

# 2018 Stormwater Management Manual for Eastern WA Update Webinar Will Begin Soon

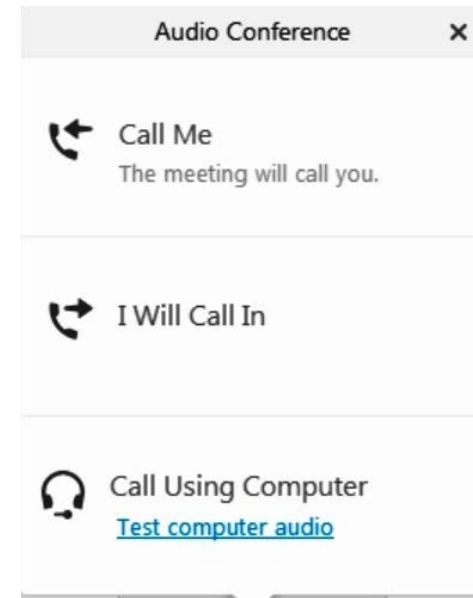
## Connecting to Audio: 3 Options

### Phone (**best sound quality**)

1. Select “Call Me”
  - Enter your phone number
  - You will be called
2. Or select “I Will Call In” and dial the number provided

### Computer microphone and speakers

3. Select “Call Using Computer” and follow directions



# 2018 Stormwater Management Manual for Eastern WA Update Webinar

The webinar is starting – you should be able to hear us now!

The screenshot displays the Cisco WebEx Meeting Center interface. The main content area shows a slide titled "2018 Stormwater Management Manual for Eastern WA Update". The slide includes logos for the Washington State Department of Ecology and the Eastern Washington Steering Committee, and lists the presenters: Abbey Stockwell, Ecology; Robin Kirschbaum, RKI; and Rebecca Dugopolski, Herrera. The slide also indicates it is "Project Webinar #1" on "June 27, 2017".

On the right side of the interface, the "Participants" panel is visible, showing "Speaking:" with "Dennis (me)" and "Water Quality HQ (Host)". The "Chat" icon is circled in orange, and a large orange arrow points from the text "For technical assistance, use Chat!" to the chat icon.

At the bottom of the interface, there are controls for "Raise Hand" and "Audio", and a "Connected" status indicator.



# 2018 Stormwater Management Manual for Eastern WA Update



Eastern Washington  
Stormwater Group

**Webinar #1**  
**June 27, 2017**

Presented By:  
**Abbey Stockwell, Ecology**  
**Robin Kirschbaum, RKI**  
**Rebecca Dugopolski, Herrera**



# Agenda

Approx. Times	Topics
10:00 to 10:15 am	Introductions & meeting objectives
10:15 to 10:45 am	Project overview <ul style="list-style-type: none"><li>• Project objectives</li><li>• Mission statement</li><li>• Overview of work plan, schedule, and opportunities for public input</li><li>• Questions and answers</li></ul>
10:45 to 11:45 am	Group discussion topics
11:45 to Noon	Summary & closing remarks

## Materials:

Webinar materials are available on Ecology's project website:

[www.ecy.wa.gov/programs/wq/stormwater/easternmanual/manual.html](http://www.ecy.wa.gov/programs/wq/stormwater/easternmanual/manual.html)





# Introductions & Meeting Objectives



Eastern Washington  
Stormwater Group

# Poll Question #1

## Who are you representing?

- Steering Committee
- City representative (not on the Steering Committee)
- County representative (not on the Steering Committee)
- Secondary permittee
- State agency
- Federal agency
- Non-profit organization
- Private sector (consultant, contractor, developer, etc.)
- General public
- Other



# Meeting Objectives

- Introduce the project team and Steering Committee
- Review project mission statement
- Provide overview of the project
- Review opportunities for public input throughout the project
- Gather initial input on the Manual update

# Project Team

## Ecology:

- Abbey Stockwell (Project Manager)
- Doug Howie
- Bill Moore
- Amanda Heye
- Vince McGowan

## Consultant Team:

- Rebecca Dugopolski, Herrera (Project Manager)
- Robin Kirschbaum, RKI
- Erick Fitzpatrick, AHBL
- Teresa Dugger, GeoEngineers
- Jay Slagle, MadSkills



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## Eastern WA Steering Committee:

- Danielle Mullins, City of West Richland (Committee Chair)
- Tom Wachholder, City of East Wenatchee
- Jon Morrow, City of Ellensburg
- Shilo Sprouse, City of Pullman
- Mark Melton, City of Richland
- Adrienne Pearson, City of Spokane
- John Saywers, City of Spokane
- Art Jenkins, City of Spokane Valley
- Colleen Little, Spokane County
- Heather Killinger, Grant Conservation District
- Brad Daly, City of Walla Walla
- Tony Garcia, Walla Walla County
- Ruby Irving-Hewey, City of Yakima
- David Haws, Yakima County
- Alex Nguyen, WSDOT
- Dean Smith, Department of Corrections



# Mission Statement

“Complete a focused update of the Manual via an open and collaborative process to include the latest advances in stormwater management, needed clarifications, and improved ease of use.”



