# CLACKAMAS COUNTY BOARD OF COUNTY COMMISSIONERS

Sitting/Acting as the Board of Directors of Clackamas County Service District No. 1

## Study Session Worksheet

**Presentation Date:** May 20, 2014 **Approx Start Time:** 9:00 a.m. **Approx Length:** 30 min.

**Presentation Title:** Flexibility for Developers in Meeting Stormwater Requirements

**Department:** Water Environment Services

**Presenters:** Gail Shaloum, Don Kemp, Leah Johanson

**Other Invitees:** Cedomir Jesic, Cardno Engineering and Justin Wood, Associate Director of Government & Builder Relations, Home Builders Association of Metro Portland.

**WHAT ACTION ARE YOU REQUESTING FROM THE BOARD?**

Direction for Water Environment Services (WES) to expand outreach efforts to the Clackamas County Service District No. 1 (CCSD #1) development community to gain awareness of low impact development design tools that are available.

**EXECUTIVE SUMMARY (why and why now):**

District staff has developed internet based tools to assist the District's development community with implementing Low Impact Development Approach (LIDA) practices for stormwater management. Our goal is to offer more choices and support to development permit applicants in CCSD #1 as they design projects.

Industry trends suggest LIDA will have an increasing role in stormwater management design and implementation. LIDA follows the principle that rainfall is best and most efficiently managed at its source through decentralized small-scale controls. LIDA's goal is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source. Use of LIDA and our tools by the development community is voluntary. We do not anticipate proposing changes to current permit requirements.

Development of LIDA tools was a high priority recommendation of our District's Watershed Action Plans. If widely adopted, the use of LIDA will allow District staff to continue meeting Clackamas County's goals of supporting healthy-safe-vibrant communities and helps CCSD#1 meet its Municipal Separate Storm Sewer (DEQ) permit requirements. A stormwater permitting process that is consistent and predictable is an additional benefit for our customers that District staff strives for. We have begun working to get the new stormwater design tools out to applicants early in the planning process.

**FINANCIAL IMPLICATIONS (current year and ongoing):**

Financial implications are limited to the cost of a consultant to facilitate the outreach and beta-testing process, approximately $35,000. Moving toward LIDA for stormwater management may save developers money while reducing District ratepayer costs related to retrofitting and restoring water resources.

**LEGAL/POLICY REQUIREMENTS:**

N/A

**PUBLIC/GOVERNMENTAL PARTICIPATION:**

Staff will ask builders and developers to beta-test the Internet based tools, whether on actual or hypothetical projects, and provide feedback on their experiences.

**OPTIONS:**
N/A

**RECOMMENDATION:**
Staff recommends conducting outreach with the development community to raise awareness and increase use of District designed internet based tools. In addition, staff continues to conduct testing with the development community in an effort to identify system improvement opportunities.

**ATTACHMENTS:**
- Fact sheet on Stormwater Design Tools
- Case study example sheets

**SUBMITTED BY:**
Division Director/Head Approval _____
Department Director/Head Approval _____
County Administrator Approval _____

For information on this issue or copies of attachments, please contact Gail Shaloum @ 503-742-4597

# RiverHealth

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CLACKAMAS COUNTY

WATER ENVIRONMENT SERVICES
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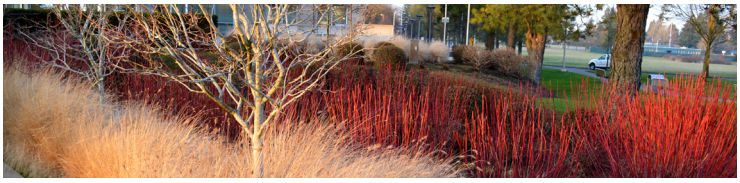
FACT SHEET

# Stormwater Management Design Tools



## Overview

Water Environment Services (WES) administers the Surface Water Management Program for Clackamas County Service District No. 1 (CCSD#1). The purpose of the program is to enhance and protect water quality and public health. CCSD#1 completed Watershed Action Plans to prioritize Surface Water Management activities, resulting in the recommendation to evaluate the use of Low Impact Development Approaches (LIDA) to manage stormwater runoff. LIDA includes site planning techniques that minimize impervious surfaces while managing stormwater in small facilities, such as rain gardens, swales, and stormwater planters.

