

Stormwater Technical Notebook (STN) Update

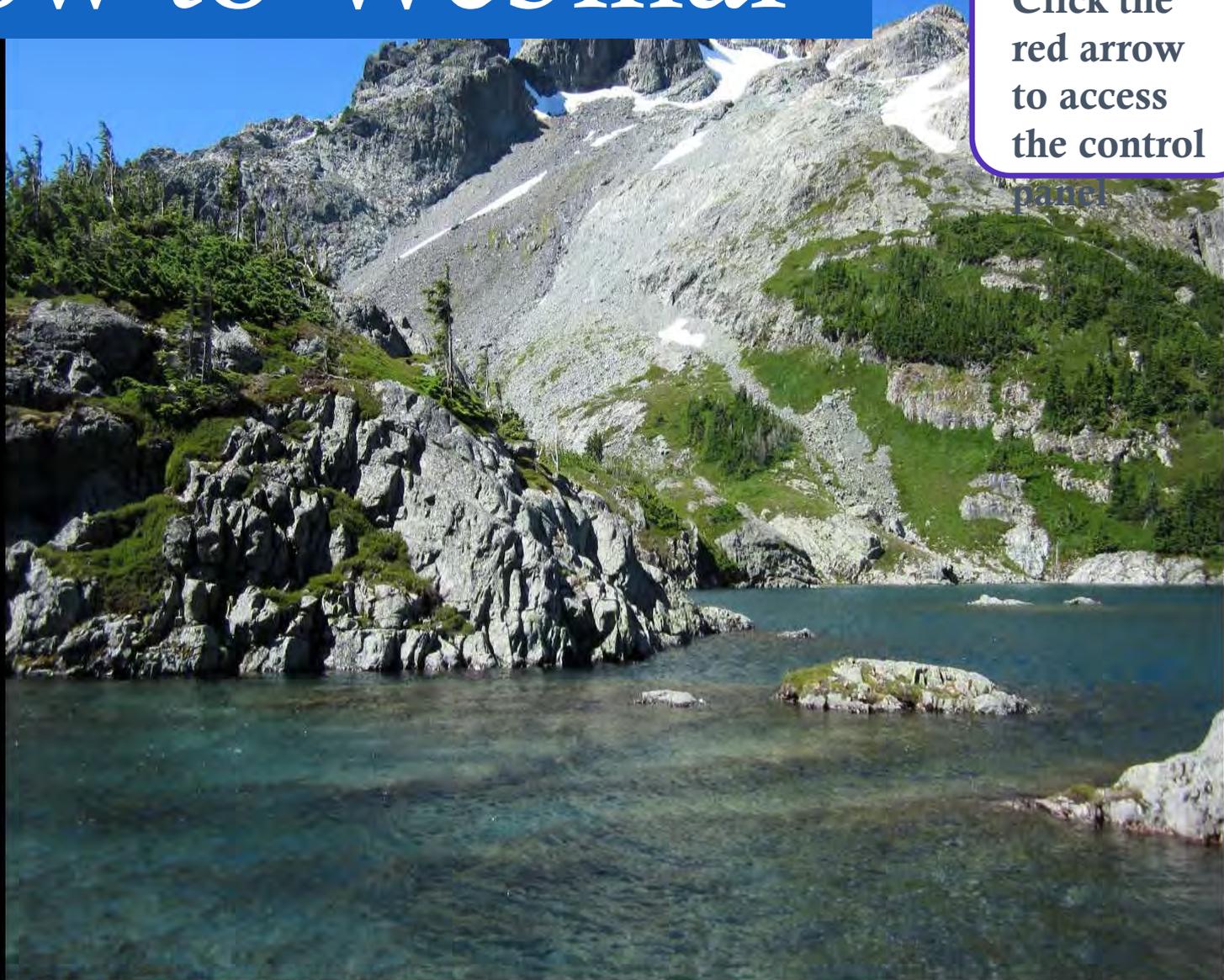


Welcome!