# Project Overview



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# Project Objectives

- Complete a focused update of the Manual
- Open and transparent public process
- Work closely with the Eastern Washington Steering Committee
- Promote public participation to solicit feedback and help improve adoption and use of the Manual
- Provide a user-friendly on-line version of the Manual

# Overview of Work Plan & Schedule

## Project Phasing

### Phase 1 – 2015-17 Biennium (through 6/30/17)

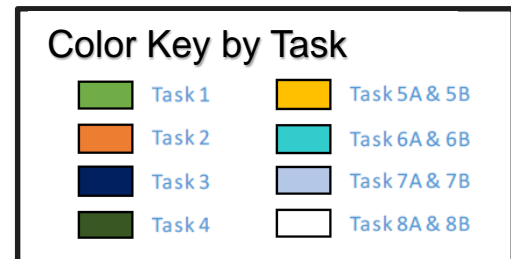
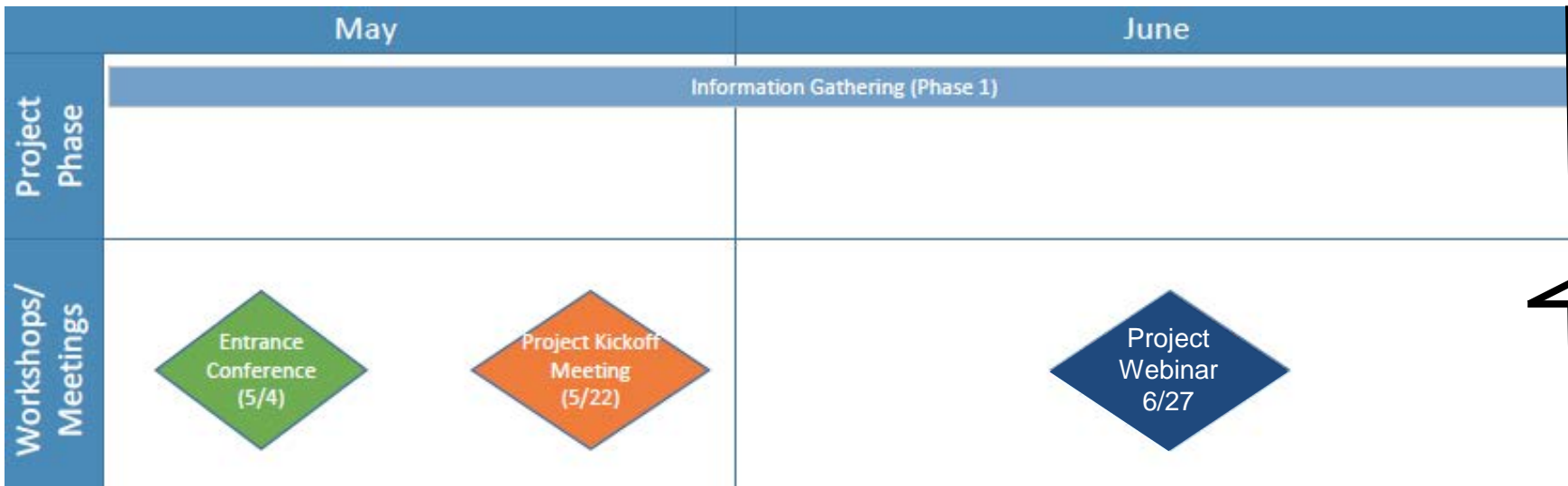
- Task 1 – Entrance Conference
- Task 2 – Project Kickoff Meeting
- Task 3 – Major Project Workshop
- Task 5A – Quality Control
- Task 6A – Updates to the Stormwater Manual
- Task 7A – Public Involvement

### Phase 2 – 2017-19 Biennium (7/1/17 through 5/30/18)

- Task 4 – Coordination Meetings with Ecology and the Steering Committee
- Task 5B – Quality Control
- Task 6B – Updates to the Stormwater Manual
- Task 7B – Public Involvement