Across the country, industry trends suggest LIDA will have an increasing role in stormwater management design and implementation. WES is in the process of engaging community stakeholders to discuss LIDA practices and principles for stormwater mitigation and to test and provide feedback on LIDA site planning and design tools and methods.

## Design Tools

WES has developed free software tools to assist in LIDA site planning and design. The GIS Planning Tool* is an online mapping tool that allows users to print a property report or receive a shapefile with various GIS overlays that provide information to evaluate and assist in site assessment. The BMP (Best Management Practices) Sizing Tool* is a software platform to assist engineers and design professionals in designing LIDA facilities.

WES is seeking public evaluation of these stormwater design tools in order to maximize their usefulness for the development community in pursuing additional options for stormwater management.

**Find out more at RiverHealth.org**

*Currently in beta version

## GIS PLANNING TOOL

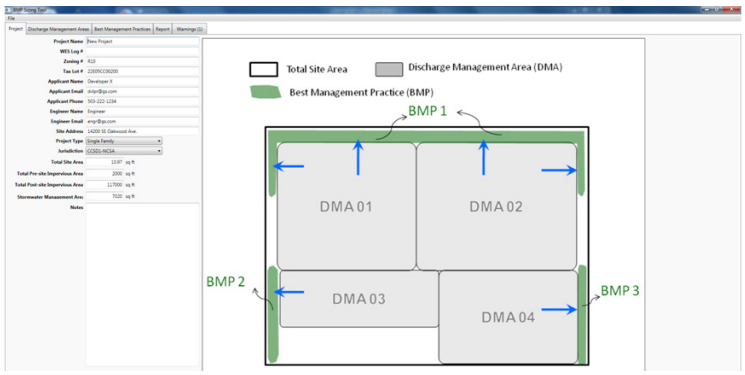
### MAPPING FOR EFFECTIVE SITE PLANNING

The GIS Planning Tool provides site information, including topography, soils, groundwater, hydrology, existing vegetation, environmentaly sensitive areas, land use and zoning, and existing utilities infrastructure. Bringing all of this data together into a printable report or shapefile enables users to quickly assess multiple factors that may influence site assessment, planning and preliminary design.

## BMP SIZING TOOL

### AUTOMATED BMP FACILITY DESIGN

The BMP Sizing Tool allows users to calculate the size of a LIDA facility based on surrounding impervious surface area. The Tool can be used to size a LIDA facility for either treatment and/or flow control design parameters. The BMP Sizing Tool will prepare a summary report of the acceptable design parameters to be included in the Stormwater Management Plan review process.



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FACT SHEET

# Stormwater Management Design Tools

## Case Study: Happy Valley Town Center

The 15.62 acre Happy Valley Town Center site is a commercial development, including a 121,000 sq ft shopping center with 484 parking stalls. The project was planned, designed and constructed with a traditional stormwater management approach, using underground detention and water quality treatment facilities. As a case study, WES evaluated the redesign of the project using the WES LIDA Toolkit. The case study examined the cost comparison between LIDA and the existing method of mitigating stormwater runoff. The same square footage of shopping area and parking stalls were maintained in the LIDA design and the resulting facilities were integrated into the overall landscaping requirements.

The case study indicated an estimated $53,000 savings in the overall construction cost of the stormwater infrastructure had LIDA been utilized during the design and construction of this project.

## CURRENT BUILD

Stormwater Management Construction Costs: $796,976

## LIDA DESIGN

Stormwater Management Construction Costs: $743,912*

## BENEFITS OF LIDA

- LIDA may be less costly than conventional stormwater management strategies.
- In some cases, traditional stormwater ponds and other conventional treatment practices can be eliminated, freeing up land for other improvements.
- LIDA facilities can be incorporated into, and count toward, landscape requirements
- LIDA can be an attractive and more desirable product to the consumer.
- LIDA is a green and sustainable method of improving water quality treatment, protecting public health, and providing a multitude of environmental benefits to the community and watershed.

