Sanitary and Stormwater Rules and Standards Update
Task Force Meeting #2 - Thursday, October 25, 2018
Meeting Notes

Participants

- Bruce Goldson, Theta
- Ben Austin, HHPR
- Cedomir Jesic, Cardno
- Kathleen Freeman, 3J Consulting
- Rand Waltz, AKS Engineering
- Ray Moore, All County Surveyors
- Josh Wheeler, City of Oregon City
- Justin Poyser, City of Gladstone
- Amy Pepper, City of West Linn
- Sally Curran, City of Happy Valley
- Deana Mulder, Clackamas County
- Jason Rice, Oak Lodge Water Services

Staff and Consultant Team

- Greg Geist, WES Director
- Ron Wierenga, WES Environmental Services Manager
- Don Kemp, WES Development Review Supervisor
- Leah Johanson, WES Senior Civil Engineer
- Alissa Maxwell, Brown and Caldwell
- Libby Barg, Barney & Worth, Inc.
- Kimi Sloop, Barney & Worth, Inc.

Agenda Items

Stormwater Performance Standards: Alissa Maxell, Brown and Caldwell gave an overview of the current CCSD #1 stormwater performance standards and NPDES permit requirements and provided technical background on hydromodification and why volume control matters. Alissa also gave a comparison of other local agency standards, including Portland, CWS, Salem, Oregon City, Lake Oswego and Clark County. She then presented the WES proposal for updated stormwater performance standards which includes:

- Site planning: Development applications would be required to allocate a percentage of the site to LID facilities or other green stormwater approaches OR demonstrate that WQ and flow control standards are met through GSI facilities. The required area for site planning would be measures as a percentage of the impervious surface.
- Water quality: Capture and treat 80% of average annual runoff volume, which can be met by sizing facilities for the 1” 24-hour storm.
- Flow control: Match flow durations to immediate pre-development conditions (range of flows still TBD). Infiltration can be used to meet the flow control performance standard. Flow control exemptions would be provided for direct discharge to major water bodies

A group discussion of the performance standards followed. Key takeaways:

- There should be different standards for different sized projects (i.e., lot of record vs. multi-lot partition). A tiered approach would be more equitable for developers. It should be based on the footprint of the new development, not total development.
- Matching flow durations is difficult when a site does not infiltrate.
- The proposal to imbed infiltration in flow control standards is a good idea.
- The idea of simplifying the standards was well received, with the caution that flexibility is still needed.
- A sizing tool is useful but the current BMP tool does not offer flexibility as the background assumptions cannot be changed. It was noted that sizing tools that do not allow assumptions to be changed are a concern for engineers who are required to stamp the drawings – they have no basis to verify the outputs. There was agreement that the tool could be improved if the engineers understood the assumptions behind the outputs better.
- May be challenging to meet the site planning performance standard for public right of way projects.
- Stormwater standards need to consider that homes are being built to lot lines now.
- The hierarchy for standards makes sense – applicants should meet the standard or have the option to pay a fee in lieu. The question then is – what is the fee in lieu? Ideally, the cost would be based on actual project costs for the watershed being impacted.

Stormwater Facility Sizing Tool Exercise: Task members completed an exercise to identify the ease of use and familiarity with a variety of stormwater sizing tools, including BMP Sizing Tool, Tualatin River Urban Stormwater Tool, Western Washington Hydrology Model, MGS Flood, EPA National Stormwater Calculator and the Portland PAC Tool. In the conversation that followed, task force members noted that the Portland PAC tool and the WES BMP sizing tool were the two tools the group was most familiar with. The Santa Barbara Urban Hydrograph method was mentioned as an easy to use tool. It was generally noted that having options as to which tool to use is a good thing. There was also recognition that having choices about what sizing tool to use may be an issue for WES when it comes to reviewing plans.

Key features noted as desirable in a tool include:

- Ability to make adjustments to the assumptions. Example - Portland PAC calculator allows more changes to the calculator.
- Ability to share the work/inputs among staff. Example - Portland PAC calculator requires a log in to use the tool which makes it cumbersome for multiple staff members to share the work.
- Better understanding of the underlying assumptions.
- A standard that could be used for smaller projects that does not involve using a sizing tool.
- For small projects, sizing tools may identify an orifice that is too small and will be difficult to maintain.

The meeting was adjourned at 1:00 p.m.

The PowerPoint slides from the meeting are attached.

Water Environmental Services

Sanitary and Stormwater Rules and Standards Task Force Workshop #2

October 25| 2018

WATER ENVIRONMENT SERVICES

Welcome & Introductions

Today's Plan

Today's Plan

- Stormwater Performance Standards (Site Planning, Water Quality, Flow Control)
  - Permit requirements
  - WES Proposal
  - Discussion/Feedback
- Break for lunch
- Exercise: stormwater facility sizing tool
- Wrap up – what we have heard

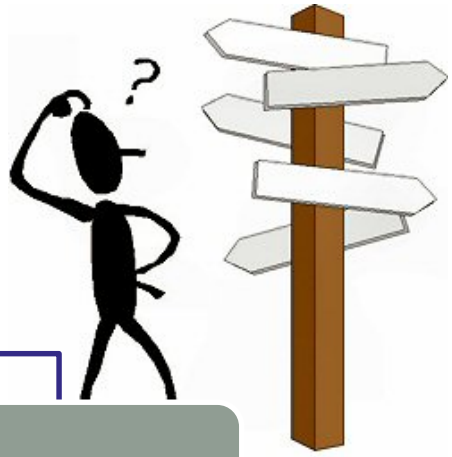
Stormwater Performance Standards

Site Planning, Water Quality, Flow Control

CCSD#1 Current Standards

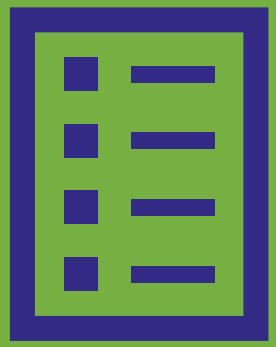
- Infiltration
  - Infiltrate all runoff from **½ inch storm**
  - **96 hours** to fully infiltrate
  - **36 hours** if used with detention
- Water Quality
  - Treatment required for the first **1"** of stormwater runoff from a **24-hour storm event**
  - WQ facilities designed to remove **65% of phosphorus** from new impervious surfaces. (SWMACC)
- Flow Control
  - Match **2-year, 24-hour** post-developed runoff rate to **½ of a 2-year, 24 -hour** pre-developed discharge rate
  - In areas of limited downstream capacity, match **25-year, 24-hour** post-developed runoff rate to **2-year, 24-hour** pre-developed discharge rate

CCSD#1 Current Standards



Infiltrate ½ Inch

- Standard Process
  - Water Quality Treatment
    - 1 inch storm
  - Peak Flow Matching
    - 2 year → ½ 2 year
    - 25-year → 2 year*
- Request a Variance
  - Water Quality Treatment
    - 1 inch storm
  - BMP Sizing Tool for Flow Duration Matching



See Handout

NPDES Permit Requirements

Clackamas County permit applies to jurisdictional areas within CCSD #1, SWMACC, and jurisdictional areas with post-construction program oversight by Clackamas County DTD.