# Overview of Work Plan & Schedule

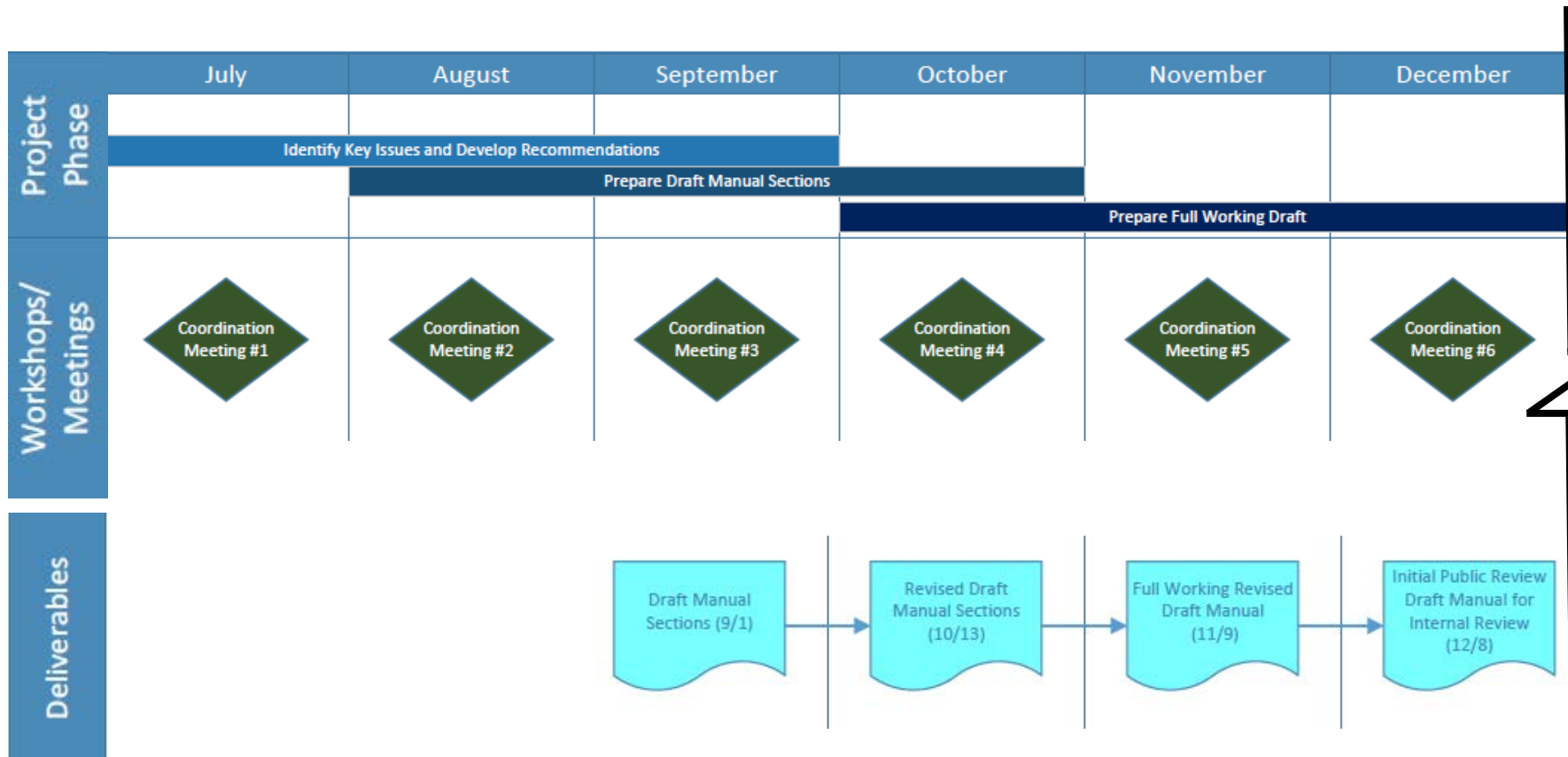
## Phase 1 – May/June 2017





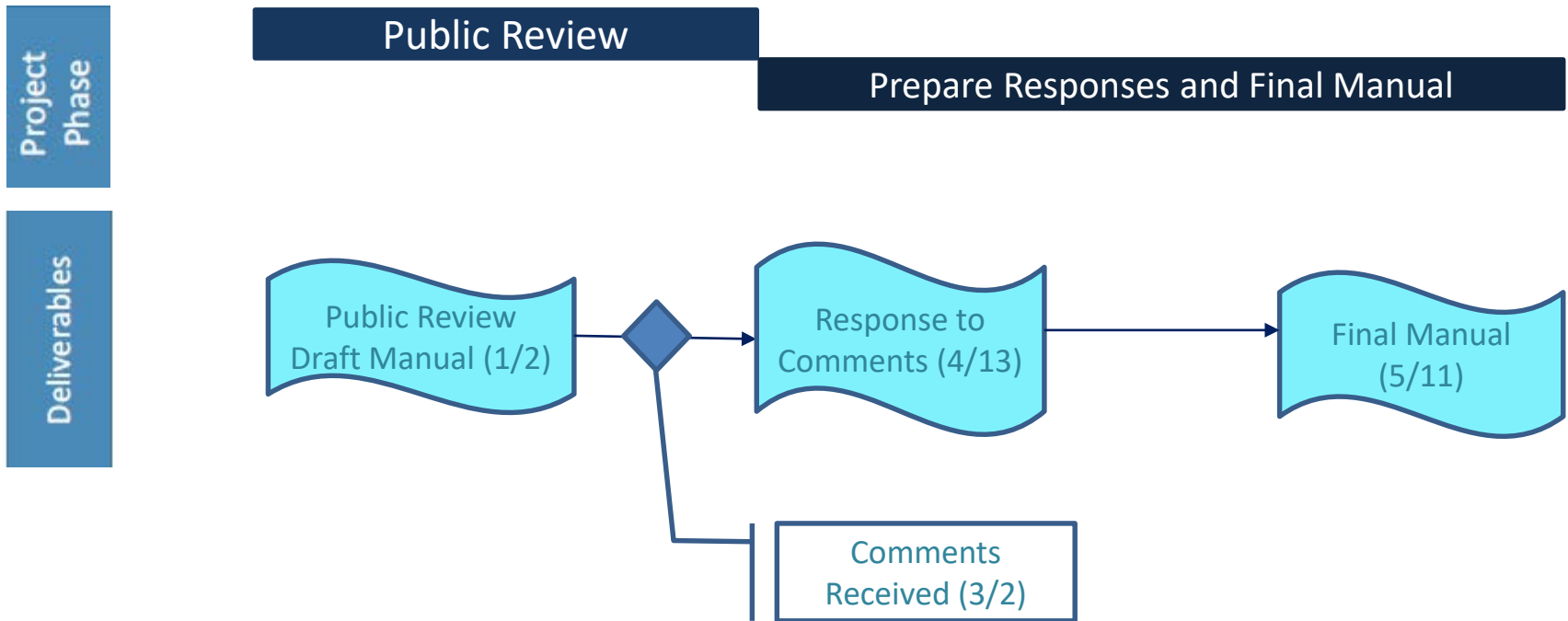
# Overview of Work Plan & Schedule

## Phase 2 - Through Dec 2017



# Overview of Work Plan & Schedule

## Phase 2 - Through May 2018



# Opportunities for Public Input





# Questions & Answers



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# Group Discussion



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# Discussion Topics

1. **Redevelopment**
2. **New/Updated BMPs**
3. **Underground Injection Controls (UICs)**
4. **Hydrology**
5. **Infiltration Assessment Procedures**

## Submit your answers by:

1. Typing in the “chat” window.
2. Selecting “raise hand.”  
We will unmute you, and then you can speak to the group.
3. Answering poll questions on your screen.

# Discussion Topic #1: Redevelopment

## Chat Question #1:

- a) Have you had experience using the redevelopment section (Section 2.1.2 of the Manual)?
- b) Have you found this section relatively easy or difficult to use?
- c) Do you have suggestions for reorganizing or improving this section?

## See Handout #1

Handouts available on the Manual website:  
[www.ecy.wa.gov/programs/wq/stormwater/esternmanual/manual.html](http://www.ecy.wa.gov/programs/wq/stormwater/esternmanual/manual.html)

### 2.1.1 New Development

New development is the conversion of previously undeveloped or pervious surfaces to impervious surfaces and managed landscape areas not specifically exempt below in section 2.1.3 or 2.1.4. See Chapter 1 for the regulatory framework under which a project may be directed to use this Manual or an approved equivalent.

