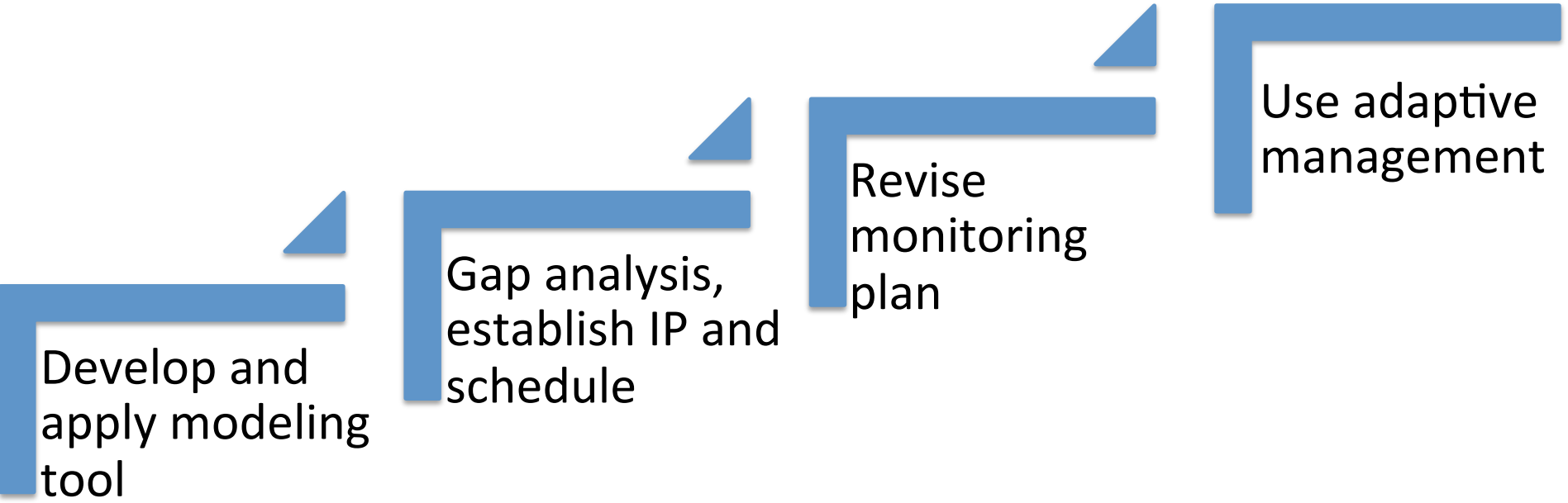
- Legal requirements
- Applicability of all TMDL WLAs
- Calculation of pollutant reduction loads
- Consideration of non-water considerations in selecting BMP locations
- Monitoring strategies – include outfalls
- Funding

ICPRB Comments

- Agreement with overall approach
- Encourages incorporation of adaptive management
- Several technical clarifications requested

Modeling Methodology and Approach

DDOE Steps to Address MS4 WLAs



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Modeling Approach Objectives

Provide best possible representation of MS4 area and apply consistent modeling approach across MS4

- Calculate baseline (circa 2000)
- Calculate current conditions with current BMP implementation (2013)
- Simulate future conditions with future BMPs
- Track progress towards meeting WLA

