

Appendix F

***Post-Construction Stormwater
Management in New and Redevelopment***

CERTIFICATE OF PARTICIPATION

AWARDED TO

Wendy Edde

FIFTEEN (15) CONTINUING EDUCATION HOURS

FOR ATTENDING

VEGETATED PRIVATE WATER QUALITY
MANAGEMENT TRAINING

MAY 23 & 25, 2016

CleanWater Services




**Portland
Community
College**

Tony Gilbertson

David Sandrock

Post-Construction Stormwater Controls— Behind the Scenes in Bend

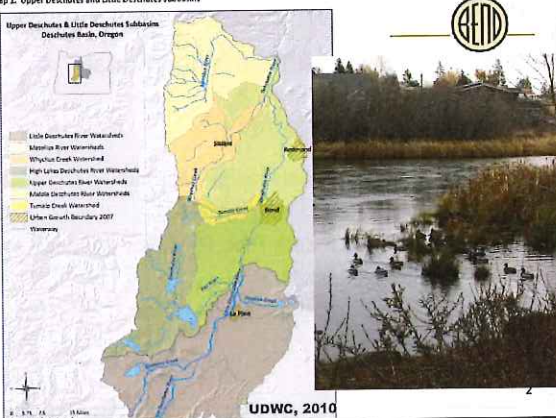
Center for Watershed Protection



Wendy Edde, CSM
Stormwater Program Manager
November 18, 2015

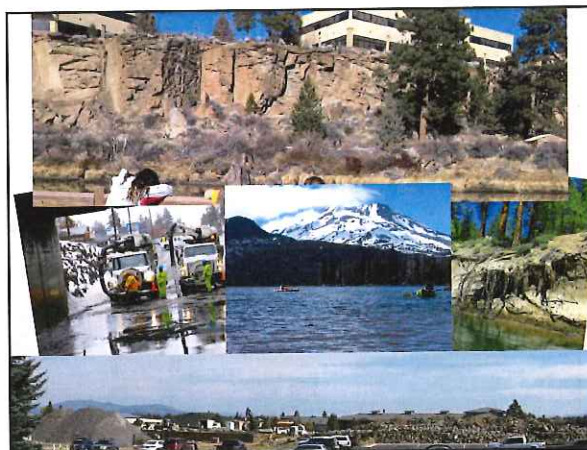
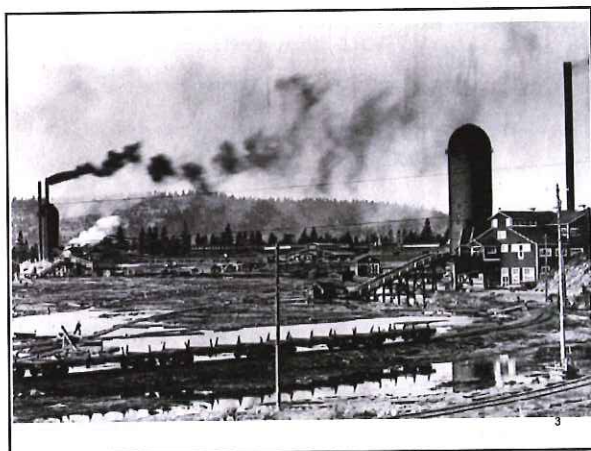
1

Map 1. Upper Deschutes and Little Deschutes Subbasins
Deschutes Basin, Oregon



UDWC, 2010

2



Bend's MS4 System Location

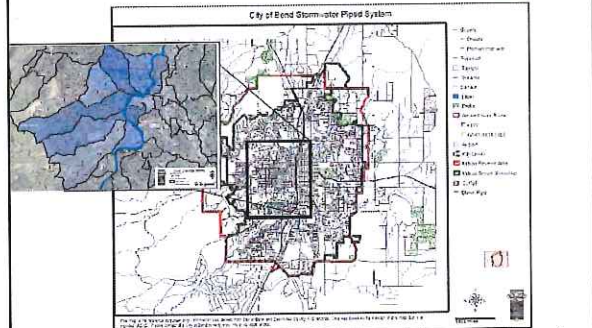


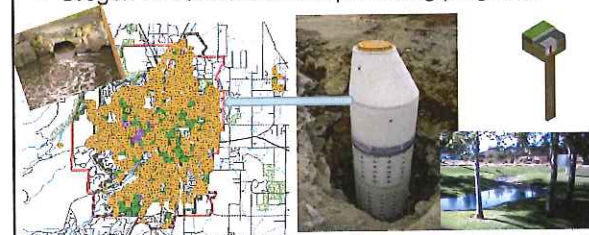
Figure 2: Vicinity of City of Bend's MS4 System

5

Overview – Stormwater in Bend

<p>Surface Water To Deschutes River (currently 28 outfalls)</p>	<p>Groundwater Infiltration and/or Underground Injection Controls (UIC) (5,600 City owned UICs)</p>
--	--

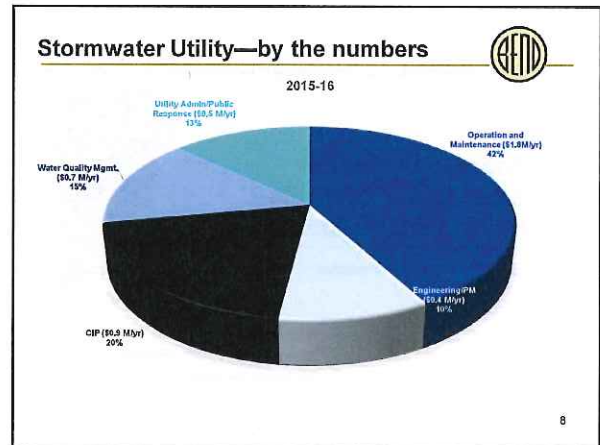
- Oregon DEQ oversees the permitting programs



Post-Construction Controls

- NPDES Phase II Permit--individual
- SWMP Requirements
 - Develop Regional Design Manual
 - Establish O&M Program
 - Evaluate & Update Plan Review & Inspection
 - Provide Education
 - Develop Performance Standards

7



Understand What We Have

- Policy, Code, Ordinance Review
- GPS All Facilities
- Our systems:
 - Ambient Water Quality Monitoring
 - Wellhead Protection Area Delineation

9

Collaborate

Development Rule Update Highlights

- Comprehensive Policy, Code & Ordinance Review (2007- 2008)
- Development of Central Oregon Stormwater Manual (2005-2010)
- Update Standards and Specs (2010-2011)
- Development of Draft Ordinance (2008- 2012)

- Interdepartmental / Regional Coordination
- Public Advisory Group Reviews
- Broad public outreach

10

Central Oregon Stormwater Manual

- Includes Design, Source Control, LID, Maintenance
- Design:
 - Quantity: 25 year/24 hour Type I Storm (2.5" storm depth), Safe Passage 100 year (3.1" storm depth)
 - Water Quality: 6 mth/24 hr Storm (1" storm depth)
- Benefits: Regional Consistency, Sound Science for Our Area
- Revisions 2010

11

Standards and Spec Update-2011

12

Post-Construction: Section 16.10 & 16.15

Previous

- Minor / Major Grading permit & Drainage Review
No Design Guidelines →
- Unclear enforcement authority
- Keep all storm water on site →
- Encourages Specific Low Impact Development (LID)

Bend Code Title 16

- One permit and Drainage Review
- Provides Design Guidelines via Central Oregon Stormwater Manual
- Clear enforcement authority
- 25-year, 24-hour design storm Safe overflow path for 100-year storm event *or* no increase to pre-development runoff (Oregon Drainage Law)
- Maintenance Required
- Encourages LID

13

Maintenance Considerations

- Maintenance Agreement
- Central Oregon Stormwater Manual Inspection Checklists
- Future: Incentive Program

STORMWATER MANAGEMENT FACILITIES MAINTENANCE AGREEMENT
The Stormwater Management Facilities Maintenance Agreement (Agreement) is between the City of Bend, Oregon (City) and GIBB GROUP LLC, LORR, JENNA LLC, C & V SERVICES LLC, WITH RESOURCES LLC AND URBAN BEND LLC (Property Owner).

RECITALS

A. To comply with the City's obligations under the Clean Water Act, Safe Drinking Water Act, and other federal and state law, and general requirements, the City shall require that all stormwater facilities are properly operated and maintained by entities responsible for those facilities. The Property Owner is the holder of the property interests known as 2711 Hill View Drive, Bend, Oregon County Assessor's Map 10-2-2002, Tax ID 201. Later described as Parcel 1 of Parcel 1 known as 2711 Hill View Drive (the Property) and more particularly described as the parcel, Exhibit A-1 of the Stormwater Management Facilities Manual.

TERMS OF AGREEMENT

SECTION 1: CONSTRUCTION, OPERATION AND MAINTENANCE OF FACILITIES
Property Owner shall construct, operate and maintain the Facilities in full accordance with the





City of Bend

Private LID: Disconnected




City of Bend

Keeping Stormwater Onsite



Turf Block/Porous Asphalt



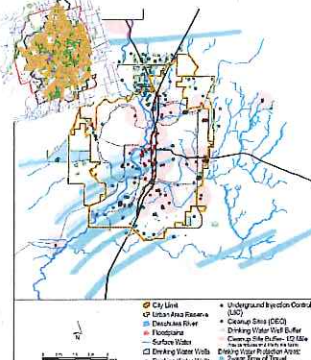
City of Bend

Regulatory Influence: UICs

Circa 2006-2008

- Remove Storm UICs from wellhead protection areas (10 yrs)
- Place Approved Controls on Rest
- Register and Rule Authorize/Permit

\$150 million public system cost anticipated to meet regulatory water quality requirements

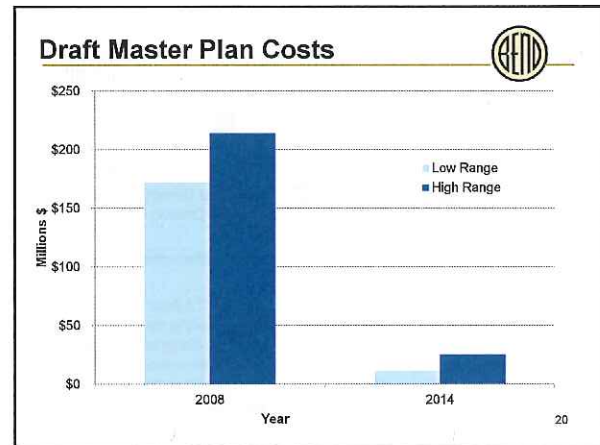


18

Approach

- Advocate for Science-based Policy
- Coordinate Regionally and Statewide
 - Stormwater Quality Data Review
 - Groundwater Protectiveness

19



Addressing UIC Spill Risk

21

Future Improvements

- Tailoring Treatment to Area
- Maintenance Incentive Program
- Refinements with Lesson's Learned
 - Utility Code Enforcement
 - Continue Evaluations
- Improve Private Database
- Addressing Regulatory Changes
 - MS4 NPDES Reissuance
 - TMDLs

Photo Credit: Chris Hart-Henderson


22

Old Mill Today

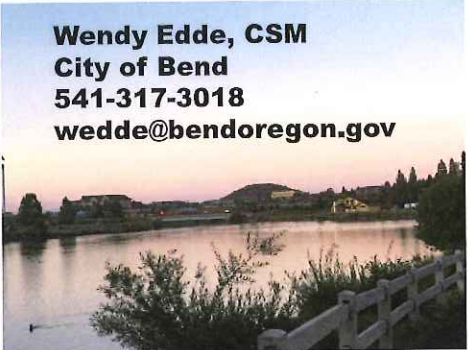
23

Old Mill Today

24



Wendy Edde, CSM
City of Bend
541-317-3018
wedde@bendoregon.gov



25



Webinar Evaluation Summary

Center for Watershed Protection
Checking in on stormwater Management

UTILITY DEPARTMENT

November 18, 2015

The webinar had 4 attendees, 3 of which completed an evaluation form that is summarized below.

1. Please Rate the presentation (1 being poor, 3 average, 5 Excellent)				
1	2	3	4	5
0% (0)	0% (0)	33% (1)	66% (2)	0% (0)

Comments:

2a. Please Rate the Facility (1 being poor, 3 average, 5 Excellent)				
1	2	3	4	5
0% (0)	0% (0)	33% (1)	66% (2)	0% (0)

2b. Please Rate the Refreshments (1 being poor, 3 average, 5 Excellent)				
1	2	3	4	5
0% (0)	33% (1)	0% (0)	66% (2)	0% (0)

Comments:

3. Please list one thing you learned:

- Adopt a swale can help offset maintenance costs.

4. Please provide any additional comments/ suggestions for improvements, or for other training that you find useful:

- One too many speakers, lost the group with the last presentation
- Prefer line/ retimed training over pre-recorded trainings

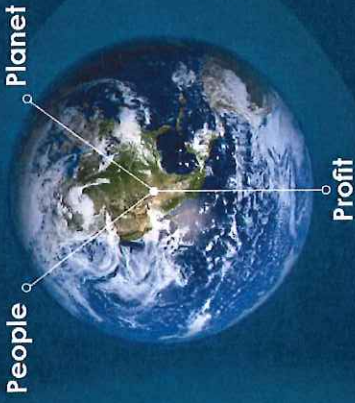


USEPA's **Faster...Cheaper...Greener**

Webcast Series

21st Century Innovation and Design for the Triple Bottom Line

**“Connecting Natural and Built Systems for
Economic Growth & Resiliency”**



This certificate is presented to:

Wendy Ede

Participant's Name

for successfully completing

Biophilic Design for Human Health

Course Title

Dominique Lueckenhoff

Deputy Director, Water Protection Division,
EPA Region 3 Water Protection Division

November 5, 2015, 1:00 – 2:30 pm, 1.5 hours

Date of Participation, Duration of Course

THANK YOU FOR ATTENDING!

Environmental Protection Agency

Biophilic Design for Human Health

Date: November 5, 2015 Time: 10:00 am to 11:30 am



UTILITY DEPARTMENT

PLEASE SIGN IN

	Name	Signature	Affiliation
1	Wendy Edle	Wendy Edle	
2	David Buchanan	David Buchanan	
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

T

J

C