- ◆ Introductions
- ◆ How to Webinar
- ◆ Low Impact Development (LID) Code Update
- ◆ Stormwater Notebook Changes
- ◆ Rationale
- ◆ Q&A

How to Webinar

Click the red arrow to access the control panel



How to Webinar



File View Help

Audio

Audio Mode: Use Telephone Use Mic & Speakers

 Access You

Talking: Nathalie Descusse

Questions

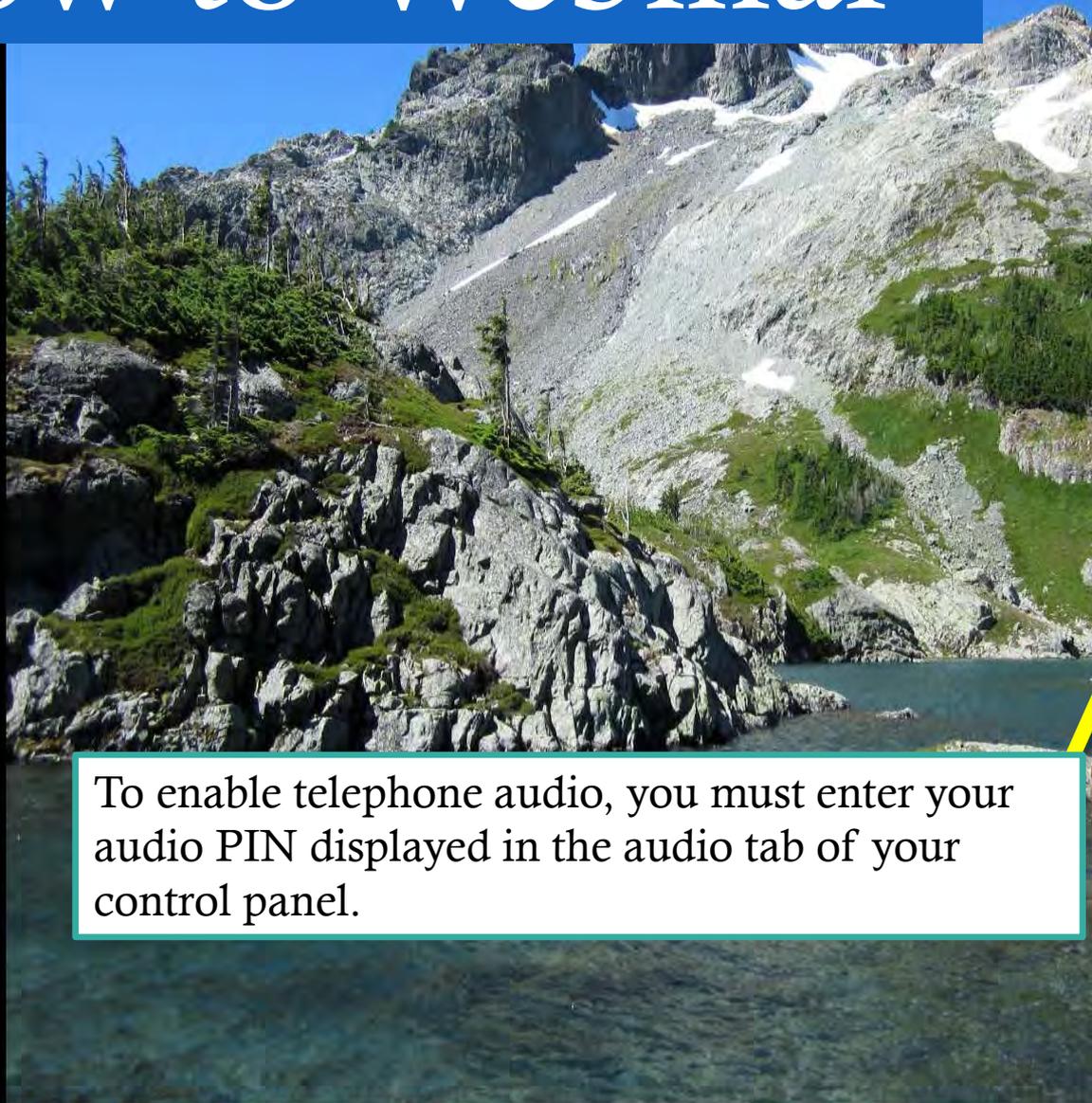
Send

EHR Reporting with Crystal Report - Dry Run
Webinar ID: 850-780-150
GoToWebinar™

Click the icon to raise your hand.

Type your question here

How to Webinar



To enable telephone audio, you must enter your audio PIN displayed in the audio tab of your control panel.