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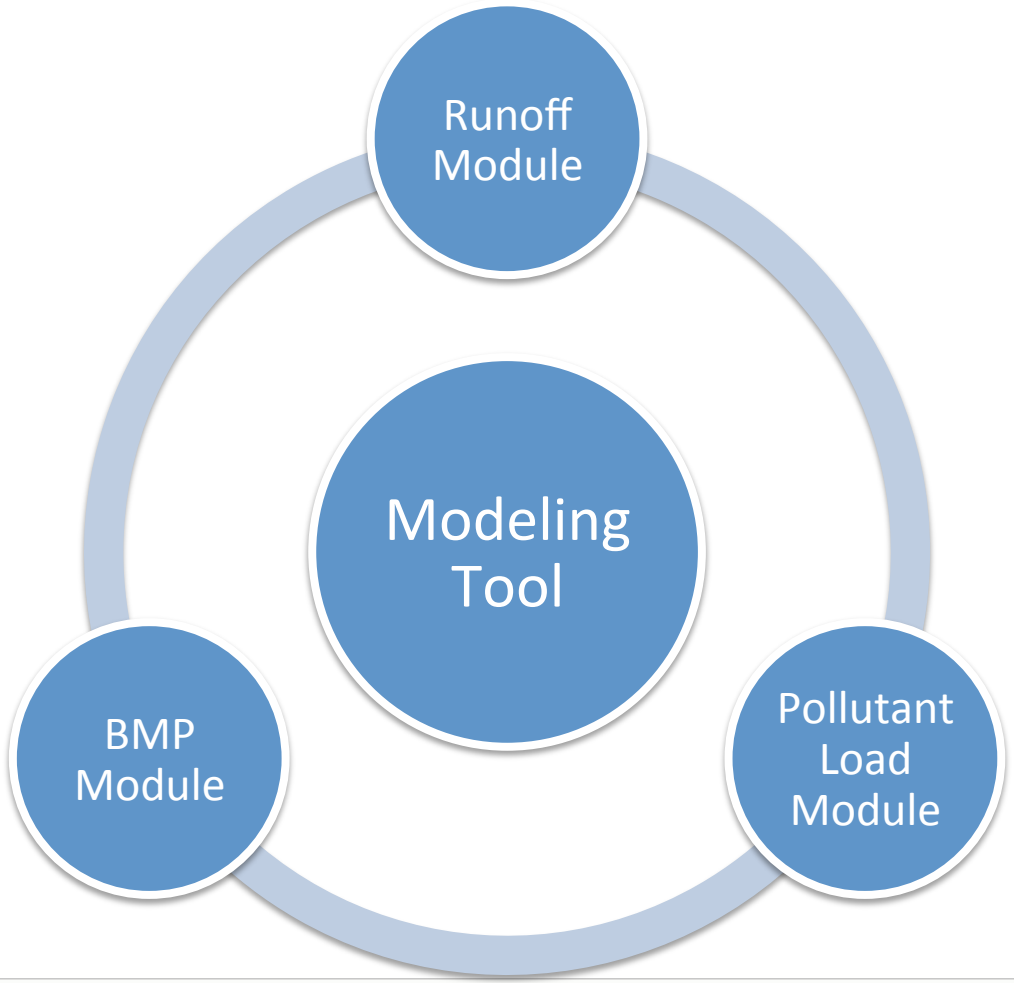
Modeling Progress

- Review existing DC TMDLs for relevant information
- Select approach for calculating runoff volume and pollutant load
- Define model input parameters
- Validate model for runoff and loads
- Calculate baseline load
- Develop BMP database and efficiencies



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Runoff Module

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Runoff Module

Apply “Simple Method”

Inputs include

- Area
- Runoff Coefficient
- Precipitation

$R = 0.9 * P * Rv * A$

R = annual runoff volume

P = annual rainfall

Rv = runoff coefficient

A = area

Runoff Inputs: Area

Use most recently delineated MS4 area

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Runoff Inputs: Runoff Coefficient

Function of land cover and soil

Compute for each MS4 area using reference values (Schueler, CSN)

Runoff Coefficients (Rv) by Landcover and Soil Type			
	Open/Turf	Forest	Impervious
HSG A Soils	0.15	0.02	0.95
HSG B Soils	0.20	0.03	0.95
HSG C Soils	0.22	0.04	0.95
HSG D Soils	0.25	0.05	0.95

Runoff Coefficient Calculation Example

Landuse/Soil	Area (acres)	Rv	Rv*A
Impervious	20	0.95	19
Turf/Disturbed, HSG A	1	0.15	0.15
Turf/Disturbed, HSG B	1	0.20	0.20
Turf/Disturbed, HSG C	1	0.22	0.22
Turf/Disturbed, HSG D	1	0.25	0.25
Forested, HSG A	1	0.02	0.02
Forested, HSG B	1	0.03	0.03
Forested, HSG C	1	0.04	0.04
Forested, HSG D	1	0.05	0.05
TOTAL	**28**	**-**	**19.96**

COMPOSITE Rv = 19.96/28 = 0.71

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Runoff Inputs: Precipitation

- Analyzed DCA rainfall from 1948-2013
- Chose rainfall period 1988-1990
  - Typical climate period for DC
  - Used in LTCP, some DC TMDLs, other DC models

Year	Rainfall Depth (inches)
1988 (Dry Year)	31.7
1989 (Wet Year)	50.3
1990 (Average Year)	40.8
3-year Average	41.0

Validate Approach

Validate "simple method" using gaged discharge data from Watts Branch and Hickey Run