All new development projects must comply with:

Core Element #1 Preparation of a Stormwater Site Plan,  
Core Element #2 Construction Stormwater Pollution Prevention,  
Core Element #3 Source Control of Pollution,  
Core Element #4 Preservation of Natural Drainage Systems, and  
Core Element #8 Local Requirements.

When the thresholds for Core Element #5 Runoff Treatment are met (see section 2.2.5), the following Core Elements also apply:

Core Element #5 Runoff Treatment, and  
Core Element #7 Operation and Maintenance.

When the thresholds for Core Element #6 Flow Control are met (see section 2.2.6), the following Core Elements also apply:

Core Element #6 Flow Control, and  
Core Element #7 Operation and Maintenance.

Projects that add new lanes on an existing roadway or otherwise expand the pavement edge are included in the definition of new development because they create new impervious surfaces. These projects are subject to the thresholds and requirements set forth in this Manual or adopted by a local jurisdiction or agency.

### 2.1.2 Redevelopment

Redevelopment is defined as the replacement or improvement of impervious surfaces on a developed site. Impervious surface replacements defined as exempt activities in section 2.1.3 and other projects identified in section 2.1.4 have reduced requirements. The project proponent must identify what Core Elements apply to all of the new and replaced impervious surfaces created by the project. All new impervious surfaces added during a redevelopment project are subject to the Core Elements identified in 2.1.1 above. The following sections apply to the impervious surfaces altered by a redevelopment project.