File View Help

- Audio

Telephone

Mic & Speakers

Dial: +1 (914) 614-3221

Access Code: 920-598-388

Audio PIN: ~~X~~

If you're already on the line, press **#xxx#** now

[Problem dialing in?](#)

- Questions

[Enter a question for staff]

Send

Test Webinar

Webinar ID: 120-165-227

GoToWebinar

LID Code Update Schedule

I can see the finish line . . .

10/18/16

Zoning Code,
RMC 13.06,
RMC 15.24

City Council

12/6/16

RMC 13.20

City Council

12/7/16

Stormwater
Technical Notebook

Technical
Committee

1/1/17

New Codes
Effective

(Permit Required
Deadline)



STN Update Schedule

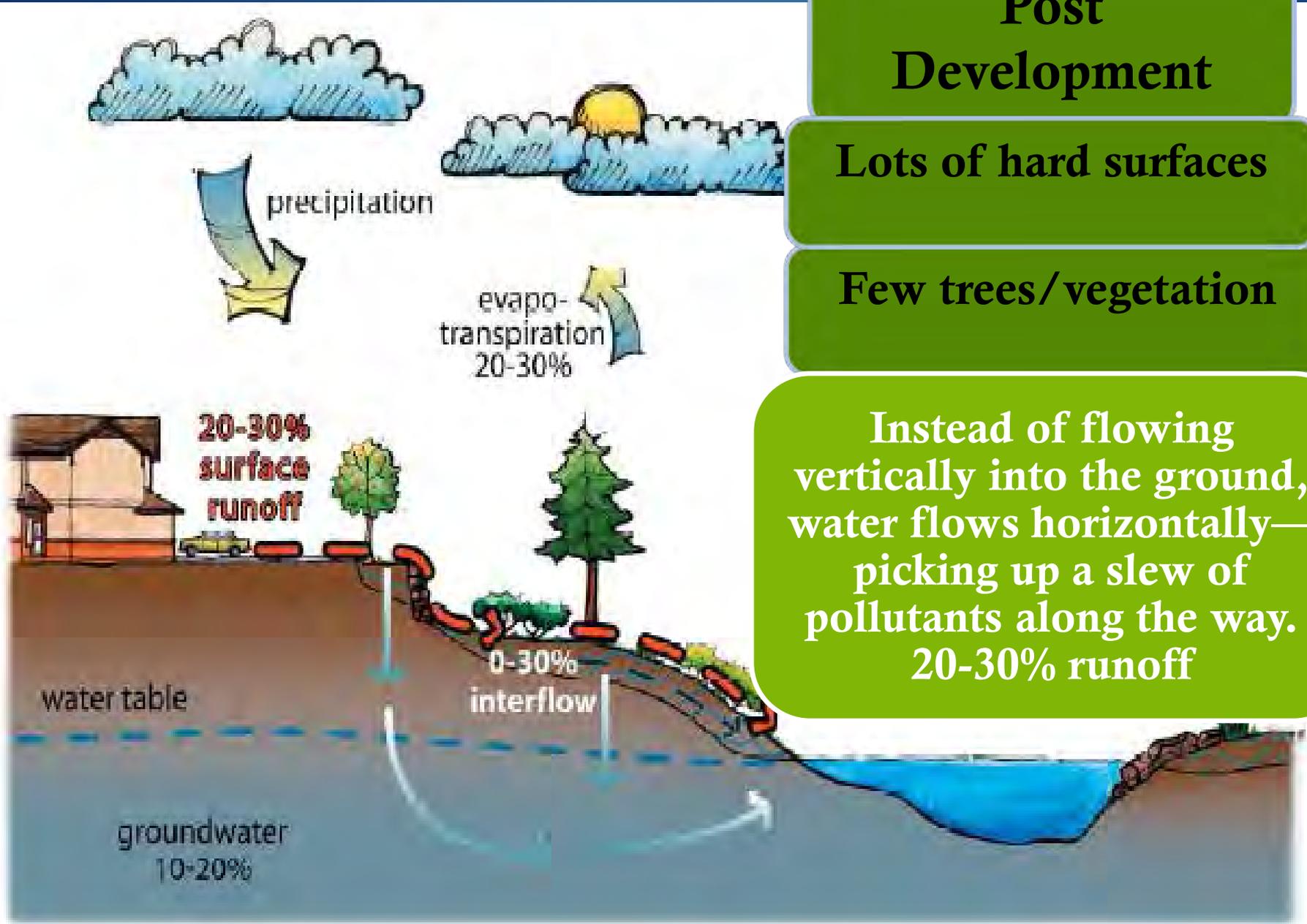
- 🔹 9/8: Draft STN Published for Review
 - 🔹 9/20: Webinar
 - 🔹 9/27: City Council Staff Report
 - 🔹 9/28: Comments due
 - 🔹 10/5: Technical Committee Briefing
 - 🔹 10/12: SEPA Determination?
 - 🔹 12/7: Technical Committee Approval
 - 🔹 1/1/17: Effective Date