Adjust runoff coefficient to optimize

Compare with TMDL reference results

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Pollutant Load Module

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Pollutant Load Calculation

- Simple method
- Inputs include
  - Runoff
  - EMC

L = R * EMC

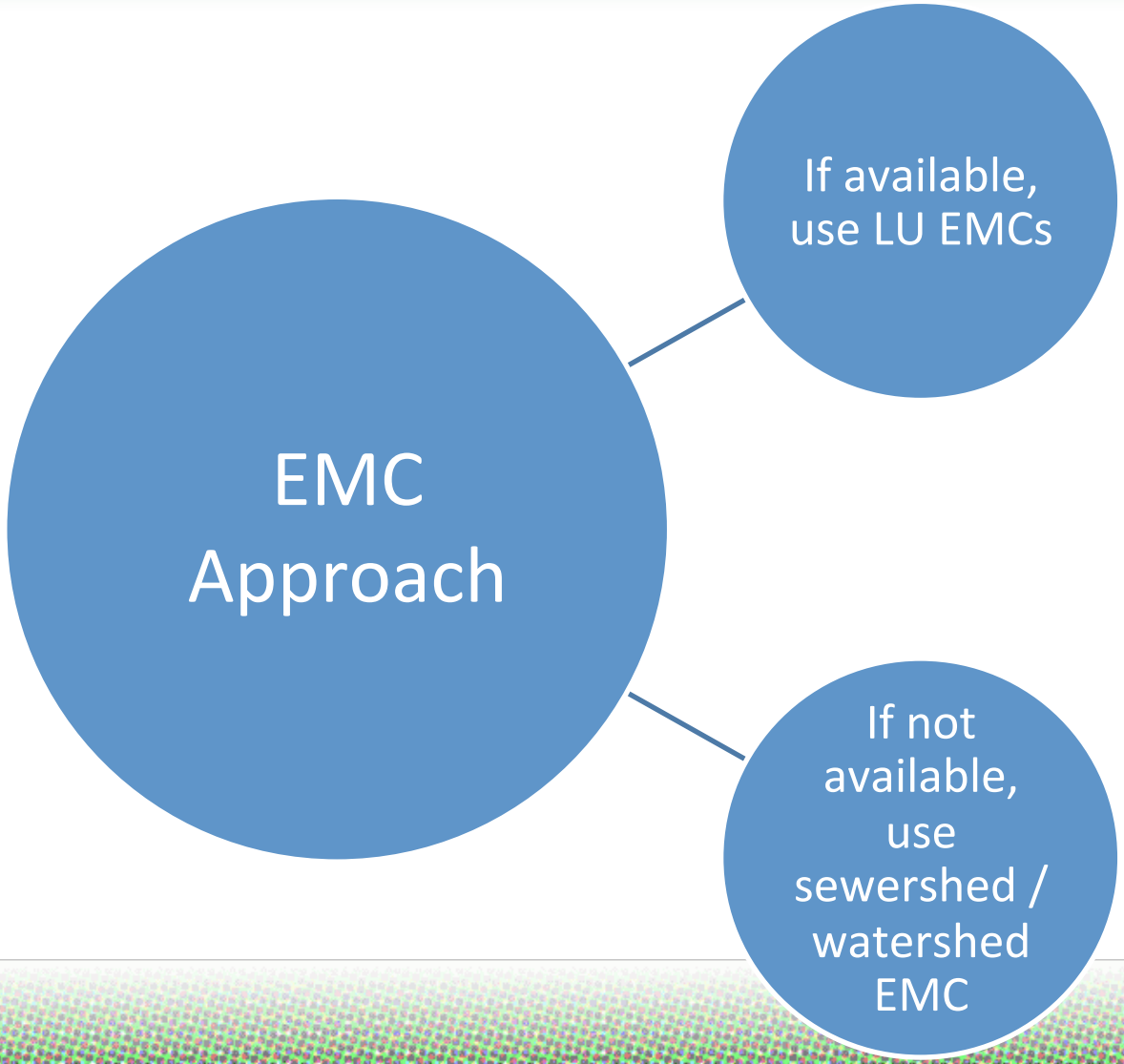
L = annual pollutant load

R = annual runoff volume

EMC = event mean concentration

Load Calculation Inputs: EMC

- Types/sources of EMCs
  - Sewershed/Watershed based EMCs
    - DC TMDLs
    - DC MS4 Monitoring Data (end of pipe)
  - Land Use Based EMCs
    - Literature



- Validate against MS4 monitoring data
- Compare against TMDL EMCs
- Adjust LU EMCs to optimize match