#### Objective

The long-term goal of the redevelopment standard is to reduce stormwater pollution from existing developed sites, especially when a water quality problem has been identified or the site is being improved to accommodate a use with a greater potential to contribute pollution to the receiving waters. More stringent redevelopment thresholds and requirements may



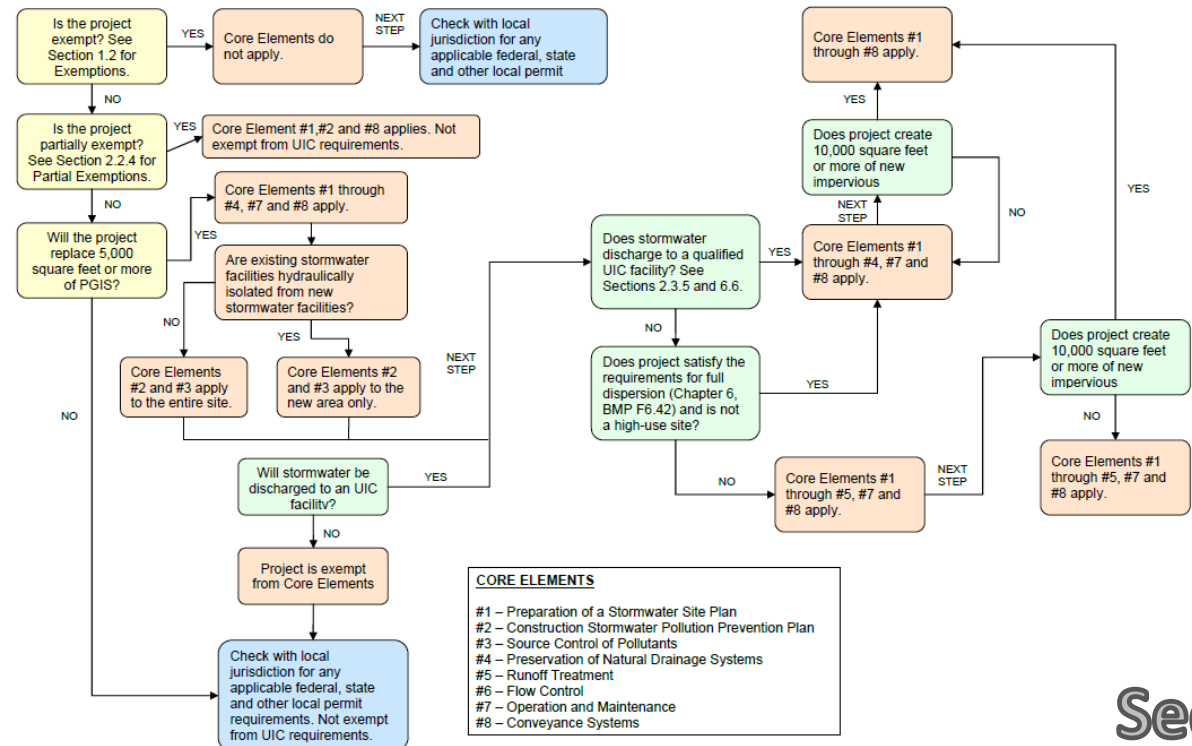
# Discussion Topic #1: Redevelopment

## Poll Question #2:

Would a flowchart (such as the one in the Yakima County Regional Stormwater Manual) be helpful?

- Yes
- No

FIGURE 2.2 - REDEVELOPMENT CORE ELEMENT FLOW CHART



See

Handout #2

Handouts available on the Manual website:

[www.ecy.wa.gov/programs/wg/stormwater/easternmanual/manual.html](http://www.ecy.wa.gov/programs/wg/stormwater/easternmanual/manual.html)



# Discussion Topic #2: New/Updated BMPs

**Poll Question #3:**  
Which of the following BMPs from the Eastern WA LID Guidance Manual need additional guidance?  
(select one or more)

- Amending construction site soils
- Dispersion
- Bioretention
- Trees
- Permeable pavement
- Vegetated roofs
- Minimal excavation foundations
- Rain water harvesting



AMENDING CONSTRUCTION SITE SOILS



DISPERSION



BIORETENTION



TREES



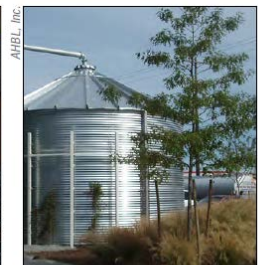
PERMEABLE PAVEMENT



VEGETATED ROOFS



MINIMAL EXCAVATION FOUNDATIONS



RAIN WATER HARVESTING



# Discussion Topic #2: New/Updated BMPs

## Chat Question #2:

Refer to Handout #3 for a list of BMPs from Chapters 5 – 8:

- Are there any BMPs that need additional design guidance?
- Are there any BMPs that should be added?
- Are there any BMPs that should be removed?