Post Development

Lots of hard surfaces

Few trees/vegetation

Instead of flowing vertically into the ground, water flows horizontally—picking up a slew of pollutants along the way. 20-30% runoff

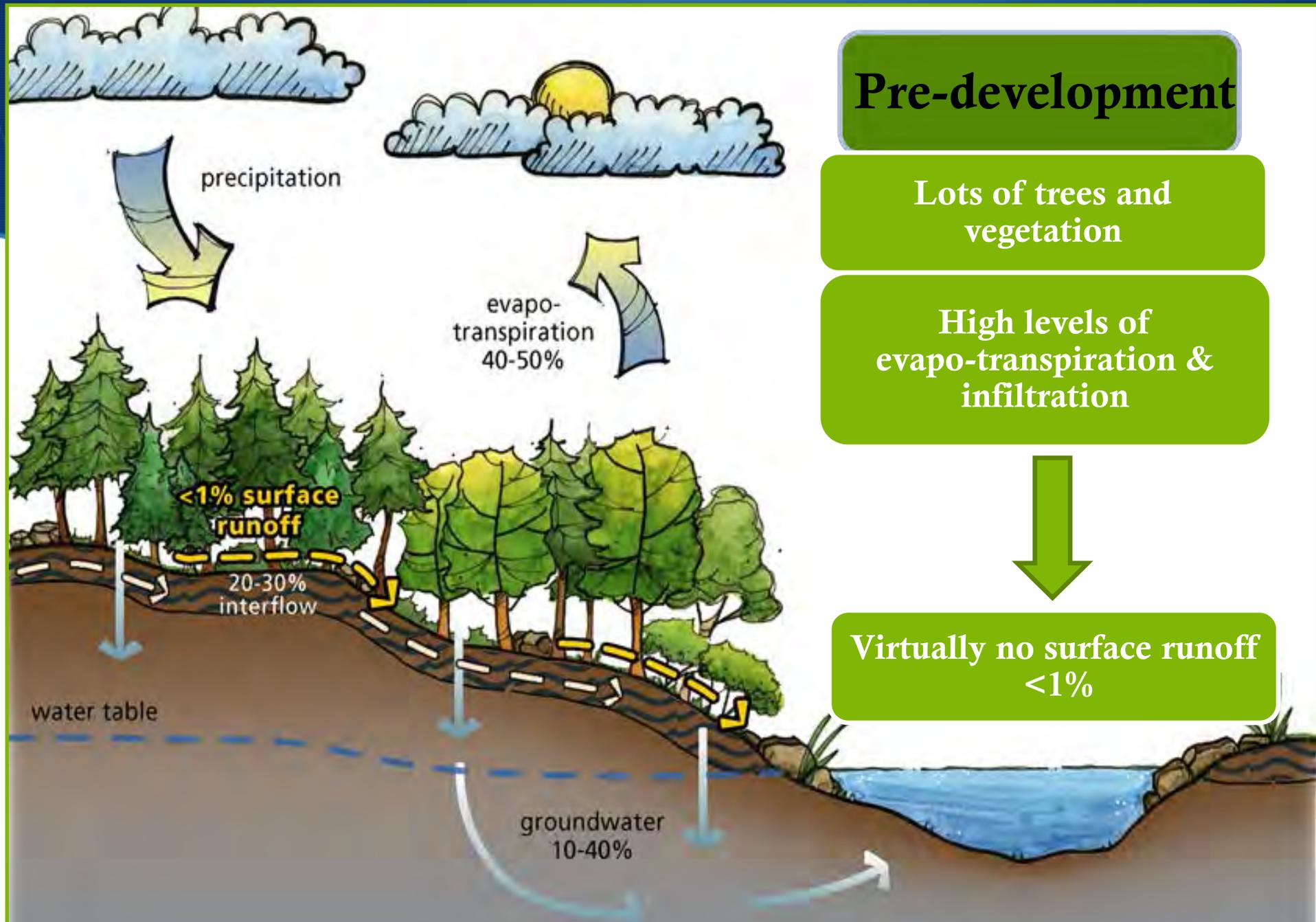


Pre-development

Lots of trees and vegetation

High levels of evapo-transpiration & infiltration

Virtually no surface runoff
<1%



Ecology 9 Minimum Requirements (MRs) for Development

MR #1 (Site plan)