MS4 NPDES Permit
Post Construction Requirements

- Must establish standards that…
  - Target natural surface conditions
  - Reduce volume, duration, and rates of discharge
  - Prioritize Low Impact Development (LID) and Green Infrastructure (GI)
  - Capture and treat 80% of average annual runoff volume
- Stormwater program must also…
  - Remove LID barriers in municipal code
  - Include specific BMP design criteria
  - Ensure tracking and maintenance of facilities.

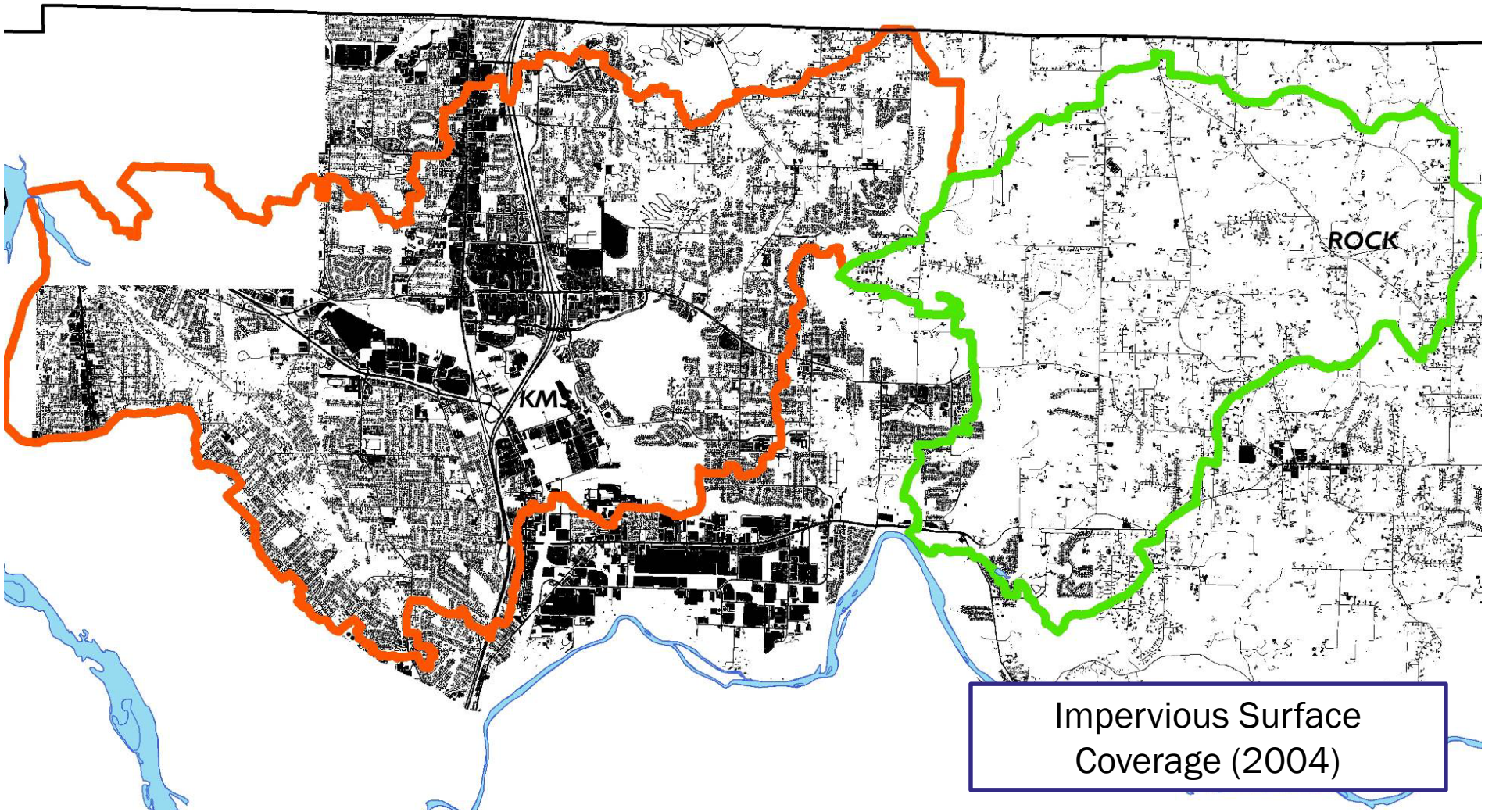
Requirements may change with next permit issuance