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BMP Module

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BMP Modeling Objectives

Account for runoff volume and mass of pollutants reduced

Include structural and non-structural BMPs

Apply consistent approach for current and future BMPs

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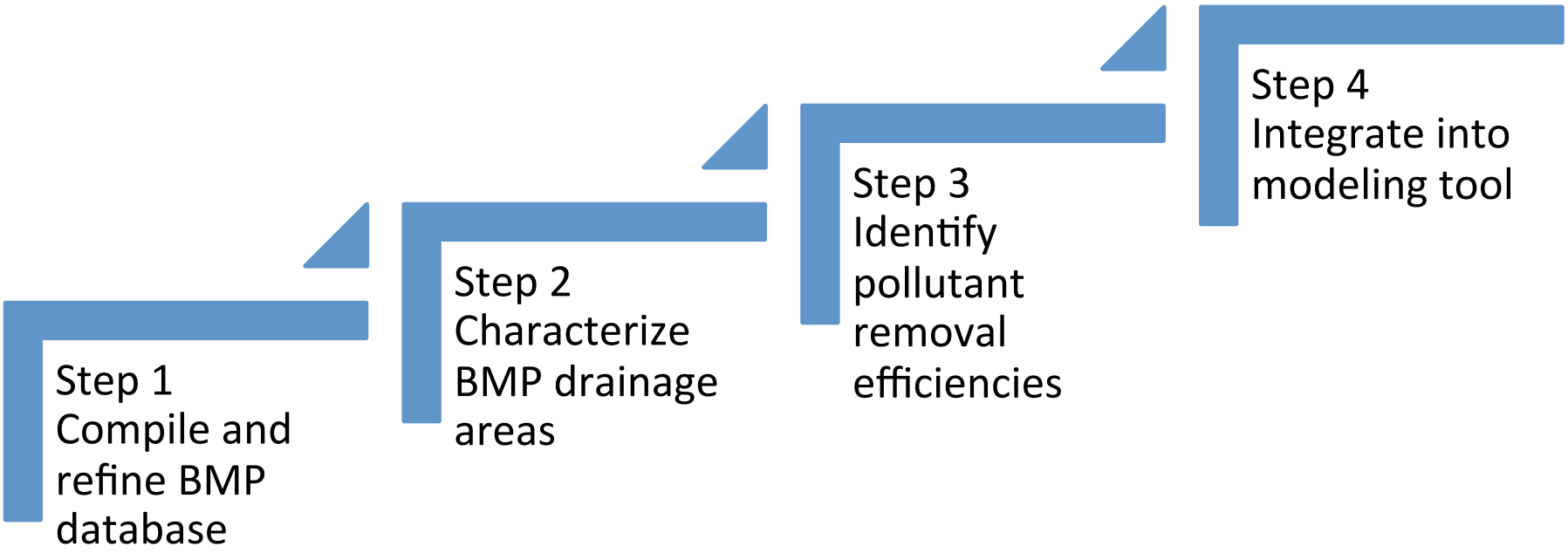
BMP Modeling Overview



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BMP Efficiency Approach

1. Based on traditional, reported BMP efficiency (accepted "average" pollutant removal)
2. Based on design runoff reduction capacity

Traditional BMP Efficiency

- Assumes average efficiency value, representing average BMP configuration and performance
- Does not explicitly account for runoff reduction
- Use for BMPs with no runoff reduction capacity (e.g., filters) or existing BMPs with no information on runoff reduction capacity

BMP	TSS Efficiency	TN Efficiency	TP Efficiency	Bacteria Efficiency
Filters	90%	45%	65%	80%
Permeable Pavement	25%	25%	25%	0%
Bioretention	50%	60%	50%	50%