MR #2 (Temporary Erosion Control)

MR #3 (Source Control)

MR #4 (Natural Discharge)

MR #5 (Low Impact Development)

MR #6 (Runoff Treatment)

MR #7 (Flow Control)

MR #8 (Wetland Protection)

MR #9 (O & M Manuals)

Technical MRs

MR #5 (Low Impact Development)

MR #6 (Runoff Treatment)

MR #7 (Flow Control)

MR #8 (Wetland Protection)

New Changes . . .
Its all about that LID

MR #5 (Low Impact
Development)

Major Changes Zoning Code & Municipal Code

- ◆ Zoning Code: Minor Changes to allow for LID
- ◆ Zoning Code: 5% Planning Area identified early in planning
- ◆ RMC 13.06: Minor changes. Source Control
- ◆ RMC 13.20: New Minimum Requirement 5 Requirements impact regional facility areas.
- ◆ RMC 15.24: Updates to all Minimum Requirements



Zoning Code

5% LID Planning Area

- ◆ To Meet MR5, On-Site Stormwater Infiltration is Required for all sites
- ◆ Prior to land use entitlement, identify areas that will accommodate this infiltration
- ◆ Before engineering, assume 5% of net buildable area
- ◆ After engineering, use what you need only

RMC 13.06: Stormwater Management Code

- ◆ Minor Updates
- ◆ MR 3 – Source Control

RMC 13.20: Stormwater Capital Facilities Charges

- ◆ Codes were adopted to meet MR6 & MR7

MR #5 (Low Impact Development)

MR #6 (Runoff Treatment)

MR #7 (Flow Control)

RMC 13.20: Stormwater Capital Facilities Charges

- ◆ Codes were adopted to meet MR6 & MR7
- ◆ MR 7 = 10% of Land Fully Encumbered for Vault
- ◆ MR6 = Treatment Requirements
- ◆ MR5 = Significant New Requirements
 - ◆ Urban Center Competing Need
 - ◆ City Compromise: Infiltrate 91% of Roof Runoff
 - ◆ Requires 1.3% to 4.8% of Land

RMC 15.24: Clearing, Grading and Stormwater Management

- ◆ No Significant Changes in 20 years.
- ◆ Overhauled to Align with 2012 Ecology Manual
- ◆ Updates to all Minimum Requirements

Major Changes

Stormwater Technical Notebook

- ◆ Adopt Ecology Manual
- ◆ Vesting
- ◆ Hard Surface Assumptions
- ◆ Source Control BMPs
- ◆ LID Feasibility
- ◆ Pervious Pavement & Functional Equivalency
- ◆ Proprietary Stormwater Treatment
- ◆ Regional Facilities and Minimum Requirement 5

Adopt Ecology's 2012 SWMMWW as amended in 2014

- ◆ Low impact development (LID) requirements
- ◆ Determining infiltration rates
- ◆ Source control and treatment BMPs
- ◆ Construction BMPs
- ◆ Wetland Protection
- ◆ Western Washington Hydrology Model (WWHM) update and modeling guidance.

Vesting



- No Change: Building Permit, Plat & Short Plat, Clearing & Grading
- A single family lot, to be built as part of a plat, is vested as part of the preliminary plat or short plat, **provided that its building permit application is submitted within five years of final plat approval. ** Draft**
- Capital project design standards are vested at the completion of 30% design.

Clarify hard surface assumptions for subdivisions.