Technical Background

What is Hydromodification

Why Volume Control Matters

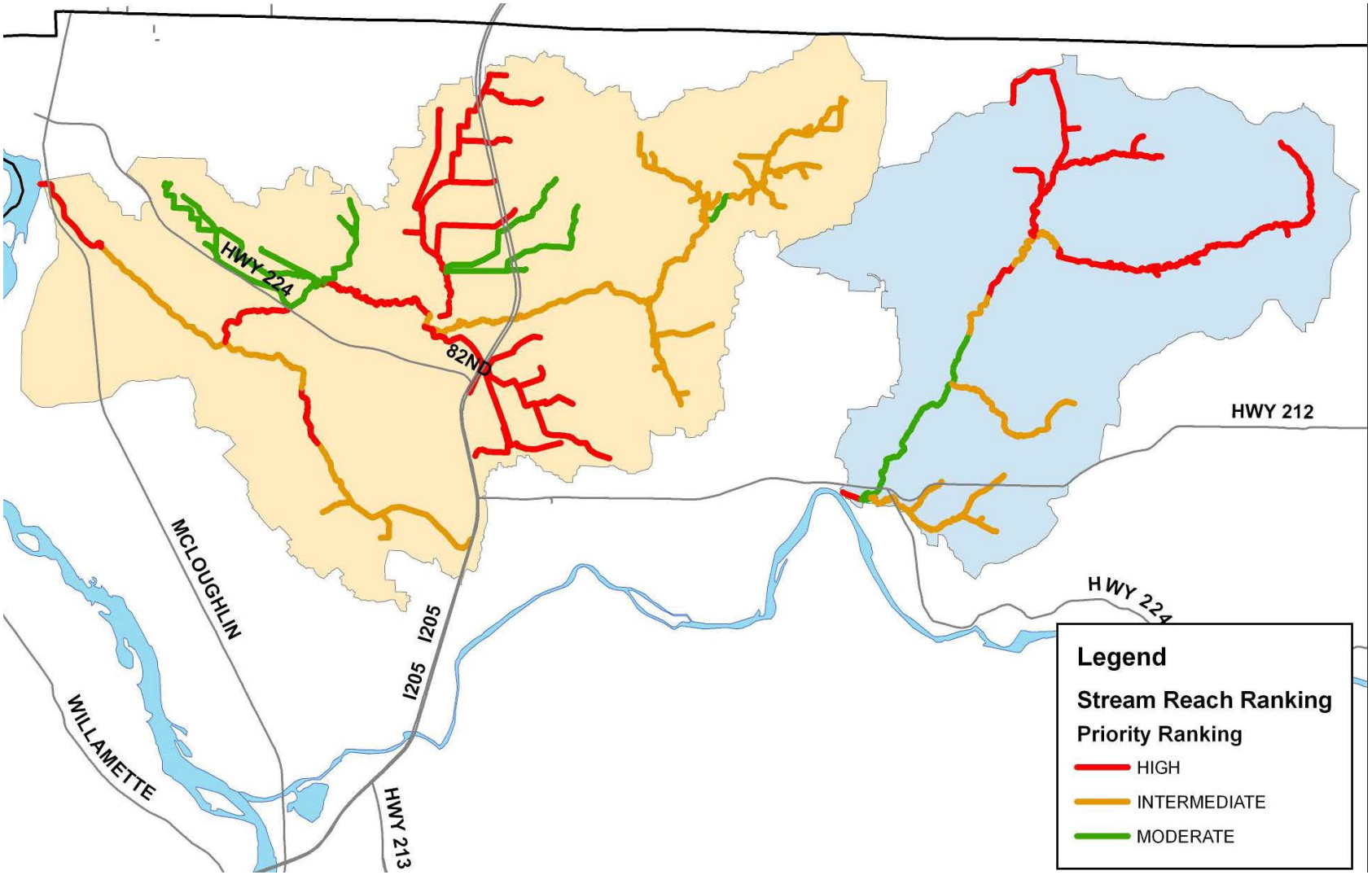
Watershed Action Plans
Study Areas



Watershed Action Plans
Key Observations

- Hydromodification
  - Low summer flow
  - Increased runoff
  - Channel instability
- Water quality degradation
  - Reduction in sensitive aquatic species
  - Increase in tolerant aquatic species
  - Reduction in quality of in-stream habitat
- Areas of Degraded Riparian Habitat
- Insufficient Riparian Cover

Watershed Action Plans
Management Strategy Prioritization



What does the science say?

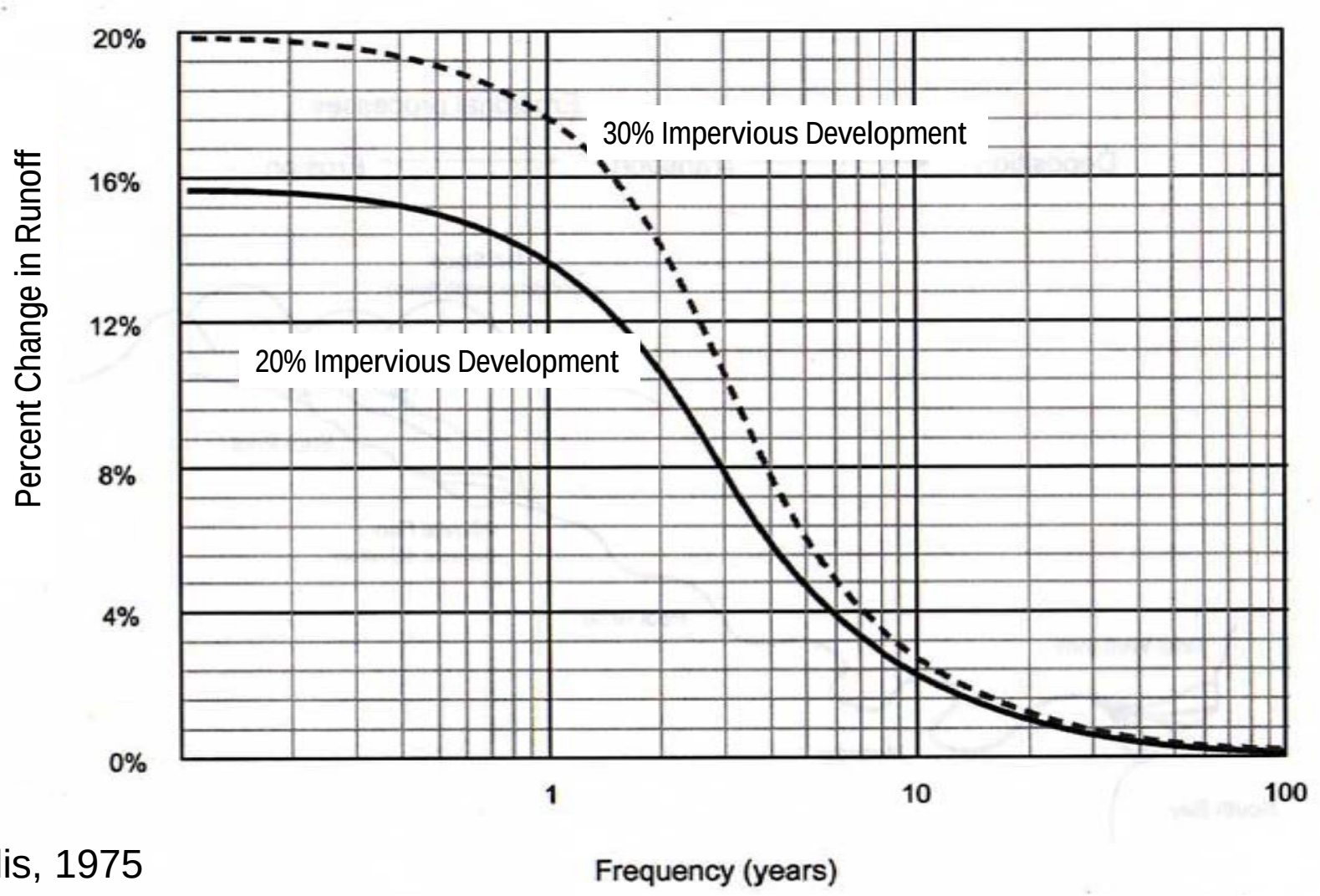
Dunne and Leopold

- ***Geomorphically significant flows*** range from a lower threshold of flow where bed material begins to move to an upper limit where flood flows are no longer contained in the channel.

- The frequency and duration of ***geomorphically significant flows*** are the primary factors that control channel stability or instability.