*As modeled using WES Stormwater Management Design criteria and tools

**STORMWATER MANAGEMENT DESIGN STANDARDS**
**CASE STUDY- SEQUOIA VILLAGE**

The 9.6 acre Sequoia Village site is zoned high density residential. This zoning requires a minimum of 30 dwelling units per acre. The original site design accommodated 276 condominium units. Parking exceeds code requirements with 523 stalls and is provided via private garages on the ground floor of the buildings and as surface stalls. WES current design requirements for stormwater flow control and water quality treatment were met using underground facilities. As a case study, the development was then re-designed using the WES proposed design standards which emphasize a Low Impact Development Approach (LIDA) in order to evaluate the cost difference between LIDA and the current standards. Under the proposed standards, the same number of units is provided and the use of LIDA facilities saves the developer $53,000 in estimated construction costs.

| Element | Current Standards | Proposed LID Standards |
|---|---|---|
| Total Units | 276 | 276 |
| Parking | 523 Stalls (exceeds requirement) | 456 Stalls (meets requirement) |
| Detention/Infiltration Requirement | 368 feet of 48" perforated pipe | 18,652 ft of Vegetated Swales and 917 sq ft of water quality planters |
| WQ Treatment Requirement | CDS Media Filtration System: 70 filter cartridges | Met with swales and wq facilities listed under detention above. |
| Total Stormwater Management Construction Costs | $796,976 | $743,912 |
| Cost Difference | | **$53,064 in cost savings** |

## Current Standards

## Proposed Standards

Additional benefits of LIDA include:

- LIDA is often less costly than conventional stormwater controls. LIDA practices can be cheaper to construct and maintain and have a longer life cycle cost than centralized stormwater strategies.
- The need to build and maintain stormwater ponds and other conventional treatment practices will be reduced and in some cases eliminated. Developers benefit by spending less on pavement, curbs, gutters, piping, and inlet structures.
- LIDA facilities can be incorporated into (and counts toward) County landscape requirements
- LIDA creates a desirable product that often sells faster and at a higher price than equivalent conventional developments.
- LIDA improves environmental quality, protects public health, and provides a multitude of benefits to the community.

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**STORMWATER MANAGEMENT DESIGN STANDARDS**
**CASE STUDY – HAPPY VALLEY TOWN CENTER**

The 15.62 acre Happy Valley Town Center site is a commercial development. The project was originally designed and constructed as a 121,095 sq ft shopping center with 484 parking stalls. All commercial developments within the City of Happy Valley are required to have 15% of their parking area landscaped. WES current stormwater design requirements were met using underground detention and water quality treatment facilities. As a case study, the project was then re-designed using the WES proposed design standards which emphasize a Low Impact Development Approach (LIDA) techniques in order to evaluate the cost difference between LIDA and the current standards. Under the proposed standards, the same square footage of shopping area and parking stalls were provided and LIDA stormwater facilities were integrated into the landscaping requirement. If LIDA had been utilized during the design and construction of this project, it would have resulted in an estimated $60,000 savings in construction cost to the developer

| Element | Current Standards | Proposed LIDA Standards |
|---|---|---|
| Total Building Area | 121,000 sq. ft. | 121,000 sq ft. |
| Parking | 484 | 484 |
| Detention/Infiltration Requirement | 33,000 cu ft underground detention: 420 ft of 120-inch metal pipe + 200 ft of 18" perf. pipe. | 16,050 sq ft of Vegetated swales/planters . |
| WQ Treatment Requirement | Three Downstream Defenders | Met with swales and wq facilities listed under detention above. |
| Total Stormwater Management Construction Costs | $716,000 | $656,000 |
| Cost Difference | | **$60,000 in cost savings** |

## Current Standards

## Proposed Standards

Additional benefits of LIDA include:

•LIDA is often less costly than conventional stormwater controls. LIDA practices can be cheaper to construct and maintain and have a longer life cycle cost than centralized stormwater strategies.

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**STORMWATER MANAGEMENT DESIGN STANDARDS**
**CASE STUDY – GREENBRIAR SUBDIVISION**

The 15.62 acre Greenbriar residential community was originally developed with 59 single family lots averaging 7,100 sq feet in size. The WES stormwater design requirements for water quality and detention were met with a traditional detention/water quality pond. As a case study, the project was then re-designed using the WES proposed design standards which emphasize a Low Impact Development Approach (LIDA) in order to evaluate the cost difference between LID A and the current standards. Under the proposed standards, the number of buildable lots rose to from 59 to 61. The overall lot yield was increased by using water quality swales distributed throughout the development and along the road-right-of way rather than a traditional treatment pond. A detention facility was still needed but required less land area to build. If LIDA had been utilized during the design and construction of this project, it would have resulted in an additional cost of $384.00 per lot in construction cost to the developer but a net gain of two additional buildable lots.