- ◆ **TC Policy Adopted 9/16/2015**

- ◆ **Threshold Determination:**

- ◆ Single-family developments that include subdivision of property shall be classified as New Development
- ◆ Hard surfaces are new
- ◆ Hard surfaces assumed to equal 80% of the maximum impervious area allowed by zoning code.
- ◆ May use 4200 SF for large lots

Source Control

- ◆ Required documentation of applicable (mandatory) and recommended source control BMPs for all sites
- ◆ Supports Wellhead Protection Goals
- ◆ Won't apply to most sites
 - ◆ Industrial – YES
 - ◆ Commercial – Sometimes
 - ◆ Residential – No

Pervious Pavement – Functional Equivalents

- ◆ Developers may use Ecology's lists to determine appropriate BMPs
- ◆ If pervious pavement is selected for public surfaces, then use functionally equivalent alternative
 - ◆ Reverse slope sidewalk
 - ◆ Infiltration Trench
 - ◆ Bioretention
 - ◆ (Modeling is required to demonstrate equivalency)

Proprietary Treatment

- ◆ Multifamily, Commercial and industrial sites: Private stormwater facilities, then Ecology approved BMPs are allowed.
- ◆ Single Family Residential projects:
 - ◆ Infiltration first.
 - ◆ Ponds and swales are preferred over vaults.
 - ◆ **Proprietary treatment technologies shall not be allowed.**

Regional Facility Area Infiltration Targets

- ◆ RZC: Preliminary on-site stormwater management infiltration areas = 5% of Net Buildable Area
- ◆ Flow Control Exempt Areas (Downtown)
- ◆ Overlake (LID Where Feasible)

Stormwater Technical Notebook

- ◆ Codes were adopted to meet MR6 & MR7

MR #5 (Low Impact Development)

MR #6 (Runoff Treatment)

MR #7 (Flow Control)



Minimum Requirements in Regional Surcharge Areas

- ◆ MR 1-4, 8, 9 – All Apply
- ◆ MR5 – Low Impact Development
 - ◆ Developer Does Something Onsite
- ◆ MR6 – Runoff Treatment
 - ◆ Met by Regional Facility (Most Sites)
 - ◆ City built treatment. Developer pays fee.
- ◆ MR7 – Flow Control
 - ◆ Met by Regional Facility
 - ◆ City built a big pipe or vault. Developer pays fee.

MR5 – Low Impact Development

- ◆ LID Performance Standard.
 - ◆ Match predevelopment durations of discharge from 8% to 50% of the 2 year storm
- ◆ “The List”
 - ◆ Full dispersion, bioretention, pervious pavement, etc.
- ◆ Flow Exempt: “no bioretention or pervious pavement, but . . . these projects must implement BMP T5.13; BMP T5.10A, B, or C and BMP T5.11 or T5.12; if feasible”

MR5 - Flow Exempt Gotchas

- ◆ T5.13: Compost Amended Soil (Easy)
- ◆ T5.10A,B,C: Roof Downspout Controls (Easy in outwash soils. Difficult in Till Soils)
- ◆ T5.11 or T5.12: Dispersion of runoff (Not feasible in urban setting)

Roof Downspout Controls

1. ~~Full Dispersion or Downspout Full Infiltration (5.10A)~~
(Trench or Drywell for roof)
2. ~~Rain Gardens~~
3. Downspout Dispersion (T5.10B)
4. Perforated Stub-Outs (T5.10C)



Competing Needs Clause

- ◆ If using “The List”. Feasibility may consider Competing Needs.
- ◆ “The On-site Stormwater Management BMPs can be superseded or reduced where they are in conflict with:
 - ◆ Federal or state laws, etc.
 - ◆ Public health & safety
 - ◆ “Where an LID requirement has been found to be in conflict with special zoning district design criteria adopted and being implemented pursuant to a community planning process, the existing local codes may supersede or reduce the LID requirement. **This does not relieve municipal stormwater permittees of the requirement to review local design codes, standards and rules to remove barriers and require use of LID principles and BMP’s”**

Redmond's Downtown Needs

- ◆ Sammamish River Temperature Problem
- ◆ Flow Exempt Status of River relies on LID
- ◆ Groundwater aquifer recharge
- ◆ Regional treatment facilities sized to assume some infiltration (reduce maintenance cost, improve effectiveness)
- ◆ Regional pipe capacity assumes some infiltration (avoid flooding)
- ◆ Downtown Development maximize density

Redmond's Overlake Needs

- ◆ Regional Facilities are Sized to Assume some LID Infiltration
- ◆ More Infiltration means third facility is smaller and regional fee is lower than if less infiltration
- ◆ This was explicitly explained to Planning Commission and City Council
- ◆ Code says projects shall do “LID Where Feasible”
- ◆ Overlake Development Maximize Density