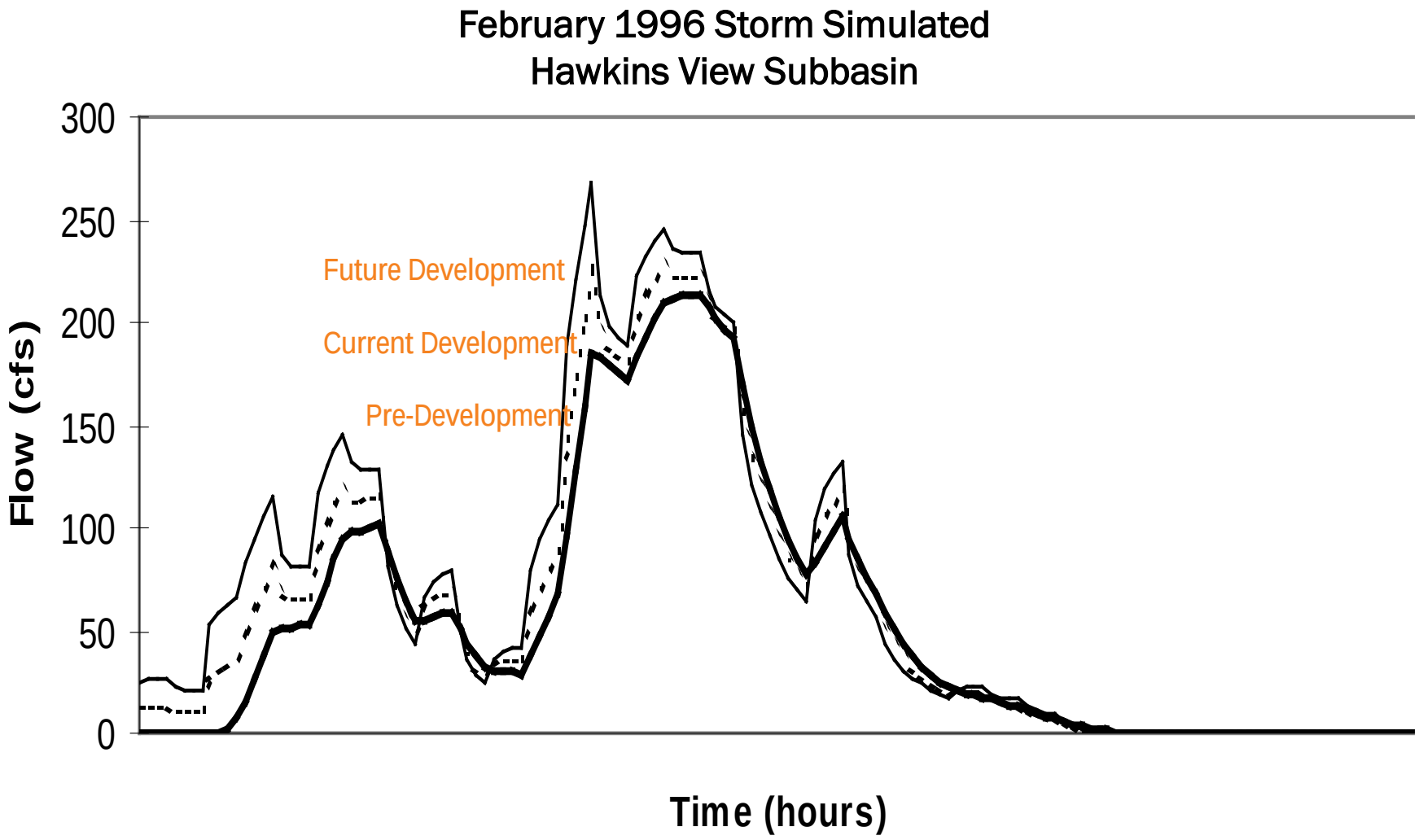
- Frequent flow events move the most sediment over time and maintain the channel dimensions.