2018 Stormwater Management Manual  
for Eastern WA (Manual) Update  
Webinar #1, June 27, 2017  
Handout #3 – BMP List



Section	BMP	Keep	Update	Add	Remove	Notes
<b>Chapter 5 - Runoff Treatment Facilities</b>						
5.4	<b>Surface Infiltration and Bio-Infiltration Treatment Facilities</b>					
	BMP T5.10 Infiltration Ponds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	BMP T5.20 Infiltration Trenches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	BMP T5.21 Infiltration Swales	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	BMP T5.30 Bio-infiltration Swale	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.5	<b>Bioinfiltration Treatment Facilities</b>					
	BMP T5.40 - Biofiltration Swale	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	BMP T5.50 Vegetated Filter Strip	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.7	<b>Wetpool/Wetpond and Dry Pond Facilities</b>					
	BMP T5.70 Basic Wetpond	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	BMP T5.71 Large Wetpond	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	BMP T5.72 Wetvaults	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	BMP T5.73 Stormwater Treatment Wetlands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.8	<b>Sand Filtration Treatment Facilities</b>					
	BMP T5.80 Basic Sand Filter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	BMP T5.81 Large Sand Filter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	BMP T5.82 Sand Filter Vault	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	BMP T5.83 Linear Sand Filter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.1	<b>Oil and Water Separators</b>					
	BMP T5.100 API (Baffle type) Separator Bay	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	BMP T5.110 Coalescing Plate (CP) Separator Bay	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

See  
Handout #3

Handouts available on the Manual website:

[www.ecy.wa.gov/programs/wq/stormwater/easternmanual/manual.html](http://www.ecy.wa.gov/programs/wq/stormwater/easternmanual/manual.html)





# Discussion Topic #3: UICs

## Chat Question #3:

Do you have recommendations for what information needs to be clarified or refined in the spill containment section (Section 5.1.2) of the *Guidance for UIC Wells that Manage Stormwater* (2006)?

## See Handout #4

Handouts available on the Manual website:  
[www.ecy.wa.gov/programs/wq/stormwater/easternmanual/manual.html](http://www.ecy.wa.gov/programs/wq/stormwater/easternmanual/manual.html)

### 5.1.2 Spill containment structures

The type of land use will determine if a spill control containment structure is required. See the stormwater manual chapter on source control for more information on spill containment structures and when they are required.

High vehicle traffic areas (see definition below), fueling stations, and other facilities where fueling activities take place, and areas where petroleum products are stored and/or transferred in amounts greater than 1,500 gallons per year, must include:

- A spill containment structure.
- A spill prevention control and containment plan (see stormwater management manual).

*High vehicle traffic areas are:*

- *Commercial or industrial sites subject to an expected average daily traffic count (ADT)  $\geq 100$  vehicles/1000 ft<sup>2</sup> gross building area (trip generation).*
- *Road intersections with an ADT of  $\geq 25,000$  on the main roadway, and  $\geq 15,000$  on any intersecting roadway.*



# Discussion Topic #3: UICs

## Chat Question #4:

Do you have recommendations for what information needs to be clarified or refined regarding appropriate treatment requirements and techniques in Section 5.2 of the *Guidance for UIC Wells that Manage Stormwater* (2006)?

**Table 5.4: Pre-treatment Required for Solids, Oil and Metals**

Find the *Treatment Capacity Classification* from Table 5.2 and the *Pollutant Loading Classification* from Table 5.3. Use Table 5.4 to determine the pre-treatment requirements for solids, oil, and metals based on these classifications. Pre-treatment technologies for solids, oil, and metals removal are provided by the Department of Ecology stormwater manuals.

<b>Treatment capacity</b> \ <b>Pollutant loading</b>	<i>High</i>	<i>Medium</i>	<i>Low</i>	<i>None</i>
<i>Insignificant</i>	None	None	None	None
<i>Low</i>	None	None	None	Remove solids <sup>2</sup>
<i>Medium</i>	Two-stage drywells <sup>1</sup>	Two-stage drywells <sup>1</sup>	Remove solids <sup>2</sup>	Remove solids <sup>2</sup>
<i>High</i>	Remove oil <sup>3</sup>	Remove oil <sup>3</sup>	Remove oil and solids <sup>2,3</sup>	Remove oil and solids <sup>2,3</sup>

Handouts available on the Manual website:

[www.ecy.wa.gov/programs/wq/stormwater/easternmanual/manual.html](http://www.ecy.wa.gov/programs/wq/stormwater/easternmanual/manual.html)

## See Handout #4



# Discussion Topic #3: UICs

## Chat Question #5:

Do you have suggestions for what information needs to be clarified and refined in the oil control section (Section 5.2.4.3) of the *Guidance for UIC Wells that Manage Stormwater* (2006)?

## See Handout #4

Handouts available on the Manual website:  
[www.ecy.wa.gov/programs/wq/stormwater/easternmanual/manual.html](http://www.ecy.wa.gov/programs/wq/stormwater/easternmanual/manual.html)

### 5.2.4.3 Oil control

Treatment to remove oil means to apply one of the separation or adsorption technologies identified in an Ecology stormwater manual.

