

INTEGRATED STORMWATER MANAGEMENT PLAN



**FOR THE
CITY OF BEND, OREGON
MARCH 10, 2004
*as revised November 2006***



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Bend ISWMP

Revised: November 2006

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ACRONYMS AND ABBREVIATIONS

BMP	Best Management Practice
CDD	Community Development Department Director
CFS	Cubic Feet per Second
CIP	Capital Improvement Plan
CM	City Manager
COM	Communications Manager
COIC	Central Oregon Intergovernmental Council
CWA	Clean Water Act
DEQ	Oregon Department of Environmental Quality
DO	Dissolved Oxygen
DWPA	Drinking Water Protection Area
EPA	U.S. Environmental Protection Agency
GIS	Geographic Information Systems
GPS	Global Positioning System
ISWMP	Integrated Storm Water Management Plan
MS4	Municipal Separate Storm Sewer
ODOT	Oregon Department of Transportation
PAC	Public Advisory Committee
PW	Public Works
PWD	Public Works Director
PWMA	Public Works Management Analyst
SDWA	Safe Drinking Water Act
SWAT	Stormwater Action Team
SWMP	Storm Water Management Plan
TBD	To Be Determined
TMDL	Total Maximum Daily Load
TWMP	Total Water Management Plan
UDWC	Upper Deschutes Watershed Council
UIC	Underground Injection Control
UGB	Urban Growth Boundary
USGS	United States Geological Survey
WPCF	Water Pollution Control Facilities

SECTION ES: EXECUTIVE SUMMARY

The purpose of this Integrated Stormwater Management Plan is to meet federal clean water requirements for both the Deschutes River and groundwater through Bend and to protect the quality of Bend's water resources. Improperly managed stormwater may cause problems to physical property, result in localized flooding, destabilize stream flows and stream banks, or result in increased pollution or storm drain maintenance costs. The City is addressing these issues through a two-pronged approach—through the revision of this Integrated Stormwater Management Plan to address water quality issues, and through the development of a separate Stormwater Master Plan to address quantity issues.

Federal regulations required the City to submit, by March 10, 2003, an application for a Phase II Storm Water National Pollutant Discharge Elimination System (NPDES) permit, and, by March 10, 2004, a Storm Water Management Plan (SWMP). The City met both of these deadlines. However, due to state-wide legal issues regarding stormwater NPDES permits, the Department of Environmental Quality (DEQ) has been delayed in issuing Phase II NPDES permits across the state including the City of Bend's. The legal issues have been resolved, and DEQ intends to issue the permit in early 2007.

Due to DEQ's delay in reviewing and approving the City's SWMP, the schedules in the original SWMP are no longer appropriate. Also, since the initial SWMP was prepared, the City has accumulated additional important information on stormwater management within the City. For the above reasons, the City has updated its SWMP, herein.

In addition to its NPDES permit for discharges to the Deschutes River, the City is required by the DEQ to obtain an Underground Injection Control (UIC) Water Pollution Control Facility stormwater permit for its underground discharges. This permit, too, requires a SWMP. Furthermore, the City has incorporated a section addressing Drinking Water Protection Areas (DWPA), the delineation of which is required by the Oregon Health Division. Many of the activities designed to protect surface water from stormwater impacts are identical to those that would protect groundwater from such impacts. Therefore, the plan that is being updated here is termed an Integrated Storm Water Management Plan (ISWMP), because it applies both to the river discharges and underground discharges.

The ISWMP consists of several components required by various federal laws including the Clean Water Act and the Safe Drinking Water Act. These include actions to keep the public informed and involved, to reduce the amounts of pollutants from homes and businesses to the storm drain system, to improve municipal operations, to monitor stormwater, and to lessen the impacts of development on water quality. The plan also addresses drinking water protection areas.

SECTION I: INTRODUCTION AND BACKGROUND

The City of Bend is a National Pollutant Discharge Elimination System (NPDES) designated Small Municipal Separate Storm Sewer (MS4) owner and operator and, as such, was required by state and federal regulations to submit a Stormwater Management Plan (SWMP) by March 10, 2004. The City met this deadline; however, due to the lengthy delay in obtaining permits from the regulatory agencies involved, the City has determined it to be necessary to update the SWMP to better reflect the timelines of the permit period and to incorporate the additional understanding gained since the initial SWMP was submitted. A SWMP is required for the catch basins and associated conveyance systems owned and operated by the City of Bend that discharge stormwater to the Deschutes River. The City has approximately 20 such discharges that serve a portion of the City along the river. Privately owned and maintained entities, such as the Old Mill District, specific subdivisions in town as well as the Bend Metro Park and Recreation District that operates 2000 acres of developed and undeveloped park land and open space, are outside of the City's jurisdiction with respect to the NPDES permit.

As with all private owners of dry wells and drill holes in Oregon, the City is also subject to Oregon's Underground Injection Control (UIC) program that requires the City to prepare a SWMP for the catch basins, drill holes and dry wells that it owns that discharge stormwater underground. This includes most of the City's approximately 5,100 catch basins and all of its more than 1,000 drill holes and 1,900 dry wells (see Figure 1). The City does not have jurisdiction over the water quality aspects of stormwater management on private property, but private UIC owners must meet DEQ's UIC requirements for stormwater quality in addition to meeting the City's requirements for managing stormwater quantity.

The main difference between the MS4 and the UIC systems is that each MS4 system discharges stormwater to the river whereas the UIC systems discharge to a dry well or drill hole. The area drained by each MS4 system is generally larger than the area drained by a typical UIC system. The purpose of the MS4 program is to prevent pollution of surface water and the purpose of the UIC program is to prevent pollution of ground water.

Because the regulations that specify SWMP content are nearly identical for the MS4 and UIC programs, the City has decided to develop an Integrated Stormwater Management Plan (ISWMP). Both sets of regulations require the City to employ Best Management Practices (BMPs) to keep contaminants out of stormwater or, if necessary, remove the contaminants before the water is discharged underground or to the river. BMPs are defined as:

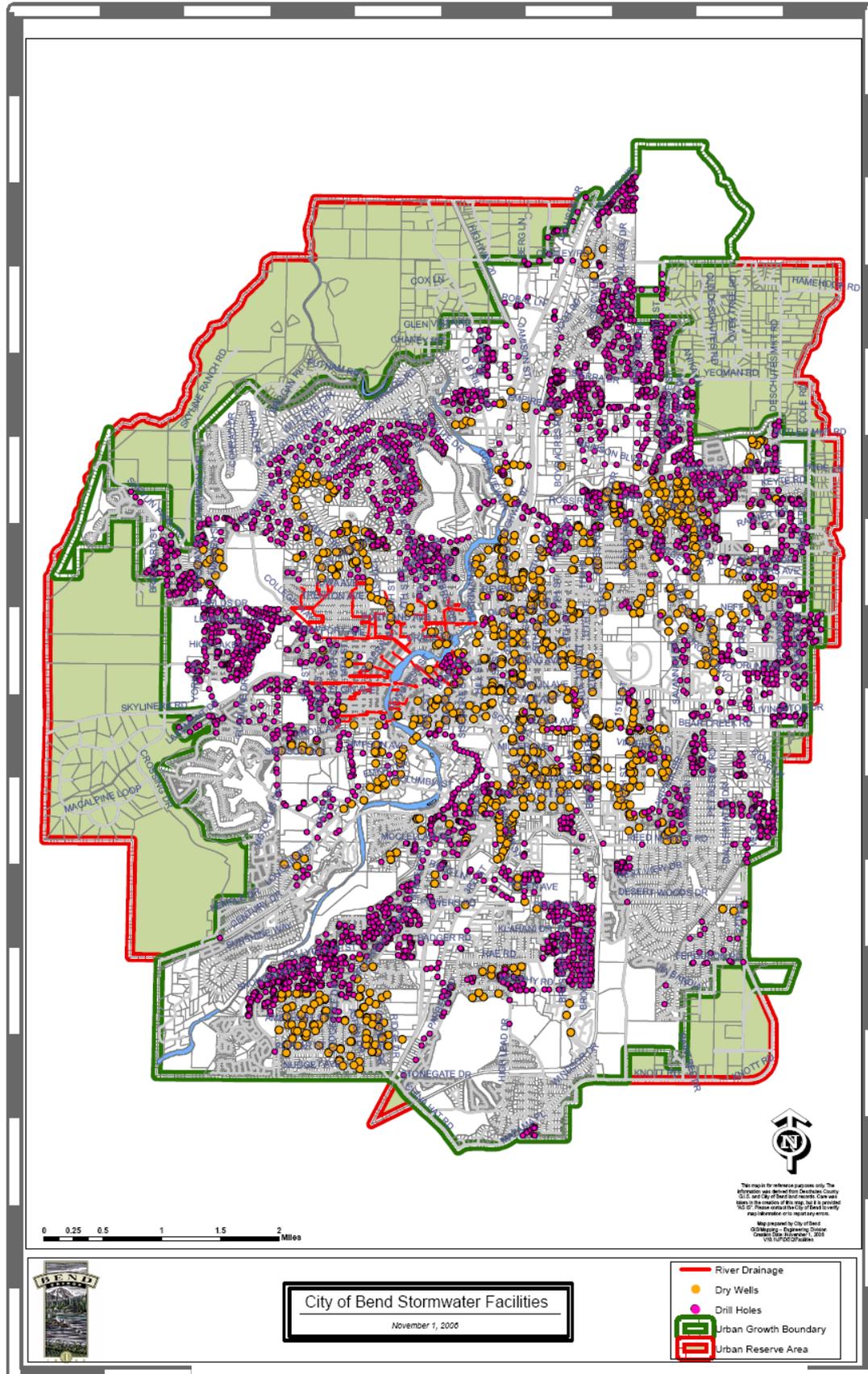


Figure 1. City of Bend Stormwater Facilities

“...schedules of activities, prohibitions of practices, maintenance procedures or other management practices to prevent or reduce the pollution of waters of the state. BMPs for stormwater may include operational and structural source controls that minimize and prevent contaminants from entering stormwater as well as treatment BMPs that remove contaminants contained in stormwater runoff before disposal or discharge.”

--United States Environmental Protection Agency

The City will receive a NPDES MS4 permit and a separate UIC Water Pollution Control Facilities (WPCF) permit.

This Integrated Stormwater Management Plan may become part of a Total Water Management Plan (TWMP), tentatively planned for development. The City of Bend's TWMP would address all water management issues within the Urban Growth Boundary (UGB). Water conservation, a key element of the TWMP, will reduce dry weather irrigation flows and associated landscape chemical discharges to storm drains. The TWMP would also address drinking water source protection, one of the main purposes of Oregon's Underground Injection Control and Ground Water Protection regulations. The City also plans to have a Stormwater Master Plan completed by the end of 2008.

SETTING

The City of Bend, located within Deschutes County, was incorporated in 1905. The City is a chartered home-rule city, operated by a City Council/City Manager structure. Elected officials include seven at-large City Council Members, who appoint one of their own to serve as Mayor. Bend covers 32 square miles (the extraterritorial jurisdiction covers 72.3 square miles), is located at Latitude 44° 03' 30" and Longitude 121° 18'51", and is 3,628-feet above sea level. Average high temperatures are 40-50 degrees F in the winter and 80 to 90 degrees F in the summer. Average low temperatures are typically 22-51 degrees F in the winter and 40 to 50 degrees F in the summer. The average annual precipitation is 11.6 inches; the average snowfall is 34 inches. The regional topography is hilly to mountainous although Bend itself is relatively flat to gently sloping with some buttes located throughout town.

Demographics

Understanding the makeup of a community is important to implementing a successful stormwater management program. Currently, the City of Bend has a population of approximately 70,328 as of 2005, up from 52,029 as of the 2000 Census. With the high growth rate, implementing development-related BMPs and educating the public about general stormwater considerations in Bend should be a priority.

Nearly 13,000 residents were enrolled in school, (roughly 10,000 of them in grades K-12) per the 2000 Census. Over 90% of the population 25 years and over have a high school degree or better, and English is the primary language. Only 2.3% of the population aged five years and over speak English less than

“very well” per the 2000 census. Spanish is the second most common language. Given the high percentage of residents who speak English, the focus of public outreach efforts in this permit period will be on materials for English speakers.

Storm Drain System

The City has roughly 13 miles of storm sewers and approximately 20 outfalls that discharge to the Deschutes River (see Figure 1). Runoff management, as well as street maintenance, is handled by the Department of Public Works, Street Division. However, the following highways through the City are the responsibility of Oregon Department of Transportation (ODOT) to maintain: Highway 20, Highway 97, and Business Highway 97 north of Highway 20.

The Deschutes River

Bend has one main natural waterbody running through the City, the Deschutes River. The City’s (and others) stormwater discharges contribute contaminants to the Deschutes River. This can occur when there is rainfall or snow melt at which time there are also many natural contaminant discharges to the river. However it can also occur in times of dry weather flows. There is not yet enough information to determine if the City’s discharges significantly affect the river’s water quality. Early in 2004, the City and the Upper Deschutes Watershed Council began a multi-year monitoring program to provide additional data on the presence or absence of stormwater pollutants in the Deschutes River within the Bend Urban Boundary (Deschutes River Miles 172 and 159). This may result in restrictions being placed on the City’s discharges to the river in the future.

The Oregon Department of Environmental Quality (DEQ) has placed the Deschutes River through Bend on the list of impaired waterbodies for the following pollutants:^{1,2}

- *Chlorophyll a* (Deschutes River Mile 168.2 to 189.4, Columbia Street to Harper Bridge, June 1 – September 30): *Chlorophyll a* is an indicator of algae and other water plants that form the basis of the aquatic food chain. If production is extremely high, then eutrophication can occur, resulting in high daily fluctuations in pH and DO that can negatively affect the numbers and types of organisms available to survive in the reach. The growth rate of these primary producers can be elevated by phosphorous and other artificial nutrients introduced to the waterway.
- *Dissolved Oxygen (DO)* (Deschutes River Mile 168.2 to 189.4, Columbia Street to Harper Bridge, all year; 189.4 to 222.2 (Harper Bridge to Downstream of Wickiup, September 1- June 30): a measure of the concentration of oxygen in the water, DO is needed by fish and aquatic life to survive; elevated levels of algae and aquatic plants can lead to the reduction of the availability of this DO, resulting in harm to fish and aquatic habitat.

1 Oregon Department of Environmental Quality, 2004/2006 303(d) List,

2 UDWC, 2005.

- *pH* (Deschutes River Mile 126.4 to 162.6, Steelhead Falls to upstream end of Tumalo State Park, all year; 162.6 to 168.2, Upstream end of Tumalo State Park to Columbia Street, summer): A logarithmic measure of the hydrogen ion concentration of the water, pH levels outside the generally preferred range of 6.5 to 8.5 can affect the toxicity of and availability of pollutants (e.g., ammonia and metals) to aquatic organisms. pH fluctuates depending on the activity of primary producers, and may change because of failing septic or sewer systems and urban or agricultural runoff.
- *Temperature* (Deschutes River Mile 126.4 to 168.2, Steelhead Falls to Columbia Street, all year; 168.2 to 189.4(Columbia Street to Harper Bridge, September 1- June 30): Outside of preferred ranges, temperature can directly or indirectly result in mortality for aquatic organisms. Additionally broad, shallow zones in rivers cause warming, leading to increased algae production and the resulting harm to habitat (see *Chlorophyll a* and DO).
- *Turbidity* (Deschutes River Mile 168.2 to 222.2, Columbia Street to Downstream of Wickiup, Spring/Summer): Turbidity measures the clarity of the water column. Long exposure to high turbidity levels can reduce a fish's ability to see and obtain food and can clog fish gills affecting the ability to breathe. Turbidity can also reduce the penetration of sunlight into the water column, leading to algal die off.
- *Sedimentation* (Deschutes River Mile 168.2 to 222.2, no season stated): Sediment loading can occur both naturally and as a result of human activities, such as land management, stormwater, construction, logging, roadway, flow regulations and agricultural activities. Sediment can smother fish eggs and benthic organisms.