Why small storms are important

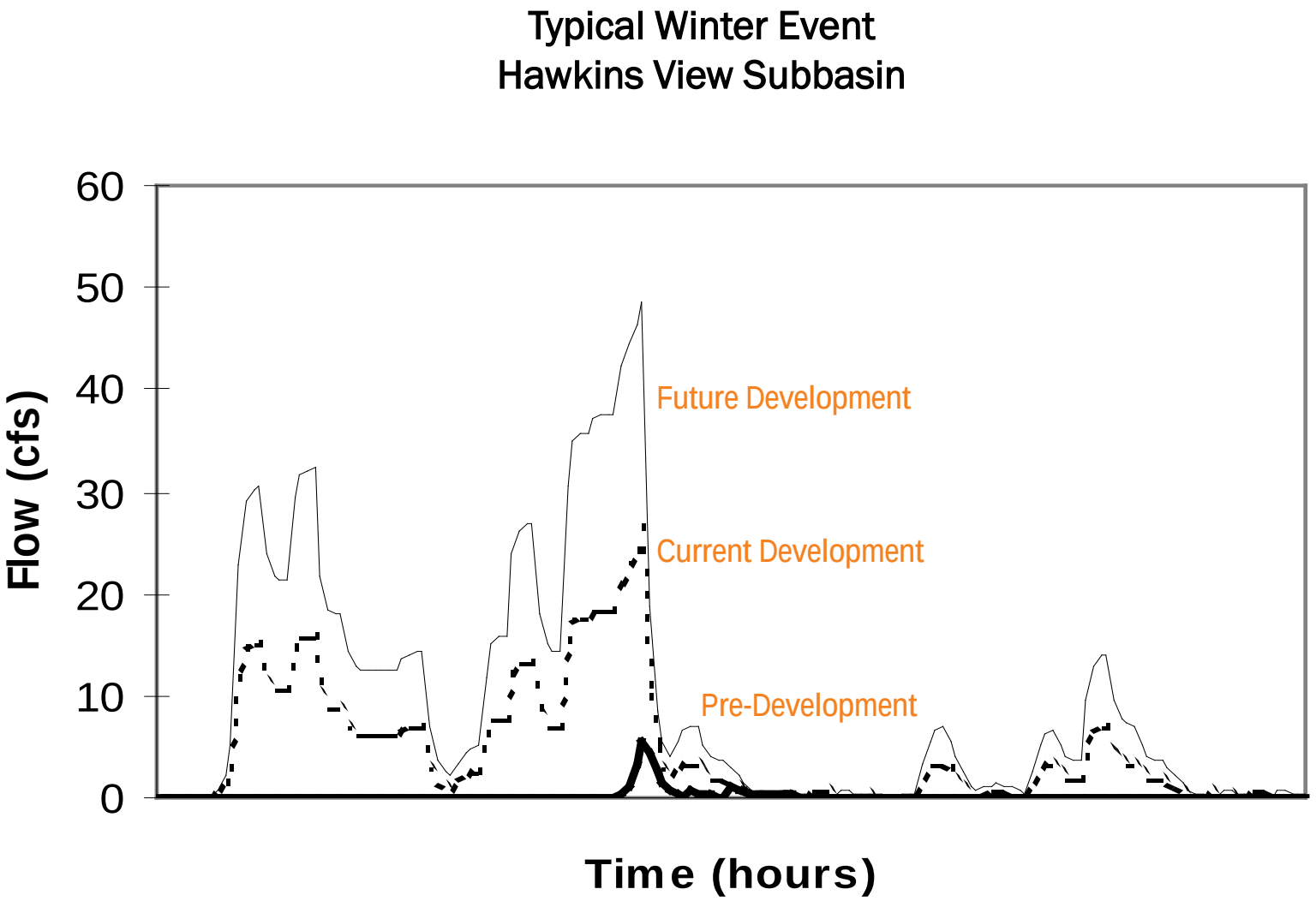


Hollis, 1975

Example Hydrograph – Large Event

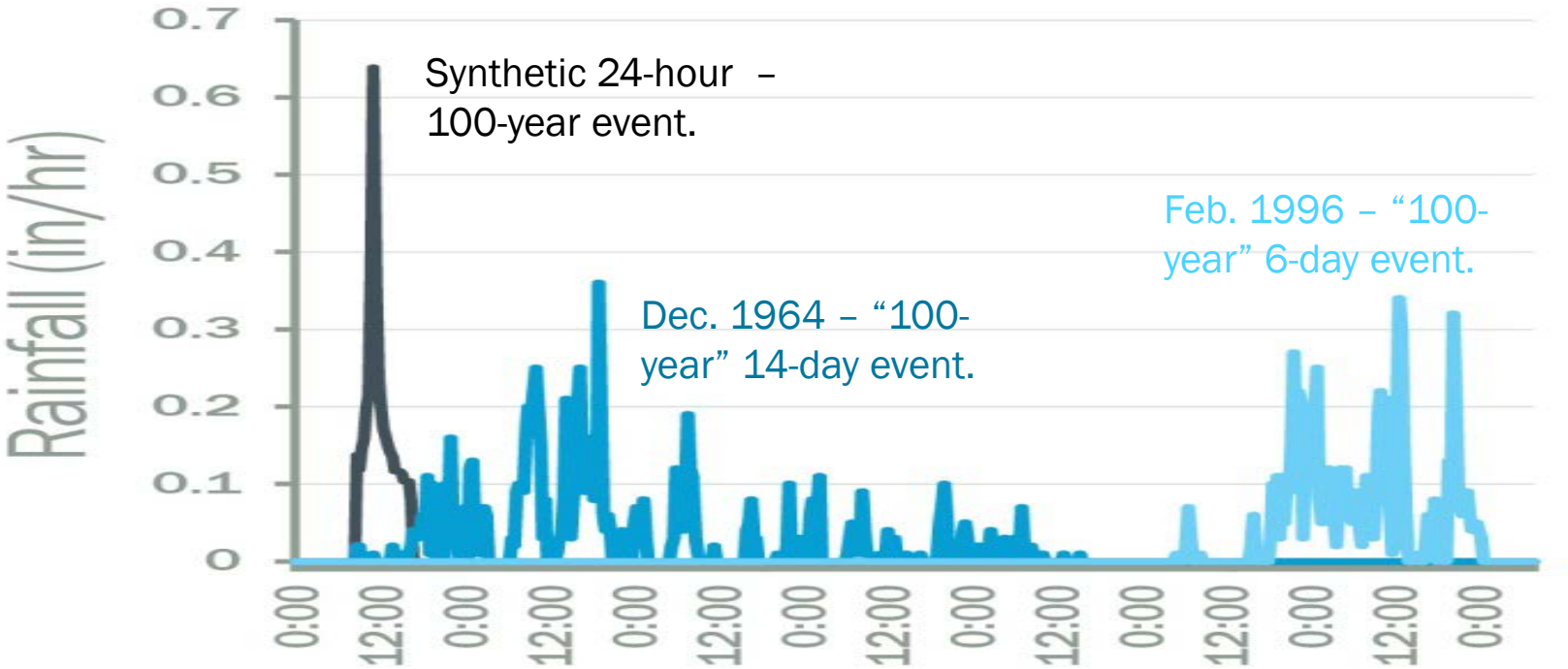


Example Hydrograph – Small Event

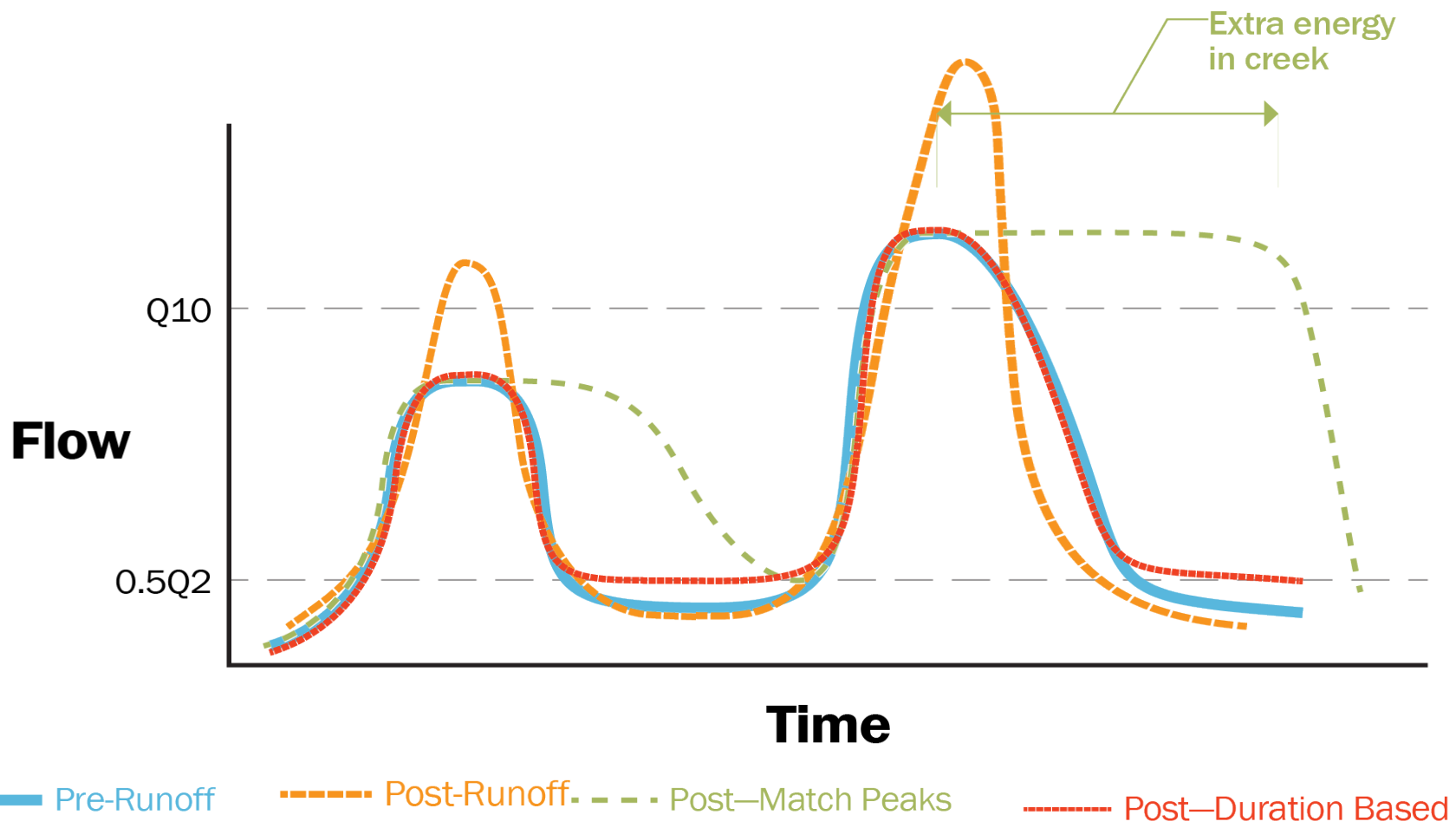


Peak Flow Matching

- 24-hour rainfall distribution.
- Peak flows are typically very conservative (high).
- Release rates/outflows from detention may prolong discharge of geomorphically significant flows.