Stormwater with pollutant loadings in the “high” category, as described in Table 5.4, must be pre-treated for removal of oil.

An oil-water separator should be used at high-density intersections and at commercial or industrial sites subject to an expected average daily traffic count (ADT)  $\geq 100$  vehicles/1,000 ft<sup>2</sup> gross building area. These areas are expected to generate sufficient quantities of oil to justify the operation of a separator.

Basic treatment that also provides adsorptive capacity may be used at:

- Other sites where oil control is required except for the ones listed above.
- Commercial parking and streets with ADT > 7,500. Alternatively, a simple passive oil control device, such as a turned down elbow, may be used.
- In eastern Washington, roads with ADT > 30,000.

Examples of basic treatment that provide adsorptive capacity include biofiltration swales, bioinfiltration swales, filters, and catch basin inserts. See Ecology’s stormwater management manuals or other equivalent department approved manuals for more examples and information on these BMPs.



# Discussion Topic #4: Hydrology

## Poll Question #4:

Which of the following design storms (Section 4.2) do you use for runoff treatment in your jurisdiction?

(select one or more)

- 3-hour short duration storm
- 24-hour or longer regional storm
- 24-hour SCS Type IA storm
- Modified 24-hour SCS Type IA storm
- 24-hour SCS Type II storm
- 0.5" of runoff
- 2-year mean precipitation depth
- Other design criteria that meet or exceed the intent of Core Element #5

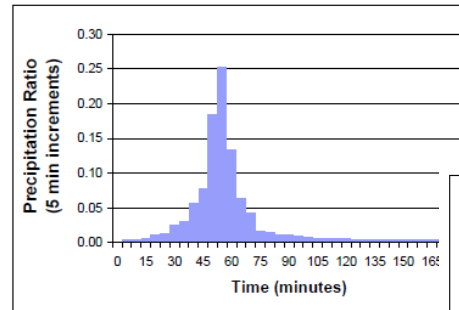


Figure 4.2.1 Short-duration storm unit hyetograph

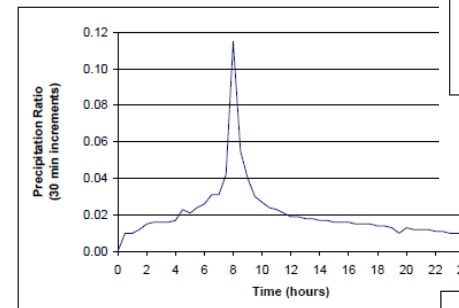


Figure 4.2.3 SCS Type IA Hyetograph

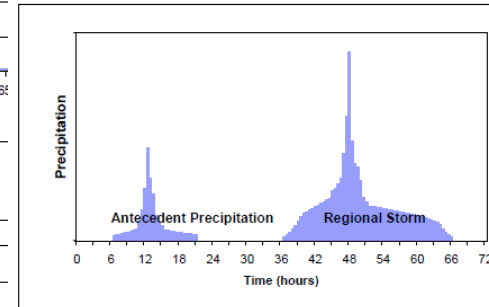


Figure 4.2.2 Sample regional storm hyetograph. The regional storm utilizes only the second event of the "long-duration storm" hyetograph, following the dry period and beginning at about 36 hours.

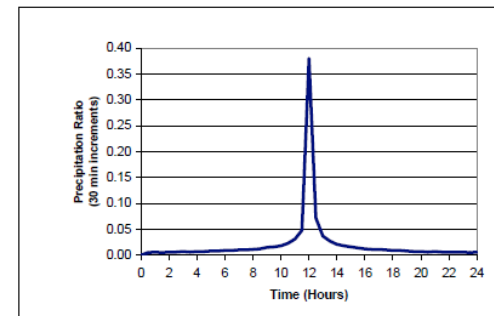


Figure 4.2.4 SCS Type II Hyetograph



# Discussion Topic #4: Hydrology

## Poll Question #5:

Which of the following design storms (Section 4.2) do you use for flow control in your jurisdiction?

(select one or more)

- 24-hour regional storm
- 24-hour SCS Type IA storm
- Modified 24-hour SCS Type IA storm
- Other design criteria that meet or exceed the intent of Core Element #6

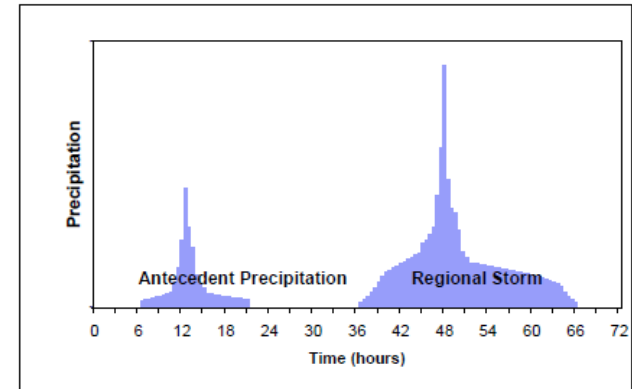


Figure 4.2.2 Sample regional storm hyetograph. The regional storm utilizes only the second event of the “long-duration storm” hyetograph, following the dry period and beginning at about 36 hours.