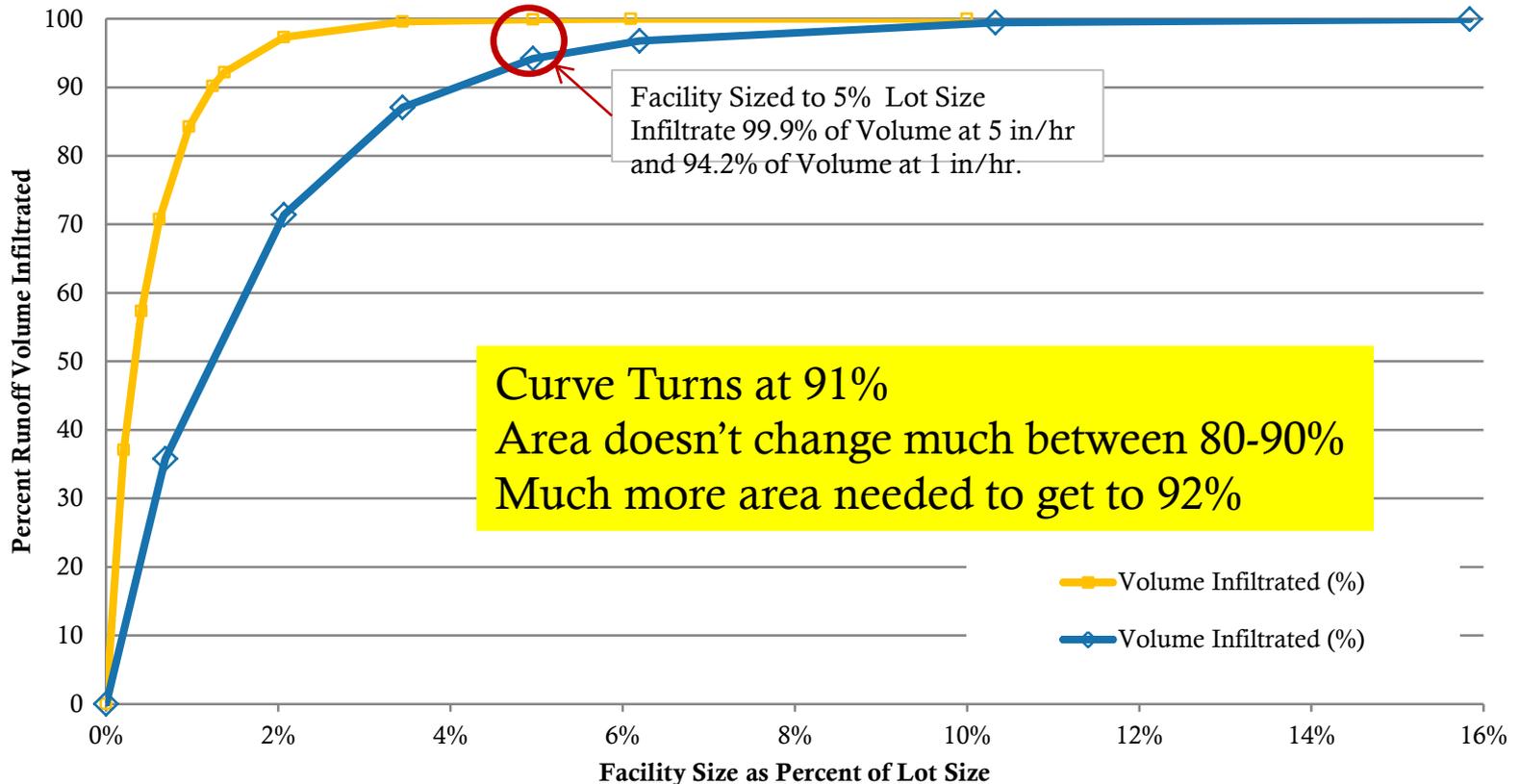
Options for Urban Centers

- Require BMP T5.10A: Full Roof Infiltration **100%**
- Something in the middle 
- Cite Competing Needs: density over all **0%**

Scenario	Alternative Standards	Facility Footprint Outwash (5 in/hr)	Facility Footprint Till (1 in/hr)
1	No Infiltration	0%	0%
3	91% Infiltration	1.3%	4.1%
4	99% Infiltration	6.1%	15.8%