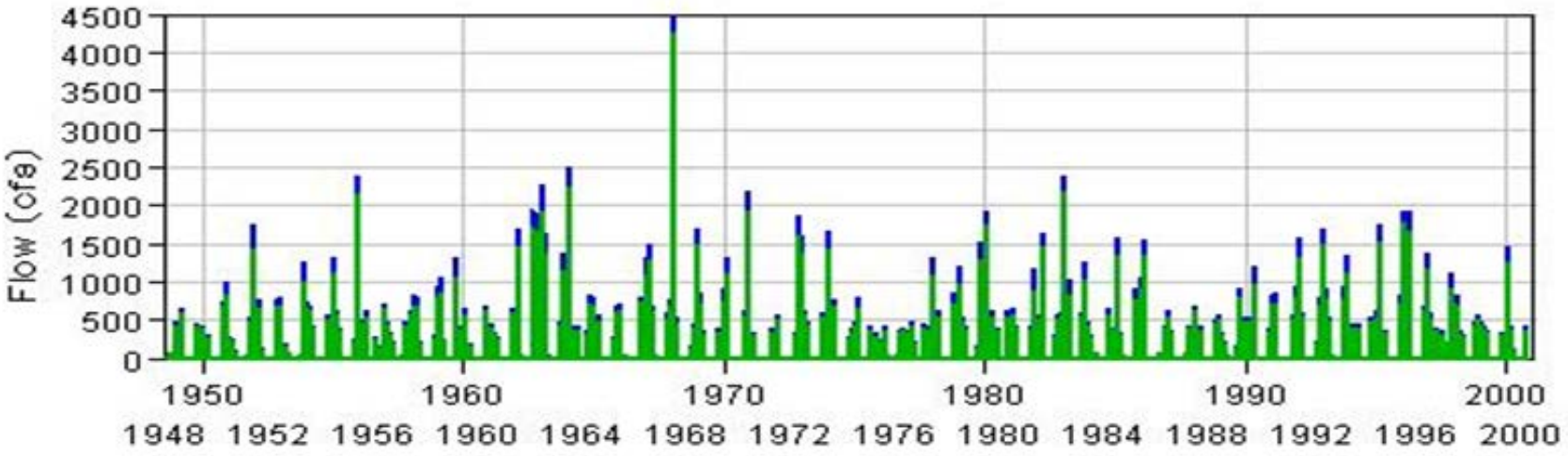


Peak Flow Matching vs. Volume and Duration Control

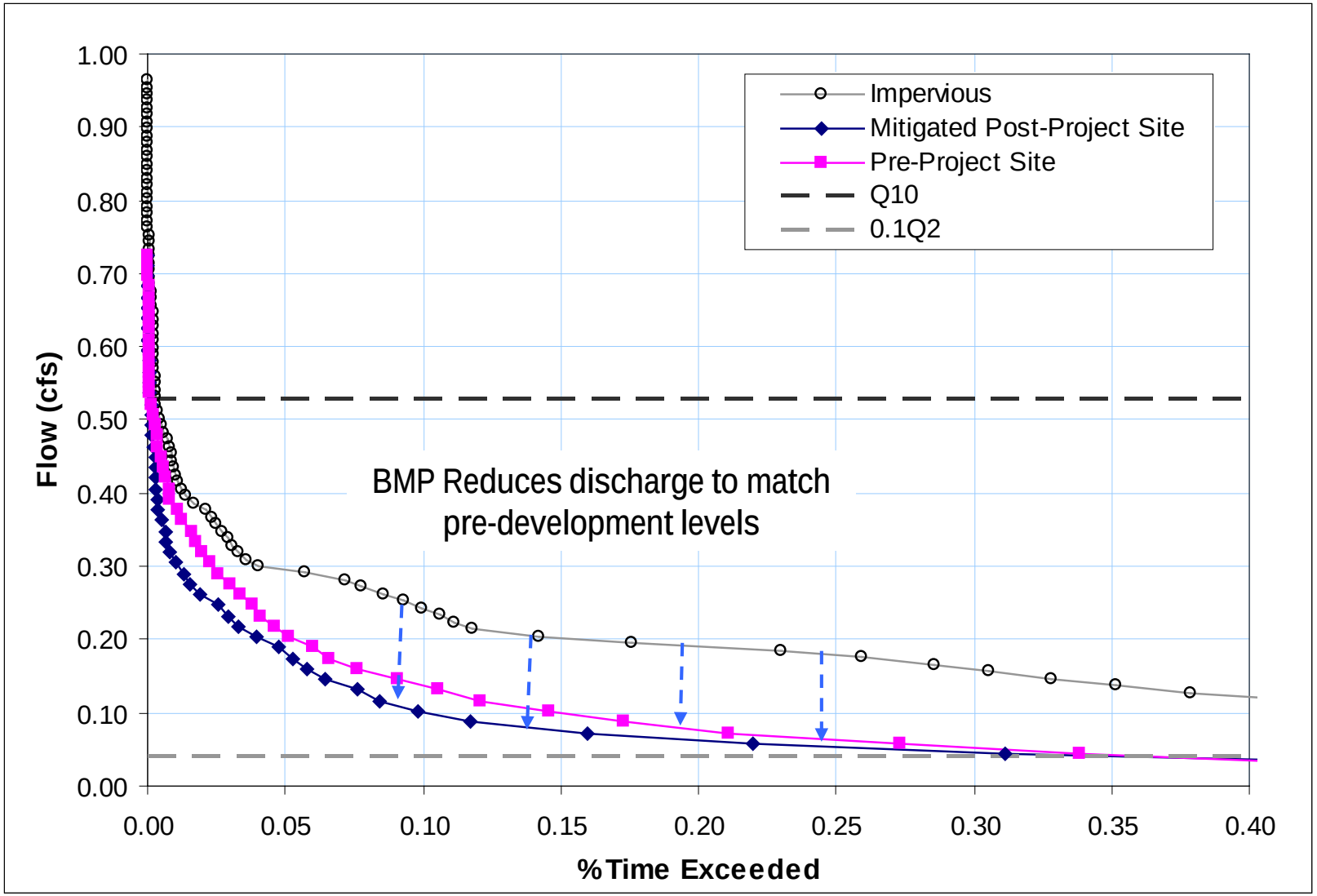


Flow Duration Matching

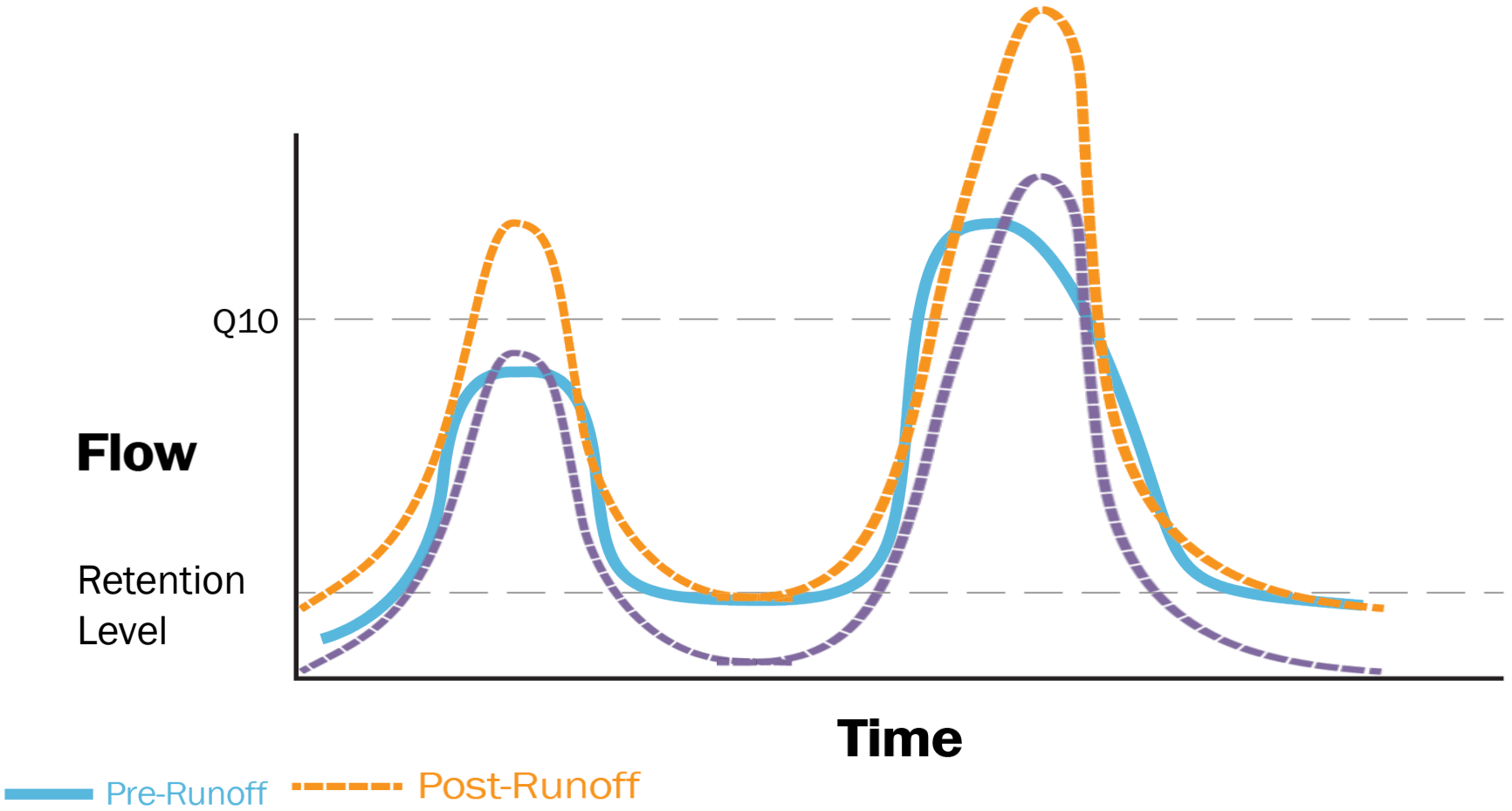
- Simulate long-term rainfall record.
- Evaluate and compare the duration of peak flows for pre- and post- development conditions.
- Design facility to match flow durations for range of flows that cause channel movement.
- Controls volume, duration, and rate of flows



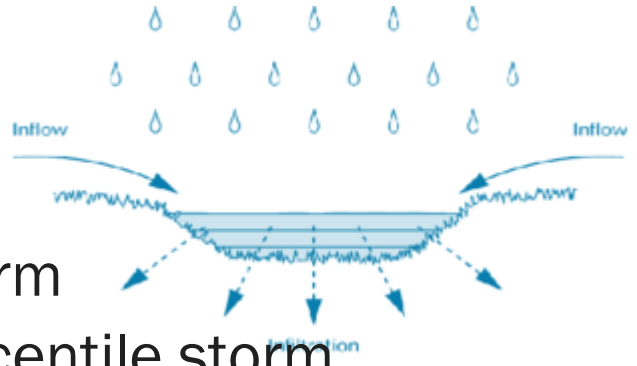
Flow Duration Matching



Retention/Infiltration Standard



Retention/Infiltration Standard



- Examples:
  - CCSD – Infiltrate ½ inch storm
  - Lake Oswego – Infiltrate the 10-year Storm
  - California Examples – Retain the 85 percentile storm
- Typically based on synthetic event-based sizing
- Does not require complex modeling
- Challenging to implement in areas where infiltration is not feasible
- Does not account for pre-development runoff conditions

Local Agency Comparison

LID, Infiltration, Flow Control, Pre-developed Definition

Local Agency Comparison

	LID or GSI Required	Infiltration Required	Flow Control Required	Fee in Lieu Option
Portland	X	X	Peaks	X
CWS			Peaks	X
Salem	X	X	Peaks	X
Oregon City	X	X	Flow Duration	X
Lake Oswego		X	Peaks	
Clark County	X	X	Flow Duration	

City of Portland

- **Infiltration and discharge hierarchy for soils >2 in/hr**
  1. Total onsite infiltration with vegetated facilities.
  2. Total onsite infiltration of 10-year event with vegetated facilities that overflow to subsurface infiltration facilities.
  3. Onsite detention with vegetated facilities that overflow to a drainage way, river, or storm-only pipe.
  4. Onsite detention with vegetated facilities that overflow to the combined sewer system.
- **Flow Control**
  - Infiltrate the 10-year storm to the MEF
  - Peak flow matching for 2-year, 5-year and 10-year events
  - Stream discharge: Match 2-year to ½ of pre-developed 2-year
- **Predevelopment is ground cover and grading prior to any development taking place (i.e., Lewis & Clark days).**

Clean Water Services

- Has not been issued an updated permit
- LIDA is an option to meet water quality