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| Element | Current Standards | Proposed LIDA Standards |
|---|---|---|
| Total Dwelling Units | 59 | 61 |
| Detention/Infiltration Requirement | 0.33 Acre Detention/Water Quality Pond | 0.078 Acre Detention Pond |
| Water Quality Requirement | See above | 0.091 Acres total of LIDA Water Quality Swales (Distributed) |
| Total Stormwater Management Construction Costs | $299,365<br>$5,073 per lot<br>(59 lots) | $332,933<br>$5,457 per lot<br>(61 lots) |
| Cost Difference | | **+ $33,558**<br>**= Two Additional Buildable lots** |

## Current Standards

## Proposed Standards

Additional benefits of LIDA include:
•LIDA is often less costly than conventional stormwater controls. LIDA practices can be cheaper to construct and maintain and have a longer life cycle cost than centralized stormwater strategies.
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•LIDA facilities can be incorporated into (and counts toward) County landscape requirements
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# Water Environment Services

## Supporting Industry with Stormwater Design Tools

Water Environment Services

*Beyond* clean water.

www.clackamas.us/wes

# Trends in stormwater management

- Industry trends suggest low impact development approach (LIDA) will have an increasing role in stormwater management design and implementation
  - Produces attractive natural designs for consumers
  - Creative way to meet water quality standards
  - Relieves pressure for new treatment capacity investments

# Partnership with our construction industry

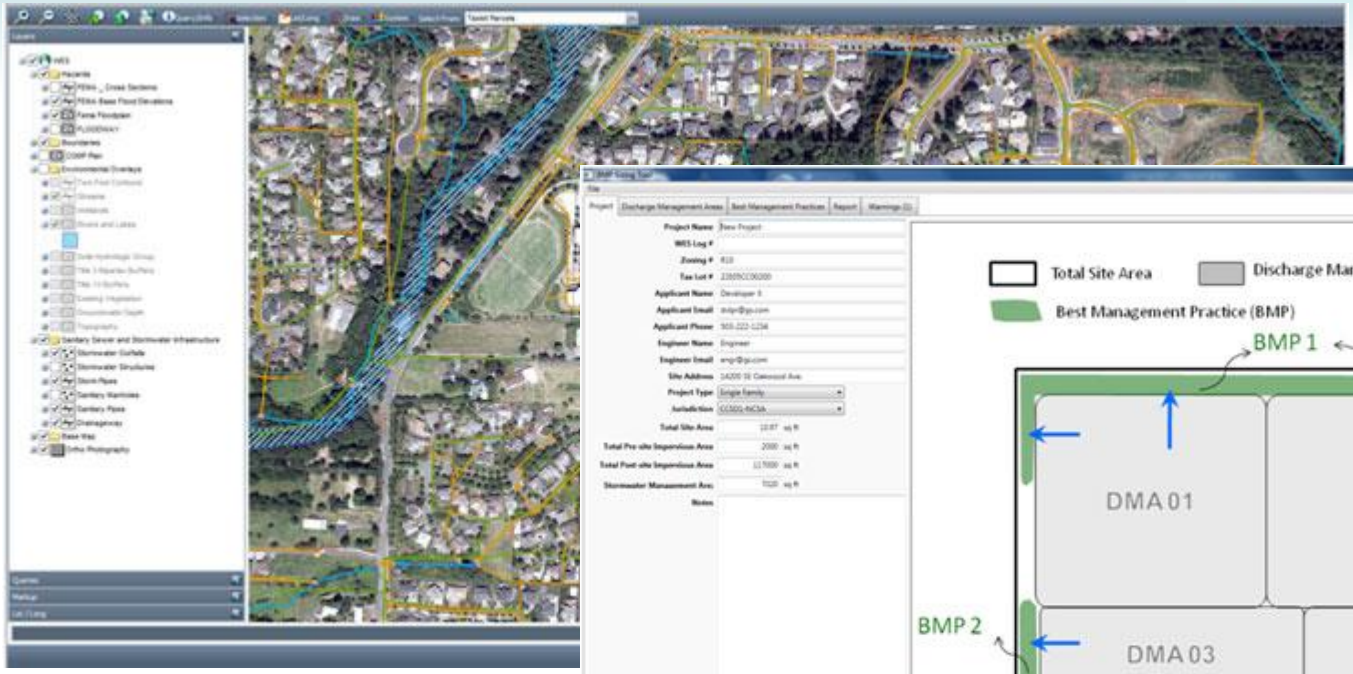
- WES created online tools to help industry implement LIDA and streamline permitting
  - Tools are a free service and not required
  - Not associated with permitting rules or new regulations
- Home Builders Association and WES will test and refine the tools throughout 2014