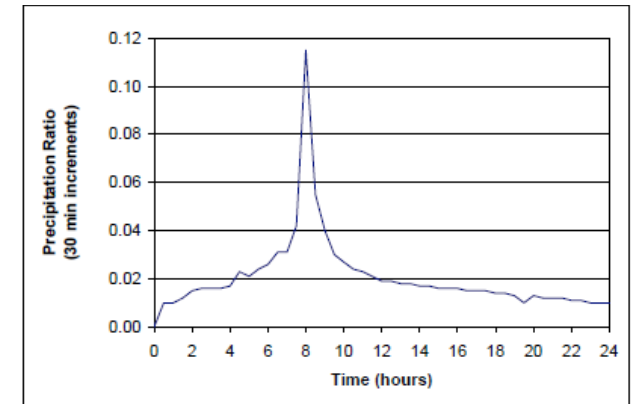


Figure 4.2.3 SCS Type IA Hyetograph





# Discussion Topic #5: Infiltration Assessment Procedures

## Poll Question #6:

Which of the following infiltration rate determination methods do you use in your jurisdiction?  
(select one or more)

- Borehole percolation test
- Test pit methods
- Single-ring infiltrometer
- Constant head permeability test
- Laboratory grain size analysis (ASTM D2487-90)
- Atterberg limits determinations (ASTM D4318-84)
- Other



*Pilot Infiltration Test (courtesy of Associated Earth Sciences, Inc.).*



# Discussion Topic #5: Infiltration Assessment Procedures



Photograph from Spokane Regional Stormwater Manual:  
[www.spokanecounty.org/DocumentCenter/View/1640](http://www.spokanecounty.org/DocumentCenter/View/1640)

## Poll Question #7:

Should detail on any of the following infiltration rate determination methods be added to the Manual?

(select one or more)

- Large Pilot Infiltration Test (PIT)
- Small-scale PIT
- Soil grain size analysis (ASTM D422)
- Spokane 200 Method (Spokane Manual)
- Full Scale Drywell Test (Spokane Manual)
- Swale Flood Test (Spokane Manual)
- Pond Flood Test (Spokane Manual)
- None



# Discussion Topic #5: Infiltration Assessment Procedures

## Poll Question #8:

Are there any concerns with folding the infiltration rate correction factors from the *Eastern WA LID Guidance Manual* into the Manual?

- Yes
- No

Correction factor range	SWMMEW	SWMMWW	EWA LID
Site variability	NA	0.33 to 1.0	0.33 to 1.0
Degree of influent control to prevent siltation and bio-buildup	NA	0.9	No correction factor required
Test method	NA	0.40 to 0.75	NA
<b>Overall</b>	<b>2 to 4</b>	<b>0.12 to 0.68</b>	<b>0.33 to 1.0</b>



# Discussion Topic #5: Infiltration Assessment Procedures

## Poll Question #9:

Which of the following infiltration testing parameters need to be updated/clarified?

(select one or more)

- Depth of test
- Testing season
- Pit area
- Saturation duration
- Stable flow duration
- Falling head duration
- None

Parameter	SWMMEW	SWMMWW	EWA LID
Depth of test	2-5' below proposed facility	Pit bottom	Pit bottom
Testing season	NA	12/1 – 4/1	NA
Pit area	8 sf	12-100 sf	12-100 sf
Saturation duration	< 2 hours	> 5 hours	> 6 hours
Stable flow duration	0.5 hours	≥ 1 hour	≥ 1 hour
Falling head duration	30 minutes	Until dry	Until dry







# Summary & Closing Remarks



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# Poll Question #10

- How did you find out about this webinar?
  - E-mail from Steering Committee member
  - Eastern WA Manual listserv
  - Ecology Eastern WA Manual website



# THANK YOU!

1. Visit the Manual website:  
[www.ecy.wa.gov/programs/wq/stormwater/easternmanual/manual.html](http://www.ecy.wa.gov/programs/wq/stormwater/easternmanual/manual.html)
2. Sign up for the Eastern WA Manual and Phase II Permit Listserv  
<https://listserv.wa.gov/cgi-bin/wa?A0=STORMWATER-EASTERN-WA>
3. Submit comments via e-mail on the existing Manual (using the spreadsheet template)  
[SMO-EasternWASstormwaterManualUpdate@herrerainc.com](mailto:SMO-EasternWASstormwaterManualUpdate@herrerainc.com)



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