  - Meet water quality treatment through treatment train, proprietary treatment systems, or LIDA
- Flow Control
  - Peak flow matching for 2, 10, and 25-year storms
  - OR upsize downstream conveyance system
  - OR pay SDCs
  - Discharges to sensitive areas shall maintain the hydroperiod and flows of pre-development site conditions
- No clear definition of pre-developed condition

City of Salem

- **All projects must apply GSI to the MEF**
  - GSI to the MEF = as a facility equal to 10% of the new and replaced impervious surface
  - OR A facility that mitigates runoff from 80% of the new and replaced impervious surface.
  - OR Document limiting factors (site constraints or financial impacts).
- **Match peak flows for ½ of the 2-year and the 10-year**
- **Predeveloped based on defined CNs for each hydrologic soil group (35/58/72/79)**

Oregon City

- **Hierarchy requires surface infiltration to the MEP**
  - MEP defined as full infiltration of the 10-year storm OR infiltration facility surface area equal to 10% of contributing imperious area
  - Few sites have adequate infiltration
- **Flow Control**
  - Match flow durations for all flows between 42% of the 2-year peak flow to the 10-year peak flow.
- **Predevelopment based on map of conditions prior to settlement (forested)**

Lake Oswego

- **All projects must provide Onsite Stormwater Management**
  - Infiltrate the 10-year storm to the MEP
  - OR use impervious area reduction techniques (pervious pavement, green roof)
  - OR use sheet flow dispersion
- **Flow Control**
  - Match peak flows for 2-year, 5-year and 10-year
- **Predevelopment is CN of 70**

Clark County

- LID Feasibility checklist
- Must use LID facilities or demonstrate infeasibility
- Flow control performance standards
  - All projects: match flow durations from 8% of the 2-year peak flow to 50% of the 2-year peak flow.
  - Larger projects: match flow durations from 50% of the 2-yr peak flow up to the full 50-yr peak flow.
- Pre-developed condition is forest unless downstream basin was already 40% impervious by 1985

Performance Standards

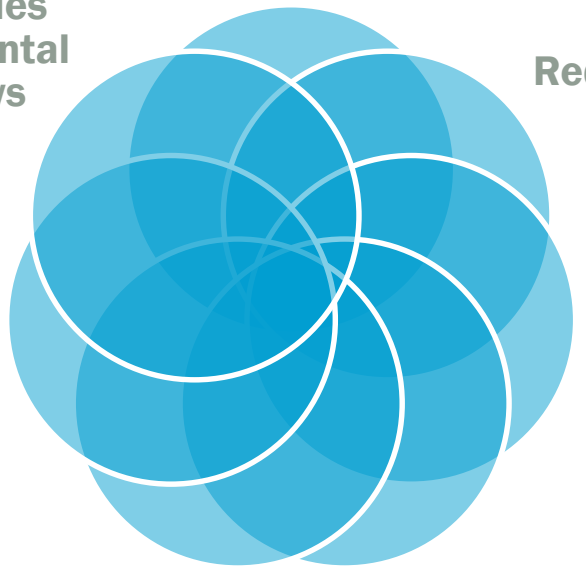
Site Planning, Water Quality, Flow Control