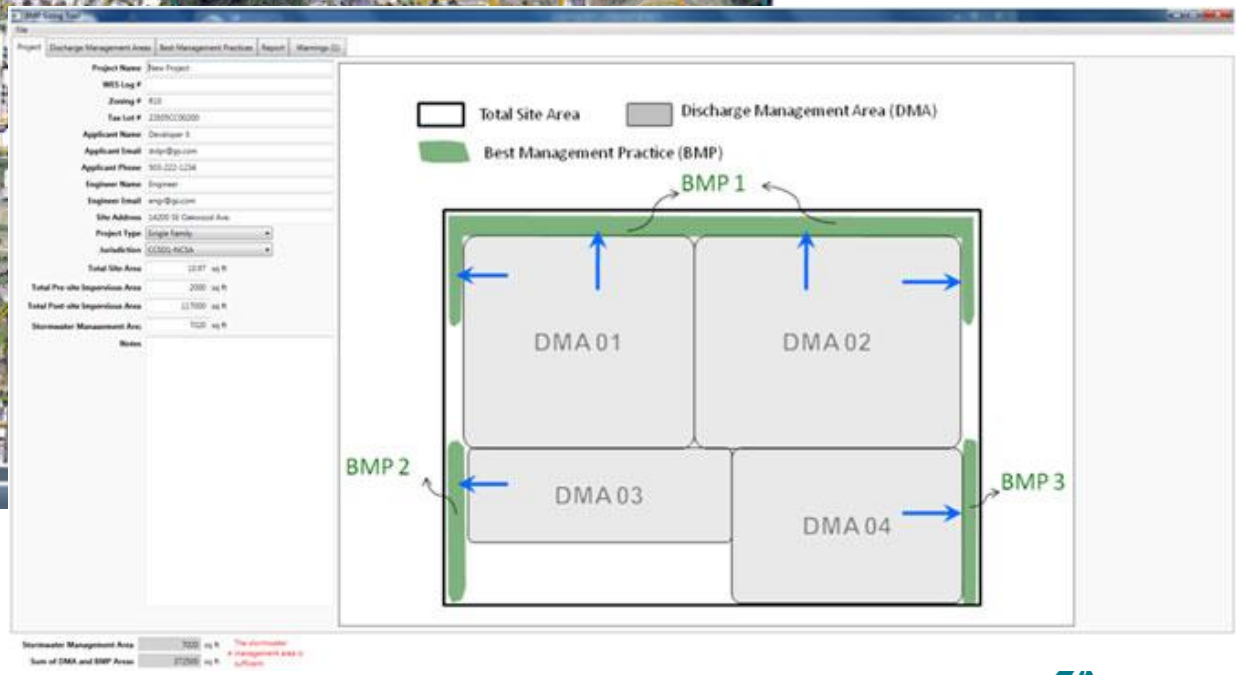
# WES Goals

- → Make sure tools work for users!
- → Make potential users aware of the tools
- → Create consistency and predictability to reduce cost while meeting all environmental requirements

# Stormwater design tools

## GIS Planning Tool






## BMP Sizing Tool

# What is a low impact development approach (LIDA)?

Centralized vs.