Source: Watershed Treatment Model Documentation, CWP, 2013

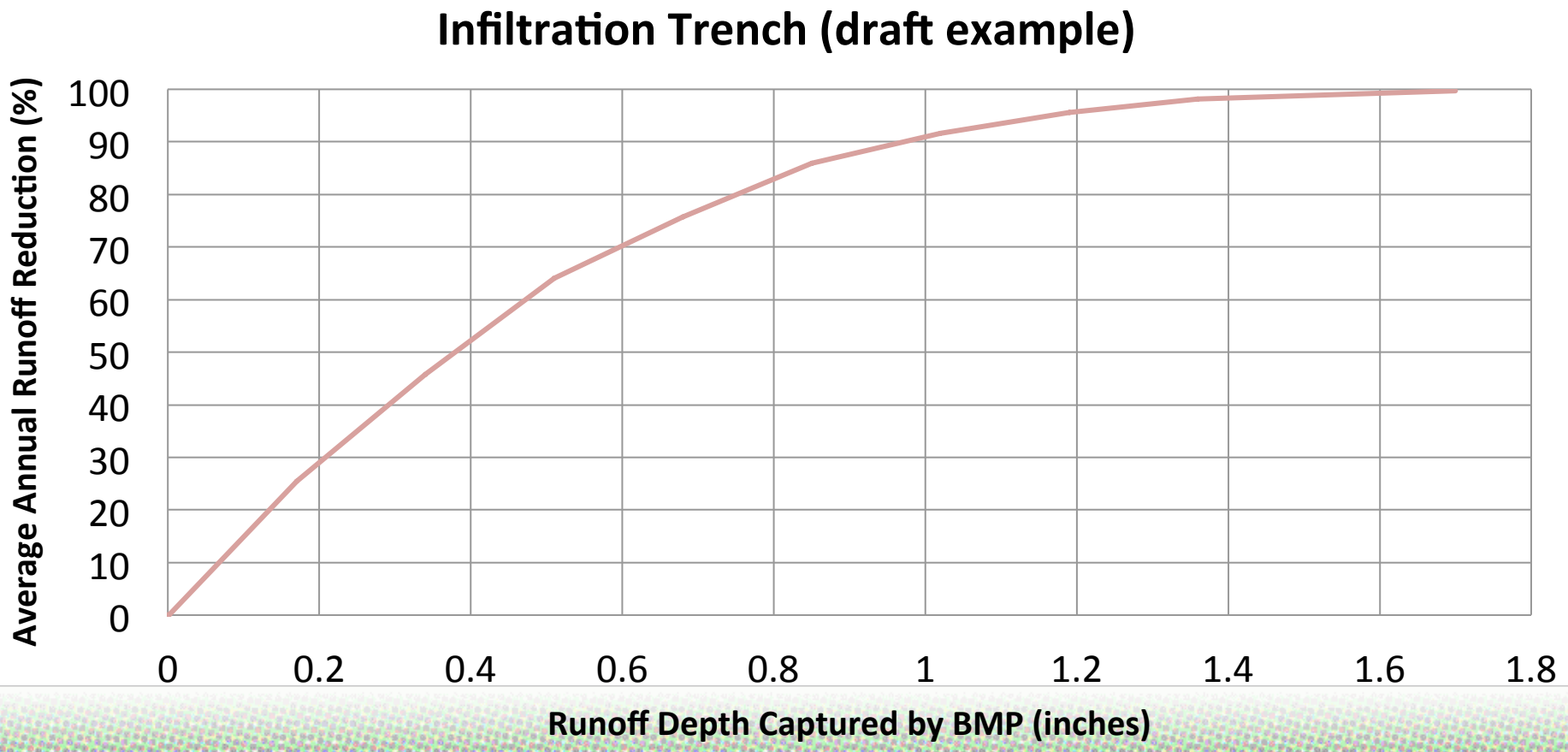
Efficiencies for Non Conventional Pollutants

If consistent data on efficiencies does not exist, investigate use of surrogate pollutants to establish efficiencies

Efficiency Based on Runoff Reduction

- Assumes efficiency changes based on runoff reduction provided
- Use if runoff reduction capacity is known

Efficiency Based on BMP Runoff Reduction



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What About Maintenance?

- Recognize that BMPs have a limited life span and not all BMPs will be optimally maintained
- Research how this impacts BMP efficiency and how the modeling tool can reflect this

Non-Structural BMPs

If possible to quantify pollutant removal, include in modeling tool

- Ex: Street sweeping, stream restoration

If unable to quantify removal, can't include in modeling tool

- Ex: pet waste signs, catchbasin stencils
- BUT: can still include as goals in IP

BMP Integration Into Modeling Tool

- Assign BMPs to MS4 area
- Assign approach for each BMP
- Calculate load reductions
- Sum reductions by MS4 area

Putting It All Together

Gap Analysis

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Next Steps

Upcoming Deliverables and Timing

Spring 2014

- Establishment of baseline conditions
- BMP database & efficiencies

Early Summer 2014

- Establishment of current conditions
- Baseline/current conditions report

Late Summer - Winter 2014

- Scenario Development
- Modeling Tool Interface

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Questions