Performance Standards Challenges and Issues

Flow duration matching is physically based and protective for streams

Redevelopment provides treatment and incremental improvement for flows

Comply with NPDES Permit:
Prioritize LID
Reduce volume, duration, and rate of flow



New development provides treatment and flow control

Inherent incentives to use LID and Green Infrastructure approaches

Streamline design and review process

Flexibility in site design and facility selection

Performance Standards
WES Proposal

Site Planning

- Allocate a percentage of the site to LID facilities or other green approaches (5-6% of impervious surface)

or

- Demonstrate that WQ and flow control standards are met through LID facilities

Water Quality

- Capture and treat 80% of average annual runoff volume
- Size facilities for 1" 24-hour storm

Flow Control

- Match flow durations to immediate pre-development conditions

- *Infiltration can be used to meet performance standard*
- *Flow control exemptions for direct discharge to major water bodies*

Fee in lieu option TBD…

Discussion

What do you like about the proposed standards?

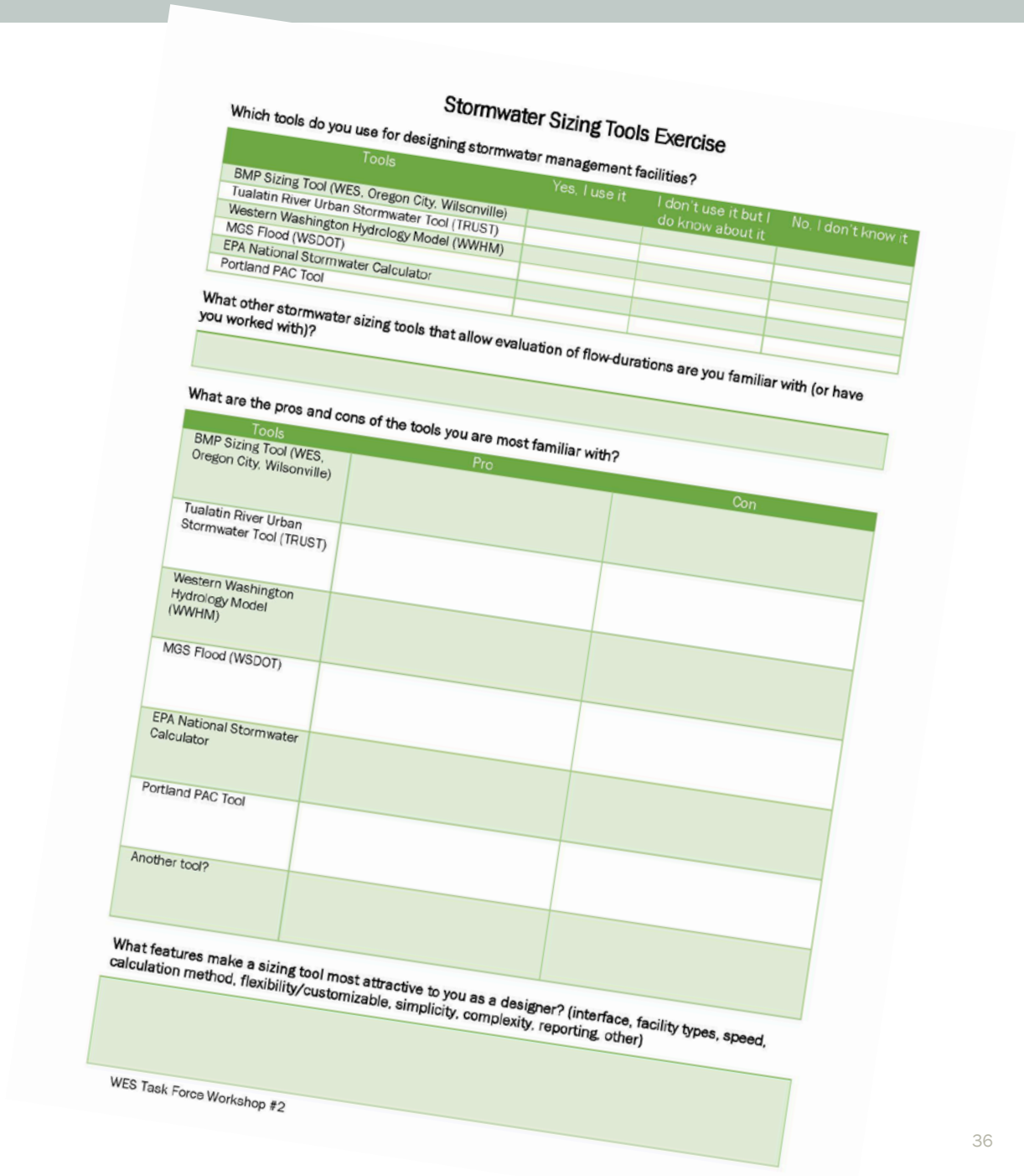
What would improve the standards?

What project types will need modification to the standards?

Stormwater Facility Sizing Tool

Task Force Input

Give us your thoughts



Stormwater Sizing Tools Exercise

Which tools do you use for designing stormwater management facilities?

Tools	Yes, I use it	I don't use it but I do know about it	No, I don't know it
BMP Sizing Tool (WES, Oregon City, Wilsonville)			
Tualatin River Urban Stormwater Tool (TRUST)			
Western Washington Hydrology Model (WWHM)			
MGS Flood (WSDOT)			
EPA National Stormwater Calculator			
Portland PAC Tool			

What other stormwater sizing tools that allow evaluation of flow-durations are you familiar with (or have you worked with)?

What are the pros and cons of the tools you are most familiar with?

Tools	Pro	Con
BMP Sizing Tool (WES, Oregon City, Wilsonville)		
Tualatin River Urban Stormwater Tool (TRUST)		
Western Washington Hydrology Model (WWHM)		
MGS Flood (WSDOT)		
EPA National Stormwater Calculator		
Portland PAC Tool		
Another tool?		

What features make a sizing tool most attractive to you as a designer? (interface, facility types, speed, calculation method, flexibility/customizable, simplicity, complexity, reporting, other)

WES Task Force Workshop #2

Wrap Up

Task Force Meetings

Meeting #1 – Kick-off

- Project Overview
- Hot Topics
- Stormwater Facility Selection

Meeting #2 – Stormwater, pt. 1 (today)

- Infiltration Feasibility
- Flow Control Strategy
- Stormwater Facility Sizing Tools

Meeting #3 – Stormwater, pt. 2 (November 15)

- Stormwater Submittals
- Rural and Small Project Exceptions
- Downstream Analysis

Meeting #4 – Fiscal Policies & Sanitary Sewer (December 13)

- Sanitary Pump Stations
- Reimbursement Districts
- Sanitary Rate Table
- Industrial Pretreatment and Extra Strength Charges

Questions