Why 91%? It is Reasonable

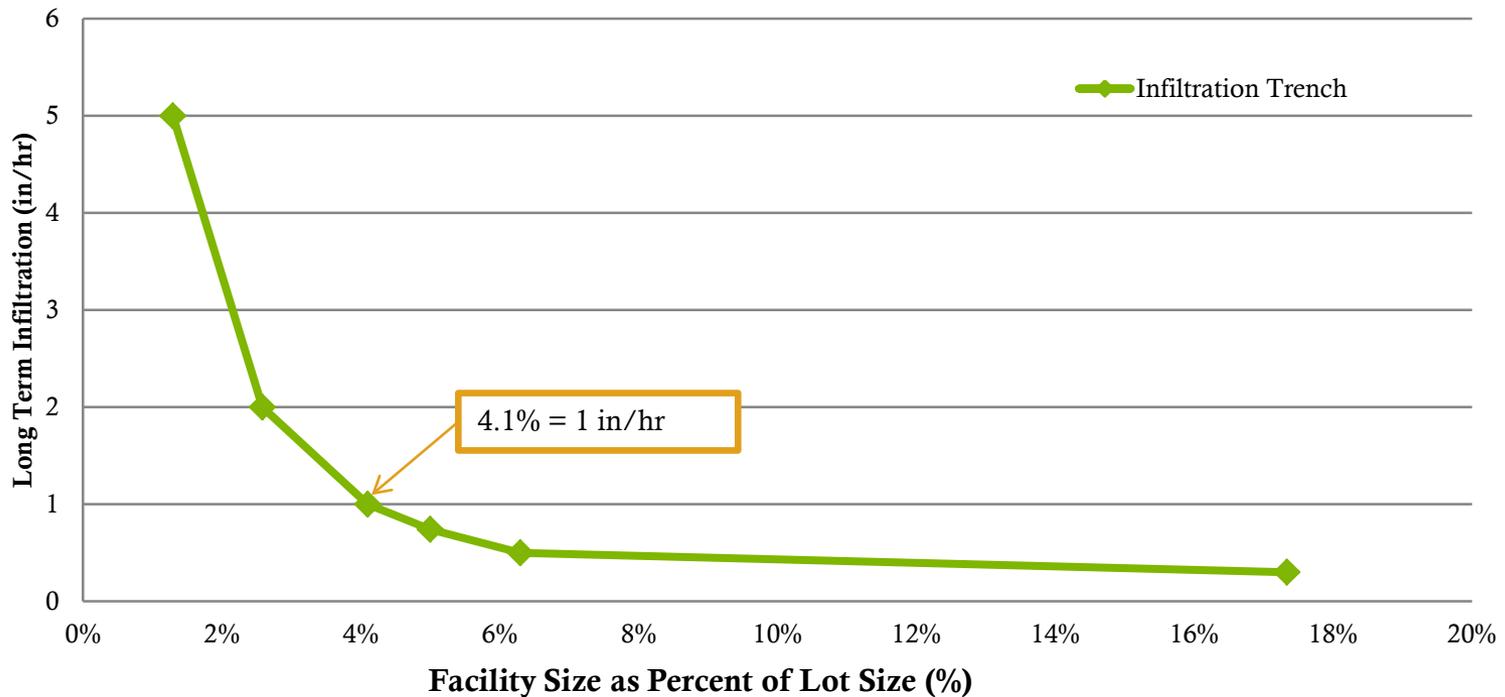
Trench Infiltration



91% Infiltration

Infiltration Rate vs Required Area

91% Infiltration



Proposal

- ◆ Require all developments to infiltrate 91% of annual runoff volume if it can be done in 5% of site
- ◆ Sites that infiltrate 1 in/hour need just 4.1% of the site.
- ◆ Sites that infiltrate < 1 in/hour don't need to infiltrate
- ◆ Therefore 5% is enough for all sites. In Downtown and Overlake most sites can do it in less than 2%.
- ◆ Incentive granted for sites that infiltrate 99%
- ◆ This standard is predictable for developers

Next Steps

- ◆ Public Comments Due 9/28
- ◆ SEPA Determination 10/12
- ◆ Technical Committee Approval 12/7
- ◆ Council Action on Related RMC Changes 12/6
- ◆ STN Effective 1/1/2017

Questions

◆ General: LID@redmond.gov

◆ Zoning Code:

Peter Holte, pholte@redmond.gov

◆ Municipal Code:

Andy Rheume, ajrheume@redmond.gov

◆ Stormwater Technical Notebook:

Steve Hitch, sjhitch@redmond.gov