Decentralized controls

# Conventional stormwater management solution

# Low impact development examples: rain gardens

SE Logus Rd., Milwaukie

Hoodview Park, Happy Valley

Water Environment Services
www.clackamas.us/wes

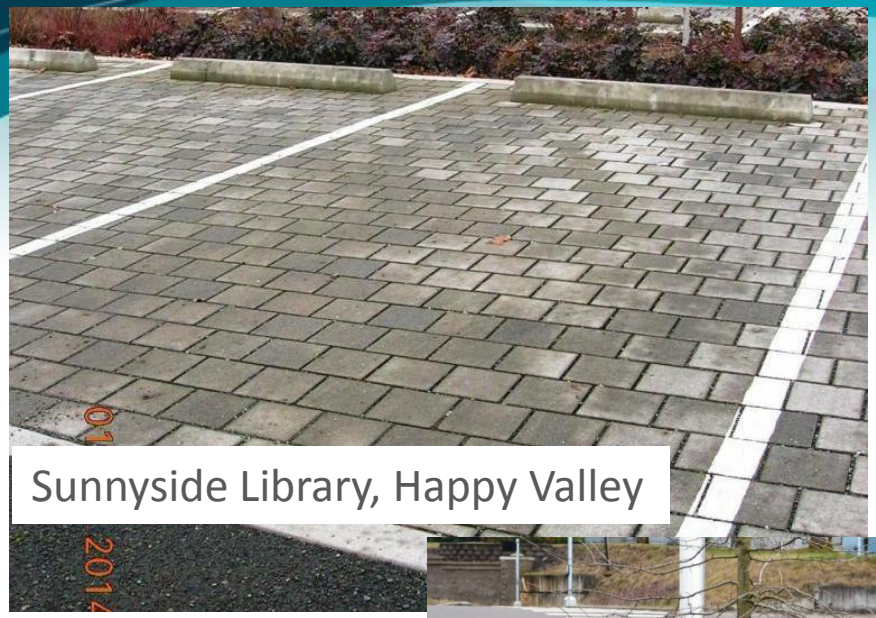
# Low impact development examples: swales

Sunnyside Library, Happy Valley

Warner Milne Rd., Oregon City

Taralon, Happy Valley

# Low impact development examples: porous paving, stormwater planters



Sunnyside Library, Happy Valley

Clackamas View Care Facility, Milwaukie

SE 172nd Ave.,
Happy Valley

Water Environment Services
Beyond clean water. www.clackamas.us/wes

# Case study:
# Red Soils Campus

# Case study: Red Soils Campus

# Putting it all together on the ground

- → Test the tools before releasing: use our tools to re-design existing built projects for comparison
- → Engineer/landscape architect team from Cardno developed 3 case studies to determine feasibility and impact to development

# Case study: Sequoia Village

Current design

**Proposed design**

# Case study: Sequoia Village

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| Housing units | 276 | 276 |
| Parking | 523 (exceeds req't) | 456 (meets req't) |
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| WQ treatment | CDS Media Filtration System, 70 filter cartridges (proprietary devices) | Swales and stormwater planters |
| Stormwater mgmt const. costs | $796,976 | $743,912 |
| Cost difference | | $53,064 cost savings |

# Case study: Happy Valley Town Center

Current design

**Proposed design**

# Case study: Happy Valley Town Center

| Element | Current design | Proposed design |
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| Commercial bldg space | 121,000 sf | 121,000 sf |
| Parking | 484 | 484 |
| Detention/infiltration | 33,000 cf underground detention (420 ft of 120" metal pipe & 200 ft of 18" perf pipe) | 16,050 sfvegetated swales & stormwater planters |
| WQ treatment | 3 "Downstream Defenders" (proprietary devices) | Swales & stormwater planters |
| Stormwater mgmt const. costs | $716,000 | $656,000 |
| Cost difference | | $60,000 cost savings |

# Case study: Greenbriar subdivision

Current design

**Proposed design**

# Case study: Greenbriar subdivision

| Element | Current design | Proposed design |
|---|---|---|
| Lots | 59 | 61 |
| Detention/infiltration | 0.33 ac detention/water quality pond | 0.078 ac detention pond |
| WQ treatment | 0.33 ac detention/water quality pond | 0.091 ac vegetated swales |
| Stormwater mgmt const. costs | $299,365 or $5,073 per lot | $332,933 or $5,457 per lot |
| Cost difference | | +$33,558<br>Two additional buildable lots |

# Next steps

- → Need to test usability of the tools
- → Work with developers and their engineers to test - Home Builders Association has expressed interest in the tools
- → Participation is *optional*

# Questions?

Protect Our Local Rivers and Streams
This facility filters stormwater runoff to protect public health and local rivers and streams.
City of Happy Valley
Water Environment Services
Beyond clean water.
RiverHealth
Clackamas County Service District No. 1
To find out more about maintenance, or impacts to water quality in this facility, please call (503) 742-4567 or visit us online at www.RiverHealth.org