The State will calculate the maximum amount of each of these pollutants that the Deschutes River can receive and still meet water quality standards, as well as an allocation of that amount to pollutant sources. It is important to note that this is a comprehensive list of pollutants as required by Section 303 of the federal Clean Water Act (known as 303(d)-listed pollutants of concern) for the Deschutes River within Bend and urban runoff may not be the source, or the sole source. These calculations are known as Total Maximum Daily Loads, or TMDLs.³ Once developed, not meeting the load allocations could result in violations of the Federal Clean Water Act. DEQ has indicated that implementation of the Stormwater Management Plan during the first permit period will be adequate to meet the TMDL requirements (DEQ, August 2006).

In addition to water quality impacts, stormwater discharges can result in adverse affects for the aesthetic characteristics of the Deschutes River throughout the City, including within Mirror Pond. Stormwater sediment, trash and debris may all contribute to visual impairment.

³ U.S. Environmental Protection Agency, February 2005.

Groundwater

Currently, approximately half of the City's potable water is obtained from water wells located within the UGB and this dependency on groundwater will increase as the City grows. Groundwater quality is extremely good. The City is committed to protecting the quality and quantity of this water source.

Sewage, industrial and commercial waste water, and stormwater have been discharged underground for decades in Central Oregon. Public water system operators have been required to regularly test their water for over 20 years. In the late 1990s, the United States Geological Survey and others performed extensive sampling and analysis of water wells in the Bend area. Groundwater monitoring well networks have been in operation for many years at the City's wastewater treatment plant evaporation ponds and the Deschutes County landfill. None of the monitoring data reveal any pattern of drinking water standards violations or significant groundwater quality degradation (Oregon Department of Human Services, 2006).

Public drinking water in and around Bend generally is obtained from wells that are over 300 feet deep. Even though the geology in the area is generally porous, there is an opportunity for underground discharges to disperse before they reach the groundwater. In addition, the recharge rate for the principal aquifer in which the public wells are located is close to 4,000 cubic feet per second (CFS). Over 75% of this is from snow melt in the Cascade Mountains.

Theoretically, this would quickly dilute any contamination to levels that would not be detected by the methods normally used to analyze drinking water samples. Moreover, less than one percent of the recharge is from urban area stormwater underground injection (USGS, 2001). The two major rivers—Deschutes and Crooked—are gaining streams, receiving most of their water from their interconnection with the basin's principal aquifer.

The principal (deep) aquifer is overlain with shallower aquifers that generally are not tapped for public drinking water. Oregon's groundwater protection rules require that all aquifers be protected. Very little monitoring has been done to determine if these shallower aquifers are being contaminated by stormwater.

The hydrogeology of the Upper Deschutes Basin has been studied extensively. It is a complex and unique system where groundwater and surface water are interconnected. The many canals that crisscross the basin add to the complexity. An understanding of the complexity and uniqueness of the basin's hydrogeology along with its semi-arid climate and cold winters is necessary to tailor a stormwater management program that is most effective and workable for this area.

GOALS AND STRATEGY

The overall goal of this Plan is to create a program that maintains the high level of water quality historical to the area and meets the regulatory requirements of both the Phase II NPDES stormwater program and the UIC program by

minimizing stormwater pollution to the maximum extent practicable. Based on the specific characteristics of Bend, the City feels it would be most effective to focus its efforts in this first permit period on meeting the following strategic objectives:

- Within this initial permit(s) cycle, the City's strategy is to first and foremost develop a dependable funding source via creation of a stormwater utility fee, and to ensure proper legal authority sufficient to allow for effective implementation of the plan components designed to meet the regulatory requirements related to stormwater quality.
- Due to the high growth rate within Bend and its impacts to the City in addressing both quality and quantity of runoff, the second highest priority will be to address stormwater controls related to development—both construction and post-construction.
- Throughout all of the elements, public education will be a key factor since many of the changes being implemented within this time frame will require relatively new concepts for the area and potential paradigm shifts needed from municipal staff, the business and industry community, and the public. For cost-effectiveness, existing educational materials will be used to the extent possible, modified to the specific situation in Bend.
- A fourth priority will be to focus on adhering to best management practices within the City, so that the City's municipal operations will serve as a model for the rest of the community, and will allow the City to use its experiences to help others.
- In addition, the City will seek to work with regional groups in areas that are cost-effective and effective to partner, such as public education and monitoring.

ORGANIZATION OF THE ISWMP

The nine elements of this ISWMP are:

- Program Administration, Planning, and Financing (Section II)
- Public Education and Outreach on Stormwater Impacts (Section III)
- Public Involvement and Participation (Section IV)
- Illicit Discharge Detection and Elimination (Section V)
- Construction Site Stormwater Runoff Control (Section VI)
- Post-Construction Stormwater Management in New and Redevelopment (Section VII)
- Municipal Operations (Section VIII)
- Monitoring (Section IX)
- DWPA investigation, re-delineation and management (Section X).

Within each element are:

- a. BMPs to be implemented. The BMPs are numbered by their section followed by a hyphen and an identifying number within that section.
- b. Rationale used to determine the selected BMP(s)
- c. Measurable goals and interim milestones for each BMP
- d. Designation of person(s) responsible for the implementation of each BMP.

The table in Appendix A summarizes and illustrates the implementation schedule for the BMPs and tasks committed to in this plan.

**SECTION II:
PROGRAM ADMINISTRATION, PLANNING AND FINANCING**

REGULATORY REQUIREMENT

National Pollutant Discharge Elimination System Stormwater Discharge Permit, DEQ, Permit Number 1200-MS4:

Schedule A Discharge Limitations and Stormwater Management Program:

2. Stormwater Management Program Requirements.
a. The permittee must develop, implement, enforce, and measure the effectiveness of a Stormwater Management Program (SWMP) designed to reduce the discharge of pollutants from the permittee's small MS4 to the maximum extent practicable (MEP), to protect water quality, and to satisfy the appropriate water quality requirement of the federal Clean Water Act, and State of Oregon water quality regulations.

Schedule D Special Conditions

1. Legal Authority. The permittee must maintain, through ordinance, interagency agreement or other means, adequate legal authority to implement and enforce the provisions of this permit.

EXISTING CONDITIONS/ CURRENT PROGRAMS

The City has begun work by holding management and staff level meetings to coordinate stormwater activities and planning, and to begin work towards developing a Stormwater Master Plan and utility fees. City staff are also actively participating in permit negotiations.

GENERAL APPROACH

The Plan calls for the formation of two main advisory groups, a Public Advisory Committee (PAC) and an internal Stormwater Action Team (SWAT). These groups will be composed of individuals with the knowledge, skills and experience needed to deal with the full range of stormwater issues. These will be key working groups in the development and implementation of the City's stormwater management program. The PAC and SWAT may call on other individuals with specific knowledge, skills and expertise.

Education, training and exchange of information will be emphasized throughout the development and implementation of the Plan. The City believes that raising the level of stormwater awareness among City employees and the public is a necessary and important first step regardless of the subsequent steps.

Because stormwater is an issue that goes across departmental boundaries—requiring the work and knowledge of planners, engineers, code enforcement, building department, inspectors, public works streets, public works wastewater, public works stormwater, and public works water division, water quality laboratory staff, and communication managers—a successful program can only occur with useful pathways to conduct both intradepartmental and interdepartmental communication and coordination. Therefore this section seeks to set up those pathways, along with adequate funding, legal authority to implement, and tasks to meet the required review and reporting tasks.

The City will place reducing erosion and sediment impacts as a high priority in this first permit period because:

- Sedimentation and turbidity are listed as pollutants of concern in the Deschutes River through Bend and are influenced by stormwater flows;
- The high growth rate and amount of construction being experienced in Bend at present can result in significant erosion and sedimentation if not properly managed; and
- Sedimentation can result in costly impacts such as localized flooding, and clogging of dry wells and pretreatment systems.

Improving the planning for and installation of post construction controls to adequately address both the quantity and quality of stormwater runoff will also be a high priority. Since a stormwater quality program is new to the Bend area, educating the public, businesses, and city staff about the importance of watershed protection, stormwater quality, and simple actions that can be taken to improve their water quality will also be a focus.

SELECTED BEST MANAGEMENT PRACTICES

The following six best management practices have been chosen to meet the administration, planning, and reporting needs as outlined in this section, Section II, of this integrated plan.

BMP II-1. Administration and Coordination

Description: An action-oriented regular (at least quarterly) meeting of Responsible Parties, to be called the Stormwater Action Team (SWAT), will be held to create and cement communication and coordination pathways. The goal of this oversight committee is to cost-effectively create success within the stormwater program and the City by keeping one another apprised of activities, and determining pathways to improve staff coordination, efficiencies and resource sharing.

In addition, a Public Advisory Committee (PAC) will also be created to provide public oversight, ideas, and advice (see BMP IV-1 for more details). The PAC

will be comprised of members of the public representing various interests such as Chamber of Commerce, environmental interests, and engineering interests.

Additionally, the SWAT can pull together various ad-hoc work groups as needed to work on specific tasks. These work groups may be used to coordinate with outside agencies and groups as well. Staff may also participate on the stormwater-related work groups hosted by other agencies such as the Central Oregon Intergovernmental Council (COIC).

Measurable Goals: The SWAT team will meet as needed and at least quarterly. A list of SWAT team members along with yearly participation rates will be noted in the annual report along with meeting summaries. Participation in other as-needed work groups will be tracked and noted.

Schedule: At least quarterly meetings of the SWAT team starting in Year 1 and continuing through the permit period. Quarterly meetings of the PAC will be scheduled beginning in Year 1 after formation of the PAC.

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	Administer and coordinate implementation of the ISWMP	Public Works Director; Community Development Director, Public Works Management Analyst	Year 1	Ongoing
2	Hold SWAT meetings	Public Works Director; Community Development Director, Public Works Management Analyst	Year 1	Ongoing
3	Participate in external stormwater workgroups (e.g., COIC)	Public Works Management Analyst	Year 1	Ongoing
4	Convene other ad hoc workgroups as necessary	Public Works Director, Public Works Management Analyst	As needed	As needed

Responsible Persons: The Public Works Director and the Community Development Director are responsible for implementation of this BMP, to be supported by the Engineering Supervisor or designee, and by other staff as needed. Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

BMP II-2. Legal Authority

Description: Bend will manage runoff issues through the creation and enactment of an ordinance or changes to existing ordinances and regulations to

authorize a stormwater utility fee and ensure that the City has the legal authority to implement the various elements of the SWMP. As part of this effort, the City will ensure that a stormwater ordinance and standards are enacted, and that post-construction stormwater management for new development and redevelopment is addressed in detail, including low impact development concepts and proper long-term operation and maintenance of BMPs.

Rationale: A stormwater ordinance and development standards are necessary to provide adequate authority for the City to implement the stormwater management plan and meet the requirements of the Clean Water Act (with respect to stormwater flowing to surface water) and the Safe Drinking Water Act (with respect to stormwater flowing underground). Ordinances and standards provide the ability to impose citations or fines, which can serve as strong motivation for compliance.

Land-use, development, zoning and building codes sometimes make it difficult or impossible for developers to employ certain stormwater BMPs. The City's development codes need to be reviewed and revised to facilitate better stormwater management. For example, some codes that encourage high density or low cost housing make it difficult for developers to find sufficient land area for stormwater infiltration. Well-designed infiltration is one of the most desirable stormwater BMPs.

Measurable Goals: The City will first evaluate the existing development rules/documents and identify needed updates, and work to resolve conflicts in existing ordinance, policy or code language pertaining to the creation and implementation of a stormwater program. Upon review, a final stormwater ordinance, along with appropriate development code language will be adopted and implemented.

Schedule: Draft language should be completed and reviewed by staff by the end of Year 3. Final language should be adopted by the City by the end of Year 4.

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	With review and comment from PAC and direct input from SWAT, the City staff will draft a stormwater ordinance, and also review development codes and identify where additional or modified policy, guidance, or ordinance language is needed to support implementation of BMPs.	Public Works Director (PWD), Community Development Director (CDD), Public Works Management Analyst (PW Management Analyst or PWMA), PAC Chairperson, SWAT	Year 1	Year 2

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
2	Identify potential conflicts and work with impacted interests to resolve. Prepare draft development code revisions	PW Management Analyst, PAC Chairperson, SWAT	Year 1	Year 2
3	Obtain public review of draft development code revisions, and draft stormwater ordinance.	PAC Chairperson, PW Management Analyst; SWAT CDD; PWD	Year 1	Year 3
4	Finalize development code revisions and stormwater ordinance.	CDD; PWD, PW Management Analyst	Year 2	Year 4
5	Implementation complete	CDD; PWD; PW Management Analyst		Year 5

Responsible Persons: The Community Development Director, with assistance from public works staff and the Public Works Director are responsible for implementation of this BMP. Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

BMP II-3. Financing

Description: The City intends to develop Stormwater Utility and/or other fees to pay for stormwater quality and drainage management programs.

Rationale: Estimates for costs of implementing a small stormwater program range from \$1.50 to \$8.00 per person per year depending on several variables including the character, climate and geology of the city, the specific requirements of the state, the maturity of the stormwater program, the need to improve water quality in the area, and the ability to share costs with other similar programs (Reese, 2000). The U.S. EPA estimates that the annual cost for a town of 70,000 would be just under \$250,000 per year, based on their estimate of \$1,525 per permittee + \$3.50 per person (Ibid). Due to existing drainage issues, Bend's costs may be closer to the high end; budget and resource allocations will be addressed during the first phase of the Stormwater Master Plan, that phase of which is scheduled for completion in early 2007.

Measurable Goals and Schedule: The City will ensure adequate funding to implement this integrated stormwater management plan, and to complete a Stormwater Master Plan by Permit Year 4.

Task #	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Ensure adequate funding to implement the ISWMP.	Community Development Director, Public Works Director; Public Works Management Analyst	Year 1	Ongoing
2	Create Stormwater Master Plan	Public Works Director; Public Works Management Analyst	Year 1	Year 4

Responsible Persons: The City Manager, with assistance from Public Works Director and Community Development Director, is ultimately responsible for ensuring that the stormwater program is adequately funded.

BMP II-4. Planning

Description and Rationale: City staff will annually review the ISWMP, plan specific activities for the coming year, and revise the ISWMP as needed. The City expects to update this Plan as often as necessary based on new information. This is especially true with respect to the deadlines. The schedules may be updated as the advisory groups identify priorities and tasks.

Measurable Goals and Schedule: The results of the review and any changes to the SWMP will be reported on as part of the annual report, due by November 1 of each year.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Annually review ISWMP, plan activities for coming year.	Public Works Director; Community Development Director, Public Works Management Analyst	Year 1	Ongoing, yearly
2	Update ISWMP	Public Works Director; Public Works Management Analyst	As needed	As needed

Responsible Persons: The Public Works Director and Community Development Director are responsible for implementing this BMP, with assistance from the stormwater coordinator and SWAT team. Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

BMP II-5. Annual Reporting

Description and Rationale: The City will provide an annual report to be submitted to DEQ by November 1 of the activities taken and achievements made in the previous fiscal year. The report will include measurements of and discussions of the effectiveness of the program and its individual components. In addition to verifying compliance with NPDES permit and UIC requirements, the City may use the following or other tools to measure the effectiveness of various components, as appropriate:

- Surveys (meetings, workshops, website)
- Attendance lists
- Number of stormwater drainage calls by age of development
- Stormwater discharge monitoring results
- Number and type of enforcement actions.
- Tracking changes in the number of BMPs implemented between site visits/inspections.
- Amount of materials collected (e.g., street sweeping activities; public participation trash collection events).

Measurable Goals: A report of accomplishments achieved in the previous fiscal year (July 1 through June 30) and any continual improvement changes made will be provided to the DEQ by November 1.

Schedule: Yearly submittal with the first report due by November 1 of Year 2.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Prepare and submit annual report	Public Works Director; Community Development Director, Public Works Management Analyst	Year 1	November 1, Year 2; annually thereafter

Responsible Persons: The Public Works Director and Community Development Director, with assistance from Stormwater Coordinator and SWAT team are responsible for implementing this BMP. Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

BMP II-6. UIC Registration

Description: The City will complete and keep up-to-date its inventory and GIS of all storm sewer catch basins, drill holes, dry wells and river outfalls. This will include showing which parts of the system collect, convey and discharge water to the Deschutes River and which parts are injected into the ground. The City will continue to register its dry wells and drill holes with the DEQ or EPA, as required.

BMP II-6a. – Using a GPS, locate all catch basins, drill holes, dry wells and river outfalls and display information in a GIS. This effort to map

underground discharge sites ties into the efforts of BMP V-5 that includes mapping UIC structures.

Rationale: In order to manage stormwater properly, the City needs to know where all of its storm drainage structures are located, where they discharge, and the areas and land uses they drain. This can best be done by obtaining accurate geographical coordinates for each structure by means of a GPS, assigning a descriptive identification code to each structure, and recording this information in a database and GIS.

Measurable Goals and Schedule:

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	On a map, show the location of each structure. In addition, show the connections for each system that discharges to the Deschutes River	Street Supervisor, Engineering Services	Year 1	Year 2
2	Assign descriptive ID codes	PW Management Analyst	Year 2	Year 2
3	Upload information to GIS	Engineering Services (GIS)	Year 2	Year 3
4	Create GIS with layers for UGB, topography, streets, water bodies, catch basin locations, drill hole locations, dry well locations, river outfall locations, cleanup site locations, interconnections for systems discharging to the river, water well locations, and 1, 2, 5, and 10 year DWPAs.	Engineering Services (GIS)	Year 3	Year 5
5	Make GIS available on stormwater web site.	PW Management Analyst	Year 3	Year 5
6	Update GIS at least quarterly.	Street Supervisor	Year 2	Ongoing

Progress will be deemed satisfactory if all task deadlines are met.

BMP II-6b. Register dry wells and drill holes with the DEQ.

Rationale: The City has several thousand dry wells and drill holes. Existing inventories need to be checked and updated as appropriate. Failed or

abandoned dry wells and drill holes need to be decommissioned and reported to the DEQ.

Measurable Goals and Schedule:

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	Develop UIC database that can easily transfer registration and decommissioning data to DEQ database.	PW Management Analyst	Year 1	Year 1
2	Enter data for all existing UICs	PW Management Analyst	Year 1	Year 2
3	Develop process for registering new, modified or decommissioned injection systems before they are constructed, modified or decommissioned.	Street Supervisor	Year 1	Year 2
4	Maintain accurate database.	Street Supervisor	Year 2	Ongoing

Progress will be deemed satisfactory if all task deadlines are met.

Responsible Persons: The Public Works Director, with assistance as assigned above, is ultimately responsible for implementation of this task.

**SECTION III:
PUBLIC EDUCATION AND OUTREACH
ON STORMWATER IMPACTS**

REGULATORY REQUIREMENT

40 CFR 122.34 (b) (1) – *Public education and outreach on storm water impacts.* (i) You must implement a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of storm water discharges on water bodies and the steps that the public can take to reduce pollutants in storm water runoff.

EXISTING CONDITIONS/CURRENT PROGRAMS

Bend provides general public education to residents by several means of communication. The City has a Communications Manager. The City has a website and a municipal television broadcast “City Edition” for disseminating information. It also produces a periodic newsletter/paper called “Our City” as well as subject-specific brochures. Bend also works with public education partners, such as the Upper Deschutes Watershed Council that sponsor various volunteer river clean-up and stream education activities during the year. No specific information has been provided to the public regarding municipal stormwater discharge quality.

Transportation facilities and choices can significantly impact stormwater quality in terms of impervious surface coverage, atmospheric deposition, tailpipe emissions, heavy metals from brake pad wear, hazardous materials spills, etc. As of 2000, the mean travel time to work was 15.4 minutes, although roughly 1,500 citizens (5.7%) worked from home, 718 (2.8%) walked to work, and 3,323 (12.7%) carpooled. The majority (19,465 people or 74.6%) drove alone (Census 2000).

GENERAL APPROACH

Public outreach will be targeted first at providing the public a basic understanding of what stormwater is, and why using best management practices matter. Misconceptions that will be addressed include (a) people unclear on where stormwater goes once it enters the storm drain system, and (b) those involving feelings that stormwater quality improvements are not important here because we do not get that much precipitation in comparison to other areas of the state; to combat this, the concept of first-flush events will be illustrated. In addition to general information, targeted action-oriented BMP information will be created and distributed. These will focus on activities

designed to help lessen pollutants of concern using demographic data indicated in Section 1 to be most efficient.

The City will employ the following BMPs to help educate and reach out to the general public on the impacts of stormwater on surface and ground water.

SELECTED BMPS FOR PUBLIC EDUCATION AND OUTREACH

The City commits to implementing the following five BMPs to meet the above-stated goals for public education and outreach.

BMP III-1. Utility Bill Inserts, Brochures or Posters

Description: Bend will develop information pieces that describe stormwater quality and drainage issues that affect area residents and what they can do to help address these issues. Utility bill inserts will be distributed in City water or sewer bills and may be posted to the website. These mailers will also serve as preparation for implementation of the stormwater utility. Brochures and posters would be made available at counters in City facilities, and could be used in outreach events. The information may cover the following topics:

- a. Why contaminants need to be kept out of stormwater.
- b. Opportunities for public involvement.
- c. Preventing and reporting illicit discharges.
- d. Proper application of yard fertilizers and pesticides.
- e. Proper disposal of grass clippings.
- f. Proper disposal of carpet cleaning waste water.
- g. Proper disposal of vehicle fluids.
- h. Managing sediments from landscape and construction activities.
- i. Proper disposal of household wastes.
- j. Proper disposal of pet wastes.
- k. How to find information on the City's Stormwater Pollution Prevention Web Site.
- l. Street sweeping schedules.

Rationale: Utility bill single-sheet inserts are a cost-effective way to distribute information to the community. Sending a series of inserts over a period of several months is an effective way to keep stormwater issues before the community during ISWMP development and implementation.

Initially, this BMP will not involve an advisory group because topic fact sheets are already available. As the PAC and SWAT become active, they may decide to include additional or different topics.

Measurable Goals and Schedule: The measurable goal for implementation of BMP III-1 is to develop and distribute at least two stormwater information pieces to area residents per permit year. Progress will be deemed satisfactory if all task deadlines are met.

#	Task Description	Responsible Person	Task Start	Deadline Finish
1	Develop at least 2 information piece inserts.	PW Management Analyst	Year 1	In each Year 1 - 5
2	Distribute at least 4 information pieces.	PW Management Analyst	Year 2	In each Year 1 - 5

Responsible Persons. The Public Works Director or designee has responsibility for development and distribution of the utility bill inserts. He will work with the Communications Coordinator and the Utility Billing section of the Finance Department to distribute the insert in the city water or sewer bills.

BMP III-2. Stormwater Pollution Prevention Web Site

Description: The City will use the municipal website to inform the public about the stormwater management program. It will include general stormwater quality information as well as topics of interest to the general public such as litter control, and proper management of pesticides, fertilizers, used oil and household hazardous waste. Within the municipal website, the City will develop a public Stormwater Pollution Prevention Web Page that includes the following:

- a. Downloadable and printable versions of each of the utility bill inserts
- b. PAC and SWAT meeting schedules and agendas
- c. Copy of the ISWMP
- d. Copy of the annual report
- e. Other information pertaining to stormwater
- f. Contact information
- g. Links to other stormwater web sites
- h. E-mail links

Rationale: Many people rely on the Internet as their primary source of information on almost any topic. A lot of good stormwater information is already available from a number of web sites. The City will develop a site that is the primary source of stormwater information for the City's citizens and employees. A web site is the most cost-effective way of communicating stormwater information. The site will be accessible through the City's main web site at www.ci.bend.or.us

Measurable Goals and Schedule. The measurable goal for implementation of this BMP is to update the website with a stormwater message in Permit Year 2, and to keep the website updated with new information in future years. Progress will be deemed satisfactory if all task deadlines are met.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Begin organization of site.	PW Management Analyst	Year 1	Year 1

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
2	Update website with stormwater quality information.	PW Management Analyst, Communications Manager	Year 1	Year 2
3	Provide updates as new materials/information become available.	PW Management Analyst, Communications Manager	Year 2	Ongoing

Responsible Persons. The Public Works Director is ultimately responsible for implementation of this BMP. The Public Works Management Analyst, or designee, has responsibility for the design and content of the site. The Communications Manager has responsibility for uploading and implementation of the stormwater information onto the website.

BMP III-3. City News Broadcast Stormwater Quality Messages and Press Releases

Description and Rationale. Bend will use the municipal City News Broadcast and/or submit news articles to post messages about the stormwater management program that are of interest to the public. These broadcasts are played repeatedly for a month on COTV cable through Bend Broadband at various time throughout the day, are shown on a continual loop at City Hall, and are available for download on the City's website. Messages may include announcements of river clean up dates or household hazardous waste collection events; or discussing residential issues such as proper management of pesticides and fertilizer and used oil, or the availability of new resources. These newscasts or articles will remind viewers of the importance of water pollution prevention.

Measurable Goals and Schedule. The measurable goal for implementation of this BMP is to post at least one stormwater quality-related messages per year during each permit year.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Post at least 5 storm water quality messages; in general one per year.	PW Management Analyst, Public Works Director, Communications Manager	Year 1	Yearly ending in Year 5
2	Submit, either locally or as part of a regional effort, at least 3 news releases regarding stormwater issues to media outlets per year.	PW Management Analyst, Public Works Director, Communications Manager	Year 1	Ongoing

Responsible Persons. The Communications Manager, with assistance from the Public Works Management Analyst, has responsibility for implementation of this BMP. Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

BMP III-4. Stormwater/Watershed Diorama

Description and Rationale. Bend will purchase and have available a stormwater diorama, depicting a watershed complete with storm drains to be used for educational purposes. The City will have the diorama available to lend to local schoolteachers for use in their classrooms, and will use the diorama at local outreach events.

Measurable Goals and Schedule. The measurable goal for implementation of BMP4 is to purchase and make available the Stormwater/Watershed diorama for educational opportunities.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Research and purchase diorama. Become familiar with its components.	Education coordinator	Year 1	Year 1
2	Use diorama at suitable outreach events (1/year).	Education coordinator	Year 2	Year 5
3	Set up lending program and make diorama available for local schoolteachers to use. (Send 1 reminder/year to teachers of availability).	Education coordinator	Year 2	Year 5
4	Keep diorama restocked and in good working order.	Education Coordinator; Public Works Director	Year 2	Years 5

Responsible Person. The Public Works Director with support from the education coordinator is responsible for implementation of the Stormwater/Watershed Diorama.

BMP III-5. Performance Standards

Description and Rationale. The City will create performance standards and an implementation schedule for public information activities in time for submittal of the next permit application, which will require the inclusion of performance standards (DEQ, 2006).

Measurable Goals and Schedule. This task will be deemed complied with if the City has prepared draft performance standards starting in Year 4 to obtain internal review, and finishing by midyear in Year 5 for inclusion in the permit package.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Draft performance standards for internal review.	Public Works Director, Community Development Director, PW Management Analyst, Education Coordinator, SWAT and PAC committees	Year 3	Year 4
2	Finalize performance standards for inclusion in permit reapplication package.	PW Management Analyst, SWAT and PAC committees, Public Works Director	Year 4	Year 5

Responsible Parties. The SWAT and PAC committees will draft the performance standards and SWAT members will be responsible for gaining input from their staff on the performance standards and proposed schedule. Responsibility for including the performance standards in the permit package rests with the Public Works Director and the Community Development Director. Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

SECTION IV: PUBLIC INVOLVEMENT AND PARTICIPATION

REGULATORY REQUIREMENT

40 CFR 122.34 (b) (2) - *Public involvement/participation.* (i) You must, at a minimum, comply with State, Tribal and local public notice requirements when implementing a public involvement/participation program.

(ii) Guidance: EPA recommends that the public be included in developing, implementing, and reviewing your storm water management program and that the public participation process should make efforts to reach out and engage all economic and ethnic groups. Opportunities for members of the public to participate in program development and implementation include serving as citizen representatives on a local storm water management panel, attending public hearings, working as citizen volunteers to educate other individuals about the program, assisting in program coordination with other pre-existing programs, or participating in volunteer monitoring efforts. (Citizens should obtain approval where necessary for lawful access to monitoring sites.)

EXISTING CONDITIONS/CURRENT PROGRAMS

Currently, the City has pulled together technical ad hoc committees to examine the Grading/Clearing Ordinance. The committee includes city staff and members of local engineering firms. A separate Technical Committee has been formed to address the issue of excessive sedimentation within the section of the Deschutes River in town known as Mirror Pond. The Mirror Pond Technical Committee members include specialists in hydrology, wetlands and aquatic restoration, engineering, environmental planning fields, and representatives from various local, state and federal agencies. The meetings are open to the public, and non-committee members of the public have attended and provided input. Stormwater issues have been discussed because stormwater is a contributor of sedimentation into the Pond. Sediment is also a problem for the City's underground injection systems, causing clogging, and shortening the lifespan of the systems.

GENERAL APPROACH

The City will comply with state and local public notice requirements when implementing a public involvement/participation program.

SELECTED BMPS FOR PUBLIC INVOLVEMENT

The public should be included in developing, implementing, and reviewing the stormwater management program. The City will encourage and facilitate public

involvement and participation in the development and implementation of its ISWMP.

BMP IV-1. Public Advisory Committee

Bend will form an advisory committee of community leaders and stakeholders to be known as the stormwater Public Advisory Committee (PAC) as part of this Stormwater Management Program. The Committee will represent different segments of the community that will be affected by the ISWMP implementation. The PAC will play a major role in the implementation of this ISWMP and the development of future plans. They will be updated periodically regarding the ongoing program implementation.

The City will identify and contact community leaders in the following groups:

- a. Homeowner associations
- b. Developers
- c. Consulting and engineering firms
- d. Environmental organizations
- e. Private water systems
- f. Small businesses
- g. Large businesses
- h. Others as identified (Government and non-government).

Rationale: City employees experienced in dealing with the public on environmental issues will identify leaders and stakeholders. The City believes that involvement and participation of community leaders and stakeholders in the development, implementation and modification of the ISWMP is crucial to the success of the stormwater management program. The leaders will be identified and become active early on in order to provide guidance on all ISWMP implementation activities. The PAC will guide the development, implementation and modification of the ISWMP. The City believes this is necessary in order for the voluntary stormwater pollution prevention program to succeed. The PAC will be formed early to be functioning throughout the implementation of the ISWMP.

Measurable Goals and Schedule: The measurable goal for implementation of this BMP is to form and conduct at least semiannual meetings of the Public Advisory Committee. Progress will be deemed satisfactory if all task deadlines are met.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Convene PAC	Public Works Management Analyst; Communications Manager	Year 1	Year 1
2	Hold at least semi-annual Meetings	Public Works Management Analyst; Communications Manager	Year 1	Year 5

Responsible Persons. The Public Works Director is ultimately responsible for implementation of this BMP, with direct assistance from the Public Works Management Analyst and the Communications Manager.

BMP IV-2. Public Meeting

Description: During a period of public review and comment on the revised draft ISWMP, the City of Bend will hold a Public Open House meeting to present the plans to the public and gather their input. Results of the meeting and of comments received will be responded to and posted on the City's website. The draft ISWMP will be updated accordingly before being provided to Council and to DEQ for approval. This process will be repeated during development of the next permit application and associated comprehensive revision of the ISWMP, expected in four years.

Rationale: Providing the public plenty of opportunity to understand and comment on the proposed plans is expected to result in improved plans and increased public acceptance over the implementation period.

Measurable Goals and Schedule: The measurable goal for implementation of BMP IV-2 is to hold a Public Meeting in Permit Year 1. A similar meeting will be held in Year 4 prior to submittal of the permit application for the second permit period. Implementation will be according to the schedule below.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Provide open review period for draft review of initial ISWMP; post draft on website. Identify schedule for meeting.	Public Works Management Analyst; Communications Manager	Year 1	Year 1
2	Hold Public Meeting. Incorporate results	Public Works Management Analyst; Communications Manager	Year 1	Year 1
3	Initial Implementation complete.		Year 1	Year 1
4	Provide open review period for draft of revised ISWMP for second permit application package; post draft on website. Identify schedule for meeting.	Public Works Management Analyst; Communications Manager	Year 4	Year 4
5	Hold Public Meeting. Incorporate results into submittal package.	Public Works Management Analyst; Communications Manager	Year 4	Year 5

Responsible Persons. The Bend Communications Manager, with assistance from Public Works staff, has responsibility for implementation of this BMP to meet the Measurable Goals. Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

BMP IV-3. Stormwater Quality Volunteer Opportunities

Description: Bend will identify suitable opportunities for area volunteers to participate in stormwater quality activities and will develop support materials and provide them to interested parties. These volunteer opportunities may include such things as storm drain stenciling, volunteer monitoring, planting campaigns and Adopt-a Stream programs. The City may work in conjunction with other partner organizations to achieve this goal.

Measurable Goals and Schedule. The measurable goal for implementation of this BMP is to provide support materials to interested volunteers for the identified opportunities.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	1. Identify volunteer opportunities.	Public Works Management Analyst; Communications Manager, Education Specialist	Year 1	Year 3
2	2. Develop support materials and provide them to interested volunteers.	Public Works Management Analyst; Communications Manager, Education Specialist	Year 3	Year 4

Responsible Persons. The Public Works Director, with assistance from the public works management analyst, communications manager, and public works educational outreach specialist, is responsible for implementation of this BMP.

BMP IV-4. Performance Standards

Description and Rationale. The City will create performance standards and an implementation schedule for public involvement and participation activities in time for submittal of the next permit application. DEQ (2006) has indicated that performance standards will be required as part of the next permit submittal.

Measurable Goals and Schedule. This task will be deemed complied with when the City has prepared draft performance standards starting in Year 3 to obtain internal review, and finishing in Year 4 for inclusion in the permit package.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Draft performance standards for internal review.	PW Management Analyst, Education Coordinator, SWAT and PAC committees	Year 3	Year 4
2	Finalize performance standards for inclusion in permit reapplication package.	PW Management Analyst, SWAT and PAC committees, Public Works Director	Year 4	Year 5

Responsible Parties. The SWAT team and PAC will draft the performance standards and SWAT members will be responsible for gaining input from their staff on the performance standards and proposed schedule. Responsibility for including the performance standards in the permit package rests with the Public Works Director.

Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

SECTION V: ILLICIT DISCHARGE DETECTION AND ELIMINATION

REGULATORY REQUIREMENT

40 CFR 122.34 (b) (3) – *Illicit discharge detection and elimination.* (i) You must develop, implement and enforce a program to detect and eliminate illicit discharges (as defined at § 122.26(b) (2)) into your small MS4.

(ii) You must: (A) Develop, if not already completed, a storm sewer system map, showing the location of all outfalls and the names and location of all waters of the United States that receive discharges from those outfalls; (B) To the extent allowable under State, Tribal or local law, effectively prohibit, through ordinance, or other regulatory mechanism, non-storm water discharges into your storm sewer system and implement appropriate enforcement procedures and actions; (C) Develop and implement a plan to detect and address non-storm water discharges, including illegal dumping, to your system; and (D) Inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.

(iii) You need address the following categories of non-storm water discharges or flows (i.e., illicit discharges) only if you identify them as significant contributors of pollutants to your small MS4: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)), uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water (discharges or flows from fire fighting activities are excluded from the effective prohibition against non-storm water and need only be addressed where they are identified as significant sources of pollutants to waters of the United States).

(iv) Guidance:... .

EXISTING CONDITIONS/CURRENT PROGRAMS

Understanding the main industries in the City will allow City staff to focus public outreach campaign for reducing illicit discharges from area businesses and industries. According to the U.S. Census, the five largest industries in the City in 2000 were:

- (1) Educational, health and social services;
- (2) Retail trade;

- (3) Arts, entertainment, recreation, accommodation and food services;
- (4) Construction and
- (5) Manufacturing.

Currently, Bend is in the process of mapping the city's infrastructure in a GIS system. Mapping of the existing drainage will be included in this project, which should be helpful in addressing illicit discharges. The City does have a business license program.

The City Fire Department currently conducts fire inspections of local businesses. The Fire Department also responds to reported spills, and coordinates with the Redmond Fire Department, the regional hazardous materials response specialists, when needed. When the Fire Department receives an illegal dumping report, they respond to mitigate the emergency, identify the hazardous materials present, if any, and set up a command structure that includes interested departments and regulatory parties, develop and implement an action plan, and transfer authority for the incident to the appropriate agency for cleanup after the emergency is over. They also work to identify the responsible party, if possible, and complete paperwork and documentation of their actions, and for incident cost recovery.

The Code Enforcement division of the Community Development Department assures compliance with the city's land use, environmental and building codes. The City assures code compliance both by encouraging voluntary compliance and by punishing code violators who do not comply.

GENERAL APPROACH

In general, illicit discharges to storm sewers are a problem throughout the United States. Many people believe storm sewers go to the municipal waste water treatment plant. In Bend, storm sewers discharge underground or to the Deschutes River. Leaks or cross-connections from sanitary sewers or septic systems and other types of drains into storm sewers are hard to discover because they often occur underground. Homeowners and landscapers contribute to the problem when they dump grass clippings or leaves into gutters or spread fertilizers or pesticides that runoff onto sidewalks and streets. Automobile care and repair, or disrepair may result in leaks that make their way to the storm drain outfalls. Dumpsters are often left with the tops open, which allows precipitation to filter through and contaminate stormwater. Carpet cleaners frequently dump their waste water into the most convenient storm drain. The purpose of this element is to educate the community about these and other problems, help people identify and report illicit discharges, and eliminate sewer cross-connections and leaks.

SELECTED BEST MANAGEMENT PRACTICES

BMP V-1. Public Education on Illegal Discharges and Improper Disposal

Description and Rationale: Bend will develop a public education effort to inform public employees, businesses, and the public of hazards associated with illegal

discharges and improper disposal of waste. City staff may try to coordinate this effort with other like-minded agencies. (Note: This BMP is designed to work in conjunction with those under the Section III: Public Education and Outreach on Stormwater Impacts.)

The public often does not realize that storm drains do not go to the municipal sanitary sewer system. Storm drains are convenient places for people to inadvertently or intentionally dump their wastes not thinking about how this might affect their environment. The purpose of this BMP is to educate the public about this and related issues.

Measurable Goals and Schedule: Bend will develop or acquire public education materials in Year 1 of the permit period and determine an effective means of distribution (with prioritization). As part of this effort, the City will target business categories representing the greatest risk from a stormwater perspective and will research the effectiveness of workshops, self-inspection checklists, business license renewal requirements, and green-program award-type programs in determining effective means of distribution. The materials will be distributed to all public employees in Year 2 of the permit period. The materials will be distributed to half of the businesses in Year 2 and half in Year 3 of the permit period. Progress will be deemed satisfactory if all task deadlines are met.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Develop or acquire public education materials.	PW Management Analyst, Education Coordinator.	Year 1	Year 2
2	Determine an effective means of distribution.	PW Management Analyst, Education Coordinator, Communications Manager	Year 1	Year 2
3	Distribute materials to public employees.	PW Management Analyst, Communications Manager	Year 2	Year 2
4	Distribute materials to at least 50% of targeted businesses in each year.	PW Management Analyst, Communications Manager	Year 2	Year 5

Responsible Persons: The Public Works Director is ultimately responsible for implementation of this BMP, with assistance from the PW Management Analyst. The Communications Manager is responsible for distribution of public education materials on Illegal Discharges and Improper Disposal. Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

BMP V-2. Illicit Discharge Reporting Mechanism

Description and Rationale: Citizens and City employees are the best look-outs for illicit discharges if they know what to look for and it is easy for them to report the discharges to someone who can take the appropriate action.

Measurable Goals and Schedule: Under the guidance of the PAC, the following tasks will be completed:

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	Establish a procedure for responding to reports of illicit discharges.	PAC Chairperson, PW Management Analyst, SWAT	Year 1	Year 2
2	Establish and advertise an illicit discharge reporting e-mail link on the stormwater pollution prevention web site and reporting telephone hotline.	PAC Chairperson, PW Management Analyst, Communications Manager	Year 3	Year 4

Progress will be deemed satisfactory if all task deadlines are met.

Responsible Persons: The Public Works Director is ultimately responsible for implementation of this BMP, with assistance from those noted in the table above. Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

BMP V-3. Post Warnings About Illicit and Illegal Discharges

Description: Bend will require developers to label storm drain with a message that says "Don't Dump – Discharges to (Name of Water Resource) " or a similar message. The City will also provide kits for storm drain stenciling of existing systems by volunteer organizations.

Rationale: Municipalities across the country have found that appropriate curb marking or signage can help minimize illicit and illegal discharges to storm sewers. These signs are commercially available.

Measurable Goals and Schedule. In Year 1 the City will determine whether to use stencils (volunteer friendly but temporary), thermoplastic markers, or other options). Should the City decided to use stencils, the City will provide appropriate storm drain markers for volunteers in Permit Year 2. Bend will require developers to provide storm drain labels in Permit Year 3 (after implementing ordinance and procedure changes).

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	City to determine preferred marking types.	PW Management Analyst, PAC Chairperson, City Engineer, Streets Supervisor, Communications Manager	Year 1	Year 1
2	PAC to organize volunteer groups to paint or post signs, as appropriate	PAC Chairperson, PW Management Analyst	Year 2	Year 2
3	PAC and City to identify posting schedule based on risk of illicit discharge	PAC Chairperson, PW Management Analyst	Year 2	Year 2
4	City to purchase signs and materials, as needed.	PW Management Analyst	Year 2	Ongoing
5	Signs to be posted	PAC Chairperson, PW Management Analyst	Ongoing	Ongoing

Progress will be deemed satisfactory if all task deadlines are met.

Responsible Persons. The Director of Public Works is responsible for implementing storm drain labeling, with assistance from the PAC and Public Works staff. Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

BMP V-4. Post Illicit Discharge Prevention Information on Web Site

Description and Rationale: Informing citizens about how to prevent, detect and report illicit discharges can be a very effective and inexpensive way to reduce illicit discharges.

Measurable Goals and Schedule:

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	PAC to provide input on what to post on web site; SWAT to approve	PAC Chairperson, SWAT, PW Management Analyst	Year 1	Year 2/ Ongoing
2	City to post information	PW Management Analyst, Communications Manager	Year 2	Ongoing

Progress will be deemed satisfactory if all task deadlines are met.

Responsible Parties: The Communications Manager is responsible for placing the materials provided by the stormwater coordinator onto the website. SWAT team members are responsible for providing and ensuring the material posted is appropriate.

BMP V-5. Stormwater System Map

Description and Rationale: Bend will develop a GIS-based stormwater system map, showing the location of all outfalls to surface waters and the names and locations of the waters of the State that receive discharges from the outfalls. The map will be useful in education efforts (marking outfalls), and spill prevention and cleanup, as well as targeting pollution prevention programs. This effort to map surface water discharge sites ties into the efforts of BMP II-6a that includes mapping UIC structures.

Measurable Goals and Schedule: The measurable goal for implementation of this BMP is to review the status of the current map, develop an approach and acquire the tools necessary to map in the first year, and to map 25% of the drainage system per year in the first four years of the permit.

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	Conduct review and planning for mapping storm sewer system.	City Engineer, CIP Manager	Year 1	Year 1
2	Acquire mapping equipment; Map 25% of the drainage system.	City Engineer, Public Works Director	Year 1	Year 2
3	Map 25% of the drainage system.	City Engineer	Year 2	Year 3
4	Map 25% of the drainage system.	City Engineer	Year 3	Year 4
5	Map 25% of the drainage system.	City Engineer	Year 4	Year 5

Responsible Persons. The City Engineer is responsible for implementation of this BMP. The City Manager is responsible for ensuring adequate funding is available to acquire necessary equipment.

BMP V-6. Illicit Discharge Ordinance

Description and Rationale. To help prevent illicit discharges, Bend will develop an ordinance (or other regulatory mechanism) to effectively prohibit non-stormwater discharges into the storm drainage system and implement appropriate enforcement procedures and actions. This BMP is designed to be implemented in concert with BMP II-2, which is designed to ensure appropriate legal authority for implementation of the stormwater components within this

ISWMP. As part of this effort, staff will determine how best to enforce the ordinance, a discussion which may be incorporated into task 1 of BMP V-8.

Measurable Goals and Schedule. The measurable goal for implementation of this BMP is to develop a draft ordinance in Year 1 through 3 of the permit period and finalize and implement the ordinance by Year 5 of the permit period.

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	Develop a draft Illicit Discharge Detection and Elimination Ordinance.	Public Works Management Analyst, Director of Public Works	Year 1	Year 3
2	Finalize ordinance.	City Attorney, Public Works Management Analyst, Director of Public Works	Year 3	Year 4
3	Begin to Implement Ordinance	Public Works Director	Year 4	Year 5

Responsible Persons. The Director of Public Works and the City Attorney are responsible for development and implementation of the illicit discharge ordinance. The City Council is responsible for final review and approval/adoption of the ordinance.

BMP V-7. Program to Detect and Address Illicit Discharges

Description and Rationale: The City will evaluate existing programs and identify additional program requirements and resource needs to detect and address non-stormwater discharges including illegal dumping into the storm drainage system. As part of this task, City staff will examine expanding the existing Water Patrol duties to include searching for and addressing illicit discharges.

Measurable Goals and Schedule: The measurable goal for implementation of this BMP is to evaluate the existing program and identify additional program requirements and resource and training needs in Year 3. Additional resources and training will be acquired in Year 4. The program implementation will begin in Year 5.

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	Evaluate existing program and identify additional program requirements and resource and training needs.	Public Works Management Analyst, Director of Public Works	Year 1	Year 3
2	Acquire needed resources, training	Public Works Management Analyst, Director of Public Works	Year 2	Year 4

Task #	Task Description	Responsible Person	Task Deadline	
			Start	Finish
3	Implement program.	Public Works Management Analyst, Director of Public Works	Year 4	Year 5

Responsible Persons: The Director of Public Works is responsible for development and implementation of the illicit discharge program.

BMP V-8. Minimize Landscape Irrigation Runoff

Description and Rationale: Landscape irrigation runoff can carry pollutants such as pesticides, fertilizers, sediments and road grime such as oil and heavy metals to the storm drain system. These can contribute to water quality problems and clog dry wells. Minimizing irrigation overspray and runoff can help reduce these problems, and offers an opportunity to coordinate with water conservation efforts. As part of and in addition to this effort, the existing water patrol position duties will be examined to determine if additional illicit discharge inspection duties should be incorporated.

Measurable Goals and Schedule: In Year 1 and year 2 determine efforts most effective in minimizing irrigation runoff by examining existing water patrol and smart (climatologically-based) controller efforts, and examining review and approval process for proper design and installation of irrigation systems. Funding mechanisms to also be determined. Determine methods to improve. Implementation of approved ideas are scheduled to begin in Year 3 and continue in Year 4.

Task #	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Review water patrol and determine whether and how to expand duties to incorporate stormwater concerns	Water Resources Coordinator, PW Management Analyst.	Year 1	Year 2
2	Implement changes to water patrol position, as applicable.	Water Resources Coordinator, PW Management Analyst.	Year 2	Ongoing
3	Review SMART controller efforts; examine review and approval process for sizing and installing irrigation heads.	Water Resources Coordinator, Large Landscape Specialist, PW Management Analyst	Year 1	Year 2

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
4	Determine methods to improve, and an educational campaign targeting licensed landscapers and landscape maintenance providers.	Water Resources Coordinator, Large Landscape Specialist, PW Management Analyst	Year 2	Year 3
5	Implement educational campaign targeting landscapers, focusing on the connection of landscape and water management to water quality.	Water Resources Coordinator, Large Landscape Specialist, PW Management Analyst	Year 3	Year 5
6	Implement irrigation system improvement recommendations	Public Works Director, Water Resources Coordinator	Year 3	Year 5

Responsible Parties: The Public Works Director is responsible for ensuring completion of this BMP, with assistance from the Public Works Management Analyst, Water Resources Coordinator, and other public works, planning and engineering staff.

BMP V-10. Performance Standards

Description and Rationale. The City will create performance standards and an implementation schedule for illicit discharge activities in time for submittal of the next permit application.

Measurable Goals and Schedule. This task will be deemed complied with if the City has prepared draft performance standards starting in Year 3 for obtaining internal review, and finishing in Year 4 for inclusion in the permit package.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Draft performance standards for internal review.	PW Management Analyst, Education Coordinator, Water Resources Coordinator, SWAT and PAC committees	Year 3	Year 4
2	Finalize performance standards for inclusion in permit reapplication package.	PW Management Analyst, SWAT and PAC committees, Public Works Director	Year 4	Year 5

Responsible Parties. The SWAT team and PAC will draft the performance standards and SWAT members will be responsible for gaining input from their staff on the performance standards and proposed schedule. Responsibility for including the performance standards in the permit renewal package rests with the Public Works Director. Because the ISWMP crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

SECTION VI: CONSTRUCTION SITE STORMWATER ACTIVITIES

REGULATORY REQUIREMENT

40 CFR 122.34 (b) (4) – Construction site storm water runoff control.

(i) You must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to your small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of storm water discharges from construction activity disturbing less than one acre must be included in your program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more. If the NPDES permitting authority waives requirements for storm water discharges associated with small construction activity in accordance with § 122.26(b)(15)(i), you are not required to develop, implement, and/or enforce a program to reduce pollutant discharges from such sites.

(ii) Your program must include the development and implementation of, at a minimum: (A) An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State, Tribal, or local law; (B) Requirements for construction site operators to implement appropriate erosion and sediment control best management practices; (C) Requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality; (D) Procedures for site plan review which incorporate consideration of potential water quality impacts; (E) Procedures for receipt and consideration of information submitted by the public, and (F) Procedures for site inspection and enforcement of control measures.

(iii) Guidance:...

EXISTING CONDITIONS/CURRENT PROGRAMS

Currently, Bend requires construction sites to comply with the federal NPDES 1200-C Construction Stormwater General Permit as required (see <http://www.deq.state.or.us/WQ/stormwater/swpconstr.htm> for more information). Stormwater controls are included in city inspections. Noncompliance can be cause for the City to issue stop work orders, thereby halting construction until the situation is remedied. Preliminary impressions suggest that residential site development especially is in strong need of proper erosion and sediment controls.

GENERAL APPROACH

Construction sites are potential sources of stormwater pollutants. Sites that disturb one or more acres and discharge stormwater through a man-made

conveyance are already regulated through the state-administered NPDES permit program but only if the runoff may reach surface waters either directly or through storm drainage. Many construction sites within the UGB are either smaller than one acre or the stormwater discharges underground or onto the ground surface where there is little potential for it to reach surface waters. Some of these sites are of concern to the City because they discharge contaminated stormwater to City underground injection systems or onto City or neighboring property. The City's Grading/Clearing Ordinance regulates stormwater management during grading and clearing activities.

SELECTED BEST MANAGEMENT PRACTICES

The following BMPs will be implemented to address stormwater impacts at construction sites. Ensuring appropriate legal authority for such activities is addressed under BMP II-2.

BMP VI-1. Evaluate and Update Regulatory Authority and Procedures

Description: Bend will evaluate the existing legal authority to enforce the requirements for construction and post-construction erosion and sediment controls and proper waste management at construction sites, as well as the sanctions to ensure compliance with the requirements. If necessary, ordinances or other regulatory mechanisms will be updated to provide the formal authority for implementation of an erosion and sediment control program. If necessary, city procedures will be modified to require site plan review and site inspection and enforcement. Procedures will be developed to address in detail that erosion and sediment controls should be readily available at construction sites at all times and in place, as appropriate, prior to issuance of construction permits.

Rationale: An ordinance is necessary in order to ensure that stormwater from sites where grading and clearing are taking place does not contaminate ground or surface waters, deposit sediment or other contaminants off site or cause stormwater to run onto adjacent properties.

Measurable Goals and Schedule: The measurable goal for implementation of BMP VI-1 is to evaluate existing legal authority in Permit Year 1. If necessary, the ordinance, or other regulatory mechanism and procedures will be updated and adopted in the second permit year. Development and implementation will be according to the schedule below.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Evaluate existing legal authority and procedures.	PW Management Analyst, SWAT and PAC committees	Year 1	Year 1

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
2	Update ordinance or other regulatory mechanisms and procedures and adopt them.	PW Management Analyst, SWAT and PAC committees, Community Development Director, Public Works Director	Year 2	Year 4
3	Implement ordinance.	Community Development Director	Year 4	Year 5

Progress will be deemed satisfactory if all task deadlines are met.

Responsible Persons: The Community Development Director—with assistance from the stormwater coordinator, PAC, and SWAT—has responsibility for implementation of this BMP. Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

BMP VI-2. Construction Site Educational Materials

Description and Rationale: To help ensure that best management practices are used in the construction industry, Bend will compile educational materials to be used to inform the public and construction site operators of the requirements for Construction Site Stormwater Controls. Upon compilation of suitable construction site best management practices and materials, a plan sheet with the BMPs will be created to be attached to plan sheets that are used in the field.

Measurable Goals and Schedule: The City will develop or acquire public education materials in Year 1 of the permit period. The materials will be distributed to construction site operators in Year 2 and 3 of the permit period. The plan sheet will be developed in Year 4, and will be distributed and incorporated into standard operating procedures in Year 5.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Develop or acquire public educational materials.	Public Works Director, PW Management Analyst, SWAT and PAC committees	Year 1	Year 1
2	Distribute materials to permit applicants and/or via the City website.	PW Management Analyst, Community Development Director, Building Department Manager.	Year 2	Year 2 and Ongoing thereafter
3	Create plan sheet with information from brochures/flyers (above).	PW Management Analyst, SWAT and PAC committees	Year 3	Year 4

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
4	Distribute plan sheets.	PW Management Analyst, Community Development Director and planning staff	Year 4	Ongoing

Responsible Persons: The Community Development Director along with the Building Department manager has responsibility for distribution of public education materials on Construction Site Stormwater Controls. The Public Works Director and staff are responsible for ensuring creation of the education materials. Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

BMP VI-3. Construction Site Inspections and Violation Hotline

Description and Rationale: Bend will review its existing construction site inspection program and make improvements, as necessary, to ensure inspection for proper erosion and sediment controls and proper site housekeeping is occurring. As part of this effort, Bend will review the existing list of complaint phone numbers (i.e., for construction noise, grading/dust enforcement, and trash, rubbish, debris) and make any improvements necessary to set up and advertise a reporting hotline (i.e., a published phone number) for the public to report construction site problems. (This hotline may be combined with one for reporting illicit discharges or other problems.) This will facilitate the ability of the public to provide information that will assist in detection of problem discharges.

Measurable Goals and Schedule: The Measurable Goal will be to identify a department to monitor the hotline in the third permit year and set up and publicize the hotline by the fifth permit year.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Identify Department(s) to monitor reporting hotline and conduct site inspections for proper installation and maintenance of stormwater controls.	Public Works Director, PW Management Analyst, Community Development Director, SWAT	Year 3	Year 3
2	Set up hotline and inspection program. Include, set up method of forwarding reports to city inspectors.	PW Management Analyst, Community Development Department Director, Communications Manager, SWAT	Year 3	Year 5
3	Publicize hotline.	PW Management Analyst, Communications Manager	Year 4	Year 5

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
4	Implement inspection and hotline response program.	Community Development Director or Public Works Director, PW Management Analyst, Communications Manager, SWAT, inspectors	Year 4	Year 5

Responsible Persons: The Community Development Department Director with assistance from the PW Management Analyst and the Communications Manager has responsibility for implementation of this BMP. Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

BMP VI-4. Construction Site Education

Description and Rationale. The City, working with the PAC and potentially with an ad hoc group of local construction industry leaders, will spend the first years of implementation reviewing and revising policies and procedures related to construction site activities to improve erosion and sediment control and good housekeeping practices. Effectively communicating these changes to the construction industry will be crucial in obtaining voluntary compliance, which is preferred over enforcement. This BMP involves conducting a workshop or series of smaller meetings to communicate the program and construction related best management practices that will be expected in the field. Education of City implementing staff will also be necessary. Education efforts will include activities within the right-of-way.

Measurable Goals and Schedule. Year 1, the SWAT, with input for the PAC, will determine the best way to set up an education program for staff and the public. Provide education and implementation materials to planning and engineering staff. Provide education and implementation materials to inspectors. Provide education and implementation materials to construction industry personnel.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Develop or have staff attend training workshop(s) or meetings possibly via ad hoc task group to communicate construction site program for construction industry and City staff.	Public Works Director, Community Development Director, PW Management Analyst, Education Coordinator, Water Resources Coordinator, PAC and potential ad hoc committee	Year 1	Year 3

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
2	Hold workshop and/or meetings. (At least one per year.)	PW Management Analyst, PAC and ad hoc committee	Year 2	Year 4

Responsible Parties. Responsible parties will include the Community Development Director, Public Works Director, and Engineering Manager. Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

BMP VI-5. Participate in Regional Coordination Activities: Regional Stormwater Control Manual

Description and Rationale. Typically, the construction industry would like consistency throughout their operating region with regards to requirements. The City of Bend will participate in the development of the regional stormwater control manual that is being coordinated through the COIC. The City will review and provide comments on drafts of the manual and, as the manual is completed, the City will tailor those sections related to construction site activities as appropriate to the specific needs of Bend. The manual is expected to be used as design guidance for construction activities, as well as post-construction activities (see also BMP VII-2).

Measurable Goals and Schedule. In Year 1 and possibly 2, City staff will review the draft regional manual sections pertaining to construction activities and provide comment as requested. In Years 2 and 3, City staff will tailor necessary portions of the manual to the specifics within Bend. Implementation will begin in Year 3 and continue through Year 5.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Participate in preparation of regional stormwater control manual being developed in coordination with COIC.	Public Works Director, Community Development Director, Public Works Management Analyst, Education Coordinator, Water Resources Coordinator, SWAT and PAC committees	Year 1	Year 2
2	Tailor manual to specifics of Bend.	Public Works Management Analyst, SWAT and PAC committees, PWD	Year 2	Year 3

Responsible Parties. The Community Development Director, Engineering Manager, and Public Works Director are ultimately responsible for implementation of this BMP, with assistance from their staff. Because

stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

BMP VI-6. Performance Standards

Description and Rationale. Per the permit requirements, the City will create performance standards and an implementation schedule for construction site activities in time for submittal of the next permit application.

Measurable Goals and Schedule. This task will be deemed complied with if the City has prepared draft performance standards starting in Year 3 to obtain internal review, and finishing in Year 4 for inclusion in the permit package.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Draft performance standards for internal review.	PW Management Analyst, building and engineering inspectors, SWAT and PAC committees	Year 3	Year 4
2	Finalize performance standards for inclusion in permit reapplication package.	PW Management Analyst, SWAT and PAC committees, Public Works Director	Year 4	Year 5

Responsible Persons. The SWAT team and PAC will draft the performance standards and SWAT members will be responsible for gaining input from their staff on the performance standards and proposed schedule. Responsibility for including the performance standards in the permit package rests with the Public Works Director. Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

SECTION VII: POST-CONSTRUCTION STORMWATER MANAGEMENT IN NEW AND RE-DEVELOPMENT

REGULATORY REQUIREMENT

40 CFR 122.34 (b) (5) – *Post-construction storm water management in new development and redevelopment.*

(i) You must develop, implement, and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into your small MS4. Your program must ensure that controls are in place that would prevent or minimize water quality impacts.

(ii) You must: (A) Develop and implement strategies which include a combination of structural and/or non-structural best management practices (BMPs) appropriate for your community; (B) Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State, Tribal or local law; and (C) Ensure adequate long-term operation and maintenance of BMPs.

(iii) Guidance:

EXISTING CONDITIONS/CURRENT PROGRAMS

The purpose of this Element is to ensure that stormwater management is adequately addressed during and after new and re-development. Post-construction controls typically include site designs, proper long-term erosion and sediment controls, other source controls, and treatment controls.

The Community Development and Public Works Departments regulate development in Bend. There are two existing ordinances, the Development Code (NS-2016) and the Grading and Clearing Ordinance (NS-1879) that regulate development in Bend. The Community Development Department along with the Engineering Division conduct pre-development reviews of proposed development projects. Grading and Drainage permits are issued by the Public Works Department and Building Permits are issued by the Community Development Department, Building Division.

GENERAL APPROACH

In this first permit period, the City will seek to improve the planning and engineering process with respect to stormwater quality and drainage. The City will work to create manuals and standards of best management practices and preferred controls, provide education to staff, and work to inform developers of stormwater requirements and preferences as early in the planning process as possible to ensure that the ideas are incorporated earlier rather than requiring more costly changes if addressed later in the process. In development of City preferences, all departments affected by development shall be canvassed to determine their concerns and preferences related to drainage and water quality, and preferences or conditions of approval to address these will be compiled.

SELECTED BEST MANAGEMENT PRACTICES

BMP VII-1. Participate in Regional Stormwater Control Manual and Tailor to Bend

Description and Rationale. Typically, the development industry would like consistency throughout its operating region with regards to requirements. The City of Bend will participate in regional education activities directed at post construction controls, including the development of the regional stormwater control manual that is being coordinated through the Central Oregon Intergovernmental Council (COIC). The City will review and provide comments on drafts of the manual and, as the manual is completed, the City will tailor those sections related to post construction controls as appropriate to the specific needs of Bend. Tailoring the regional manual will tailor a list of post-construction source, landscape, and manufactured controls that are determined to be acceptable in Bend. Controls must be acceptable to the appropriate regulatory agencies (e.g., DEQ, EPA) as well. This list of preferred controls will help ensure that only controls that are effective for the specific Bend climate and geotechnical conditions will be installed. As part of this effort, siting criteria for both stormwater drainage to surface water and to UICs will be prepared. The tailored manual is expected to serve as design guidance once completed and be incorporated into the City code and standard specifications as appropriate.

Measurable Goals and Schedule. In Year 1 and possibly 2, City staff will review the draft regional manual sections pertaining to post construction controls and provide comment as requested. In Years 2 and 3, City staff will tailor necessary portions of the manual to the specifics within Bend and distribute via posting the information to the website and providing to planning, engineering and inspection departments for distribution. Implementation will begin in Year 3 and continue through Year 5.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Review draft manual.	PW Management Analyst, Engineering Manager, Public Works Assistant Director, Community Development Director	Year 1	Year 2
2	Tailor manual to Bend and distribute	PW Management Analyst, SWAT and PAC committees, Engineering Manager, Assistant Public Works Director, Community Development Director	Year 2	Year 3
3	Implement Manual	Community Development Director, Engineering Manager, Public Works Director	Year 3	Year 5 and ongoing

Responsible Parties. The Community Development Director, Engineering Manager, and Public Works Director are ultimately responsible for implementation of this BMP, with assistance from their staff. Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

BMP VII-2. Operation and Maintenance

Description and Rationale: Post construction controls will cease to be effective and can cause problems such as localized flooding and vector disease if not properly maintained. Requiring proper operation and maintenance over the life of a project, assigning responsibility, and setting up a project-lifetime tracking system is necessary for implementing a successful post-construction control program.

Measurable Goals and Schedule: In Year 1 City staff will determine responsibility for maintenance of controls by development type, and will begin updating local regulations, ordinances, and guidance to set up a program requiring operation and maintenance. A tracking program will be set up by Year 2. An O&M verification program that may include inspections of a subset of installed controls will begin in Year 4.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Determine maintenance responsibility by development type.	PW Management Analyst, SWAT and PAC committees	Year 1	Year 2
2	Include O&M requirements in ordinance, regulations, guidelines	PW Management Analyst, SWAT and PAC committees, Public Works Director	Year 2	Year 3
3	Develop post-construction control and operation and maintenance tracking system.	PW Management Analyst	Year 1	Year 2
4	If O&M conducted by outside agencies, groups then set up O&M verification program.	PW Management Analyst	Year 3	Year 5

Responsible Parties: The Public Works Director and Community Development Director are responsible for implementation of this BMP. Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

BMP VII-3. Evaluate and Update Plan Review and Inspection Programs

Description and Rationale: Bend will integrate construction and post-construction stormwater quality requirements into plan review and inspection programs. They will evaluate existing procedures and identify needed changes and implement the revised programs. As part of this effort, the City will create a flow chart to show how the requirements fit into the City process.

The effort will ensure that proposed construction and post-construction stormwater site designs and controls—preferably based on the products from BMPs VII-1 through VII-3, above, and those related to construction activities as described in Section VI—will be properly reviewed during land use decisions, implemented through grading permits and as a component of site construction, and maintained as appropriate.

Measurable Goals and Schedule: The measurable goal for implementation of this BMP is to evaluate existing procedures and identify needed changes in Permit Year 1, to make needed changes and draft guidance in Year 2 and to implement the revised programs in Permit Year 3. Development and implementation will be according to the schedule below.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Evaluate existing procedures and identify needed changes.	PW Management Analyst, Community Development Director, Engineering Manager	Year 1	Year 1
2	Draft changes to procedures, prepare guidance, and obtain review.	PW Management Analyst, SWAT and PAC committees, Public Works Director, Community Development Director, Engineering Manager	Year 1	Year 2
3	Implement the revised programs.	Community Development Director, Engineering Manager	Year 3	Ongoing

Responsible Persons: The Community Development Director and Public Works Director have responsibility for implementation of this BMP. Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

BMP VII-4. Post-Construction Control Education

Description: Educate developers, residential do-it-yourselfers and others involved in development and re-development about acceptable stormwater management and operation and maintenance practices. As part of this effort, the City will participate in a regional grant request for Low Impact Development education through coordination with the COIC.

Rationale: Many of those involved in development in the City are not familiar with stormwater BMPs that can reduce or eliminate discharges of pollutants to surface and ground water, or how to maintain them over the life of the control. The soils, climate and geology of the City present some challenges and offer some opportunities that developers may not be familiar with. This BMP will educate the development community and do-it-yourself homeowners and business-owners about these challenges and opportunities.

Measurable Goals and Schedule:

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Work with COIC to request LID grant.	PW Management Analyst	Year 1	Year 1

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
2	Assist to implement the proposal, if receive grant approval.	PW Management Analyst, Community Development Director, Public Works Director	Year 1	Year 3
3	Identify and contact leaders in the development community to assist in development of educational program.	PW Management Analyst	Year 1	Year 1
4	Conduct first in series of development stormwater pollution prevention workshops	PW Management Analyst	Year 2	Year 2
5	Make pertinent information regularly available on web site	PW Management Analyst, Communications Manager	Year 1	Ongoing
6	Organize and facilitate biannual workshop	PW Management Analyst	Year 3	Year 5

Progress will be deemed satisfactory if all task deadlines are met.

Responsible Persons: The Public Works Director and Community Development Director are responsible for implementation of this BMP. Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

BMP VII-5. Performance Standards

Description and Rationale. Per the permit requirements, the City will create performance standards and an implementation schedule for new and redevelopment post-construction activities in time for submittal of the next permit application.

Measurable Goals and Schedule. This task will be deemed complied with if the City has prepared draft performance standards starting in Year 3 to obtain internal review, and finishing in Year 4 for inclusion in the permit package.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Draft performance standards for internal review.	PW Management Analyst, building and engineering inspectors, SWAT and PAC committees	Year 3	Year 4

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
2	Finalize performance standards for inclusion in permit reapplication package.	PW Management Analyst, SWAT and PAC committees, Public Works Director	Year 4	Year 5

Responsible Parties. The SWAT team and PAC will review the draft performance standards created by a special ad hoc task group and SWAT members will be responsible for gaining input from their staff on the performance standards and proposed schedule. Responsibility for including the performance standards in the permit package rests with the Public Works Director.

Because stormwater management crosses department boundaries and requires interdepartmental coordination, the City Manager retains ultimate responsibility for ensuring such coordination is conducted effectively.

**SECTION VIII:
MUNICIPAL OPERATIONS AND MAINTENANCE—
POLLUTION PREVENTION AND GOOD HOUSEKEEPING**

REGULATORY REQUIREMENT

40 CFR 122.34 (b) (6) – *Pollution prevention/good housekeeping for municipal operations.* (i) You must develop and implement an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations. Using training materials that are available from EPA, your State, Tribe, or other organizations, your program must include employee training to prevent and reduce storm water pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance.

(ii) Guidance: EPA recommends that, at a minimum, you consider the following in developing your program: maintenance activities, maintenance schedules, and long-term inspection procedures for structural and non-structural storm water controls to reduce floatables and other pollutants discharged from your separate storm sewers; controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, municipal parking lots, maintenance and storage yards, fleet or maintenance shops with outdoor storage areas, salt/sand storage locations and snow disposal areas operated by you, and waste transfer stations; procedures for properly disposing of waste removed from the separate storm sewers and areas listed above (such as dredge spoil, accumulated sediments, floatables, and other debris); and ways to ensure that new flood management projects assess the impacts on water quality and examine existing projects for incorporating additional water quality protection devices or practices....

EXISTING CONDITIONS/CURRENT PROGRAMS

Bend has roughly 13 miles of stormwater main lines, as well as stormwater drainage ditches. The Department of Public Works, Streets Division handles runoff management, street drainage system maintenance and street maintenance. These operations are housed at the main Public Works facility, which also houses the Water Division and fleet maintenance activities for City vehicles and equipment. The City will be mapping the existing drainage system in a GIS (ArcView, ArcInfo) format. The Department of Public Works, Wastewater Division maintains the sanitary sewer system. These operations are

housed at Water Reclamation Facility, located approximately 10 miles northeast of Bend City Hall.

APPROACH

The City discharges stormwater to dry wells, drill holes and the Deschutes River. It also conducts many activities that have the potential to contaminate stormwater. This section describes BMPs the City will employ for its own operations. The City acts as a model for the entire community, and so operating with good housekeeping practices and proper operational procedures is crucial prior to asking the community to do the same.

SELECTED BEST MANAGEMENT PRACTICES

BMP VIII-1. Street Sweeping.

Description: Conduct a street sweeping program. Conduct review of and make modifications to street sweeping program to increase efficacy in terms of stormwater quality and reduction of trash, cinders, leaf litter, and sediments to drywells and the Deschutes River. Progress will be deemed satisfactory if all task deadlines are met.

Currently, City collectors and arterials, downtown streets and those streets with bike lanes are swept multiple times per month and often weekly; while remaining streets are swept about six times per year. Bend will evaluate the frequency, timing and methods of street sweeping for optimum sediment and litter control. It will also evaluate parking and other ordinances that will help improve the cleanliness of its streets and facilitate street sweeping.

Rationale: Sediments accumulate on streets and roadways between storm events. Street sweeping is an effective way to keep these from being washed into drill holes and dry wells or the Deschutes River. Street sweeping is the main technique used to clean up cinders placed on roadways for winter driving safety.

Measurable Goals and Schedule: The measurable goal for implementation of this BMP is to track the amount of materials collected via street sweeping activities, monitoring the build-up of litter and sediment between sweepings in Permit Years 2 and 3 and make a schedule recommendation in Permit Year 4. Starting in Permit Year 4, Bend will implement the recommendation. The cleaning plan will include a monitoring component. Development and implementation will be according to the schedule below.

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	Implement a street sweeping program.	Street Supervisor	Ongoing	Ongoing

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
2	Establish a Clean Streets Task Group within Public Works and determine monitoring protocols.	Public Works Management Analyst, Street Supervisor	Year 1	Year 1
3	Collect data and monitor build-up of sediment and litter.	Street Supervisor	Year 2	Year 5
4	Task Group to confirm where improved cleaning needed most, examine potential for coordinating schedule with garbage pickup routes to reduce trash; notification improvements so roads can be cleared of automobiles on sweeping days; methods to improve cinder cleanup; GIS in sweeper to improve measurements of sweeping miles traveled, and materials collected.	Street Supervisor	Year 3	Year 4
5	Task Group to develop cleaning plan and budget	Street Supervisor	Year 4	Year 4
6	Order additional equipment if necessary	Street Supervisor	Year 5	Ongoing
7	Implement cleaning plan	Street Supervisor	Year 4	Year 5, ongoing

Responsible Persons: The Director of Public Works has ultimate responsibility for implementation of this BMP, with assistance from staff as indicated in the table above.

BMP VIII-2. Parking Lot Sweeping

Description: The City conducts sweeping of city-owned parking lots. This BMP would involve reviewing parking lot sweeping activities and requirements, and determining changes in operations that would improve efficacy. City staff will also consider the impacts of parking lot post construction controls on staff's ability to sweep and will address any conflicts. The cleaning plan will include a monitoring component.

Rationale: Sediments and other contaminants accumulate on paved parking areas between storm events. Sweeping is an effective way to keep these from being washed into drill holes and dry wells or the Deschutes River.

Measurable Goals and Schedule: The measurable goal for implementation of this BMP is to monitor the build-up of litter and sediment between sweepings of public-owned parking lots in Permit Years 2 and 3 and make a schedule recommendation in Permit Year 4. Starting in Permit Year 4, Bend will implement the recommendation. The cleaning plan will include a monitoring component. Development and implementation will be according to the schedule below.

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	Establish a Clean Lots/Litter Task Group within Public Works	PW Management Analyst, Facilities Manager	Year 1	Year 2
2	Collect data and monitor build-up of sediment and litter.	Facilities Manager, Streets Manager, PW Management Analyst	Year 2	Year 3
3	Task Group to identify where improved cleaning needed most	Facilities Manager, Streets Manager, PW Management Analyst	Year 3	Year 4
4	Task Group to develop cleaning plan and budget	Facilities Manager, Streets Manager, PW Management Analyst	Year 4	Year 4
5	Order additional equipment if necessary	Facilities Manager, Streets Manager, PW Management Analyst	Year 5	Ongoing
6	Implement cleaning plan	Facilities Manager, Streets Manager, PW Management Analyst	Year 4	Year 5, ongoing

Progress will be deemed satisfactory if all task deadlines are met.

Responsible Parties. The Public Works Director is ultimately responsible for implementation of this BMP, with assistance from staff.

BMP VIII-3. Litter Collection and Material Disposal

Description: This BMP involves examining whether and where any additional garbage cans are needed, or if changes to scheduled maintenance are needed to prevent overflow. In addition to other gross pollutants, leaf litter will also be reviewed and addressed.

Rationale: Litter is not only unsightly, it accumulates in storm drains causing them to malfunction and increasing maintenance costs. Trash that enters the Deschutes River can cause direct impacts to wildlife, and impair aesthetics.

Measurable Goals and Schedule:

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Establish a Clean Lots/Litter Task Group within Public Works	PW Analyst, Manager Management Facilities	Year 1	Year 2
2	Task Group to identify where improved cleaning needed most	PW Analyst, Manager Management Facilities	Year 2	Year 3
3	Task Group to develop cleaning plan and budget	PW Analyst, Manager Management Facilities	Year 3	Year 3
4	Order additional equipment if necessary	PW Analyst, Manager, Director Management Facilities Public Works	Year 4	As needed
5	Implement cleaning plan	PW Analyst, Manager Management Facilities	Year 4	Ongoing

Progress will be deemed satisfactory if all task deadlines are met.

Responsible Parties: The Public Works Director is ultimately responsible for implementation of this BMP, with assistance from staff as noted above.

BMP VIII-4. Landscape Maintenance Practices

Description: The City provides landscape maintenance to all medians and some parking strips throughout town. The Bend Metro Parks and Recreation District, the Old Mill District, and specific homeowner's associations that drain runoff through private systems are separate entities autonomous from the City.

This BMP involves pulling a task group together to examine City maintenance operations, create a list of landscape maintenance best management practices and improve the City's practices as necessary to better incorporate such objectives as integrated pest management and the use of native vegetation. Bend Park and Recreation maintenance staff, Old Mill District and homeowner association's staff will be invited to a workshop hosted by the City that will provide an overview of stormwater concerns and requirements, and an introduction to the best management practices. The best management practices will also be incorporated onto the City's website.

Rationale: Landscaping activities can contaminate stormwater with sediments and chemicals. Over-watering wastes water and results in dry weather discharges to storm drains. Herbicides, pesticides and fertilizers can run off landscaped areas and impact receiving waters.

Measurable Goals and Schedule:

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	Establish a Landscaping Task Group within Public Works.	Landscape Maintenance Supervisor, Large Landscape Specialist	Year 2	Year 2
2	Identify opportunities to improve practices	Landscape Maintenance Supervisor, Large Landscape Specialist	Year 2	Year 2
3	Develop landscaping guidance.	Landscape Maintenance Supervisor, Large Landscape Specialist	Year 2	Year 4
4	Host workshop and invite Bend Park and Rec., Old Mill, and HOA maintenance staff to hear overview of stormwater requirements and BMPs.	Landscape Maintenance Supervisor, Large Landscape Specialist, Process Manager, PW Management Analyst	Year 4	Year 4
5	Implement improved practices.	Landscape Maintenance Supervisor, Large Landscape Specialist	Year 4	Ongoing

Progress will be deemed satisfactory if all task deadlines are met.

Responsible Parties. The Public Works Director is ultimately responsible for completion of this BMP.

BMP VIII-5. Improved Catch Basin/ Storm Drain Facilities Cleaning

Description and Rationale: One of the purposes of catch basins and sediment manholes is to catch sediment and debris. Catch basins that are not maintained properly lose this functionality. The purpose of the BMP is to review and improve maintenance procedures for cleaning catch basins and other storm drainage facilities. If necessary, recommendations for changes to designs that would help facilitate maintenance may be compiled and addressed.

Measurable Goals and Schedule:

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	Establish a Catch Basin Task Group within Public Works	Street Supervisor, PW Management Analyst	Year 1	Year 2

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
2	Identify opportunities to improve maintenance practices	Street Supervisor, PW Management Analyst, SWAT	Year 1	Year 2
3	Develop improved maintenance procedures	Street Supervisor	Year 1	Year 2
5	Implement improved procedures.	Street Supervisor	Year 3	Year 5

Progress will be deemed satisfactory if all task deadlines are met.

Responsible Parties. The Public Works Director is ultimately responsible for completion of this BMP.

BMP VIII-6. Spill Prevention, Response Materials, and Training

Description and Rationale: Spills that occur on streets and parking areas can severely contaminate ground water and surface water. Good spill prevention and response can help minimize the chances of a spill and reduce cleanup costs. Bend will continue to provide training to applicable employees in spill response procedures and will examine current operations to determine whether and how improvements could be made. The City will also continue coordinate with the Oregon Department of Transportation (ODOT) to address spill response for Highways 97 and 20 through town.

Measurable Goals and Schedule: The measurable goals for implementation of this BMP are to identify spill-prone locations and develop and implement improved spill response procedures, and to provide spill response kits and training to applicable employees in Permit Year 4. Development and implementation will be according to the schedule below.

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	Establish a Spill Prevention and Response Task Group within Public Works	PW Management Analyst, Street Supervisor	Year 3	Year 5
2	Identify spill-prone locations	Street Supervisor	Year 3	Year 3
3	Develop improved spill prevention and response plan and procedures. Coordinate with ODOT as applicable.	Street Supervisor, PW Management Analyst, Public Works Director	Year 3	Year 4

Task #	Task Description	Responsible Person	Task Deadline	
			Start	Finish
4	Provide spill response kits and training, as needed.	Street Supervisor, PW Management Analyst	Year 4	Year 4
5	Implement improved procedures.	Street Supervisor, PW Management Analyst	Year 5	Year 5, Ongoing

Progress will be deemed satisfactory if all Task deadlines are met.

Responsible Parties. The Public Works Director is ultimately responsible for completion of this BMP, with assistance from staff.

BMP VIII-7. Illicit Dumping

Description and Rationale: Illicit dumping on City property can cause serious stormwater contamination. This BMP involves identifying locations of, and creating and implementing BMPs for City-controlled property where illicit or illegal dumping is likely to occur and contaminate stormwater runoff.

	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Identify City-owned or controlled property where illicit or illegal dumping occurs or is likely to occur and contaminate stormwater runoff.	PW Management Analyst, Facilities Manager, SWAT	Year 3	Year 4
2	Identify BMPs to prevent dumping	Facilities Manager, PW Management Analyst	Year 4	Year 5
3	Implement BMPs	Facilities Manager	Year 5	Year 5, Ongoing

Progress will be deemed satisfactory if all task deadlines are met.

Responsible Parties. The Public Works Director is ultimately responsible for completion of this BMP.

BMP VIII-8. City-owned Corporation Yards, Industrial and Commercial Facilities

Description: This BMP involves identifying locations of, and creating and implementing BMPs for City-controlled commercial and industrial facilities to reduce the occurrence and contamination of stormwater runoff. This will include a review of the City corporation yard(s). As part of this effort, the City will evaluate the drainage at any vehicle and equipment wash facilities and the potential need for a roof over the facility. BMPs may include the closure of

drywell and drill holes in areas that have been identified to have the potential for high contaminate levels.

Rationale: The City owns and operates some commercial or industrial facilities including the airport, vehicle maintenance shops, etc. These types of facilities have the potential to contaminate stormwater. The risks of contamination can often be reduced by changing operating practices.

Measurable Goals and Schedule: The measurable goal for implementation of this BMP is to develop checklists of BMPs for City-owned commercial and industrial facilities in Year 2 and to provide it to facility managers. Initial reviews to determine the status of BMP implementation (e.g. wash areas, loading areas, garbage area, storage areas, food preparation and use areas) would be held in Year 3 and a meeting to discuss areas of improvement and schedules for improvement to be implemented by Year 5.

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	Identify City-owned or operated commercial and industrial facilities.	PW Management Analyst, Facilities Manager	Year 3	Year 3
2	Establish task group to identify BMPs and develop schedule for implementation.	PW Management Analyst, Facilities Manager	Year 4	Year 4
3	Implement BMPs	Facilities Manager	Year 5	Ongoing

Progress will be deemed satisfactory if all task deadlines are met.

Responsible Persons: The Director of Public Works has responsibility for implementation of this BMP.

BMP VIII-9. Detect and Correct Cross-connections and Leaks.

Description and Rationale: Cross-connections or leaks from sanitary sewers or septic systems to storm drains are not uncommon. They often go unnoticed because they occur underground. There are several areas within the UGB where septic systems are still in use. When these fail, they often discharge to a storm drain, especially during wet weather. Detecting, preventing and correcting these illicit discharges are an important BMP.

Measurable Goals and Schedule:

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	Post cross-connection and leak detection and prevention information for sewer connections and septic systems on stormwater pollution prevention web site	Wastewater Supervisor, Communications Manager, PW Management Analyst	Year 2	Year 2; Ongoing updates as necessary
2	Establish cross-connection and leak detection and prevention team	PW Management Analyst, Wastewater Supervisor	Year 3	Year 5
3	Determine areas within City where septic systems are still in use	Wastewater Supervisor, County Sanitation (Health Department)	Year 3	Year 4
4	Provide education on septic system maintenance, how to determine and address leaks to septic system owners; and encourage hookup to City sewer	PW Management Analyst, Communications Manager	Year 4	Year 5
5	Set up repair program for cross-connections and leaks as identified	Wastewater Supervisor	Year 4	Ongoing

Progress will be deemed satisfactory if all task deadlines are met.

Responsible Parties. The Public Works Director is ultimately responsible for completion of this BMP, with assistance from staff as noted above.

BMP VIII-10. Promote Commute Alternatives for Municipal Employees and the Public

Description and Rationale: This BMP seeks to reduce the number of single occupancy vehicle trips in the City. Higher numbers of vehicle trips correlate with the needs for additional or wider streets and more parking areas resulting in increased impervious surface coverage, and increased volume and velocity of runoff. In addition atmospheric deposition of pollutants from vehicle emissions, tire and brake pad wear, and oil leaks can result in heavy metals and other pollutants entering stormwater.

Task #	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Implement a transportation demand management program for city staff to encourage alternative modes of transportation and reduce single occupancy vehicle trips.	Community Development Director; Transit Manager	Year 1	Ongoing
2	Plan and Implement mass transit service (e.g. bus service (BAT))	Public Works Director, Transit Manager	Year 1	Ongoing

Responsible Parties. The Community Development Director is ultimately responsible for trip reduction incentive programs and the Public Works Director, under whom is the Transit Manager, is responsible for bus/ mass-transit service.

BMP VIII-11. Performance Standards

Description and Rationale. Per the permit requirements, the City will create performance standards and an implementation schedule for municipal operations and maintenance activities in time for submittal of the next permit application.

Measurable Goals and Schedule. This task will be deemed complied with if the City has prepared draft performance standards starting in Year 3 to obtain internal review, and finishing in Year 4 for inclusion in the permit package.

Task #	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Draft performance standards for internal review covering street sweeping, storm drain facilities, spill response, material disposal, litter control, corporation yards, road repair and maintenance, and open space areas.	PW Management Analyst, Streets Supervisor, SWAT and PAC committees	Year 3	Year 4
2	Finalize performance standards for inclusion in permit reapplication package.	PW Management Analyst, SWAT and PAC committees, Public Works Director	Year 4	Year 5

Responsible Parties. The SWAT team and PAC will review the draft performance standards created by a special ad hoc task group and SWAT members will be responsible for gaining input from their staff on the performance standards and proposed schedule. Responsibility for including the performance standards in the permit package rests with the Public Works Director.

SECTION IX: MONITORING

REGULATORY REQUIREMENTS

Under the UIC Rule, Bend must prepare and implement a stormwater management plan with these required elements:

Monitoring Plan

- **Identify representative locations for monitoring and sampling**
- **Minimum sampling—2 times in first year, then annually at onset of wet weather conditions**
- **Grab samples prior to injection**
- **Sample analysis—Use analytical methods with detection limits below MCLs. Analyze for contaminants identified in system assessment plus BTEX, benzo(a)pyrene, Pb, Cr, Cd, total nitrogen, fecal coliform bacteria.**

EXISTING CONDITIONS/CURRENT PROGRAMS

Early in 2004, the City and the Upper Deschutes Watershed Council began a multi-year monitoring program to provide additional data on the presence or absence of pollutants of concern in the Deschutes River within the Bend Urban Boundary (Deschutes River Miles 172 and 159).

GENERAL APPROACH

During the first three to five years of the ISWMP, data will be gathered to help direct later stormwater management practices. The BMPs and Tasks in this section to describe how this will be done. The City may join with other municipalities in the region to develop and implement regional stormwater monitoring.

SELECTED BEST MANAGEMENT PRACTICES

BMP IX-1. Monitor Stormwater Discharges to Deschutes River

Description: Monitor and characterize stormwater discharged to the Deschutes River and how it affects river water quality.

Rationale: Very little is known about the quantity and quality of stormwater discharged to the Deschutes River. Within the next three to five years the DEQ will establish Total Maximum Daily Loads (TMDLs) for several Deschutes River pollutants. These TMDLs may result in restrictions being placed on the City's discharges to the river if it is determined that the discharges have a significant negative effect on river water quality. The City needs to better understand what it is discharging and how the discharges affect the river. In addition, the City is required by its permits to measure the effectiveness of its control measures.

Measurable Goals and Schedule:

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	Fund * and implement Upper Deschutes Watershed Council monitoring plan.	PWMA, Public Works Director	Ongoing	Year 1
2	Analyze and report results.	PW Management Analyst	Ongoing	Year 2

* A funding request has been approved by City Council and work has begun.

Progress will be deemed satisfactory if all task deadlines are met.

Responsibly Parties: The Public Works Director is ultimately responsible for implementation of this BMP.

BMP IX-2. Enhanced Drinking Water Well Monitoring

Description and Rationale: The City is required by the Safe Drinking Water Act to regularly monitor its well water for compliance with drinking water standards. This has been done for over 20 years with no indications of standard violations or degradation of ground water quality. However, this monitoring is not designed to provide the earliest possible indication of contamination. The purpose of this BMP is to develop and implement an enhanced monitoring plan designed to provide the earliest practicable detection of contamination and degradation of the City's well water.

Measurable Goals and Schedule:

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	Form enhanced monitoring task group	PW Management Analyst, Water Supervisor	Year 1	Year 1
2	Develop enhanced monitoring plan	PW Management Analyst, Water Supervisor	Year 2	Year 3
3	Obtain funding for enhanced monitoring	PW Management Analyst, Water Supervisor	Year 2	Year 4
3	Implement enhanced monitoring.	PW Management Analyst, Water Supervisor	Year 4	Ongoing
4	Prepare annual monitoring reports (write up in section of NPDES annual report may suffice).	PW Management Analyst	Year 1	Ongoing

Progress will be deemed satisfactory if all task deadlines are met.

Responsibility Parties: The Public Works Director is ultimately responsible for implementation of this BMP, with assistance from staff as noted above.

BMP IX-3. Stormwater Monitoring for UICs

Description: The City is committed to managing its stormwater responsibly. It is also committed to perform monitoring to characterize its stormwater discharges and the effects of these discharges on receiving water and provide an early warning of any groundwater contamination that may occur in the future.

Since the City is so dependent on ground water, it is especially committed to protecting its water wells from contamination. The Oregon Health Division has delineated Drinking Water Protection Areas (DWPAs) for each of the City's water wells.

Rationale: Little is known about the quantity and quality of the stormwater the City discharges underground or to the river. The UIC permit will require stormwater monitoring. Monitoring will be necessary in order for the City to determine BMP effectiveness and to determine compliance with permit conditions.

Measurable Goals and Schedule:

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	Form monitoring task group	PW Management Analyst	Year 1	Year 1
2	Develop monitoring plan	PW Management Analyst	Year 2	Year 2
3	Obtain funding for monitoring	PW Management Analyst	Year 2	Year 3
3	Implement monitoring.	PW Management Analyst	Year 4	Ongoing
4	Prepare semi-annual monitoring reports.	PW Management Analyst	Year 4	Ongoing

Progress will be deemed satisfactory if all task deadlines are met.

Responsible Party. The Public Works Director is responsible for implementing this BMP.

BMP IX-4. Performance Standards

Description and Rationale. The City will create performance standards and an implementation schedule for monitoring activities in time for submittal of the next permit application.

Measurable Goals and Schedule. This task will be deemed complied with if the City has prepared draft performance standards starting in Year 3 to obtain internal review, and finishing in Year 4 for inclusion in the permit package.

#	Task Description	Responsible Person	Task Deadline	
			Start	Finish
1	Draft performance standards for internal review.	PW Management Analyst, SWAT and PAC committees	Year 3	Year 4
2	Finalize performance standards for inclusion in permit reapplication package.	PW Management Analyst, SWAT and PAC committees, Public Works Director	Year 4	Year 5

Responsible Parties. The SWAT team and PAC will review the draft performance standards created by a special ad hoc task group and SWAT members will be responsible for gaining input from their staff on the performance standards and proposed schedule. Responsibility for including the performance standards in the permit package rests with the Public Works Director.

SECTION X: DRINKING WATER PROTECTION AREAS INVESTIGATION, RE-DELINEATION AND MANAGEMENT

REGULATORY REQUIREMENTS

OAR Chapter 333 Division 061 Effective 2/1/2006: 333-061-0057 Voluntary Drinking Water Protection Program (2) Delineation of the drinking water protection area (DWPA): (d) Wells. ((f) Delineation Update. The water system's DWPA delineation shall be re-examine every five years or during the sanitary survey for that system for potential revisions (OAR 340-040-0190)....

See Appendix A for an overview of Oregon's Drinking Water Protection Process for Public Water Systems.

EXISTING CONIDITIONS/CURRENT PROGRAMS

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. The purpose of this section is to provide the information the City needs in order to do this.

GENERAL APPROACH

The City will first determine the delineations for the one, two, five, and ten year Drinking Water Protection Areas for each of the City's water wells. The City will then develop and implement a drinking well protection plan.

SELECTED BEST MANAGEMENT PRACTICES

The following best management practices will be completed to implement this section.

BMP X-1. Drinking Water Protection Area Delineation

Description: Investigate the existing Health Division delineations and, if necessary, re-delineate the 1, 2, 5 and 10 year DWPAs for all of the City's water wells.

Rationale: The complex, porous geology where the City's water wells are located makes it difficult to delineate accurate DWPAs. The existing DWPAs need to either be confirmed or replaced with new DWPAs that are based on the best available information. This is necessary for the City to properly manage activities within the DWPAs.

Measurable Goals and Schedule:

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	Hire an expert to investigate the DWPAs delineation for two of the City's water wells.	Water Supervisor	Year 1	Year 2
2	Re-delineate the DWPAs for these two wells if the investigation so indicates.	Water Supervisor	Year 2	Year 3
3	If the above investigation so indicates, obtain a quote for investigating and re-delineating the rest of the DWPAs.	Water Supervisor	Year 3	Year 3
4	Obtain funding for additional investigations and delineations.	PW Management Analyst	Year 3	Year 4
5	Let contract for work.	PW Management Analyst	Year 4	Year 4
6	Complete re-delineations.	PW Management Analyst	Year 4	Year 6

Progress will be deemed satisfactory if all task deadlines are met.

Responsible Persons: The Public Works Director is ultimately responsible for implementation of this BMP, with assistance from staff noted above.

BMP X-2. Drinking Water Protection Plan

Description: Continue development of a drinking water protection plan. The focus of this task will be to identify real and potential contaminant sources within the DWPAs, designate which are private and which are public sources, and develop and provide targeted educational materials on minimizing potential contaminant sources for those agencies, businesses, and residences within existing DWPAs. Work to incorporate more stringent design guidelines, as appropriate, for new or redevelopment within the DWPAs. Review potential threats and work with appropriate agencies to develop or refine emergency response standard operating procedures and communication pathways as appropriate.

Rationale: In Oregon, a drinking water protection plan is voluntary and DWPA delineations are the first step (see BMP X-1). The UIC program does not allow the DEQ to rule-authorize drill holes or dry wells within two-year time-of-travel DWPAs. Currently there are many City and private dry wells and drill holes within the two-year delineated DWPAs. Several of the DWPAs include a high

level of development activity. The City needs to determine how it will most effectively manage development activities within the DWPA and provide education to those entities located within DWPA's that they are in a sensitive area.

Measurable Goals and Schedule.

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	Form a DWPA task group of public and government stakeholders and experts.	Water Supervisor	Year 1	Year 1
2	Identify contaminant sources within the DWPA's.	Water Supervisor, PW Management. Analyst	Year 1	Year 2
3	Develop targeted education materials.	PW Management Analyst, Education Coordinator	Year 1	Year 3
4	Work to incorporate more stringent development design guideline as appropriate.	Water Supervisor, PW Management Analyst, Engineering Manager, Community Development Director	Year 1	Year 3
5	Distribute educational materials.	Water Supervisor, Education Coordinator	Year 2	Year 5
6	Review and refine emergency response standard operating procedures and communication pathways for threats within DWPA's.	Water Supervisor	Year 3	Year 4

Progress will be deemed satisfactory if all task deadlines are met.

Responsible Parties. The Public Works Director, with assistance from staff indicated above, is responsible for implementing this BMP.

BMP X-3. Groundwater Vulnerability Study

Description and Rationale: To gain a better understanding in how best to protect drinking water quality and our groundwater aquifer, the City will participate with COIC regarding the review and possible pursuit of a United States Geological Survey (USGS) Groundwater Vulnerability Study proposal. The proposal would be for the USGS to assess the aquifer vulnerability and

source areas for public supply wells in the upper Deschutes Basin. The first phase would focus on analyzing the intrinsic susceptibility of the aquifer system in the area, including analyzing existing water quality data and examining the geology of the unsaturated zone, and of the age and sources of water to different parts of the system. A second phase of the anticipated proposal would combine the susceptibility knowledge from the first phase with groundwater sampling and analysis for contaminants to better understand the aquifer's vulnerability.

Measurable Goals and Schedule.

Task #	Description	Responsible Person	Task Deadline	
			Start	Finish
1	Participate on COIC work group to review USGS Groundwater Vulnerability proposal.	PW Management Analyst, Water Supervisor	Year 1	Year 1
2	If appropriate, identify and help fund the proposed study.	PW Management Analyst, Public Works Director	Year 1	Year 2
3	If appropriate review draft products and provide comment.	PW Management Analyst, Water Supervisor	TBD	TBD
4	As appropriate, use results of final report to improve practices.	PW Management Analyst, Public Works Director	TBD	TBD

Progress will be deemed satisfactory if all task deadlines are met.

Responsible Parties. The Public Works Director, with assistance from staff indicated above, is responsible for implementing this BMP.

CERTIFICATION

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 assure 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.

Ken Fuller, Director of Public Works

Date

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APPENDICES

Appendix A:
ISWMP Task Summary and Permit Implementation Tracking

Appendix B:
Oregon's Drinking Water Protection Process for Public Water Systems.

Appendix A:
ISWMP Task Summary and Permit
Implementation Tracking

APPENDIX A--TABLE 1: ISWMP TASK SUMMARY AND PERMIT IMPLEMENTATION TRACKING

Program	BMP	Activity	Dept./ Person ¹	Date Due				
				YR1	YR2	YR3	YR4	YR5
Program Administration, Planning and Financing (Section II)	1. Administration and Coordination	Administer and coordinate implementation of the ISWMP	PWD, CDD, PWMA					
		Hold at-least quarterly SWAT meetings	PWD; CDD, PWMA					
		Participate in external stormwater workgroups (e.g., COIC)	PWMA					
		Convene other ad hoc workgroups as necessary	PWD, PWMA					
	2. Legal Authority	With review and comment from PAC and direct input from SWAT, the City staff will draft a stormwater ordinance, and also review development codes and identify where additional or modified policy, guidance, or ordinance language is needed to support implementation of the BMPs described herein.	PWD, CDD, PWMA, PAC Chairperson, SWAT					
		Identify potential conflicts and work with impacted interests to resolve. Prepare draft development code revisions	PWMA, PAC Chairperson, SWAT					
		Obtain public review of draft development code revisions, and draft stormwater ordinance.	PAC Chairperson, PWMA; SWAT CDD; PWD					
		Finalize development code revisions and stormwater ordinance.	CDD; PWD, PWMA					
		Implementation complete	CDD; PWD; PWMA					
		3. Financing	Ensure adequate funding to implement the ISWMP.	CDD, PWD; PWMA				

¹ Note: Person noted in **bold** holds primary responsibility for implementation of BMP.

APPENDIX A--TABLE 1: ISWMP TASK SUMMARY AND PERMIT IMPLEMENTATION TRACKING

Program	BMP	Activity	Dept./ Person ¹	Date Due					
				YR1	YR2	YR3	YR4	YR5	
		Create Stormwater Master Plan	PWD; PWMA						
Program Administration, Planning and Financing (Section II)	4. Planning	Annually review ISWMP, plan activities for coming year.	PWD; CDD, PWMA						
		Update ISWMP	PWD; PWMA						
	5. Annual Reporting	Prepare and submit annual report	PWD; CDD, PWMA						
	6. UIC Registration 6A: Location			PWD					
			On a map, show the location of each structure. Show the connections for each system that discharges to the Deschutes River	Street Supervisor					
			Assign descriptive ID codes	PWMA					
			Upload information to GIS	Engineering Services (GIS)					
			Create GIS with layers for UGB, topography, streets, water bodies, catch basin locations, drill hole locations, dry well locations, river outfall locations, cleanup site locations, interconnections for systems discharging to the river, water well locations, and 1, 2, 5, and 10 year DWPAs.	Engineering Services (GIS)					
			Make GIS available on stormwater web site.	PWMA					
			Update GIS at least quarterly.	Street Supervisor					
6.b. Registration		Develop UIC database that can easily transfer registration and decommissioning data to DEQ database.	PWMA						
		Enter data for all existing UICs	PWMA						

APPENDIX A--TABLE 1: ISWMP TASK SUMMARY AND PERMIT IMPLEMENTATION TRACKING

Program	BMP	Activity	Dept./ Person ¹	Date Due				
				YR1	YR2	YR3	YR4	YR5
Program Administration, Planning and Financing (Section II)		Develop process for registering new, modified or decommissioned injection systems before they are constructed, modified or decommissioned.	Street Supervisor					
		Maintain accurate database.	Street Supervisor					
Public Education and Outreach (Section III)	1. Utility Bill Inserts, Brochures or Posters	Develop 2 information piece inserts per year.	PWD, PWMA					
		Distribute 4 information pieces per year, beginning in year 2.	PWMA, COM					
	2. Stormwater Pollution Prevention Web Site	Begin organization of site.	PWD, PWMA					
		Update web site with stormwater quality information.	PWMA, COM					
		Provide updates as new materials/information become available.	PWMA, COM					
	3. City News Broadcast Stormwater Quality Messages and Press Releases	Post at least 5 storm water quality messages; in general one per year.	PWD, PWMA, COM					
		Submit, either locally or as part of a regional effort, at least 3 news releases regarding stormwater issues to media outlets per year.	PWD, PWMA, COM					
	4. Stormwater/Watershed Diorama	Research and purchase diorama. Become familiar with its components.	PWD, Education coordinator					
Use diorama at suitable outreach events (1/year).		Education coordinator						

APPENDIX A--TABLE 1: ISWMP TASK SUMMARY AND PERMIT IMPLEMENTATION TRACKING

Program	BMP	Activity	Dept./ Person ¹	Date Due				
				YR1	YR2	YR3	YR4	YR5
		Set up lending program and make diorama available for local schoolteachers to use. (Send 1 reminder/year to teachers of availability).	Education coordinator					
Public Education and Outreach (Section III)		Keep diorama restocked and in good working order.	Education Coordinator; PWD					
	5. Performance Standards	Draft performance standards for internal review.	PWD, CDD, PWMA, Education Coordinator, SWAT and PAC committees					
		Finalize performance standards for inclusion in permit reapplication package.	PWMA, SWAT & PAC, PWD					
Public Involvement and Participation (Section IV)	1. Public Advisory Committee (PAC)	Convene PAC	PWD; PWMA; COM					
		Hold at least semi-annual meetings	PWMA; COM					
	2. Public Meetings	Provide open review period for draft review of initial ISWMP; post draft on website. Identify schedule for meeting.	PWMA; COM					
		Hold Public Meeting. Incorporate results.	PWMA; COM					
		Initial implementation complete.						
		Provide open review period for draft of revised ISWMP for second permit application package; post draft on website. Identify schedule for meeting.	PWMA; COM					

APPENDIX A--TABLE 1: ISWMP TASK SUMMARY AND PERMIT IMPLEMENTATION TRACKING

Program	BMP	Activity	Dept./ Person ¹	Date Due				
				YR1	YR2	YR3	YR4	YR5
		Hold Public Meeting. Incorporate results into submittal package.	PWMA; COM					
	3. Stormwater Quality Volunteer Opportunities	1. Identify volunteer opportunities.	PWD ; PWMA; COM, Education Specialist					
Public Involvement and Participation (Section IV)		2. Develop support materials and provide them to interested volunteers.	PWMA; COM, Education Specialist					
	4. Performance Standards	Draft performance standards for internal review.	PWD, CDD ; PWMA, Education Coordinator, SWAT and PAC committees					
		Finalize performance standards for inclusion in permit reapplication package.	PWMA, SWAT and PAC committees, PWD					
Illicit Discharge Detection and Elimination (Section V.)	1. Public Education on Illegal Discharges and Improper Disposal	Develop or acquire public education materials.	PWD, CDD , PWMA, Education Coordinator.					
		Determine an effective means of distribution.	PWMA, Education Coordinator, COM					
		Distribute materials to public employees.	PWMA, COM					
		Distribute materials to at least 50% of targeted businesses each year.	PWMA, COM					
	2. Illicit Discharge Reporting Mechanism	Establish a procedure for responding to reports of illicit discharges	PWD, COM, PAC Chairperson, PWMA, SWAT					

APPENDIX A--TABLE 1: ISWMP TASK SUMMARY AND PERMIT IMPLEMENTATION TRACKING

Program	BMP	Activity	Dept./ Person ¹	Date Due				
				YR1	YR2	YR3	YR4	YR5
	3. Post Warnings About Illicit and Illegal Discharges	Establish and advertise an illicit discharge reporting e-mail link on the stormwater pollution prevention web site and reporting telephone hotline.	PAC Chairperson, PWMA, COM					
		City to determine preferred marking types.	PWD, COM, PWMA, PAC Chairperson, City Engineer, Streets Supervisor					
Illicit Discharge Detection and Elimination (Section V.)		PAC to organize volunteer groups to paint or post signs, as appropriate	PAC Chairperson, PWMA					
		PAC and City to identify posting schedule based on risk of illicit discharge	PAC Chairperson, PWMA					
		City to purchase signs and materials as needed.	PWMA					
		Signs to be posted	PAC Chairperson, PWMA, COM					
	4. Post Illicit Discharge Prevention Information on Web Site	PAC to provide input on what to post on web site; SWAT to approve	PWD, COM, PAC Chairperson, SWAT, PWMA					
		City to post information	PWMA, COM					
	5. Stormwater System Map	Conduct review and planning for mapping storm sewer system.	PWD, City Engineer, CIP Manager					
		Acquire mapping equipment; Map 25% of the drainage system.	City Engineer, PWD					
		Map 25% of the drainage system.	City Engineer					
		Map 25% of the drainage system.	City Engineer					
Map 25% of the drainage system.		City Engineer						

APPENDIX A--TABLE 1: ISWMP TASK SUMMARY AND PERMIT IMPLEMENTATION TRACKING

Program	BMP	Activity	Dept./ Person ¹	Date Due				
				YR1	YR2	YR3	YR4	YR5
	6. Illicit Discharge Ordinance	Develop a draft Illicit Discharge Detection and Elimination Ordinance.	PWD, PWMA					
		Finalize ordinance.	City Attorney, PWMA, PWD					
		Begin to Implement Ordinance	PWD					
	7. Program to Detect and Address Illicit Discharges	Evaluate existing program and identify additional program requirements and resource and training needs.	PWMA, PWD					
Illicit Discharge Detection and Elimination (Section V.)		Acquire needed resources, training	Public Works PWMA, PWD					
		Implement program.	PWMA, PWD					
	8. Minimize Landscape Irrigation Runoff	Review water patrol and determine whether and how to expand duties to incorporate stormwater concerns	Water Resources Coordinator, PWMA					
		Implement changes to water patrol position, as applicable.	Water Resources Coordinator, PWMA					
		Review SMART controller efforts; examine review and approval process for sizing and installing irrigation heads.	Water Resources Coordinator, Large Landscape Specialist, PWMA					
		Determine methods to improve, and an educational campaign targeting licensed landscapers and landscape maintenance providers.	Water Resources Coordinator, Large Landscape Specialist, PWMA					
	Implement educational campaign targeting landscapers, focusing on the connection of landscape and water management to water quality.	Water Resources Coordinator, Large Landscape Specialist, PWMA						

APPENDIX A--TABLE 1: ISWMP TASK SUMMARY AND PERMIT IMPLEMENTATION TRACKING

Program	BMP	Activity	Dept./ Person ¹	Date Due				
				YR1	YR2	YR3	YR4	YR5
		Implement irrigation system improvement recommendations	Public Works Director, Water Resources Coordinator					
	9. Performance Standards	Draft performance standards for internal review.	PWMA, Education Coordinator, Water Resources Coordinator, SWAT and PAC committees					
		Finalize performance standards for inclusion in permit reapplication package.	PWMA, SWAT and PAC committees, PWD					
Construction Site Stormwater (Section VI).	1. Evaluate and Update Regulatory Authority and Procedures	Evaluate existing legal authority and procedures.	PWMA, SWAT and PAC committees					
		Update ordinance or other regulatory mechanisms and procedures and adopt them.	PWMA, SWAT and PAC committees, CDD, PWD					
		Implement ordinance.	CDD					
	2. Construction Site Educational Materials	Develop or acquire public educational materials.	PWD , PWMA, SWAT and PAC committees					
		Distribute materials to permit applicants or via website.	PWMA, CDD and Building Department Manager					
		Create plan sheet with information from above brochures/flyers.	PWMA, SWAT and PAC committees					
		Distribute plan sheets.	PWMA, CDD and planning staff					

APPENDIX A--TABLE 1: ISWMP TASK SUMMARY AND PERMIT IMPLEMENTATION TRACKING

Program	BMP	Activity	Dept./ Person ¹	Date Due				
				YR1	YR2	YR3	YR4	YR5
	3. Construction Site Inspection and Violation Hotline	Identify Department(s) to monitor reporting hotline and conduct site inspections for proper installation and maintenance of stormwater controls.	PWD, CDD, PWMA, SWAT					
		Set up hotline and inspection program. Include, set up method of forwarding reports to city inspectors.	PWMA, CDD, COM, SWAT					
		Publicize hotline.	PWMA, COM					
		Implement inspection and hotline response program.	PWMA, CDD or PWD, COM, SWAT, inspectors					
Construction Site Stormwater (Section VI).	4. Construction Site Education	Develop or have staff attend training workshop(s) or plan series of meetings possibly via ad hoc task group to communicate construction site program for construction industry and City staff.	PWD, CDD, PWMA, Education Coordinator, Water Resources Coordinator, PAC and potential ad hoc committee					
		Hold workshop and/or meetings.	PWMA, PAC and ad hoc committee					
	5. Participate in Regional Coordination Activities: Regional Stormwater Control Manual	Participate in preparation of regional stormwater control manual being developed in coordination with COIC.	PWD, CDD, PWMA, Education Coordinator, Water Patrol supervisor, SWAT and PAC committees					
		Tailor manual to specifics of Bend.	PWMA, SWAT and PAC committees, PWD					

APPENDIX A--TABLE 1: ISWMP TASK SUMMARY AND PERMIT IMPLEMENTATION TRACKING

Program	BMP	Activity	Dept./ Person ¹	Date Due				
				YR1	YR2	YR3	YR4	YR5
	6. Performance Standards	Draft performance standards for internal review.	PWD, CDD, PWMA, building and engineering inspectors, SWAT and PAC committees					
		Finalize performance standards for inclusion in permit reapplication package.	PWMA, SWAT and PAC committees, PWD					
Post-Construction Stormwater Management	1. Participate in Regional Stormwater Control Manual and Tailor to City of Bend	Review draft manual.	PWMA, Engineering Manager, Assistant PWD, PWD, CDD					
Post-Construction Stormwater Management in New and Redevelopment (Section VII)		Tailor manual to Bend and distribute.	PWMA, SWAT and PAC committees, Engineering Manager, Assistant PWD, CDD					
		Implement Manual.	CDD, Engineering Manager, PWD					
	2. Operation and Maintenance	Determine maintenance responsibility by development type.	PWD, CDD, PWMA, SWAT and PAC committees					
		Include O&M requirements in ordinance, regulations, guidelines	PWMA, SWAT and PAC committees, PWD					

APPENDIX A--TABLE 1: ISWMP TASK SUMMARY AND PERMIT IMPLEMENTATION TRACKING

Program	BMP	Activity	Dept./ Person ¹	Date Due					
				YR1	YR2	YR3	YR4	YR5	
		Develop post-construction control and operation and maintenance tracking system.	PWMA						
		If O&M conducted by outside agencies, groups then set up O&M verification program.	PWMA						
		3. Evaluate and Update Plan Review and Inspection Programs	Evaluate existing procedures and identify needed changes.	PWD, CDD, PWMA, Engineering Manager					
			Draft changes to procedures, prepare guidance, obtain review.	PWMA, SWAT and PAC committees, PWD, CDD, Engineering Manager					
			Implement the revised programs.	CDD, Engineering Manager					
Post-Construction Stormwater Management in New and Redevelopment (Section VII)	4. Post-Construction Control Education	Work with COIC to request LID grant.	PWD, PWMA						
		Assist to implement the proposal, if receive grant approval.	CDD, PWD, PWWA						
		Identify and contact leaders in the development community to assist in development of educational program.	PWMA						
		Conduct first in series of development stormwater pollution prevention workshops	PWMA						
		Make pertinent information regularly available on web site	PWMA, COM						
		Organize and facilitate biannual workshop	PWMA						

APPENDIX A--TABLE 1: ISWMP TASK SUMMARY AND PERMIT IMPLEMENTATION TRACKING

Program	BMP	Activity	Dept./ Person ¹	Date Due				
				YR1	YR2	YR3	YR4	YR5
	5. Performance Standards	Draft performance standards for internal review.	PWD, CDD, PWMA, building and engineering inspectors, SWAT and PAC committees					
		Finalize performance standards for inclusion in permit reapplication package.	PWMA, SWAT and PAC committees, PWD					
Municipal Operations and Maintenance—Pollution Prevention and Good Housekeeping (Section VIII)	1. