



CITY OF BEND

## 2014-2015 ANNUAL REPORT

**STORMWATER NPDES PERMIT No. 102901**  
**STORMWATER UIC WPCF PERMIT No. 103052**

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### National Pollutant Discharge Elimination System Municipal Separate Storm Sewer Annual Report

### Underground Injection Control System Annual Report



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*October 29, 2015*





FY 2014-2015 NPDES Annual Report

## City of Bend

### Certification Regarding the City of Bend NPDES Municipal Stormwater Annual Report

*"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information; the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."*

A handwritten signature in blue ink, which appears to read "Jon Skidmore", is written over a horizontal line.

**Jon Skidmore**  
**Assistant City Manager, Operations**  
**City of Bend**  
**October 29, 2015**





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**National Pollutant Discharge Elimination System  
Municipal Separate Storm Sewer Annual Report**

**Underground Injection Control System Annual Report**

*October 29, 2015*

*Prepared by:*

**City of Bend  
Utility Department  
Stormwater Utility**

62975 Boyd Acres Road  
Bend, OR 97701

<http://bendoregon.gov/stormwater>  
541-317-3000



**Accommodation Information for People with Disabilities**

To obtain this information in an alternate format such as Braille, large print, electronic formats and audio cassette tape, please contact Karin Morris at (541)693-2141, or email [Kmorris@bendoregon.gov](mailto:Kmorris@bendoregon.gov).

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## ACRONYMS AND ABBREVIATIONS

ACWA	Association of Clean Water Agencies
APWA	Association of Public Works Agencies
ASCE	American Society of Civil Engineers
BEDAB	Bend Economic Development Advisory Board
BMPs	Best Management Practices
BOPA	Batteries, Oil, latex Paint, and Antifreeze
City	City of Bend, Oregon
CMP	Congestion Management Plan
COBA	Central Oregon Builders Association
COIC	Central Oregon Intergovernmental Council
COSM	Central Oregon Stormwater Manual
CTF	Stormwater Utility Fee Citizen’s Task Force
DEQ	Oregon Department of Environmental Quality
DHS	Oregon Department of Health Services
DWPA	Drinking Water Protection Areas
EPA or US EPA	United States Environmental Protection Agency
ERU	Equivalent Residential Unit
FOG	Fats, Oil, Grease
FTE	Full Time Equivalent
FY	Fiscal Year
GIS	Geographic Information System
GPS	Geographical Positioning System
HHW or HHHW	Household Hazardous Waste
IAC	Utility Infrastructure Advisory Committee
IECA	International Erosion Control Association
IPM	Integrated Pest Management
ISWMP	Integrated Stormwater Management Plan
LID	Low Impact Development
MEP	Maximum Extent Practicable
Monitoring Plan	<i>City of Bend Water Quality Monitoring Plan</i>
MS4	Municipal Separate Storm Sewer System
NHD	High-Resolution National Hydrography Data Set
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
O & M	Operation & Maintenance
OEC	Oregon Environmental Council
OLCA	Oregon Landscape Contractors Association
PAG	Stormwater Quality Public Advisory Group
PCBs	Polychlorinated Biphenyls
PCOs	Pest Control Operators
PEO	Professional Engineers of Oregon

PIP	Public Involvement and Participation
POCs	Pollutants of Concern
	City of Bend Ambient Water Quality Monitoring Project
QAPP	Quality Assurance Project Plan
SWAT	Stormwater Action Team
SWMP	Storm Water Management Plan or Program
SWPPP	Storm Water Pollution Prevention Plan
TDM	Transportation Demand Management
TMDL	Total Maximum Daily Load
UDWC	Upper Deschutes Watershed Council
UGB	Urban Growth Boundary
UIC	Underground Injection Control; drywell or drill hole
USGS	United States Geologic Survey
WHPA	Wellhead Protection Area
WPCF	Water Pollution Control Facility





# 1.0

## INTRODUCTION

### Background

The City of Bend is both a National Pollutant Discharge Elimination System (NPDES) designated small Municipal Separate Storm Sewer System (MS4) owner and operator, and a stormwater underground injection control (UIC) owner and operator. As such, the City is required to meet the requirements of NPDES Permit No. 102901 (DEQ File No. 113602) that it received on February 26, 2007 from the Oregon Department of Environmental Quality and of Water Pollution Control Facility-Underground Injection Controls (WPCF-UIC) Permit No. 103052 (DEQ File No. 112361) that it received on May 14, 2013.

The NPDES permit requirements are based on the federal Clean Water Act (33.U.S.C. §1342(p)), as amended, along with federal Environmental Protection Agency (EPA) regulations for MS4 discharges. The permit authorizes the discharge of stormwater from all municipal separate storm sewer system outfalls owned and operated by the City. The City has 28 outfalls to the river that serve a portion of the City along the Deschutes River and West Hills. Privately owned and maintained entities, such as the Old Mill District and specific subdivisions in town that do not discharge to the City's MS4 system, are outside of the City's direct jurisdiction with respect to the NPDES permit. The City has applied for renewal of its NPDES permit and is working with DEQ to negotiate the terms for the next five year permit. In the meantime, the City's permit coverage is extended through the negotiation period under the existing permit, and so the City must continue to implement the Integrated Stormwater Management Plan (2006) during this time.

Per item 1 of the NPDES permit's Schedule C, Compliance Conditions and Schedules, initial implementation of the approved stormwater management plan (the City's *Integrated Stormwater Management Plan* (ISWMP)), was required to begin by July 31, 2007. The ISWMP (2006) described the activities the Program would implement during the City's first 5-year NPDES permit period. These activities are divided among the following major components of the Program:

- Overall Program Administration, Planning and Financing;
- Public Education and Outreach;
- Public Involvement and Participation;
- Illicit Discharge Detection and Elimination;
- Construction Site Stormwater Management;
- Post-Construction Stormwater Management in New and Redevelopments;

- Municipal Operations and Maintenance—Pollution Prevention and Good Housekeeping;
- Monitoring;
- Drinking Water Protection Areas: Investigation, Re-Delineation and Management.

On May 14, 2013, the City received its first Water Pollution Control Facility Permit (WPCF) for Underground Injection Controls (UIC) under the federal Safe Drinking Water Act and Oregon Administrative Rules. This permit covers the City's drywells and drill holes that inject stormwater into the ground. The WPCF permit allows the City to operate Underground Injection Control systems to manage stormwater. Starting in FY2013-14, the City began implementing the Integrated Stormwater Management Plan 2022 (2012) that was accepted under the City's WPCF-UIC permit and is being considered for the NPDES permit reissuance negotiation.

### **Contents of the Annual Report**

This represents the ninth Annual Report submitted to the DEQ and describes stormwater quality and pollution prevention activities implemented by the City during Fiscal Year 2014-2015 (July 2014 through June 2015). As quoted from item 2 of the NPDES permit's Schedule B, Monitoring and Reporting Requirements, the annual report must contain the following:

- a) The status of compliance with permit conditions, an assessment of the appropriateness of the identified BMPs, progress towards achieving the statutory goal of reducing the discharge of pollutants to the MEP (maximum extent practicable), and the measurable goals for each of the minimum control measures;
- b) Results of information collected and analyzed, if any, during the reporting period, including evaluation criteria used to assess the success of the program at reducing the discharge of pollutants to MEP;
- c) A summary of the stormwater activities the permittee plans to undertake during the next reporting cycle, including a schedule for implementation;
- d) A description of changes made to the SWMP, including changes to BMPs or measurable goals identified in the SWMP;
- e) Information on all new additions or removals of annexed areas that result in an expansion or contraction of the MS4's boundaries;



- f) Notice that the permittee is relying on another government entity to satisfy some of the permittee's permit obligations (if applicable); and,
- g) Number and nature of enforcement actions taken.

Per subsection 4. of the City WPCF-UIC permit, the annual Underground Injection Control System Report must:

- a. Include stormwater monitoring reports conducted in accordance with their Stormwater Monitoring Plan, including a spreadsheet of all data from sampled UICs provided in the analytical laboratory reports;
- b. Discuss any action level exceedances (outlined in Permit Table 1) and actions taken to address the exceedances;
- c. Describe any actions taken to implement the Underground Injection Control System Management Plan required in Schedule D, condition 5, any proposed modifications to the Underground Injection Control System Management Plan, and any additional actions taken to manage the City's injection systems to ensure groundwater protection;
- d. Describe any actions described in your Underground Injection Control System Management Plan that you were not able to complete and why;
- e. Identify any injection systems that you closed, retrofitted, or installed during the year;
- f. Describe your future (in the next year) known plans to install, modify, convert, or close any underground injection systems; and
- g. Provide one hard copy and one electronic copy of the annual Underground Injection Control System Report to DEQ.

The Annual Report contains detailed information on each component required by both permits, including the purpose and general strategy of the component; the tasks completed; an assessment of the effectiveness of activities conducted in reducing or preventing stormwater pollution; and a summary, by individual component, of modifications proposed to the ISWMP per the review conducted this fiscal year. Tables or documents produced under each task are presented in an appendix at the end of each component section. At the end of each task header throughout the report, a notation is included as to whether the task applies to the City's Municipal Separate Storm Sewer System (MS4), which is the piped system that drains to the Deschutes River or other surface waterbody, or to Underground Injection Controls (UIC) or both. The stormwater quality regulatory requirements are different depending on whether the stormwater discharges through an MS4 or UIC system.





# 2.0 OVERALL PROGRAM MANAGEMENT AND LEGAL AUTHORITY

## Introduction

This section describes the overall administrative and management support functions that the City provides to operate and manage the stormwater quality program. This section also describes activities to ensure adequate legal authority and facilitate enforcement of the City's environmental codes related to water quality. In general, the City's stormwater staff are responsible for the overall coordination of the Integrated Stormwater Management Plan (ISWMP) (2006) and ISWMP 2022 (2012). However, several City departments assist the stormwater utility staff with the coordination and implementation of the tasks, taking direct responsibility for some tasks.

## Tasks Completed (ISWMP (2006))

The following ISWMP standard and steady improvement tasks have been completed or are ongoing:

### Task II.1 Administration and Coordination (MS4/UIC)

**Stormwater Coordinators.** The City exceeded the requirement of having interdepartmental stormwater coordination meetings at least four times per year in FY2014-15. Stormwater Coordinators consist of multiple intra-agency groups that focus on coordinating on stormwater issues, taking the duties of the now-defunct Stormwater Action Team (SWAT) that was active in the initial years of the utility. Stormwater Coordinators are comprised of Stormwater Liaisons, higher management involved with the Economic Development and Infrastructure Strategic Management (EDISM), and subgroups of these. The Stormwater Liaisons consists of representatives from multiple departments that focus on stormwater issues. Stormwater items that require coordination at the highest department-head level are handled through the standing EDISM committee, a City management and department head level coordination committee. This committee discussed the timing of Stormwater Public Facilities Plan and utility budgeting and rates across multiple meetings in FY2014-15. To increase efficiency, the City targeted meetings with subgroups of this Liaisons group and other sub group members on specific issues this year including one-on-one meetings.

City staff also continued to participate in the Galveston Improvement project planning efforts. The project purpose is "to create a collective effort of business owners, property owners, and neighboring residences to enhance economic vitality, improve pedestrian and bicycle safety and effectively manage stormwater

along the Galveston corridor (See <http://www.bend.or.us/index.aspx?page=1240> for project details).

Meeting agendas and sign-in sheets for EDISM and Stormwater Liaisons meetings specific to stormwater are included in Appendix A. Additional ad hoc meeting summaries are available upon request.

Organization charts of stormwater utility staff are included in Appendix A.

**Planning Commission.** The City Planning Commission reviewed the Stormwater Public Facilities Plan in October and November 2014 (see Appendix C).

**City Council.** City staff brought the following stormwater presentations and issues before the Council in FY2014-15: Stormwater Master Plan public hearing and consideration for adoption (August 6, 2014); Stormwater Public Facilities Plan public hearing and consideration for adoption (December 3, 2014 and December 17, 2014). The passage of the Stormwater Public Facility Plans met one of the 2014 City Council Goals and Priority Projects for Infrastructure (see Appendix A). As in past years, City staff notified City Council of the availability of the stormwater quality annual report through a written message in the weekly City Manager memorandum to Council in the November 7, 2014 memorandum, (see Appendix A). City Council was also kept apprised of Mirror Pond project updates, which include proposals for stormwater improvements.

**Other.** Coordination also occurred external to City staff. This included coordination of the Stormwater Quality Public Advisory Group and participation in other local, regional and statewide groups.

*Public Advisory Groups.* The City's Stormwater Quality Public Advisory Group (PAG) provided input to staff on stormwater quality issues and projects during the year; see Task IV-1 for more details.

*Regional and Statewide Groups.* City staff served on the Board of the Oregon Association of Clean Water Agencies (ACWA), and participated on the Groundwater Committee, Stormwater Committee, and Public Education committees. Staff also led the illicit discharge detection and elimination outreach subgroup that is working to revise and develop multiple best management practices fact sheets and booklets to aid in minimizing illicit discharges. Drafts of a pressure washing fact sheet and booklet were created during FY2014-15.

Additionally, City managerial staff actively participated in the Pacific Northwest Clean Water Agencies and the American Water Works Association. At the annual ACWA conference in July 2014, City stormwater staff moderated a session and also coordinated and provided a walking tour of area Low impact

Development facilities to interested conference attendees. City staff is also participating in the statewide DEQ Technical Advisory Committee for the MS4 permit. Tom Hickmann, EIPD Director, provided a presentation on UICs and groundwater contamination to the Pacific Northwest Section of the AWWA at a spring 2015 workshop. On February 12, 2015, the City's Stormwater Program Manager provided a presentation to the High Desert Green Industry Conference held in Redmond on, "WaterWise Landscaping: Considerations for Reducing Pollutants and Maintaining Landscaped Stormwater Facilities."

The City of Bend is an Accredited Public Works Agency, which it earned through the American Public Works Association. The accreditation process includes review of the City of Bend's stormwater activities and processes. City staff successfully underwent its second reaccreditation in FY2014-15.

*Effectiveness.* As described above, there was a large amount of coordination in FY2014-15, but with a greater emphasis on more focused meetings to increase efficiency as workload pressures increased with an improving economy. Together the Stormwater Coordinators (which have taken the place of the former Stormwater Action Team) exceeded the measurable goals for FY2014-15. The City has effectively worked to further incorporate ad hoc task groups to improve efficiency and effectiveness with key staff people on smaller implementation projects.

#### Task II.2 Legal Authority (MS4/UIC)

The goal of this task is to ensure that the City has the legal authority to implement the various elements of the ISWMP. Securing adequate legal authority has been a top priority in developing the stormwater quality program. On December 6, 2006, the Bend City Council adopted the Integrated Stormwater Management Plan. Since the adoption of the ISWMP, the Bend City Council has passed several resolutions establishing the stormwater utility and ensuring adequate funding will be available to the stormwater utility.

In 2011, the City adopted an updated Standards and Specifications that strengthened and clarified stormwater requirements and adopted the Central Oregon Stormwater Manual (August 2010). On January 4, 2012 the City Council adopted Bend Code Title 16 a comprehensive management stormwater ordinance covering clearing, grading and erosion control on construction sites; stormwater management design standards and maintenance controls; illicit discharge controls; well drilling; and stormwater drainage utility. (See Appendix A of the FY2011-12 Annual Report for the full title).

In FY2014-15, the City's finalized the Stormwater Master Plan on August 6, 2014 by unanimous decision. The Stormwater Master Plan formed the basis for the City's first Stormwater Public Facilities Plan, developed by the City to meet State

land use OARs Goal 11. The City adopted its first Stormwater Public Facilities Plan (PFP) and Findings at the December 17, 2014 City Council meeting. These documents have both helped the City meet State Goal 11 requirements. The City submitted the notice of adoption to the Oregon Department of Land Conservation and Development (DLCD) on December 22, 2014, which opened a 21-day appeal period. With no appeals filed, the PFP has been acknowledged by DLCD.

*Effectiveness.* The City has met its measurable goals for all subtasks. Over the initial NPDES MS4 permit term, the City has successfully passed resolutions and an ordinance to set up the stormwater utility, adopted the improved standards and specifications, and adopted the new stormwater ordinance, Bend Code Title 16. The City continues to work in a thorough, planned approach to address stormwater improvement opportunities as they arise.

### Task II.3 Financing (MS4/UIC)

Over the course of the Integrated Stormwater Management Plan (2006) planning period, the City has adopted several resolutions and Title 16 that established a stormwater utility with enterprise funding through monthly service charges based on impervious surface coverage. The rate in FY2014-15 remained at \$4 per equivalent residential unit (ERU). The City finalized its rate model for stormwater and gained approval in FY2014-15 to increase the rate to \$5 per ERU in FY2015-16. The increase was anticipated to fund the projects outlined in the City's Stormwater Master Plan, adopted by City Council on August 6, 2014

The City operates on a biennial budget. The FY2015-17 budget report related to stormwater is included in Appendix A. Finally, staff kept abreast of federal and state rule changes that could impact or influence legal authority and requirements including the EPA's proposed Waters of the U.S. Rule, and federal lawsuits related to Total Maximum Daily Loads (TMDLs).

*Effectiveness.* The City has successfully established a stormwater utility service charge, and began collecting fees in July 2007. The City collected \$2.5 million in service charge fees in FY2014-15, and obtained approval to increase the rate in FY2015-16 to address the planning goals in the Stormwater Master Plan. The City Budget Committee and City Council supported the budget and rate increase.

### Task II.4 Planning (MS4/UIC)

In the fall of FY 2006-07, the City underwent a thorough review and rewrite of its original stormwater management plan. City Council adopted the revised Integrated Stormwater Management Plan on December 6, 2007. Per the NPDES permit requirements, implementation of the Integrated Stormwater Management

Plan had to begin by July 31, 2007. In July 2011, the City submitted a draft Integrated Stormwater Management Plan 2022 as part of its NPDES permit reissuance renewal application for DEQ review. The City released the draft in October 2011 for full public review through January 2012. The City incorporated those comments along with modifications based on changes to the WPCF-UIC permit template. The City resubmitted the revised draft ISWMP 2022 to DEQ for consideration as the management plan for both its piped system to the river (NPDES permit SWMP) and for drainage to dry wells and drill holes (UIC management plan) in December 2012. DEQ accepted the ISWMP 2022 for the WPCF-UIC permit after holding its own public review period, and is still reviewing it for the City's NPDES Phase II permit reissuance. Therefore this annual report summarizes efforts to implement both ISWMPs. A review of the ISWMP this year resulted in no recommended changes.

The City continues to prepare for future regulations by participating on the DEQ MS4 Phase II NPDES TAC group, and by staying apprised of TMDL regulatory issues. City staff from Utility Department and EIPD attended fall Center for Watershed Protection webinars entitled: "Stream Restoration as a Pollutant Reduction Strategy" (September 10, 2014) and "Local TMDLs & Regional River Basin TMDLs" (October 8, 2014) (See Appendix A).

Since July 2007, the City of Bend voluntarily retains Association of Public Works Agencies (APWA) Accreditation, a certification that the City complies with the recommended practices in the APWA Public Works Management Practices Manual. One full chapter in the APWA Manual focuses on stormwater and includes several water quality-related sections. The City successfully gained recertification in the spring 2015.

**Annexations.** In FY2014-15, there were no annexations.

**Urban Growth Boundary.** In 2009, the City of Bend submitted a proposal to expand the City's urban growth boundary (UGB) to the Oregon Department of Land Conservation and Development (DLCD) for approval. In 2010, the Oregon Land Conservation and Development Commission (LCDC) issued an order that partially acknowledged and remanded the proposal back to the City for further work, which is continuing. The City is on track to have both the City Council and the Deschutes County Board of Commissioners adopt a final UGB amendment in April of 2016. City stormwater staff continues to track the ongoing process.

**Effectiveness.** The City effectively met the August 2011 deadline for submittal of its NPDES Permit reissuance package for DEQ review. The City obtained its Water Pollution Control Facility Permit for stormwater underground injection controls on May 14, 2013. The NPDES permit reissuance is still under review by DEQ and a new permit is anticipated in FY2015-16.

## Task II.5 Annual Reporting (MS4/UIC)

This annual report, covering FY2014-15, is the ninth annual report prepared by the City and serves to cover ISWMP (2006), describing continuing activities and achievements made to meet the water quality requirements of the NPDES permit and ISWMP 2022 which has been approved by DEQ as the management document for the WPCF-UIC permit. This is the second annual report submitted to DEQ for activities required by the WPCF-UIC permit. Descriptions of effectiveness are included under each task. Per the City's stormwater permits, the annual reports are due by November 1 of each year. A summary of performance standard implementation status to date for all components is included in Appendix A. This annual report was created with input and review from Stormwater Liaisons members representing several municipal departments and Stormwater Quality Public Advisory Group (PAG) members representing various community interests (see Appendix C).

*Effectiveness.* The completed report signifies that this task has been met for the current fiscal year. The review of the draft by the Stormwater Quality Public Advisory Group and internal departments helped improve the quality of the final document.

## Task II.6 UIC Registration (UIC<sup>1</sup>)

The City's GIS geodatabase includes all known City-owned stormwater facilities, an impervious surface area layer and drinking water protection area layers. A copy of the most recent (October 2015) UIC registration list is included in Appendix I. This provides information on new UICs, as well as UICs that have been closed or retrofitted. The City's UIC facilities and wellhead protection areas are included on the City's mapping services website, using Geoblade, located at: <http://www.bendoregon.gov/index.aspx?page=463>. Additionally the City has street level imagery that staff can use for internal research purposes.

*Effectiveness.* This is an ongoing task, but the City continues to update and improve its base map of existing structures and knowledge of its facilities. The City's database now includes 4,804 dry wells; 974 active drill holes, and 10,461 catch basins and additional storm facilities. The database also includes the location of bioswales, the direction of pipe flows, and dry well test report data.

City staff have developed a standard operating procedure for registering and incorporating public UICs under the City's permit under one facility, which has been helpful for maintaining the accuracy of the City's UIC database. With the receipt of the permit, some procedures have been modified to reflect the permit registration requirements.

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<sup>1</sup> See BMP V-5 for MS4-related mapping.



## Tasks Completed (ISWMP 2022)

The City's WPCF-UIC permit recognized the ISWMP 2022. Whereas several of the tasks mirror those in the original ISWMP (2006), some are different. For those that mirror, we direct you to the ISWMP (2006) task status update.

### BMP II-1. Administration and Coordination (MS4 and UIC)

See ISWMP 2006 Task II.1 Administration and Coordination (MS4/UIC).

### BMP II-2. Legal Authority (MS4 and UIC)

See ISWMP 2006 Task II.2 Legal Authority (MS4/UIC).

### BMP II-3. Financing (MS4 and UIC)

See ISWMP 2006 Task II.3 Financing (MS4/UIC).

### BMP II-4. Planning (MS4 and UIC)

See ISWMP 2006 Task II.4 Planning (MS4/UIC).

### BMP II-5. Annual Reporting (MS4 and UIC)

See ISWMP 2006 Task II.5 Annual Reporting (MS4/UIC).

## Summary Assessment of Effectiveness

Since adoption of the ISWMP (2006), the City has (a) formed a stormwater utility, (b) obtained reliable funding for that utility, (c) staffed the utility, currently with a program manager, a program analyst, 4 dedicated stormwater field staff, 3 FTE sweeper staff, 1/2 FTE management/administration staff, and additional temporary staff as needed. The City is actively coordinating internally, as well as with the public through the Stormwater Quality Public Advisory Group and the Infrastructure Advisory Committee and stormwater quality staff participate on other city planning task groups as invited. Additionally, the City is also actively coordinating with other municipalities in the state (through the Oregon Association of Clean Water Agencies (ACWA)), to improve effectiveness, knowledge and efficiencies. The internal meeting summaries included in Appendix A are evidence of continued coordination among departments. The City was effective in improving its stormwater-related legal authority as per regulatory requirements including for construction site management, post-construction controls, utility and financial stability, and illicit discharge. Efficiency could increase if the City could operate under just one Integrated Stormwater Management Plan 2022 rather than the dual plans given the permit reissuance timing, but the City anticipates a new Phase II permit in FY2015-16.

## ISWMP Revisions/Future Improvement Tasks

The City seeks to have one stormwater quality management plan to address both its surface water and underground discharges, thus an integrated stormwater management plan. The City submitted to DEQ by the August 3, 2011 NPDES Permit reissuance submittal deadline, a fully updated draft Integrated Stormwater Management Plan 2022 for DEQ NPDES staff review. The draft ISWMP 2022 public review period ran from October 2011-late January 2012, and included a public meeting. The City revised the document (November 30, 2012) based on comments received and submitted it to DEQ as part of the WPCF-UIC permit issuance package in December 2012. This revised copy was also provided for consideration by DEQ NPDES permit staff. As part of the WPCF-UIC permit issuance, the draft ISWMP 2022 underwent a public review period conducted by DEQ and was accepted without change. The City began implementing the ISWMP 2022 in FY2013-14 under the WPCF-UIC Permit that was issued in May 2013, and carries through a 10-year planning period to coincide with that permit. A major review will be conducted at the five year planning mark. While DEQ staff continue to consider the ISWMP 2022 for the NPDES permit the City must by NPDES permit regulations also continue to implement the original ISWMP (2006). Therefore, the City continues to implement the ongoing tasks in the City's original ISWMP (2006) that is incorporated into the City's existing NPDES permit. City staff are effectively meeting the initial performance standards based on the timeline adjustments noted in the ISWMP 2022 given the date of acceptance and permit issuance (see Appendix A for an implementation status summary of performance standards within ISWMP 2022).

The City has reviewed the ISWMP 2022 tasks and has no proposed modifications to the ISWMP 2022 itself at this time. Modifications to the City's UIC Stormwater Monitoring Plan requested to improve our ability to collect enough stormwater to take samples were accepted and put into effect in FY2014-15 (see Task IX.3).



## **PUBLIC EDUCATION AND OUTREACH ON STORMWATER IMPACTS**

### **Introduction**

The purpose of this component is to implement a program to distribute educational materials to the community or conduct equivalent outreach activities about stormwater discharge impacts on water resources, including both surface waters and groundwater, and the steps that the public can take to reduce such pollutants in stormwater runoff. The City is committed to providing a strong public outreach component for this program to provide the public a basic understanding of what stormwater is and why using best management practices (BMPs) matter.

### **Tasks Completed (ISWMP (2006))**

The following tasks have begun or continued implementation in FY2014-15.

#### **Task III.1 Utility Bill Inserts, Brochures or Posters (MS4/UIC)**

**Utility Bill Inserts.** The City included in the August 2014 Our City newsletter an article “Keeping Our River Clean” announcing Stream Stewardship Day. The City also included in the November 2014 Our City Newsletter an article on a Boy Scout volunteer Evan Goetz, who organized a storm drain marking event that included 36 volunteers marking 816 storm drains on Awbrey Butte for his Eagle project (see Appendix B). The newsletters are sent with utility bills and also posted to the City’s website as well: <http://www.bend.or.us/index.aspx?page=67>.

**Clean Water Works Campaign.** In spring of 2015, the City kicked off its new Clean Water Works campaign. As part of the Clean Water Works campaign, the City developed an identifier and several new outreach pieces including illicit discharge fact sheets for residents and businesses, lead reduction fact sheet, sediment reduction fact sheets, food service outreach update, business inspection checklist, a commercial vehicle wash fact sheet, and a Kids Activity Guide (see Appendix B). The City printed and posted a call for entries for the City of Bend and BendFilm Clean Water Works video contest for students. Copies of these were delivered to area schools with students in the age range of the contest (6<sup>th</sup>-12<sup>th</sup> grade). Schools included: Pilot Butte Middle School, Mountain View High School, St. Francis, Trinity, Marshall High School, J Bar J Ranch, REALMS, Bend High School, Summit High School, seven Peaks, High Desert Middle School, Morning Star Christian School, Cascades Academy, Sky View Middle School, Westside Village Magnet School. And staff provided an

electronic copy to the local Home School outreach group to post to their members. City staff provided an overview of the Clean Water Works partnership program to attendees of an Oregon Environmental Council member meeting in June 2015. The City also designed one 3'x10' and two 3'X 8' banners that included the Clean Water Works logo and pollution prevention messages for use starting in FY2015-16. The banners will be used primarily for displays at outreach booths at events.



**Targeted Mailouts.** The City conducted a targeted mailout to all recycled car wash facilities with a Bend Business License at the end of June, as a start to the Clean Water Works partner program. As part of this effort, the City sent a mailing to 22 facilities with an introductory letter, fact sheet, partnership form, and Clean Water Works sticker inviting them to participate. The City continued to send other targeted mailings in the next few weeks thereafter to businesses that were selected based on the campaign pollutants of focus (illicit discharges in general, lead, and sediments).

**“It’s All Connected” Outreach.** Earlier in the fiscal year and even as a sub-message in Clean Water Works messages, the City continued to use the “It’s All Connected” message to illustrate to the public the connections between stormwater, drinking water and river water quality, and the importance of not polluting. The City used its “It’s All Connected” banner at outreach events such as Quest at the Fest, distributed illicit discharge flyers and Illicit Discharge Minimization Manuals with the “It’s All Connected” graphic. Additionally, the sound bite from the 30-second public service announcement that is included on the City’s You Tube and web page (<http://www.bendoregon.gov/index.aspx?page=290>) is played on the City’s public works telephone “hold” music. The entire It’s All Connected PSA was played at the intermission of Munch n Movies that took place in Compass park on Fridays from mid-August to mid-September in 2014, and an “It’s All Connected” movie slide advertisement was advertised at the popular Bend Film Festival in October 2014. The It’s All Connected advertisement “Only Rain in the Storm Drain” was also included in the Bend Park and Recreation guides (see Appendix B).

**Other Outreach/ Distribution.** On Saturday, July 12, 2014, City staff included poster series outlining City activities including one for the “Stormwater Utility

Program” and used the watershed diorama at Quest at the Fest, the City’s area at Summerfest festival. The City also distributed training opportunity and other announcements by email using the City’s Stormwater Stakeholder email list; and made announcements on the City’s website and social media including Facebook and Twitter.

City stormwater staff stocked information holders at public areas throughout the City (Boyd Acres, 15<sup>th</sup> Street, City Hall, Finance Department) with one or more of the following:

- Kids Activity Guide\*
- ACWA “Protecting Your Watershed” (English and Spanish)
- Considering Stormwater—Time and Moneysaving Considerations at the Conceptual Planning Stage
- ACWA Construction Site Stormwater Guide—Illustrated Best Management Practices\*
- ACWA UIC brochures (Clean Water Tips for the Home and Clean Water Tips for Business and Industry)\*
- APWA “P.W. Paws Rain of Terror” comic book\*
- Bend’s Better Site Design Walking tour—Ideas for Keeping water Quality in Mind When Developing Sites\*
- Training Webinar Announcements
- Illicit Discharge Manual
- Pressure Washing and Surface Cleaning Brochure
- Oregon Rain Garden Guide with revised Plant List\*

The City helped sponsor and had a booth at the annual Earth Day Fair and Parade, held on April 25, 2015. Stormwater-related handouts made available at the booth included those in the list above with an asterisk next to them, along with “It’s All Connected” magnets.

Staff also gave stormwater pollution prevention presentations. Wendy Edde, Stormwater Program Manager, gave a presentation on design and maintenance of low impact developments at the High Desert Green Industry Conference in spring 2015, and Tom Hickmann, EIPD Director, gave a presentation entitled “Ground Water Contamination from UICs?” at the Pacific Northwest AWWA conference on May 4, 2015. Communications department staff gave a presentation to students in Spring 2015 entitled “as Bend Grows” that includes a stormwater component. Wendy, together with ACWA Executive Director Janet Gillespie, also gave a presentation to State regulators entitled “Challenges and Opportunities for Oregon’s Water Quality” in June 2015. (See Appendix B).

City staff continued to provide outreach that discussed the importance of not discharging Fats, Oil, and Grease (FOG) into sewer or storm drains (see webpage at <http://www.bend.or.us/index.aspx?page=190>).

*Effectiveness.* The City of Bend conducted a pre-Clean Water Works campaign survey in spring 2015 (see Appendix B). The survey was designed to include baseline questions to compare the effectiveness of the stormwater program over time. This was the first time the City has paid for a stormwater specific statistically significant professional survey, and this is part of a pre- and post-campaign survey, the latter of which will be conducted in late fall 2015 as the first year Clean Water Works campaign is coming to an end. Sixty-five percent of respondents recognized that stormwater in Bend either drains to the Deschutes river or into the ground; while 35% incorrectly felt it travels to the sewer treatment/water reclamation plant. In an informal survey answered by 121 people in 2008, 40% incorrectly felt that stormwater in Bend travels to the sewer treatment/water reclamation plant.

The City chooses long-standing guides like the Bend Park and Recreation District's Recreation Guides to display its educational outreach messages because these are more likely to be kept around for a while before being discarded, lending to additional chances to be viewed multiple times by the target audience.

### Task III.2 Stormwater Pollution Prevention Web Site (MS4/UIC)

The City continued to update the stormwater website [www.bendoregon.gov/stormwater](http://www.bendoregon.gov/stormwater) by revamping the site to incorporate the Clean Water Works campaign a [www.bendoregon.gov/cleanwaterworks](http://www.bendoregon.gov/cleanwaterworks). The Clean Water Works website includes buttons for home and garden resources; kid's page; businesses; and discounts and partners. The website includes general stormwater quality information as well as topics of interest to the general public. The rest of the stormwater site remains organized into interest areas, including: What's New?, About Stormwater, Business Resource, Home Resources, Regulations, Stormwater Master Plan, Get Involved, and Frequently Asked Questions. The "Get Involved" section includes several outreach resources for interested consumers. The City announces new- and redevelopment-related stormwater webinar workshops through the City's stormwater webpage, as well as posting outreach materials ([www.bendoregon.gov/stormwaterbmp](http://www.bendoregon.gov/stormwaterbmp)) and Master Plan updates ([www.bendoregon.gov/stormwatermp](http://www.bendoregon.gov/stormwatermp) and Appendix A). There was also a site for the Third Street Underpass project (see <http://www.bendoregon.gov/index.aspx?page=645>). The City also continued to use other communication tools, such as Facebook, Twitter, and an internal City intranet site to distribute announcements.

*Effectiveness.* Overall, the use of the website has again increased over the past year (see table on page 3-5). The exception to this is the Business and Home page, which makes sense given that the page was split this year with the Home and Garden section moved onto its own page. Keeping the stormwater website

updated is a continual process. The City has included a link on the website to comment on the stormwater pages and no comments from that link were received during FY2014-15. Over 190 people are on the City News email update list. The City has over 6,628 likes in FY2014-15, up from 5,698 Likes on its Facebook page last year. The City currently has 4,292 followers on Twitter, up from 2,921 followers in FY2013-14 and 1,177 followers in FY2012-13. Increasing trends means social media is becoming an increasingly useful media to incorporate into campaigns.

### Web Page View Comparison (FY2013-14 to FY2014-15)

Page Titles	Date Range	Visits	Pageviews	Avg Time	% Exit
<b>City of Bend : What's New?</b>					
	7/1/2013-6/30/2014	45	248	0:01:33	18.15%
	7/1/2014-6/30/2015	62	292	0:01:08	20.55%
	% Change	↑37.78%	↑ 17.74%	↓-26.35%	↑13.22%
<b>City of Bend : Business and Home Resources</b>					
	7/1/2013-6/30/2014	261	601	0:01:42	40.27%
	7/1/2014-6/30/2015	194	476	0:01:19	32.56%
	% Change	↓25.67%	↓ -20.80%	↓ -22.30%	↓-19.15%
<b>City of Bend : Get Involved!</b>					
	7/1/2013-6/30/2014	12	69	0:01:20	17.39%
	7/1/2014-6/30/2015	29	100	0:01:07	28.00%
	% Change	↑41.67%	↑ 44.93%	↓ -16.02%	↑61.01%
<b>City of Bend : Regulations</b>					
	7/1/2013-6/30/2014	52	179	0:01:21	26.26%
	7/1/2014-6/30/2015	59	256	0:01:48	21.88%
	% Change	↑13.46%	↑ 43.02%	↑ 32.35%	↓-16.68%
<b>City of Bend : Discounts and Partners</b>					
	7/1/2013-6/30/2014	0	0	0:00:00	0.00%
	7/1/2014-6/30/2015	116	415	0:01:36	27.47%
	% Change	↑00.00%	↑ 100.00%	↑ 100.00%	↑100.00%
<b>City of Bend : Clean Water Works</b>					

Page Titles	Date Range	Visits	Pageviews	Avg Time	% Exit
	7/1/2013-6/30/2014	0	0	0:00:00	0.00%
	7/1/2014-6/30/2015	86	723	0:01:18	11.48%
	% Change	↑00.00%	↑100.00%	↑100.00%	↑100.00%
City of Bend : Home and Garden Resources					
	7/1/2013-6/30/2014	0	0	0:00:00	0.00%
	7/1/2014-6/30/2015	31	537	0:01:01	5.03%
	% Change	↑00.00%	↑100.00%	↑100.00%	↑100.00%

### Task III.3 City News Broadcast Stormwater Quality Messages and Press Releases (MS4/UIC)

As part of the Clean Water Works Campaign the City worked with a local media company to produce a 30-second TV commercial introducing the Clean Water Works campaign. The Clean Water Works commercial aired 1,435 times on local TV and cable stations in the spring 2015. The commercial is also posted on the City web site <http://www.bendoregon.gov/modules/showdocument.aspx?documentid=22500>. The commercial was also screened to the Council and Budget Committee during biennial budget considerations in Spring 2015.

The City also developed three 60-second radio public service announcements (PSAs)—one focusing on [illicit discharge reduction](#); one focusing on what our [stormwater utility service charge covers](#); and one focusing on [sediment reduction](#). The PSAs played on five separate radio stations and aired a total of 592 times. The radio PSAs are posted on the City web site [www.bendoregon.gov/cleanwaterworks](http://www.bendoregon.gov/cleanwaterworks) at the bottom of the home and garden page under “Audio.”

The City continues to utilize City Edition to provide updates on the stormwater utility and its programs. The school education program that included footage taken during the stormwater quest field trip was highlighted on City Edition cable television COTV Channel 11 on Bend Broadband at 6:30 p.m. on Monday, Wednesday and Friday and on closed circuit TV in City Hall both during the month of May 2015 along with being made available on YouTube ([www.youtube.com/watch?v=pOXo5ZOrlUc](http://www.youtube.com/watch?v=pOXo5ZOrlUc)).

*Effectiveness:* The City’s You Tube News channel has 401 subscribers, and the City Edition broadcast has been viewed 84 times on You Tube from the end of



May until the end of September 2015, along with the broadcasts on cable television and within City Hall for the month of June 2015. COTV is shown on BendBroadband in Bend, Redmond, Sisters, Black Butte Ranch, Tumalo, Sunriver, and Powell Butte. The Bend DMA rank which covers this area and beyond is 193 with a cable penetration of 60% according to Zolo Media quoting a 2013 PSU study (Zolo Media, 2014).

The new Clean Water Works campaign webpage received 723 page views between its inception in April 2015 and the end of the fiscal year on June 30, 2015. The “It’s All Connected” video on the City’s YouTube channel has had 8 additional views this year, up to 247 views since December 2008. The Vactor Truck Stormwater Operations video has had 6,334 (+1024) views in the five years it has been on the channel. The “3<sup>rd</sup> St. Stormwater Project” that was published on October 31, 2013 has received 285 (+68) views on the channel. The video includes information on drill hole spill control measures as well.

The public, including school children, were able to view stormwater equipment, the watershed diorama and other public works equipment during Quest at the Fest event, which was located downtown adjacent to the Bend Summer Fest on July 12, 2014. Volunteers worked the watershed diorama and provided outreach materials.

The City released two stormwater quality related news releases/articles in FY2014-15. *Our City: A Newsletter for Bend Citizens*, distributed with monthly utility bills and posted on the website, included the following articles (See Appendix B for copies unless otherwise noted):

- Keeping Our Rivers Clean (August 2014);
- Volunteers Help Protect Water Quality (November 2014);

The City Communications Department provides media releases and several resulted in news coverage. News coverage related to stormwater included (see Appendix B for copies):

- The Source Weekly, City Quest at the Fest information, July 2015
- Bend *Bulletin* News Article, “Weeds Flourish along Reed Market Road” Hillary Borrud, (July 12, 2014).
- The Source Weekly, “City Council Roundup” (Stormwater Master Plan adoption) (August 14, 2014)
- Bend Chamber, “City Seeking Representative for Stormwater Advisory Committee,” (December, 2014)
- Bend *Bulletin* News Article, “How to Keep Mirror Pond Clear,” Scott

Hammers, (March 9, 2015).

- Bend *Bulletin* News Article, “Where Does Bend Water Come From?” Jasmine Rockow, (May 13, 2015).
- Call for Storm Drain Artists, various outlets, June 2015.

Electronic copies of *Our City* are available on the City’s website at: [www.bendoregon.gov/index.aspx?page=649&parent=3243](http://www.bendoregon.gov/index.aspx?page=649&parent=3243).

As mentioned above, the City continued to purchase advertising space in the Bend Park and Recreation Guides, the advertisements include a stormwater pollution prevention “It’s All Connected” message in each guide (See Appendix B). The guides were chosen as a useful outreach tool as people tend to keep them to refer to for recreational activities throughout the quarter rather than recycling them immediately as with a newspaper.

The City displayed the “It’s All Connected” movie graphic prior to several films at the Bend Film Festival, held October 11-14, 2014 (see graphic). The City also advertised the “It’s All Connected” 30-second public service announcement at Munch ‘n’ Movies as well (see <http://www.youtube.com/watch?v=fMMDbsMJ3Zg>).

*Effectiveness.* The City exceeded the measurable goals for this task, which was to post at least one stormwater quality-related message per year during each permit year, and to submit either locally or as part of a regional effort at least three news releases regarding stormwater issues to media outlets per year.

The school education program “Water Resource Education” City Edition segment has received 76 views on You Tube as of August 21, 2015, as well as additional views in City Hall and cable television.

The Bend *Bulletin* has a daily circulation of 27,547 Monday through Friday, 28,924 on Saturday and 29,997 on Sundays according to the Oregon Newspaper Publisher’s Association (August 2012). In addition to Bend, the *Bulletin* is delivered to Gilchrist, LaPine, Sunriver, Sisters, Redmond, Terrebonne, Prineville, Madras, and Warm Springs, so the City’s efforts may have benefits beyond the City limits.

*The Source Weekly* has a net weekly circulation of 15,000 and a total readership of 37,500 weekly (Source Weekly, 2013 Distribution and Circulation). It is distributed in Bend, Redmond, Prineville, Madras, Sisters, Sunriver, and LaPine.

The newsletter is distributed monthly with the approximately 35,000 utility bills, is made available

<b>Bend Film Festival AGE OF ATTENDEES</b>	
0-29:	14%
30-44:	32%
45-64:	43%
65+:	11%

(Source: Bend Film Festival, 2014.)

on the City's website and is emailed out to email subscribers. The City's Facebook page has just under 6,596 Likes and 1,177 followers on Facebook. The City's You Tube page has 401 subscribers and has over 200,031 total uploaded views since March 2008.

According to its 2014 sponsorship packet, the Bend Film Festival routinely brings in 5,000+ attendees, 80% of whom are from the Bend Area for approximately 80+ screenings of movies over four days at 6 venues. The gender breakdown is 68% female, and the age of attendees is broken out above. Education levels of attendees indicate that 38% hold post-graduate degrees and 96% attended college. The slide is shown multiple times prior to a screening, and thus is an effective tool for getting our pollution prevention message to people in a cost-effective manner. City continued with "It's All Connected" video shown before Munch n' Movies showings this year, deemed effective as it is a local family-friendly event.

#### Task III.4 Stormwater/Watershed Diorama (MS4/UIC)

The City again made its watershed diorama available to lend to local school teachers for use in their classrooms. The diorama includes both surface water and groundwater components. City staff continued to use additional setup pieces that included a gas station, apartment building to promote additional urban setting pollution prevention discussions. In FY 2014-15, the diorama was used at several schools as part of the river keeper program and at the Quest at the Fest both held July 12, 2014.

In FY2014-15 the City constructed a new Underground Injection Control (UIC) model to help the public better understand the connection between drinking water and UICs. The new UIC model depicts a city street that drains into four catch basins cut-aways. Two of the basins are connected to a drywell and the other connect to a drill hole. The model also contain a simulated well, to show how water infiltrates back into the soil towards our drinking water aquifer. The model will be initially displayed at the City Quest at the Fest 2015 event in July 2015.



*Effectiveness.* As in past years, the diorama has been well received as an interactive, visual, three-dimensional learning tool. Using the unit at Quest at the Fest was especially effective as it draws families in to learn about pollution prevention in an enjoyable manner.

**Task III. 5 Performance Standards (MS4/UIC)**

The new ISWMP 2022, containing the completed performance standards, was approved by DEQ as part of the WPCF-UIC permit issuance. Baseline implementation status is being met in full. A summary of Performance Standards and implementation status is available in Appendix A.

*Effectiveness.* The City met its goal of completing the performance standards task for inclusion in the ISWMP 2022 draft that was accepted by DEQ for the WPCF-UIC permit in FY2012-13, and has begun implementing the new performance standards as part of the ISWMP 2022. A summary of initial implementation status efforts is included in Appendix A. The City is on schedule with implementation considering the City received its WPCF-UIC permit in May 2013.

**Tasks Completed (ISWMP 2022)****BMP III-1. Develop and Implement Strategic Outreach Plan Targeting Pollutants of Focus for the Public and City Employees (MS4 and UIC)**

City staff worked with the Stormwater Quality Public Advisory Group (PAG) to develop and finalize the strategic outreach plan in November 2013, and began implementation thereafter (see Annual Report FY13-14 Appendix B). City Stormwater Program staff are also working with the other utilities to coordinate City utility messages.

Substantial progress was made on all implementation goals noted in the strategic outreach plan for FY2014-15:

- Development of remaining and refinement of fact sheets to support tail-gate meeting training for City Staff, and initial distribution that was upgraded as a continual improvement project to COMPLI starting in FY2014-15 to improve training reach and recordkeeping (Message I) (see Appendix G). The following topics are covered:

Topic	Suitable for Applicable Staff:	Recommended Time Interval	Time Needed for Training
Vehicle and Equipment Washing	Garage, Utility, Streets; EIPD	Yearly to Biannually	5-10 minutes
Leaky Equipment and Fueling Training	Garage; Utility, Streets	Yearly	5-10 minutes
Spill Prevention, Control and Cleanup Training	Garage; Utility, Streets, EIPD field	Yearly	5-10 minutes
Utility/Road Repair & Maintenance Training	Streets, Utilities, EIPD field	Yearly	10-15 minutes
Paint Use and Disposal Training	Streets, Utilities	Yearly	5-10 minutes

Topic	Suitable for Applicable Staff:	Recommended Time Interval	Time Needed for Training
Landscape Maintenance Training	Streets, Utilities (Stormwater)	Yearly	5-10 minutes
Illicit Discharge Follow-up Stormwater Training	Stormwater Program Staff only	Biennially	10-15 minutes
Illicit Discharge Recognition and Reporting	All City Staff	Yearly	5-10 minutes
Surface Cleaning	Streets, Utilities, Garage, Facilities	Yearly	5-10 minutes
Winter Road Care	Streets	Yearly	5-10 minutes
Street Sweeping	Streets	Yearly	5-10 minutes
Concrete Use and Disposal	Utility, O&M, Streets, EIPD, Inspectors	Yearly	5-10 minutes

- Acronyms and Abbreviations distributed at front counters, on the website under “What’s New,” and upon request (Message II)
- Research of new/additional dioramas and development of a UIC diorama model completed (Message II)
- Advertising at BendFilm Festival and Munch n Movies, and began working with BendFilm to jointly host a Clean Water Works film contest together with Future Filmmakers. Conducted advertising to schools with contest-aged children (6<sup>th</sup> to 12<sup>th</sup> grade) (Message II)
- Banner messages were developed and three new banners with the Clean Water Works message were ordered (Message II)
- Single-family Residential Site Plan and ACWA Erosion and Sediment Control guide included on City’s website ([www.bendoregon.gov/stormwaterbmp](http://www.bendoregon.gov/stormwaterbmp)) and distributed by private engineering (Message II)
- Print advertising continued in Parks and Recreation Guides (Message II)
- Illicit discharge fact sheets for both residents and businesses were developed and posted on the Clean Water Works website (Message III)
- Storm drain marking occurred with most of Awbrey Butte covered in markers as part of a large scale volunteer effort coordinated by a Boy Scout as his Eagle project (see Chapter 4.0 for details) (Message III)
- City staff provided a training on stormwater facility maintenance at the High Desert Green Industry Conference in February 2015 (Messages III (infiltration) and IV)
- Preparation for an incentive program with a discount card for various businesses was conducted in spring/summer 2015, with car washes the first business group to be targeted with an offer. This wasn’t scheduled until later years, but we flipped the schedule with the pilot incentive program entitled “Stormwater Facility Maintenance

Assistance Program” that was developed in late FY2013-14 released to purchasing for review and distribution in July 2014 but that has gotten delayed due to purchasing division staffing shortages. City stormwater staff are still awaiting review and approval to come in line with a new workable new timeline considering the separate Clean Water Works incentive program with discount cards that is occurring during summer-winter 2015 (Message IV)

- City staff offered IECA webinars to improve knowledge of effective erosion and sediment control; continued to distribute ACWA Construction Site Guide and developed a sediment fact sheet for both residents and businesses (Message IV)
- Work to improve illicit discharge coordination and reporting internally began in FY2013-14 with development of the fact sheets with input from operation staff. Additionally work was completed to get scheduled for a public works wide safety meeting in September 2014. Distribution improvements using Compli software were setup and began taking place in late FY2014-15 (Message V)
- City staff contracted with a consulting firm to assist with TMDL preparedness and modified the scope of work in early 2014 to include a review of best management practices and structural controls specific to local stormwater pollution concerns (Message V).

The Clean Water Works campaign that launched in April 2015 was developed keeping the following objectives noted in the public outreach strategic plan in mind:

- Use positive messages throughout the campaign.
- Continue watershed/stormwater awareness, but move more towards actions
- Conduct evaluation surveys to research the levels of awareness in the city and effectiveness of the programs
- Increase awareness of sediment impacts to storm drainage facilities and the Deschutes River/Tumalo Creek
- Through a media campaign, educate residents and businesses about the link between lands use activities and water quality/flooding as well as about the City’s role in protecting water resources and managing stormwater.
- Increase awareness of potential pollutants from automotive vehicles and options to minimize these pollutants
- Increase awareness of what constitutes an illicit discharge and how to prevent spills and encourage behaviors to reduce illicit discharges.

*Effectiveness.* The City is effectively implementing the Strategic Outreach Plan for stormwater education.

BMP III-2 Stormwater Pollution Prevention Web Site (MS4 and UIC)

See ISWMP (2006) Task III.2 Stormwater Pollution Prevention Web Site (MS4/UIC).

BMP III-3. Media Relations: City News Broadcast Stormwater Quality Messages and Press Releases (MS4 and UIC)

See ISWMP 2006 Task III.1 Utility Bill Inserts, Brochures or Posters (MS4/UIC) and ISWMP 2006 Task III.3. City News Broadcast Stormwater Quality Messages and Press Releases (MS4/UIC)

BMP III-4. School/Enrichment Activity Outreach: Stormwater/Watershed Diorama (MS4 and UIC)

See ISWMP 2006 Task III.4 Stormwater/Watershed Diorama (MS4/UIC) and Task IV.3.

BMP III-5. Implement Performance Standards (MS4 and UIC)

See ISWMP 2006 Task III. 5 Performance Standards (MS4/UIC) and Appendix A.

### **Summary Assessment of Effectiveness**

The City met or exceeded the measurable goals for implementation of required permit activities. Because City staff understand the importance of effective outreach and education for stormwater quality, stormwater education and outreach will continue to be a priority in the upcoming years, and the City will be measuring the effectiveness of its pilot Clean Water Works program with a post-survey to be conducted in FY2014-15.





4.0**PUBLIC INVOLVEMENT  
AND PARTICIPATION****Introduction**

The goal of the public involvement and participation (PIP) component is to work with City residents, public employees, businesses, and government officials concerning the importance of and methods for controlling pollutants in urban runoff. Ultimately, community involvement in implementing pollution prevention practices and in evaluating and documenting conditions within the watershed is the only hope of achieving meaningful change in the quality of urban runoff.

**Tasks Completed (ISWMP (2006))**

The following tasks are completed or ongoing routine tasks conducted during FY 2014-2015:

**Task IV.1 Public Advisory Group (MS4/UIC)**

During FY2014-15 the Stormwater Quality Public Advisory Group (PAG) met 4 times providing input on the annual report, stormwater public facilities plan, public outreach strategic planning and the Clean Water Works. The City also took this year to fill several vacancies on the PAG (See Appendix C for a list of PAG members, and meeting agendas/summaries).

*Effectiveness.* The City exceeded its goal of convening the Public Advisory Group at least semiannually. City staff continues to find the Public Advisory Group very helpful in providing input and new perspectives to new materials and concepts and thereby directly helps improve the effectiveness of the stormwater program. Both groups have proven effective with the PAG focused on providing input to stormwater staff and the IAC focused on providing input and recommendations to the City Council.

**Task IV.2 Public Meeting (MS4/UIC)**

On August 6, 2014, the Bend City Council held a public hearing prior to adopting the Stormwater Master Plan (See Appendix C). The Stormwater Public Facilities Plan was brought before the Bend Planning Commission on October 13, with public hearings held on November 10, 2014 and November 24, 2015 (see Appendix D). On December 3 and 17, 2014 the Bend City Council also held public meetings to gain input on and approve the Stormwater Public Facilities Plan (See Appendix C).

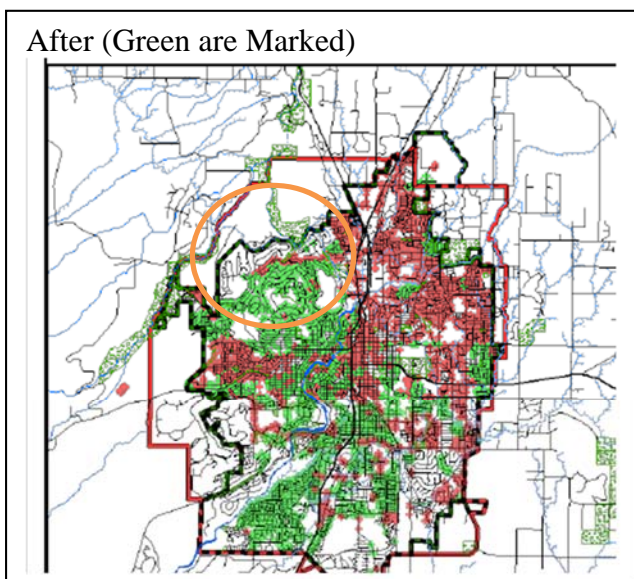
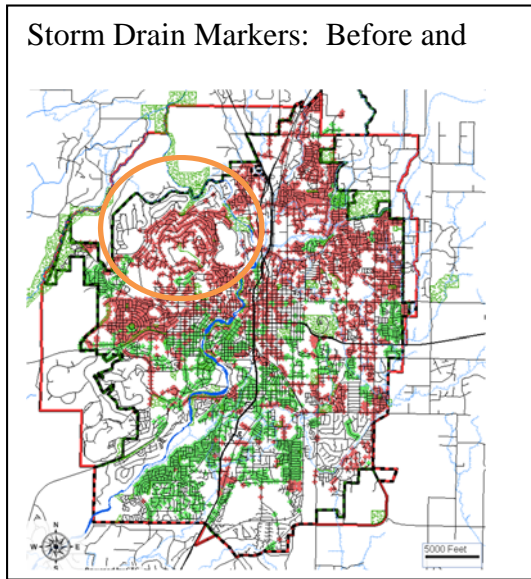
*Effectiveness.* Due to previous public input meetings, comments on the Stormwater Master Plan and Stormwater Public Facilities Plan were minimal and

largely positive. Both plans passed without appeals.

**Task IV.3 Stormwater Quality Volunteer Opportunities (MS4/UIC)**

**City’s Volunteer Program.** The City’s Volunteer Coordinator is working with several members of the community including high school students, landscape architects, contractors and nursery experts to modernize landscaping and public facilities to be water and maintenance friendly, and incorporating designs that use and demonstrate stormwater features to address a stormwater localized flooding problem. In a project that started in FY 2012-13, a grand celebration entitled “The Dedication of Franklin’s Corner Community Garden” was held on September 23, 2014 for the community garden project at 9<sup>th</sup> Street and Franklin incorporating a stormwater demonstration projects with planter boxes, bioretention and permeable walks (See Appendix C, <http://www.franklinscorner.org>, <https://www.facebook.com/Franklinscornercommunitygarden>).

The City stormwater staff continued to work with the Bend Beautification Program staff to coordinate volunteers from service clubs, private individuals, church groups, Neighborhood Associations and other groups for litter pickup, vegetation management, and storm drain marking. With regards to storm drain marking, the City of Bend worked with Evan Goetz, a member of the Boy Scout Troop #25, Goetz organized a team of volunteers to install markers. Evan volunteered 206 hours for the project and under his guidance approximately 30 Volunteers installed 872 markers in a single day. On December 23, Evan Goetz earned the rank of Eagle Scout in part for his efforts marking storm drains.



City staff made maps, kept bags stocked and tracked and ensured directions were followed. Staff are monitoring the marker installations by date installed to track their longevity.

The City both actively participated in and helped to sponsor the Stream Stewardship Day (see Appendix C). This annual event was coordinated by the Upper Deschutes Watershed Council (UDWC), and was held on August 23, 2014. With the City helping to sponsor the 2014 event early, the UDWC was able to increase its resources as a result of a matching grant from the musician Jack Johnson to promote the event, which was held in August to coordinate with the Jack Johnson concert to increase the reach of the effort. The event included REI, and the Old Mill District as sponsors as well, among others who helped advertise the event. The City announced the event via its Facebook site and posted event posters. To encourage City staff support, the stormwater division coordinated with streets division to have staff available to help collect and dispose of bags of litter collected by local dive teams and riparian area collection efforts. Announcements of the event were also made on local radio stations.

**Downtown Bend Business Association.** In January 2015, the City worked with Downtown Bend Business Association Executive Director to focus a City edition news magazine segment on their efforts to keep the downtown streets and sidewalks clean of cigarette butts and other debris. The idea came to fruition with a City Edition segment in which local storeowners and DBBA employees participated: <https://www.youtube.com/watch?v=3eE6d2-eH3Y&list=PLufJOv4LpbfAT2WkINy89WDCrQ9YdFBkE&index=23>. Additionally City staff highlighted stormwater-related capital improvement projects in the downtown area as part of the segment.

**School Outreach.** In spring 2015, the City worked to invite students to participate in the Clean Water Works Video contest. See Section III.1 and Appendix C for more details.

The City worked through the Upper Deschutes Watershed Council to help outreach to schools by restocking and repeatedly lending out the City's watershed diorama for their watershed education efforts, which culminate in a watershed summit for students (see <http://www.nuggetnews.com/main.asp?SectionID=8&SubSectionID=8&ArticleID=22358>). Additionally, the City continued its popular diorama lending program to area teachers and others interested. The City also provide copies of its new Kid's Activity Guide and giveaways for Upper Deschutes Watershed Council to use in their teachings.

In FY2014-15 the City of Bend Utility Department partnered with the Central Oregon Environmental Center who worked with local school teachers to develop and implement the "Our Water Program, a Journey Through Bend". The pilot program included five lesson plans related to all aspects of water, one of which

was a Stormwater Quest (see Appendix C) The Quest took place at Riverbend Park along the Deschutes River with teachers, parents, and Environmental Center staff helping to lead the efforts. Students worked to solve puzzles as they visited stormwater facilities located in the park. A City Edition video captures the event and is highlighted on the City's YouTube channel (see: [www.youtube.com/watch?v=pOXo5ZOrIUc](http://www.youtube.com/watch?v=pOXo5ZOrIUc)). The lessons were presented to a total of 1,490 students from both Marshal High School and Cascade Middle School.

*Effectiveness Evaluation.* In FY2014-15, the 954 drains were marked by volunteers and limited staff; additionally several volunteers cleared weeds and litter from City medians and right-of-ways, helping to keep them from clogging or polluting storm drains. The outstanding efforts of storm drain marking volunteer Evan Goetz who took inspiration for his idea from the newspaper article that super-storm drain marking volunteer James Newkirk earned in 2012, helped continue to spread the pollution prevention message. The City continued to work with non-profits to effectively improve the pollution prevention messaging targeted to school-age children.

#### Task IV.4 Performance Standards (MS4/UIC)

Performance standards have been completed and incorporated into the ISWMP 2022. The new ISWMP 2022 was approved by DEQ as part of the WPCF permit issuance. In FY2013-14 the City began implementing the new performance standards as part of the ISWMP 2022 for the WPCF-UIC permit, and the City continued to implement these and additional performance standards this year per the schedule. Performance Standards implementation status is available in Appendix A.

*Effectiveness.* The City met its original ISWMP 2006 goal of completing the performance standards for inclusion in the draft ISWMP 2022 and is on task meeting them.

#### **Tasks Completed (ISWMP 2022)**

##### BMP IV-1. Public Advisory Group (PAG) (MS4)

See ISWMP 2006 Task IV.1 Public Advisory Group (MS4/UIC).

##### BMP IV-2. Public Meetings (MS4)

See ISWMP 2006 Task IV.1 Public Advisory Group (MS4/UIC).

BMP IV-3. Stormwater Quality Volunteer Opportunities (MS4)

See ISWMP 2006 Task IV.3 Stormwater Quality Volunteer Opportunities (MS4/UIC).

BMP IV-4. Performance Standards (MS4)

See ISWMP 2006 Task IV.4 Performance Standards (MS4/UIC).

**Summary Assessment of Effectiveness**

The City met or exceeded its goals for public participation this year, and is seeing benefits of past year public participation encouraging others to do more (see storm drain marking). In FY2014-15 the City of Bend worked with Riley Research and Associates to conduct a random sample survey of City of Bend Residents. The goal of this survey was to learn more about the awareness, knowledge and perceptions Bend residents have on stormwater issues and pollution prevention. The survey shows that Bend residents feel it is very important to be educated on how to prevent stormwater pollution. (The full report is included in Appendix B.) The efforts of the public are helping to ensure this occurs.





# 5.0

## ILLICIT DISCHARGE CONTROLS

### Introduction

The purpose of this component is to eliminate discharges of pollutants from illicit connections and illegal dumping to the storm drainage system. This chapter describes the activities conducted during FY 2014-15 to address illicit discharges.

### Tasks Completed (ISWMP (2006))

The following tasks are tasks conducted during FY 2014-2015:

#### Task V.1 Public Education on Illegal Discharges and Improper Disposal (MS4/UIC)

In April 2015 the City kicked off a new outreach campaign, called Clean Water Works. This campaign purpose is to build awareness through targeted topics and clear messages about stormwater pollution prevention information. In FY2014-15 through FY2015-16 the campaign focuses on three main issues: general illicit discharge information, lead reduction, and sediment reduction.



The campaign included development of a campaign identifier (as shown on the right) along with print, TV and radio advertisements. Fact sheets on illicit discharges were developed for both home (<http://www.bendoregon.gov/modules/showdocument.aspx?documentid=22546A>) and commercial/industrial (<http://www.bendoregon.gov/modules/showdocument.aspx?documentid=22513>) uses. Additional outreach that indirectly helps reduce illegal discharges and improper disposal was also developed and posted under the Home and Garden, Business, and Kids sections of the new Clean Water Works website (see [www.bendoregon.gov/cleanwaterworks](http://www.bendoregon.gov/cleanwaterworks)). As part of the Clean Water Works campaign the City began developing a business partnership program for fall 2015. The goal of this program is to increase engagement in protecting water quality by providing best management practices and information in a manner that would engage the interest of the targeted business/nonprofit, by offering incentives to businesses and non-profits, such as free TV and radio spots and marketing discounts on a discount card. In return participating businesses agree to train staff on stormwater BMPs, many aimed to reduce illicit discharges, or to volunteer for clean water.

In late June 2015 the City released partnership invitations and application packets to all 25 commercial car washes and auto detailing businesses within Bend using the Bend Business License database for contact information. The application packet included a

letter outlining the incentive program, a commercial car wash fact sheet, and partnership participation form for those interested in becoming a partner (see Appendix D).

The City continued to distribute the Illicit Discharge Minimization BMP Manual and the illicit discharge flyer as educational outreach as part of illicit discharge follow-up procedures (see Appendix D of the FY2012-13 Annual Report). See Appendix D for a summary of illicit discharge response actions addressed in FY2014-15.

The stormwater utility also teamed up with the Industrial Pretreatment Program (IPP) to distribute Illicit Discharge BMP Manual and DEQ automotive repair fact sheets to automotive repair facilities within Bend. The fact sheets were handed out during IPP inspections.

In FY2014-15, the City continued to show the “It’s All Connected” movie slide prior to the start of multiple movies at the October 2014 Bend Film Festival, and the 30-second public service announcement, designed to prevent illicit discharges and show where stormwater goes, at intermission at Munch ‘n’ Movies in August-September 2014.

*Effectiveness.* The City exceeded its goal of conducting outreach to 50% of businesses within a specific segment by distributing the Commercial Carwash Fact Sheets to all known commercial car wash and detail businesses within Bend. The effectiveness of the City’s Clean Water Works initial pilot campaign will be determined with a post-survey to be conducted in FY2015-16.

Task V.3 Post Warnings About Illicit and Illegal Discharges (MS4/UIC)

Per the Standards and Specifications revisions that took effect on July 1, 2011, new and replaced City of Bend stormwater manhole covers now include an imprinted, lifelong “Only Rain in the Storm Drain” stamp (see picture in FY2012-13 Annual Report Task V.3). City design standards now require a permanent stamp on all new storm drain covers to delineate stormwater facilities in an educational manner.

In FY2014-15 the City of Bend worked with Evan Goetz, a member of the Boy Scout Troop #25. Goetz organized a team of volunteers to install markers and handout door hangers. Evan volunteered 206 hours for the project and under his guidance approximately 30 volunteers installed 872 markers in a single day. On Dec. 23, 2014 Evan Goetz earned the rank of Eagle Scout for his efforts marking storm drains.





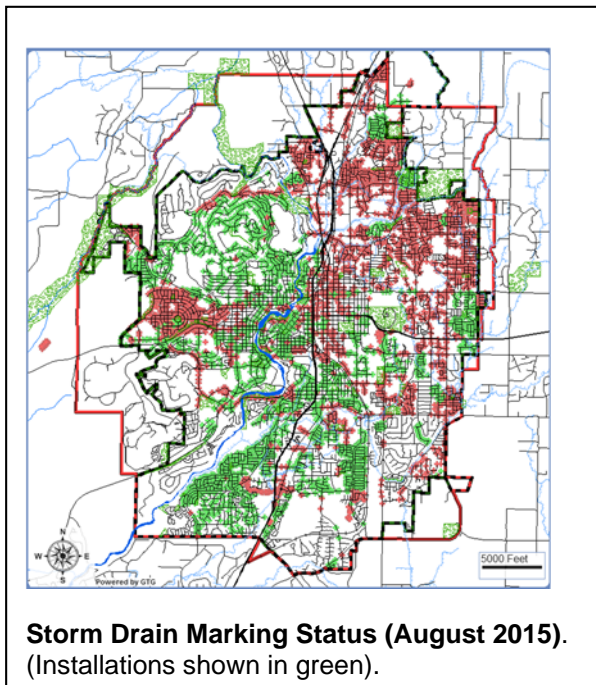
*Effectiveness.* The City has effectively chosen a long-lasting but volunteer-friendly retrofit marker; and was successful in requiring stamped manhole covers as part of new installations, given their longevity. Evan Goetz efforts to organize and oversee the installation of 872 makers make this the most productive storm drain marking year to date.

#### Task V.4 Post Illicit Discharge Prevention Information on Web Site (MS4/UIC)

Stormwater related material is located in a central location at: [www.bendoregon.gov/stormwater](http://www.bendoregon.gov/stormwater). In FY14-15 the City added a clean water works webpage that includes four main sections; home and garden, kid's page, business recourses and discount and patterns. (see [www.bendoregon.gov/cleanwaterworks](http://www.bendoregon.gov/cleanwaterworks)). City staff devolved a new illicit discharge fact sheet for both business and homeowners that is also posted on the City's web site.

*Effectiveness.* Well more than 50 markers per year are being posted. The storm drain marking continues to be a popular volunteer activity. See map for areas (shown in green) of markers installed during initial NPDES permit period. The City has been successful on focusing volunteers to focus the marking storm drains within wellhead protection areas 10 year time of travel areas, and then also in areas immediately adjacent to river drainage areas but also per volunteer request (see map at left).

#### Task V.5 Stormwater System Map (MS4<sup>1</sup>)



The City developed a geodatabase map in FY2008-09 including GPS coordinates for known City stormwater facilities, and the City has been updating the geodatabase as appropriate since. City Information Technology GIS staff regularly updates the mapping interface, Geoblade, which has greatly improved staff response times and information. A version is also available online for the public to use that includes the piped system, using Geoblade, located at: <http://www.bendoregon.gov/index.aspx?page=463>. Additionally the City has street level imagery that staff can use for internal research purposes.

*Effectiveness.* The City has successfully conducted an overall in-field inventory and ongoing maintenance to keep the data in the base map updated. The geodatabase includes directions of pipe flows as well as swales, UICs, and other features. The

<sup>1</sup> See Task II-6a for related UIC mapping.

inclusion of best known locations of public and private wells along with time of travel and buffer overlays also helps citizens with UICs better understand their locations to assist them in their own regulatory compliance and water quality protection efforts.

#### Task V.6 Illicit Discharge Ordinance (MS4/UIC)

On January 4, 2012 the Council adopted a stormwater ordinance adopting Bend Code Title 16 (see Appendix A of the FY2011-12 annual report). Chapter 16.20 of the ordinance covers Illicit Discharge Controls. In conjunction with and as called out in the ordinance. In FY2012-13 the City finalized and began distributing the Illicit Discharge Best Management Practices Minimization Manual. A copy of the manual is available in Appendix D of the FY2012-13 Annual Report. Additionally as part of the ordinance effort, interdepartmental staff worked through implementation roles and responsibilities in early to mid-2012. The Stormwater utility takes primary responsibility of illicit discharge inspection response and follow-up.

*Effectiveness.* The City has successfully developed the Illicit Discharge Manual that is referenced in the stormwater ordinance, Bend Code Title 16, and has continued the implementation and education process. Reports of illicit discharges are continuing to increase, suggesting that education efforts are helping citizens to understand what illicit discharges are and when and to whom to report them.

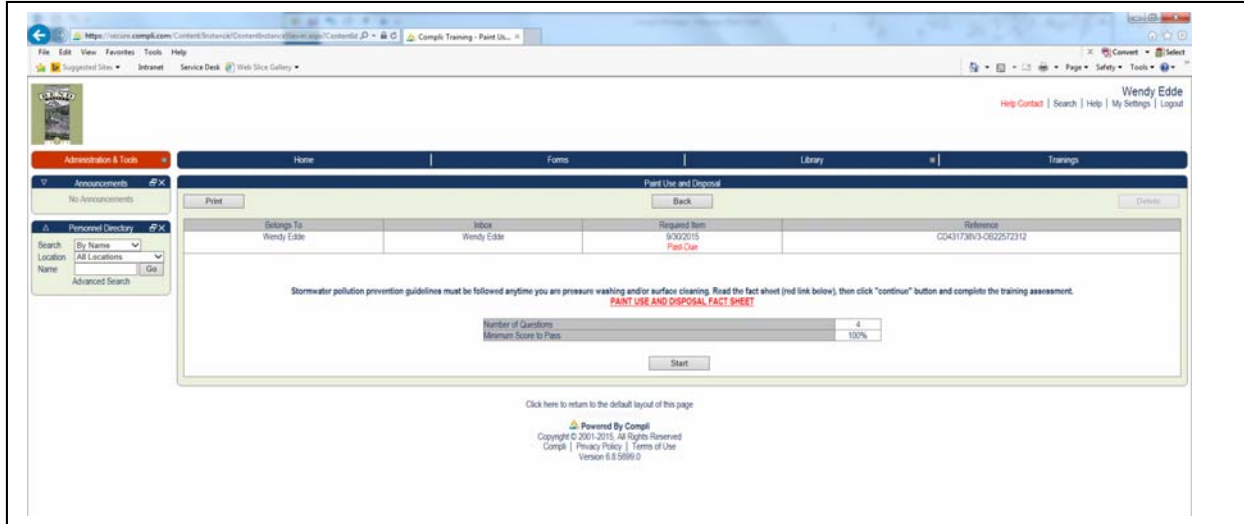
#### Task V.7 Program to Detect and Address Illicit Discharges (MS4/UIC)

The City is working with Public Works and Building Inspectors, along with additional Public Works staff including Industrial Pretreatment Program staff to coordinate efforts. The City has a Stormwater Analyst who is responsible for following up on illicit discharge notifications and complaints. Through its educational materials, the City encourages both public and staff reporting of illicit discharges.

On September 24, 2014 the Stormwater Program Manager gave a presentation on stormwater pollution prevention, illicit discharge detection and spill cleanup techniques to Public Works staff during a safety meeting. A copy of the meeting agenda and sign-in sheet is included is available in Appendix D. City staff also provided a presentation entitled “Water-Safe Landscaping—Considerations for Reducing Pollutants and Maintaining Landscaped Stormwater Facilities,” at the High Desert Green Industry Conference on February 12, 2015 (see Appendix B).

In a continuous improvement effort, staff realized that employee training through reliance on supervisor tailgate meetings was not resulting in adequate recordkeeping of occurrence. To ensure systematic training was occurring, the City began switching its performance standard training for public works employees to the online Compli program. A hazardous waste, spills and proper disposal training was uploaded onto the Compli system in June of 2015, a list of staff that completed this training is included in Appendix D. In addition, a series of stormwater-performance standard specific trainings began to be released in FY2014-15, with others following throughout the year to appropriate staff (see Table 5.1). The training is automatically emailed out to public

works employees and reminders are provided. Staff are required to review a fact sheet or review a presentation and complete a short quiz. A copy of the presentation along with a list of employees that have complete the online training is available in Appendix D.



**Table 5.1 Staff Stormwater Compli Training**

The following topics are covered:

Topic	Suitable for Applicable Staff:	Recommended Time Interval	Time Needed for Training
Vehicle and Equipment Washing	Garage, Utility, Streets; EIPD	Yearly to Biannually	5-10 minutes
Leaky Equipment and Fueling Training	Garage; Utility, Streets	Yearly	5-10 minutes
Spill Prevention, Control and Cleanup Training	Garage; Utility, Streets, EIPD field	Yearly	5-10 minutes
Utility/Road Repair & Maintenance Training	Streets, Utilities, EIPD field	Yearly	10-15 minutes
Paint Use and Disposal Training	Streets, Utilities	Yearly	5-10 minutes
Landscape Maintenance Training	Streets, Utilities (Stormwater)	Yearly	5-10 minutes
Illicit Discharge Follow-up Stormwater Training	Stormwater Program Staff only	Biennially	10-15 minutes
Illicit Discharge Recognition and Reporting	All City Staff (on Complii)	Yearly	5-10 minutes
Surface Cleaning	Streets, Utilities, Garage, Facilities	Yearly	5-10 minutes
Winter Road Care (drafted)	Streets	Yearly	5-10 minutes
Street Sweeping (under development)	Streets	Yearly	5-10 minutes

In addition to the safety meeting all new public works staff are trained through watching the video “Storm Watch, Municipal Storm Water Pollution Prevention” and they take a test/certification on Compli that they have completed the effort. The video covers the following segments:

- Good Housekeeping & Spill Prevention
- Vehicle & Equipment Washing
- Vehicle & Equipment Maintenance
- Spill Reporting & Response
- Street Maintenance
- Outdoor Storage of Materials & Wastes
- Landscaping & Lawn Care.

Stormwater program staff also met with the Safety Program Manager for an IDDE inspection safety meeting (See Appendix D for sign-in sheet).

Staff continue to conduct inspections of the City’s 15<sup>th</sup> Street and Boyd Acres Corporation Yards in conjunction with quarterly Safety Inspections (see Appendix G).

*Effectiveness.* The City continued to use its tracking system, maintaining a spreadsheet of stormwater-specific follow-up actions, tracking 56 events in FY2014-15 (see Appendix D). Staff coordinated well with various DEQ staff in addressing the issues that arose. Reports came from the public as well as from other City staff noticing problems in the field, suggesting that the staff training and public outreach have continued to be useful. Most times initial outreach and education resolve the issue. In FY2014-15 City of Bend inspection staff issued one stop work order on a site that began grading without an approved erosion control plan. The City also issued one formal violation/fine, to a commercial business whose products were blowing off site into the City storm drains. A lot of staff are on vacation in September so the presentation at the safety meeting was not as well attended as normal. Using Compli or moving the month of the in-person presentation are expected to help improve this.

Task V.2 Illicit Discharge Reporting Mechanism (MS4/UIC)

In FY2014-15 the City updated its non-emergency Code Enforcement automated phone tree. One of the options in the phone tree is for reporting Illicit Discharges. Callers who select that option are transferred directly to stormwater staff for follow-up. Another is for construction site erosion and sediment control or drainage issues, which is directed to the construction manager in the community development department overseeing private development inspectors. Additionally the

City advertises the general 541-317-3000 number for reporting illicit discharges and getting information regarding the stormwater utility. The City's "It's All Connected" and "Clean Water Works" campaigns include the public works main phone number and website information that can be used for reporting illicit discharges.

The City continues to use the illicit discharge reporting standard operating procedure (see FY2009-10 annual report for additional information). The City continues to use the Citizen Service Request (CSR) form to the City's webpage (<http://bendoregon.gov/index.aspx?recordid=133&page=26>). This form allows the public to electronically report Illicit Discharges directly. The completed form is automatically emailed to stormwater program staff for follow-up.

Front desk staff are trained on where to send illicit discharge inquiries for proper response, and they are using an automated call center program for directing calls and response. Additionally, the City posted contact information for people to report illicit discharges on the City's website. Stormwater staff is using the Infor system to issue and track work orders. City staff has implemented a preventive maintenance schedule and zones to efficiently clean and maintain the stormwater system and staff keep an eye out for evidence of illicit discharges as they do so.

*Effectiveness.* The City improved its reporting mechanisms in FY2014-15 with improvements to the code enforcement call center routing.

#### Task V.8 Minimize Landscape Irrigation Runoff (MS4/UIC)

The City continues to include landscape irrigation runoff minimization measures in its standards and specifications. City stormwater staff work closely with water conservation staff to help minimize dry weather flows from irrigation runoff.

The water conservation program hired a Water Conservation Program Manager who developed and aired a radio public service announcement and other outreach on overwatering. Staff also hosted a Water Wise Speaker Series with topics that included; "Urban Soils – The Good, Bad the Ugly," "Water "Whys" to Water Wise - Efficient Landscape Irrigation" and "Water Efficiency and Design" (see Appendix D for a copy of the advertisement flyer). Water conservation staff became a member of Oregon Landscape Contractors Association to better coordinate with local landscape professionals. Staff took a survey at a local landscape contractors event that included a question about landscape swales—many understood the concept and some expressed discontent with the maintenance required (see Appendix D for details). Water waste complaints are also followed-up with education and enforcement.

Stormwater staff presented at the 2015 High Desert Green Industry Conference in February of 2015. The presentation included landscape maintenance BMPs to reduce stormwater pollution (see Appendix B for a copy of the presentation).

*Effectiveness.* The City continues to look for ways to partner with local landscape professionals and to reduce dry weather flows. The presentation at High Desert Green

Industry Conference was well received, and the work of the new Water Conservation Program Manager has spotlighted increased efforts in increasing landscape irrigation efficiency.

### **Tasks Completed (ISWMP 2022)**

#### BMP V-1. Public Education on Illegal Discharges and Improper Disposal (MS4 & UIC)

See ISWMP (2006) Task V.1 Public Education on Illegal Discharges and Improper Disposal (MS4/UIC).

#### BMP V-2. Illicit Discharge Reporting Mechanism (MS4 & UIC)

See ISWMP (2006) Task V.2 Illicit Discharge Reporting Mechanism (MS4/UIC).

#### BMP V-3. Post Warnings About Illicit and Illegal Discharges (MS4 & UIC)

See ISWMP (2006) Task V.3 Post Warnings about Illicit and Illegal Discharges (MS4/UIC).

#### BMP V-4. Post Illicit Discharge Prevention Information on Web Site (MS4 & UIC)

See ISWMP (2006) Task V.3 Post Warnings about Illicit and Illegal Discharges (MS4/UIC).

#### BMP V-5. Implement Illicit Discharge Regulations (MS4 & UIC)

See ISWMP (2006) Task V.6 Illicit Discharge Ordinance (MS4/UIC).

#### BMP V-6. Implement Performance Standards (MS4 & UIC)

Performance standards have been completed and incorporated into the ISWMP 2022. The new ISWMP 2022 was approved by DEQ as part of the WPCF-UIC permit issuance but not yet accepted as part of the City's NPDES permit reissuance that remains in negotiation. Performance standards implementation began in FY2013-14 based on the timing of the WPCF-UIC permit issuance. A summary of Performance Standards implementation status is available in Appendix A.

*Effectiveness.* The City has started implementing the new performance standards as part of the ISWMP 2022 and is fully compliant with the scheduled implementation schedule. The use of the Compli system with performance standards fact sheets has improved staff training on the new performance standards. The City met its ISWMP (2006) goal of completing the performance standards for inclusion for consideration in the draft ISWMP 2022.

**Enforcement Actions.** In FY2014-15, the City provided education and verbal warnings along with one formal violation and issued one stop work order. In general, the City

starts with education and a problem-solving approach. Violators are provided educational materials and a form noting the violation is distributed around the neighborhood. Cost for cleanup can also be charged to the violator. More serious violations on private property are referred directly to the DEQ for follow-up and enforcement. See Appendix D for a summary of illicit discharges and follow-up activity.

### **Summary Assessment of Effectiveness**

The City has made significant progress including improved legal authority and clarifications through the illicit discharge ordinance section and associated Illicit Discharge Manual that now provides for additional education and enforcement in an effort to reduce illicit discharges. Since FY2010-11 the City has been using its new customer service data base program (INFOR). This program effectively assists in tracking initial stormwater illicit discharge reports and helps verify that the proper staff are notified of the incident. The City has improved its staff training approach that will help reduce illicit discharges. The City also continues to effectively use the online citizen service request form. Stormwater staff are also seeing improvements in spill response notification from fire and water/wastewater utilities.

The stormwater program funded and completed stocking a second spill control trailer, this one housed at the Boyd Acres facility. Within less than a month of its creation, the trailer was used almost in its entirety in responding to the BNSF diesel fuel spill along the tracks between Revere through south of Greenwood including in the underpass. The City followed up with a written report to DEQ staff in the form of an email documenting the actions taken, and received a response back accepting the report. BNSF and local law enforcement took the lead on cleanup, and apprehending a suspect who vandalized the train engine fuel tank. The leaking material was limited to the engine fuel tank. Lab results are included in Appendix I.





 **6.0 CONSTRUCTION SITE  
STORMWATER ACTIVITIES****Introduction**

The purpose of this component is to control pollutants discharged to municipal storm drains from new and redevelopment construction activities to the maximum extent practicable. Several of the pollutants of concern within the Deschutes River are related to sediment loads. Although the main source of sediments in the Deschutes River are related to upstream river management activities, the City sees it as a priority to reduce the stormwater-related sediment contributions to the problem. Sediments are a main pollutant coming off of uncontrolled construction sites and can clog stormwater facilities including drywells and drill holes as well as negatively impact the Deschutes River, which is listed for sediment and turbidity within Bend.

Construction sites that disturb one or more acres and discharge stormwater through a man-made conveyance or directly to a surface water are already regulated through the state-administered NPDES 1200-C permit program. Many construction sites within the City limits are either smaller than one acre or the stormwater discharges do not drain to a surface water. Per the City's Grading/Clearing regulations as part of the Bend Code Title 16 stormwater ordinance, grading permits are now required on all commercial developments that are adding 5,000 square feet or more of impervious surface or adding one or more UICs, and erosion must be prevented from reaching the storm drain system from all sites.

**Tasks Completed (ISWMP (2006))**

The following tasks are either completed yearly or are continuing:

**Task VI. 1 Evaluate and Update Regulatory Authority and Procedures (MS4/UIC)**

In FY2010-11, the City updated the Design Standards, Construction Specifications and the Development Codes. City's standards and specifications only apply to City-owned property and rights-of-way, not to private lands. The revised standards include new erosion control details and incorporates the COSM erosion requirements. The standards and specifications are available online at: <http://www.bendoregon.gov/index.aspx?page=161>. The revisions adopted the Central Oregon Stormwater Manual (2010) and took effect July 1, 2011.

On January 4, 2012, the City Council voted to approve the new comprehensive stormwater ordinance adopting Bend Code Title 16 (see Annual Report FY11-12 Appendix A). Bend Code Title 16 adopts the Central Oregon Stormwater Manual (2010). Staff are continuing to working with city inspectors, contractors and developers to refine the education and implementation of the ordinance especially through reorganizations and during this period of growth. Development and construction site plans for City review are routed through E-Plans, an electronic review software. The City hired a new Construction and Right-of-Way Manager in private engineering, Kyle Thomas, in FY2014-15. Kyle's role is to oversee the engineering inspectors that perform right-of-way and private development inspections.

*Effectiveness.* The City has successfully completed improving design standards and specifications including adoption and beginning implementation of Bend Code Title 16 and the revised Standards and Specifications. The City has made major progress in regulating construction site erosion and has completed the tasks outlined for this BMP. As the City moves into a period of growth, staffing pressures increase. As a result, in FY2014-15 department heads reviewed roles and responsibilities for implementing portions of Bend Code Title 16, especially with respect to construction issues. As a result of this review the Stormwater Utility has received approval to hire an additional enforcement position. This new position is intended in part to help with construction inspection and erosion and sediment control compliance on smaller lots.

#### Task VI.2 Construction Site Educational Materials (MS4/UIC)

The City developed Clean Water Works fact sheets targeting sediment reduction in FY2014-15 and posted them to our website (see <http://www.bendoregon.gov/modules/showdocument.aspx?documentid=23474> for business outreach, and <http://www.bendoregon.gov/modules/showdocument.aspx?documentid=22510> for homeowners).

The City continued to provide the “Single Family Example Drainage Plan” that can be used to help calculate stormwater flows and encourages the use of Low Impact Development, along with a “Suggested BMPs for Single Family Construction Sites—Example Erosion and Sediment Control Plan” to project proponents to help with implementation of Bend Code Title 16 (see FY2012-13 Annual Report, Appendix E for copies).

City staff also provides copies of the Oregon Association of Clean Water Agencies (ACWA) “Construction Site Stormwater Guide,” an inspection field guide. The field guide is glove-box-sized and includes example pictures and information on proper installation and maintenance of common erosion and sediment controls.

City staff have placed several construction site references on its website: [www.bendoregon.gov/cleanwaterworks](http://www.bendoregon.gov/cleanwaterworks). The references include, in addition to the three named above, the following links:

- Example Drainage Plan - Single Family Residential
- Central Oregon Stormwater Manual
- Maintain Construction Site BMPs Poster
- Erosion and Sediment Control Fact Sheet
- Grading Clearing & Erosion Permit Flow Chart
- Drainage Submittal Flow Chart
- Sample Site Plan - Single Family Residential
- Stormwater Maintenance Agreement
- Construction Site Stormwater Guide - Illustrated BMPs (ACWA)

*Effectiveness.* The City has met the schedules for this task and have provided for additional materials as well. The City continues to look for opportunities to partner with groups like ACWA and IECA to produce cost effective high quality outreach materials.

### Task VI.3 Construction Site Inspections and Violation Hotline (MS4/UIC)

In FY2014-15 grading and drainage ordinance compliance and questions were routed to Russell Grayson, City Engineer, to coordinate compliance, investigation and follow-up. When an erosion and sediment, or poor housekeeping or spill problem is discovered on site, City inspectors provide verbal education and warnings. If the erosion and sediment problems are not addressed by the time the inspector returns for the next inspection, the inspector can withhold additional inspections until the problem is remedied, which can have the effect of stopping a project from progressing. This proved to be an effective way to encourage contractors to repair erosion control deficiencies. Building inspectors help with compliance as part of their standard inspections as well.

Over 40,209 total inspections were requested in FY2014-15 of the Community Development Department. The Community Development Department recorded 910 single family residential starts and conducted approximately 1,001 residential final inspections, and 1,212 commercial final inspections. Engineering inspectors require erosion and sediment controls unless the site is in a depression and stormwater would stay on site. Erosion and sediment controls have been required on grading/drainage permits, all work in right of way and on commercial properties. In calendar year 2014, there were 33 grading/drainage reviews. Engineering inspectors inspected for erosion and sediment controls on these, providing verbal warnings as needed. No stop work orders for drainage were needed. The stormwater utility staff responded to 21 Construction Site illicit discharge complaints; those complaints were included in the Illicit Discharge Tracking sheet (see Appendix D).

In FY2014-15 the City's private engineering department worked to update standards and specifications inspection process. The City drafted a new specification Chapter, Part V - Construction Inspection and Observation Requirements. The two most applicable section for the stormwater program are sections 3.2.1.3 Preservation, Restoration and Clean-up and 3.2.1.6 Erosion Control. The City anticipates this document will be adopted by Council in FY2015-16. A copy of the draft document had been included in Appendix E.

*Effectiveness.* Both commercial construction activity and single family home starts increased in FY2014-15. Inspectors are providing verbal education and warnings regarding construction site stormwater management and delaying other inspections when needed to encourage compliance. City staff reviewed roles and responsibilities to increase effectiveness but the work load is straining existing resources in both the community development and engineering departments. As a result the City drafted a new specification chapter, Part-V. This new section will require more inspection responsibility from the design engineer, freeing up City inspection resources. The Stormwater Utility also received approval to hire an additional enforcement position that will focus on construction site erosion and post construction inspection in an effort to assist building inspectors. Currently finalizing the job description for the new position, City staff anticipates filling the position in FY2015-16.

#### Task VI.4 Construction Site Education (MS4/UIC)

The City hosted two webinars by the International Erosion Control Associations (IECA) in FY2014-15. The first presentation was held on April 15, 2015 and was titled "Biotic Soil Amendments for Site Revegetation" and the second was held on June 17, 2015 and was titled "Construction Inspection Techniques that Really Work." A copy of the presentations and sign-in sheets are available in Appendix E. Staff also successfully budgeted for a live workshop in FY2015-16.

*Effectiveness.* Between the webinars and on-site training on erosion and sediment control held last year, and the webinar held this year, the City has exceeded it biennial training requirements for this task. However attendance at the webinars was low. Therefore, staff will continue to look for opportunities to partner with the Central Oregon Builders Association and other contractors to improve effectiveness in the future and feel a coordinated live workshop may be better attended if held at the right time of year.

#### Task VI.5 Participate in Regional Coordination Activities: Regional Stormwater Control Manual (MS4/UIC)

Developed regionally and refined in 2010, the Central Oregon Stormwater Manual (2010) has been incorporated into both the City's Design Standards and Construction Specifications and Bend Code Title 16.

*Effectiveness.* The COSM (2010) is now part of the City's development rules, referred to in both the Standards and Specifications and Bend Code Title 16.

#### Task VI.6 Performance Standards (MS4/UIC)

Performance standards have been completed and incorporated into the ISWMP 2022. The ISWMP 2022 (November 2012) was approved by DEQ as part of the WPCF-UIC permit issuance to begin in FY2013-14 and is being considered by the DEQ as part of the NPDES permit reissuance. A summary of initial implementation status of the Performance Standards is available in Appendix A.

*Effectiveness.* The City has started implementing the new performance standards as part of the ISWMP 2022 and is in full compliance with the standards in FY2014-15.

#### **Tasks Completed (ISWMP 2022)**

##### BMP VI-1. Implement the Stormwater Regulations (MS4 and UIC)

See ISWMP (2006) Task VI. 1 Evaluate and Update Regulatory Authority and Procedures (MS4/UIC).

##### BMP VI-2. Implement Performance Standards Related to Construction Site Controls (MS4 and UIC)

See ISWMP (2006) Task VI.6 Performance Standards (MS4/UIC).

#### **Enforcement Actions**

The City has the ability to provide education, warnings, delayed inspection and red tags (stop work orders) to violators. In FY2014-15, one formal violation was issued and roughly 21 verbal warnings. The City issued a stop work order on a single-family residential project, for grading without a permit. Of the 56 illicit discharge complaints, 21 were related to construction or erosion control, for which educational materials were provided and cleanup activities were taken.

#### **Summary Assessment of Effectiveness**

The City has successfully implemented the tasks in this component. Staff have been and are continuing to focus on education and refining coordination efforts both internally and with external groups to ensure effective and smooth implementation of Bend Code Title 16, the Standards and Specifications and, through these, the Central Oregon Stormwater Manual. The adoption of Bend Code Title 16 provides adequate enforcement authority. Feedback from trainings

is used to refine effectiveness of future trainings. The City develops and distributes new education materials as the needs presented themselves, and is working towards improving enforcement staffing. The City is continuing to refine its enforcement plan as roles and responsibilities change with new hires, to improve it based on recent workload and experience and record-keeping needs.



# 7.0 POST-CONSTRUCTION STORMWATER MANAGEMENT IN NEW AND REDEVELOPMENT

## Introduction

The objective of the Post-construction Stormwater Management in New Development and Redevelopment chapter is to minimize the discharge of pollutants in stormwater from new developments and redevelopments within the City.

## Tasks Completed (ISWMP (2006))

The following describes yearly tasks that have been completed, or are ongoing that were performed during FY 2014-15:

### Task VII.1 Participate in Regional Stormwater Control Manual and Tailor to Bend (MS4/UIC)

The Central Oregon Stormwater Manual (2010) has been adopted as part of Bend Code Title 16 and the City's Standards and Specifications. Links to the COSM are available on the City's website.

*Effectiveness.* Obtaining DEQ review of the revised COSM (2010) and adopting the manual as part of the City's Standards and Specifications and Bend Code Title 16 helped encourage its widespread use and provided the City enforcement authority to require its use. Other municipalities that have adopted the manual include Deschutes County and the City of Redmond so it is serving as a regional guide. The COSM may need to be reviewed to consider DEQ's current risk-evaluation on stormwater underground injection controls.

### Task VII.2 Operation and Maintenance (MS4/UIC)

As noted in the FY2007-08 Annual Report, City staff have determined that, in general, private development are required to maintain private stormwater facilities and the City maintains City stormwater infrastructure. Maintenance responsibility for regional controls will be considered on a case-by-case basis.

City staff has incorporated long-term operation and maintenance considerations within the new Bend Code Title 16 (See Annual Report FY2011-12 Appendix A), Bend Code Title 16: section 16.15.040). The new code requires all new

commercial development to submit a signed maintenance agreement that will be recorded on the title of the property. In FY2014-15 the City received 140 private development maintenance agreements. The agreements are recorded on the properties' title (see FY2013-14, Appendix F for an example).

For City-owned facilities, City staff continues to use the INFOR asset management software to assist with maintenance tracking and facilities assets management. Field staff also continues to conduct a review of public stormwater facilities to determine which need to be improved/replaced as part of their everyday maintenance activities. On the private side, the City continues to use E-Plans for review and electronic record keeping.

On February 12, 2015, City staff gave a presentation at the High Desert Green Industry Conference on stormwater facility maintenance (see Appendix B). The event was well attended by local landscape contractors, designers and maintenance personnel.

*Effectiveness.* Having maintenance agreements are useful for implementing Bend Code Title 16. Additional guidance on proper maintenance, perhaps adding visuals to the maintenance descriptions in the COSM or other guidance, may help improve understanding of proper maintenance. Preventative maintenance routes have been established in the INFOR system, and are being used to schedule and track routine maintenance operations.

### Task VII.3 Evaluate and Update Plan Review and Inspection Programs (MS4/UIC)

In FY2014-15, the City drafted a new chapter to the Standards and Specifications, Part V - Construction Observation and Inspection Requirements (see Appendix A). This draft document provides clear expectations for contractors, developers, engineers of record and City staff engaged in construction of public infrastructure that will be accepted for ownership and maintenance by the City. The document changes how the City will inspect public development projects. The City intends to transfer the construction inspection responsibility onto the Design Engineer. This includes erosion/sediment control and post construction stormwater facility testing. Final approval and full implementation of this document is expected in FY2015-16.

*Effectiveness.* Although initial effectiveness of changes occurring as a result of passage of Bend Code Title 16 appear promising, the City is continuing to work through implementation of Bend Code Title 16 with respect to fine-tuning inspection and enforcement pathways given the significant reorganizations internally that continue as growth increases. The City has been monitoring efforts closely and has widespread support to work to refine and improve the processes given the changes occurring at the City.



#### Task VII.4 Post-Construction Control Education (MS4/UIC)

The City continues to distribute Bend's Better Site Design Walking Tour, which provides an approximately 3-mile walking tour in the Old Mill and Farewell Bend and Riverbend Park areas of better site design features that help improve water quality by means of low impact development techniques. Nineteen sites are noted on the tour including bioretention swales, reduced parking footprints, pervious asphalt, green roofs, and riparian buffers. The City distributed several at the Oregon ACWA conference in July 2014 together with providing a tour based on the booklet, and another 50-60 at the front table of the NW Green Building Industry Summit held on Friday October 10, 2015 in Bend. In October, 2014, the City sought public comment on the Galveston Avenues Streetscape concept that includes stormwater considerations, developed by a grassroots group of stakeholders.

The City provided several training opportunities associated with post-construction stormwater controls to internal staff and the public. The following is a listing of trainings related to post-construction controls that the City either hosted or helped to sponsor and invited the public, via notifications to the City's Stormwater Liaisons, PAG and Stormwater Stakeholder email lists, to attend (see Appendix F unless otherwise noted for sign-in sheets and presentation notes). These were hosted by the Center for Watershed Protection (CWP) or the International Erosion Control Association (IECA).

- Stream Restoration as a Pollutant Reduction Strategy (Wednesday September 10, 2014)
- Local TMDLs & Regional/River Basin TMDLs: a Happy Engagement or a Shotgun Wedding? (Wednesday, October 8, 2014)
- Retrofitting Existing Stormwater Ponds & Basins (originally aired Wednesday, November 12, 2015 but reshown December 10, 2014)
- IECA, Biotic Soil Amendments for Site Revegetation (Wednesday, April 15, 2015)

Wendy Edde provided a presentation entitled "Water-safe Landscaping—Consideration for Reducing Pollutants and Maintaining Landscaped Stormwater Facilities" on February 12, 2015 to the High Desert Green Industry Conference (see Appendix b). Tom Hickmann (EIPD Director) provided another presentation on UICs at a drinking water conference in spring 2015 as well (see Appendix B).

The City also sponsored a series of landscape water efficiency talks on Saturday April 11 on the following topics. Landscape water efficiency has a stormwater pollution prevention benefit as it can help reduce dry weather flows. The City provided Oregon Rain Garden Guides with the Central Oregon plant list (2013) as additional handouts for attendees.

- Urban Soils—the Good, the Bad, and the Ugly (Rick Martinson, Wintercreek Restoration)
- Water “Whys” to WaterWise—Efficient Landscape Irrigation (Molly McDowell Dunston, Ewing Irrigation)
- Water Efficiency & Design—A Photo Tour of Central Oregon WaterWise Landscapes (Chris Hart-Henderson, Heart Springs Landscape Design) (See Appendix D for related materials and a survey conducted of landscape contractors that included a question about stormwater swales).

Two City staff members attended ACWA’s Stormwater Summit held at Lane County Community College on May 13, 2015.

Staff continues to make available the following outreach guides on its website at [bendoregon.gov/stormwaterbmp](http://bendoregon.gov/stormwaterbmp), and several are available through the Permit Center:

- Better Site Design Walking Tour Booklet (2013 update) and Points to Ponder
- Considering Stormwater at the Conceptual Planning Stage Brochure
- Example Drainage Plan—Single Family Residential (2013)
- Central Oregon Stormwater Manual (2010)
- One Backyard at a Time Video (Bend area examples excerpt)
- Oregon Rain Garden Guide
- Central Oregon Plants for Stormwater Facilities (May 2013 update)
- Stormwater Maintenance Agreement
- Links to EPA website low impact development materials

The City helped distribute “The Oregon Rain Garden Guide” and supplemental plant list for Central Oregon by providing copies at outreach events (i.e., Stream Stewardship Day and Earth Day). The full color guide includes information specific to Central Oregon.

*Effectiveness.* City staff successfully met the requirements of this task. Having continuing education credits available helps draw the engineering community to the webinar trainings that provide access to national expertise.

#### Task VII.5 Performance Standards (MS4/UIC)

Performance standards have been completed and incorporated into the ISWMP 2022. The new ISWMP 2022 was approved by DEQ as part of the WPCF-UIC permit issuance with implementation. Implementation efforts are included in the Performance Standards implementation status, available in Appendix A.

*Effectiveness.* The City is on schedule with implementing the performance standards. DEQ is still reviewing the ISWMP 2022 with respect to the issuance

of the City's NPDES permit reissuance for drainage to the river, but has accepted them for its UIC program.

### **Tasks Completed (ISWMP 2022)**

#### **BMP VII-1. Implement the Stormwater Regulations (MS4 and UIC)**

The City continues to focus its efforts this year on the implementation of both the Standards and Specifications and Bend Code Title 16. For example, stormwater staff worked with transportation engineers to incorporate low impact development into the Reed Market Improvement project (phase two) and the Murphy Road Overpass project. The projects included sediment manhole upgrades, installation of regional bio-swales and additional planter boxes along a Reed Market Rd. City stormwater staff continue to participate on the design team to address the stormwater runoff.

The City is working to tailor its preferred post-construction facilities by area, and worked to obtain performance data as part of that effort.

The Franklin Crossing Community Garden, which converted an unused grassy area with stormwater issues into a stormwater basin, and ADA compliant community garden, developed through community volunteer work was completed and dedicated in September 2014. (See <http://www.youtube.com/watch?v=JvOr1R5-DNE> and Appendix C).

Staff and a Stormwater Quality Public Advisory Group member continued to participated on the Galveston Technical Advisory Committee and Galveston Task Force, respectively. The design was developed as part of this grass roots effort supported by transportation engineering incorporates stormwater improvement low impact development/green infrastructure concepts. Public input ws gatehred in FY2014-15. The final design concepts were presented to City Council on July 15, 2015. Stormwater staff will continue to track this project in FY2015-16.

The City has completed the Third Street Underpass Project.

*Effectiveness:* The City continues to implement post construction controls as part of retrofit projects, and was effective in securing budget increases to start implementing the capital improvement projects outlined in the Stormwater Master Plan, adopted in August 2014.

#### **BMP VII-2. Implement Performance Standards Related to New Development and Redevelopment Site Controls (MS4 and UIC)**

A summary of the implementation status for the Performance Standards

incorporated into ISWMP 2022 and accepted by DEQ under the City's WPCF-UIC permit is included in Appendix A.

*Effectiveness:* The City is currently on schedule with implementation of performance standards. The City met retrofit performance standards with the construction of Reed Market Project (phase two) work that is underway.

### **Summary Assessment of Effectiveness**

The City is on schedule in implementing the tasks in this section. Overall, City staff participated in both attending and providing multiple workshop presentations related to post-construction controls in FY2014-15. The City has updated and actively implemented the development rules and legal authority to require and maintain adequate post-construction controls. The City has begun implementing the performance standards and is meeting or exceeding the approved schedule. The City has been successful in securing additional funding to help fund the capital improvement projects described in the Stormwater Master Plan.



# 8.0 MUNICIPAL OPERATIONS AND MAINTENANCE ACTIVITIES

## Introduction

The objective of this component is to work with maintenance staff to maximize the removal of pollutants during routine maintenance activities and to minimize discharges of pollutants to watercourses and injection systems. Routine maintenance activities include: street sweeping, maintenance of storm drainage facilities and watercourses, and litter control. This component also includes reviewing corporation yard practices and making recommendations to improve the quality of stormwater runoff from these facilities.

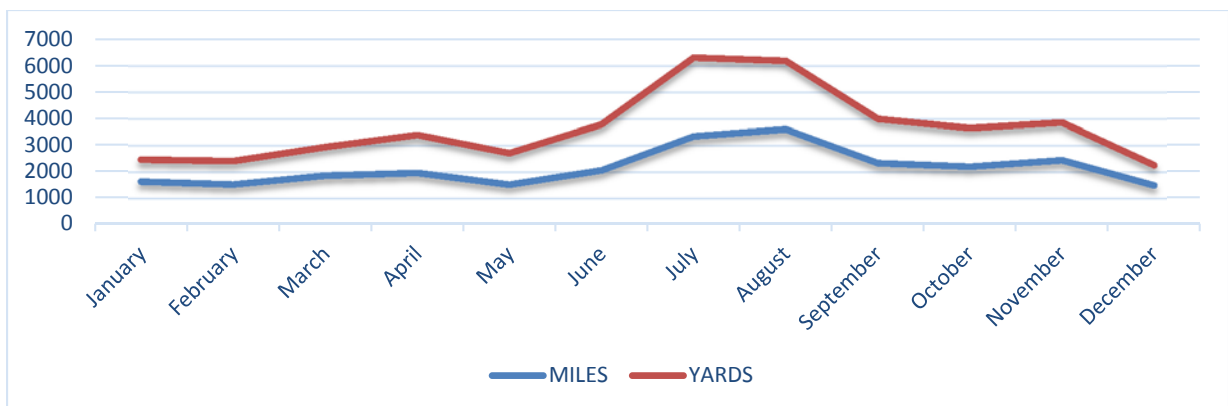
## Tasks Completed (ISWMP (2006))

The following describes ongoing tasks or tasks completed during FY2014-15:

### Task VIII.1 Street Sweeping (MS4/UIC)

The City continues its ongoing street sweeping program per its Sweeping Operations Plan (see FY2007-08 Annual Report). The City regularly has five to seven sweepers running when the pavement is dry. In FY2014-15 they traveled 26,059 miles, directly removing 18,005 yards of material from the streets.

**Figure 8-1. FY2014-15 Municipal Maintenance Sweeping**



The City staff works to optimize maintenance activities by means of creating maintenance zones. The arterials and collectors tend to collect more winter traction debris and are therefore placed in zones for maintenance twice yearly (see Appendix G). Downtown Bend is walkable with lots of pedestrian and vehicle use, so it is swept more frequently.

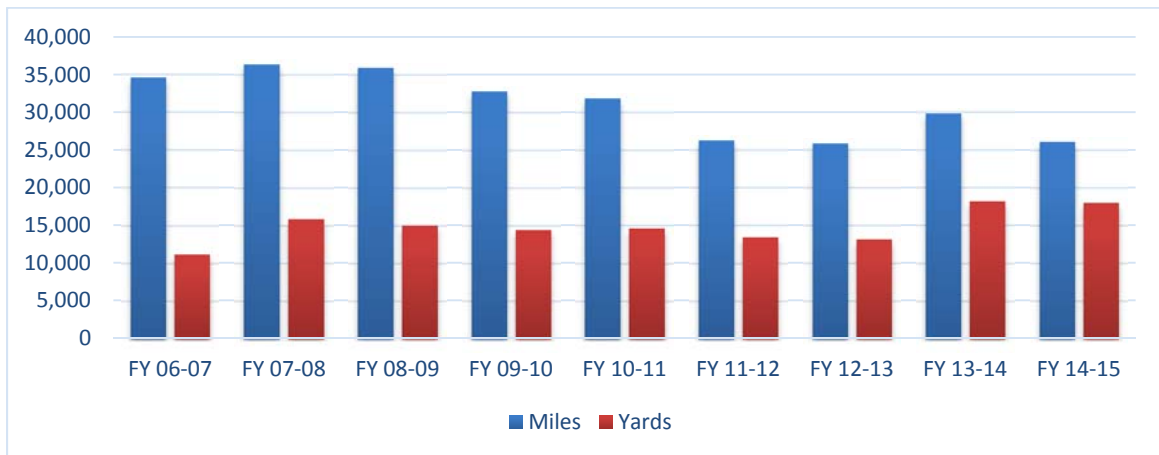
**Table 8-1 FY2014-2015 Municipal Maintenance Sweeping**

Date	Miles	Yards
July	1,645	828
August	1,533	886
September	1,865	1,081
October	1,968	1,438
November	1,524	1,194
December	2,065	1,729
January	3,353	2,966
February	3,609	2,588
March	2,339	1,664
April	2,210	1,451
May	2,452	1,416
June	1,496	765

In FY2014-15, the Stormwater Utility funded 2.8 FTE of 7 FTE sweeper positions due to the stormwater benefits of street sweeping. The Streets fund supports the other 4.2 FTE. In the new biennial budget, the Stormwater Utility will support 3 FTE.

*Effectiveness.* The 18,005 yards of material collected in FY2014-15 was kept out of the City's drainage system. This helps to reduce clogging of stormwater facilities, and helps to keep pollutants out of the Deschutes River. For the third year in a row sweepers have removed 18,000+ yards of material. The yards of material removed is also related to the type of winter weather received and the quantity of cinders/basalt that have been applied. The fact that FY2014-15 was a more mild winter hints at increasing efficiencies.

**Figure 8-2. Sweeping Summary form FY2006-2007 through FY2014-2015**



### Task VIII.2 Parking Lot Sweeping (MS4/UIC)

The City owns and is responsible for sweeping five parking lots throughout the City—the downtown parking structure, the Mirror Pond parking lots, the Brandis lot at Greenwood and Bond, and the Troy Field parking lot across Louisiana from McMenamins. While City Streets crews sweep the public streets, the City's Facilities division is responsible for sweeping the parking lots and parking structure. For efficiency, in the early years of the stormwater program, the City formed a combined Clean Streets and Parking Lots/Litter Task Group within Public Works to determine monitoring protocols and examine ways to improve the effectiveness of the entire sweeping program by first monitoring the build-up of sediment and litter and identifying where improved cleaning is needed most. The City has been able to improve its proportion of yards of material collected per road mile traveled from FY11-12 on (see Figure 8-2). See also Task VIII.1.

*Effectiveness:* Crews have not noticed excessive litter or sediments within the parking lots. See Task VIII.1 for more on effectiveness. The City continues to improve efficiency over time.

### Task VIII.3 Litter Collection and Material Disposal (MS4/UIC)

The City provides street-side litter receptacles in the downtown core area that are emptied by a local garbage/recycling company three times per week in the winter and four times per week in the summer. The Downtown Bend Business Association (DBBA) maintains these receptacles with routine cleaning and repair on an as-needed basis per an MOU with the DBBA and the City. For more information on the City's relationship with DBBA to protect stormwater quality in the downtown area, see the City Edition "Bend Downtown Stormwater" that ran during February 2015: <https://www.youtube.com/watch?v=3eE6d2-eH3Y&index=23&list=PLufJOv4LpbfAT2WkINy89WDCrQ9YdFBkE>. The City stormwater crews helped at the annual Stream Stewardship event by collecting the bags of materials brought up by volunteers.

*Effectiveness.* The program appears to be effective given the lack of complaints. Working with DBBA increases that effectiveness.

### Task VIII.4 Landscape Maintenance Practices

The City continued to implement improved landscape practices and has made adjustments to improve efficiencies, such as using the updated plant list for Central Oregon plants that are suitable for both the climate and the inundation requirements needed to survive in infiltration areas.

Furthermore, the City continues to work with its Volunteer Coordinator to use

volunteers to help maintain the landscape and medians. In FY14-15 the Volunteer Coordinator oversaw the completion and dedication of the new Community Garden at Franklin and 9<sup>th</sup> street project. This project replaced an underutilized grass section in City right-of-way, converting it to a community garden. The project includes stormwater facilities including rain gardens, and improved irrigation as demonstration projects.



Interpretive signage was also incorporated into the project. See the Franklin Community Garden website [www.franklincorner.org](http://www.franklincorner.org) for additional information on the project.

The City continues to implement the Standards and Specifications related to landscaping and low impact development landscape controls. See Chapter 7.0 for information on recent CIP projects.

*Effectiveness:* The City is effectively installing new stormwater surface controls in right-of-way areas, handling stormwater via low impact development standard measures incorporated in the Standards and Specifications and the COSM. The City has implemented improved practices such as plant selection and considering concave medians and bioretention that incorporate stormwater as a design element. However proper establishment and weed control tends to remain issues to be refined, especially during the warranty period. Volunteer projects such as described above are useful for educational and public participation purposes, although they do tend to take longer to complete and effective coordination is needed to ensure ongoing success.

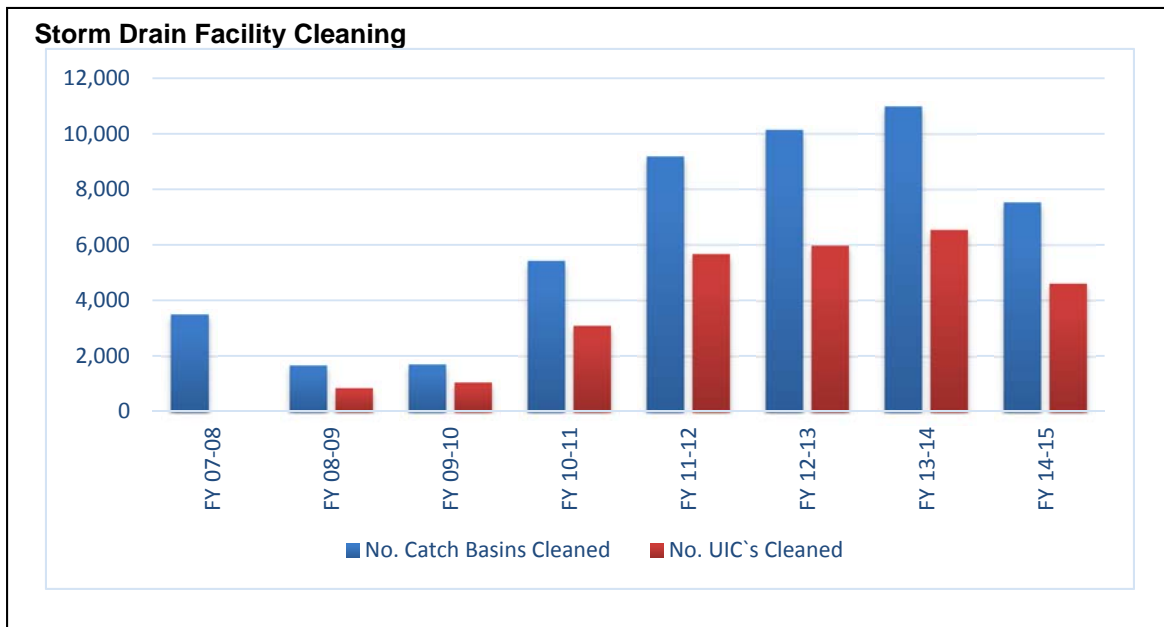
#### Task VIII.5 Improved Catch Basin/Storm Drain Facilities Cleaning (MS4/UIC)

Staff continued work to identify opportunities and improve maintenance practices. Stormwater field crews use the Infor system to manage swales, catch basin and UIC maintenance records. In FY2014-15, the four dedicated stormwater operations staff along with 2 seasonal temporary staff maintained 7,533 catch basins, and 4,614 UICs (dry wells and drill holes) removing 139 yards of material. In addition to routine cleaning and inspection, staff completed 1,182 maintenance repairs, including catch basin replacements and unplugging clogged drill holes. They also maintained 361 swales/detention basins/bioretention cells.

The City continues to maintain a Contech Stormfilter that is installed in Newport Avenue at the west end of the Newport Bridge. In addition, staff installed 189 gross pollutant traps around drill holes to help prevent clogging within the hole. These are proving effective at reducing clogging and preventing large size pollutants from entering the drill hole.



**Figure 8-2. Storm Drain Facility Cleaning**

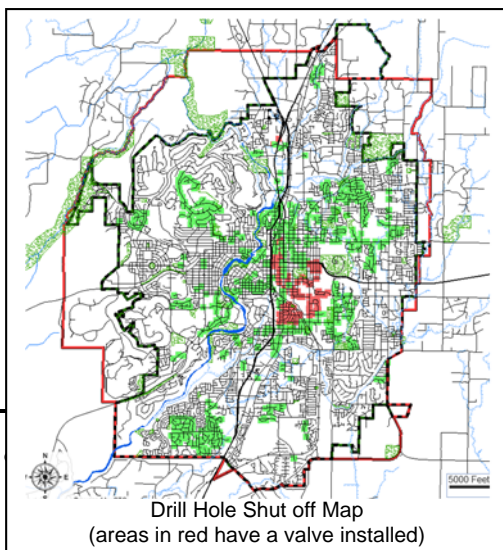


Staff has put aside a specific budget line-item to fund work on pipe replacement projects to repair deficiencies identified during the initial CCTV inspection project. City engineering staff developed a scope of work and project charter for modeling the drainage system for the Newport Main line and the west slope of Awbrey. The City will use this project to develop a pipe replacement plan for the area, making sure replacement pipes are sized properly. The City anticipates having the planning portion of the project completed in FY2015-16.

*Effectiveness.* The additional staff, along with the INFOR software (see Appendix G) continues to increase efficiency and effectiveness of the City’s stormwater program to clean the catch basins, drill holes and dry wells, removing more than 140 yards of material. The maintenance levels this year continue to increase over past years (see graphic on previous page). This is in part due to the increase in dedicated staff and fewer special projects related to increasing the City’s system understanding that were crucial to obtain in past years to be able to run the system more efficiently. Additionally, installation of gross pollutant screens on existing drill holes has helped prevent clogging and increased the efficiency in cleaning these types of UICs.

Task VIII.6 Spill Prevention, Response Materials, and Training (MS4/UIC)

Stormwater crews began implementing a drill hole valve installation program in FY2013-14. The shut-off valves will allow



stormwater crews to safely block the flow during a spill to a drill hole. In FY2014-15 staff installed 31 6"-drill hole shut-off valves at high risk locations. The City plans to continue this program and install an approximately 25 valves in FY2015-16.

Staff continued to maintain simple spill kits in each of the street and stormwater vehicles. Streets and stormwater field crews are periodically trained in spill prevention and response at the monthly staff meetings, and all of Public Works was provided a Hazardous Material overview training on April 30, 2014 and an illicit discharge prevention training in September 2015 (see Appendix D). In addition, all new public works personnel are required to watch spill prevention and control training movie as part of their training.

The City keeps one sander loaded year round to serve for spills, as the sand can be used to make a temporary berm to help contain the spilled materials. The City also maintains two spill containment trailers that is stocked with absorbents, booms, pipe plugs and other related items in order to respond to larger spills. Spill containers are also present at both Corporation Yards (15<sup>th</sup> and Boyd Acres).

In FY2013-14 the City developed a series of 13 tailgate trainings; each training packet includes an informational fact sheet/ handout. The City worked with supervisors to encourage their use. As this was not working as well as planned, Stormwater staff decided in FY2014-15 to instead start to upload those trainings into the City COMPLI program. City staff are now required to review the fact sheets annually online and complete a short quiz for each. Staff can work the completion of these into their schedule, given ample time before deadlines, and this improves tracking and accountability.

The City continues to require all new Utility, Streets, and EIPD employees to complete the training entitled "Municipal Storm Water Pollution Prevention—Storm Watch." This consists of reviewing online videos and completing a short quiz covering best management practices for: good housekeeping & spill prevention, vehicle and equipment washing; vehicle and equipment maintenance; spill reporting and response; street maintenance; outdoor storage of materials and wastes; and landscaping and lawn care. In FY2014-15 nineteen new employees completed the training (see Appendix D).

The City continues to use integrated pest management (IPM) techniques for weed control but does track its weed control program pesticide use; the reporting information that is provided yearly to the State is available upon request. Stormwater crews carry storm drain plugs and absorbents for spill response.

In March 2015, City staff posted a brief educational flyer in the utility restrooms targeting sediment pollution awareness to help increase staff understanding.

*Effectiveness.* Installing valves on high risk drill holes helps reduce response times to closed off drill holes during a spill incident. The spill trailer allows for staff to contain and clean up larger spills. Training helps staff understand how to reduce situations where spills may occur and when to report spills; along with the needs and expectations for protecting water quality through storm drain maintenance. Switching to Compli for training is helping to improve record keeping, accountability, and efficiency. With the break-up of Public Works into three individual departments, additional coordination work is necessary to ensure that training across the departments is maintained.

#### Task VIII.7 Illicit Dumping (MS4/UIC)

Areas with high pedestrian traffic tend to have higher levels of gross pollutants (trash). As a result, stormwater crews sweep the downtown corridor where there is high pedestrian traffic at a higher rate than other areas of town. City staff who see an illicit discharge or illegal dumping are trained to contact stormwater personnel for educational follow-up (see also Task V-2). City staff reported 26 of the 56 reports of illicit discharges reported in FY2014-15. Additionally, the City has focused outreach efforts, such as its successful “It’s All Connected,” and “Clean Water Works” campaigns and storm drain marking program on reducing non-stormwater discharges (see the Public Education and Public Participation chapters of the annual report for more information).

The City distributed funnels and water droplets for the July 2014 Quest at the Fest event. The water droplets contain a pollution prevention message “Only Rain in the Storm Drain” and a phone number to report illicit dumping. The message on the funnels was targeted at proper disposal of used motor oil and includes a phone number and website.

*Effectiveness.* City staff are implementing educational and inspection best management practices to help reduce the number and severity of illicit dumping incidences. The increased storm drain facility cleaning means every catch basin was examined during FY2014-15 for both illicit discharges and the need for cleaning.

#### Task VIII.8 City-owned Corporation Yards, Industrial and Commercial Facilities (MS4/UIC)

City staff continued to conduct municipal self-audits to determine ways to improve water quality on corporation yard sites (see Appendix G). Staff began to conduct these audits in FY2010-11. Staff have identified City owned and operated facilities, and have performed inspections of both the Boyd Acres facility and 15<sup>th</sup> Street facility, completing self-inspection checklists quarterly together with the safety inspections.

*Effectiveness.* The City has been effective in conducting corporation yards audits this year and use these as needed to initiate discussions with appropriate staff to improve practices as needed.

#### Task VIII.9 Detect and Correct Cross-connections and Leaks (MS4/UIC)

In FY2009-10, the City completed a comprehensive CCTV pipe inspection project for areas that drain to the river and found no sewer illicit connections but some connections that need further review. In FY2013-14 City crews began collecting CCTV inspections data on all new stormwater pipes. The crews verify that storm pipes are installed per the approved plans. This initial pipe survey data will help provided base line information and will allow for quicker identification of illicit connections in the future. In addition to the CCTV pipe inspections, stormwater staff are trained to look for illicit connections as part of routine zone maintenance. The City found no illicit connections in FY2014-15.

*Effectiveness.* The FY2009-10 television inspection was very effective in detecting cross connections and deficiencies in the 14 miles of storm drainage pipes that are connected to river outfalls.

#### Task VIII.10 Promote Commute Alternatives for Municipal Employees and the Public (MS4/UIC)

The City also continued its transportation demand management program (TDM) to encourage alternative modes of transportation and to reduce single occupancy vehicle trips. City staff are offered \$60 or the equivalent in time off for every 20 trips using alternative transportation. The program is coordinated through Commute Options (see Appendix G).

*Effectiveness.* Commute Options worked to coordinate better with statewide programs to improve efficiency by way of introducing Drive Less Connect in fall 2011. In FY2014-15 the City continued to promote the TDM program, and electronic reporting through the Drive Less Connect website. The 2014 Drive Less Connect event resulted in 129,242 driving miles and 3,597 gallons of gas saved in Central Oregon, according to Commute Options (see Appendix G).

#### Task VIII.11 Performance Standards (MS4/UIC)

Performance standards have been completed and incorporated into the ISWMP 2022. The new ISWMP 2022 was approved by DEQ as part of the WPCF-UIC permit issuance and was scheduled to begin in FY2013-14. The City is meeting the baseline requirements on schedule. A summary of performance standards and initial implementation status is available in Appendix A. City staff have developed and begun distributing training fact sheets to help explain performance standards and best management practices in a manner suitable to

tailgate meeting trainings.

*Effectiveness.* The City is effectively implementing the new performance standards as part of the ISWMP 2022, having met the initial standards scheduled to be met during F2013-14. The City met its goal of completing the performance standards for inclusion in the draft ISWMP 2022 and implementation efforts are progressing effectively.

### **Tasks Completed (ISWMP 2022)**

#### BMP VIII-1. Street Sweeping (MS4 and UIC)

See ISWMP (2006) Task VIII.1 Street Sweeping (MS4/UIC).

#### BMP VIII-2. Implement Performance Standards (MS4 and UIC)

See ISWMP (2006) Task VIII.11 Performance Standards (MS4/UIC).

#### BMP VIII-3. Landscape Maintenance Practices (MS4 and UIC)

See ISWMP (2006) Task VIII.4 Landscape Maintenance Practices.

#### BMP VIII-4. Improved Storm Drain Facilities Cleaning (MS4 and UIC)

See ISWMP (2006) Task VIII.5 Improved Catch Basin/Storm Drain Facilities Cleaning (MS4/UIC).

#### BMP VIII-5. Promote Commute Alternatives for Municipal Employees (MS4 and UIC)

See ISWMP (2006) Task VIII.10 Promote Commute Alternatives for Municipal Employees and the Public (MS4/UIC).

### **Summary Assessment of Effectiveness**

As demonstrated herein, the City has been able to refine its collection and cleaning programs to be more efficient. The City has also been effective in installing several new landscaped drainage controls in the right-of-way. Crews are effectively maintaining the system, and are making improvements to existing drill holes to prevent both large scale pollutants from entering the hole as well as to include emergency shut-off devices in the most high-risk areas to help facilitate quick and safe closure in the case of an emergency spill. Outreach and coordination to ensure pollution prevention at corporation yards continues and the City is working to be more effective with its staff trainings by incorporating Compli. The TDM program continues to be a success as well.



 **9.0** **MONITORING****Introduction**

As a Phase II NPDES permitted community, the City of Bend is not required to monitor stormwater discharges that drain to the river, but is required to monitor stormwater drainages to UICs as part of its WPCF-UIC permit, received in May 2013. Early in 2004, the City and the Upper Deschutes Watershed Council (UDWC) began a multi-year monitoring program to gather data on the presence or absence of pollutants of concern in the Deschutes River within the Bend Urban Growth Boundary (Deschutes River Miles 172, and 159). This baseline report was completed in FY2009-10. The baseline data of the Deschutes River monitoring study will be useful to compare results of overall river health over time to help illustrate overarching effectiveness of pollution prevention efforts.

**Task Completed (ISWMP (2006))****Task IX.1 Monitor Stormwater Discharges to the Deschutes River (MS4)**

In FY2009-10, through a combined effort with the Upper Deschutes Watershed Council, the City completed the City of Bend Ambient Water Quality Monitoring project. This project focused on studying the diurnal, seasonal and annual variations of pollutants of concern in the river and Tumalo Creek. As part of the multi-year study, City staff conducted monitoring on the Deschutes River and Tumalo Creek just upstream, within and downstream of the City's UGB using grab sampling and continuous temperature monitoring at 16 stations, and continuous multi-parameter monitoring at up to 3 stations. (See Annual Report FY09-10 for additional information).

In addition, the City of Bend Laboratory collects samples for and performs analysis of both routine river samples and stormwater samples over 8 months of the year for the following constituents:

- Temperature
- pH
- Dissolved Oxygen
- Conductivity
- Turbidity
- Total Dissolved Solids
- Total Nitrogen
- Total Phosphorus
- Nutrients

### *Escherichia Coli* and Total Coliforms

Since September of 2005, the City has deployed multi-parameter submersible sondes at locations upstream and downstream of the City's stormwater outfalls. The purpose for these sondes is to detect changes in river water quality resulting from storm events. The sondes have been in place for significant storm events. The parameters monitored were pH, temperature, conductivity, turbidity and dissolved oxygen. More data and a more intensive data analysis will be necessary to determine if there are any significant stormwater impacts on river water quality, especially with respect to the nitrogen regime. Sondes are deployed during the winter rainy season as well as during the summer.

The City has continued to monitor in FY2014-15 and is working with a consultant to analyze the data collected since the UDWC report. In FY2014-15, the consultant has prepared a template for annual reporting that the City is reviewing and work to populate it continues.

*Effectiveness.* The completion of the multi-year monitoring report in FY2009-10 provides the City a useful document for understanding baseline conditions from which the City can compare with future studies to determine ultimate effectiveness of its MS4 stormwater quality programs. The additional data that the City is collecting is being compiled and analyzed which should help distinguish trends over time to the ambient water quality.

### Task IX.2 Enhanced Drinking Water Well Monitoring (UIC)

The City continues to monitor drinking water quality weekly and meet drinking water requirements under the Safe Drinking Water Act through regular well monitoring. The results of this monitoring are summarized in the City's separate yearly drinking water quality annual report, available at [www.bend.or.us/index.aspx?page=205](http://www.bend.or.us/index.aspx?page=205), which includes mention of stormwater pollution prevention efforts as well.

The City stormwater and water quality laboratory staff continued meeting as needed and these meetings serve as the enhanced monitoring task group, as well as addressing other monitoring issues.

*Effectiveness.* The City is meeting the Safe Drinking Water Act groundwater requirements through its regular well monitoring. The City has completed the Water Master Plan, and having completed a baseline river monitoring analysis, continues to collect data to help determine changes over time. The City is improving its efforts by working to analyze the data collected since the 2009 UDWC report.



### Task IX.3 Stormwater Monitoring for UICs (UIC)

The City stormwater and water quality laboratory staff continued meeting as needed and these meetings serve as the enhanced monitoring task group, as well as addressing other monitoring issues. The City developed and is implementing a stormwater monitoring plan as part of the WPCF-UIC permit issuance.

In FY2014-15, the City continued the use of automatic sampling collectors with Nalgene bottles at five UIC locations throughout the City. The City closely monitors potential precipitation events to target efforts to ensure enough precipitation is present to collect a sample. A summary of the City's stormwater monitoring data collected and the Sample Condition Weather Data Summary table for FY2014-15 are included in Appendix H.

Despite being in a severe drought the City met its goal of collecting two stormwater samples at each of the 6 sample locations. The City deployed the samplers for a total of 5 rain events.

Additionally laboratory staff offered a clean hands/dirty hands sampler training in August 2014 (see Appendix H).

In FY2013-14 the City requested DEQ approval to relocate the Ladera monitoring site. The revised Ladera site proved to a more suitable location, consistently filling the samplers even during small rain events.

In addition to the stormwater monitoring plan, stormwater staff collected three grab samples over two different days at the Greenwood underpass catch basins. The samples were collected after a BSNF train had its fuel tank punctured, and leaked roughly 3,000 gallons of diesel onto a mile long stretch of tracks as the train passed through town. See Chapter 10 for more information on spill and clean-up efforts.

City staff continued to work with the manufacturer on fine-tuning the ISCO flow monitors settings to increase accuracy and prolong battery life. The samplers are set to send out a text message to stormwater staff when flow is detected or when the unit need new batteries. The City also purchased a new software called FlowLink Global. This software automatically uploaded pipe flow measurements to an online database. The City tested the flow monitors at two locations: Century and Empire. Next year staff will work to deploying additional flow monitors and the other sample location.

*Effectiveness.* This program is continuing to provide the data needed to tailor an appropriate stormwater quality management program for both the river and UIC

disposal. The main focus in FY2014-15 was conducting UIC monitoring per the approved monitoring plan and continue to refine the ISCO flow monitoring setup. All analytes monitored were within compliance levels.

#### Task IX.4 Performance Standards (MS4/UIC)

Performance standards have been completed and incorporated into the ISWMP 2022. The new ISWMP 2022 was submitted in December 2012 and approved by DEQ as part of the WPCF-UIC permit issuance. Performance Standards and implementation status is available in Appendix A.

*Effectiveness.* The City has started effectively implementing the new performance standards as part of the ISWMP 2022.

#### **Tasks Completed (ISWMP 2022)**

##### BMP IX-1. Monitoring of the Deschutes River (MS4)

See ISWMP (2006) Task IX.1 Monitor Stormwater Discharges to the Deschutes River (MS4).

##### BMP IX-2. Stormwater Monitoring for UICs (UIC)

See ISWMP (2006) Task IX.3 Stormwater Monitoring for UICs (UIC).

##### BMP IX-3. Implement Performance Standards

See ISWMP (2006) Task IX.4 Performance Standards (MS4/UIC).

#### **Summary Assessment of Effectiveness**

The City has successfully developed and begun implementing a UIC monitoring plan tailored to Central Oregon climate and challenges. The City has increased the effectiveness of its stormwater monitoring efforts through the use of automatic grab samplers in conjunction with grab samples, and is now working to incorporate flow monitors.

 **10.0****UNDERGROUND INJECTION  
CONTROLS  
AND  
DRINKING WATER PROTECTION  
AREA INVESTIGATION,  
DELINEATION AND****Introduction**

This chapter covers reporting of activities listed under Chapter 10 of the Integrated Stormwater Management Plan 2022 entitled “Underground Injection Controls,” and Chapter 10 of the original ISWMP (2006) entitled “Drinking Water Protection Area Investigation, Delineation and Management.” One of the highest priorities for the City is protecting its drinking water wells from contamination. In order to do this, the City needs to know where and how it should focus its protection efforts and to meet Underground Injection Control (UIC) requirements that are protective of groundwater. The purpose of this section is to provide the information the City needs in order to do this, especially with respect to the City’s stormwater underground injection controls (UICs). For this reason, the title of this chapter changes between the Integrated Stormwater Management Plan (2006) and the ISWMP 2022, from “Drinking Water Protection Area Investigation, Delineation and Management,” to “Underground Injection Controls,” respectively. This chapter of the annual report covers both the ISWMP (2006) and ISWMP 2022 respective chapters.

**Tasks Completed (ISWMP 2006)**

The following describes yearly tasks that have been completed, or are ongoing that were performed during FY2013-2014:

**Task 10.1 Drinking Water Protection Area Delineation (UIC)**

The City completed its Drinking Water Protection Area Delineation for City wells in FY2010-11 (See FY2010-11 Annual Report Appendix I).

*Effectiveness.* The City successfully completed the development of new/refined well head protection area delineations for use in its required Source Water Assessment, and has completed the Source Water Assessment including updating the potential contaminant source database.

**Task 10.2 Drinking Water Protection Plan (UIC)**

The focus of this task is to identify real and potential contaminant sources within the refined Drinking Water Protection Areas (DWPAs), designate which are

private and public sources of potential pollutants, and develop and provide targeted educational materials minimizing potential contaminant sources for those agencies, businesses and residences within the revised DWPAs. This task became even more important after the DWPA project significantly changed the DWPAs. In FY2010-11 through FY2011-12, the City applied for and received a \$30,000 grant to update the potential contaminant source inventory and to perform a susceptibility analysis to prioritize protective measures that might be taken to minimize the risk to groundwater. The PCS inventory and susceptibility analysis was completed in October of 2013. The report was reviewed and accepted by Oregon Health Authority Drinking Water Program.

*Effectiveness:* The City is continuing to improve its understanding of its groundwater and stormwater systems to best be able to target efforts to protect drinking water. The City continues to provide education on the importance and methods to protect water quality (see ISWMP 2022 UIC tasks, described below, and the education–related and illicit discharge chapters of this annual report for more details).

### Task 10.3 Groundwater Vulnerability Study (UIC)

The City submitted and DEQ reviewed and accepted the study entitled “Pollutant Fate and Transport Model Results in Support of the City of Bend UIC WPCF Permit – Groundwater Protectiveness Demonstration and Proposed EDLs” in FY2011-12 (see <http://www.deq.state.or.us/wq/uic/docs/template/BendReport.pdf> or Appendix I of the FY2011-12 annual report for a copy of the report).

*Effectiveness:* The City has completed the groundwater vulnerability study and received a letter of acceptance from DEQ on February 13, 2012.

### **Tasks Completed (ISWMP 2022)**

The following describes yearly tasks that have been completed, or are ongoing that were performed during FY 2014-2015:

#### BMP X-1. Complete Systemwide Assessment (UIC)

The City completed the Systemwide Assessment (SWA) and submitted the documents to DEQ in December 2012 as part of the WPCF-UIC permit issuance package that ultimately resulted in the City receiving its first WPCF-UIC permit. A copy of the UIC Systemwide Assessment is available upon request.

#### *System Wide Assessment - Follow-up Tasks*

The Systemwide Assessment suggested the following additional tasks be conducted and reported on in the first annual report of the WPCF-UIC permit

(due November 1, 2014). This was completed in the last annual report, and additional updates are provided below as appropriate.

- *Work to complete measurements for 1,776 drywells for which the City does not have specific depth information. (Systemwide Assessment, Section 3.4). Analyze specific depths to ensure adequate separation distance from regional seasonal high groundwater (Systemwide Assessment, Section 5.5).*

For efficiency the City decided to field verify the depths of all dry wells by zone. Therefore, in FY2013-14 City staff collected drywell depth measurements from all zones of the City. That effort resulted in field verification of 1,491 drywells. Upon a quality assurance review, it has been determined that staff will continue to work on collecting measurements for or address the remaining drywells. Others were found to be owned by ODOT, so the databases are being updated. The current database is included in Appendix I.

- *The City will periodically review the State's database or capture new wells during local development actions for improved well location or installation information and include the information in future updates of the Systemwide Assessment submitted per permit requirements. (Systemwide Assessment, Section 6.6).*

The City has continued to track new private wells installations within the City limits or close enough to impact City UIC setbacks. In FY2014-15, two residential drinking water wells were added No City drywells were affected. The City will continue to periodically update its online well layer to keep it current.

*Effectiveness:* The City successfully completed the systemwide assessment that was accepted by DEQ who issued the City's WPCF UIC permit in May 2013. The City is using the systemwide assessment to help focus efforts for UIC upgrades. The City continues to install additional spill closure valves in additional high risk areas, and is yearly tracking installation of new wells.

### BMP X-2. UIC Registration (UIC)

Summary tables and a full copy of the City's UIC database is submitted with the annual report (see Appendix I). See also Chapter 2.0 (ISWMP 2006) Task II.6 UIC Registration (UIC), and Appendix I for a summary of new public UICs installed in FY2014-2015 wherein 121 drywells were installed.

The registration database in Appendix I includes information on spill and gross pollutant control best management practices installed.

*Effectiveness:* The City is submitting the registration database in an excel format once per year as part of the annual report, as directed in the City's WPCF-UIC permit. The City is willing to work with DEQ should a different format or manner of submittal (e.g., electronic) is requested to improve database management. The City is working to improve coordination of registration given confusion with changes resulting from registration associated with the new permit. Areas of improvement include notification of 30-day pre-closure notification and coordination with GIS and Infor entry along with roles and responsibility clarifications for sign-offs.

### BMP X-3. UIC Retrofits, Upgrades or Decommissioning (UIC)

As part of the City's capital improvement projects the City retrofitted or closed several UICs related to the Murphy extension project and the Reed Market Go-Bond project (see Appendix I). Appendix I also includes a table of those UICs that the City anticipates will be closed/decommissioned in FY2015-16.

*Upgrades.* Additionally, the City is working to upgrade UICs. In FY2014-15, 318 drill holes have been retrofitted with a valve that can be manually closed using a valve key in the event of a spill. This decreases spill risk and increases worker safety precautions. Similarly 189 drill holes have been retrofitted in FY2014-15 with a gross contaminant screen, designed to keep larger sized materials (litter, vegetation, etc.) from entering and clogging the drill hole. This serves to keep larger sized plastics and other pollutants from entering the drill hole.

The City also started implementing its open-grate drywell retrofit plan (see Appendix I). In FY2014-15, Wendy Edde was designated project manager for the cross-departmental retrofit project with Reese Moody taking the lead on right-of-way retrofits. Seventy-four drywells have been identified as having open grates at the following facilities:

- Airport (18 drywells)
- Brooks Alley Parking Lots (6 drywells)
- City Right-of-Way/Streets (32 drywells)
- City Corporation Yards (4 drywells at Boyd Acres)
- City Hall (2 drywells)
- Fire Department (8 drywells)
- Police Department (4 drywells)

During the biennial budget process conducted in FY2014-15 the City, between its Facilities and Utility Maintenance divisions, has set aside \$300,000 to begin work on this effort. The initial effort is funded to meet cost estimates for making upgrades to Brooks Alley parking lot, City Hall, Boyd Acres Corporation Yard, and the Police Department, along with beginning work on street right-of-way drywell upgrades.

*Effectiveness:* The City is working to improve its process for ensuring that new protocols for UIC registration, decommissioning, and reporting that are developing as a result of the new permit are appropriately communicated and met. Part of this entails better understanding and reacting to changes to processes and procedures at DEQ, then ensuring the City is obtaining the information that we need and adjusting our processes/procedures accordingly, and communicating those among departments in a manner that those employees are knowledgeable to ensure needs are met by their contractors and subcontractors. City staff will continue to work with DEQ and internally to improve in these areas.

### **Summary Assessment of Effectiveness**

The City has significantly increased scientific understanding of its system and groundwater aquifer through drinking water protection area delineation and vadose zone analysis, along with refining knowledge of the locations and status of its UIC system. The City has continued to increase its knowledge and groundwater protection efforts through implementation of the potential contaminant source identification project and Systemwide Assessment follow-up actions. The City is refining its drainage system as it redevelops to include pretreatment and is actively conducting selective outreach and field modifications to be more protective within wellhead protection areas. The City successfully submitted and received DEQ approval of its Systemwide Assessment, and has completed the related follow-up actions.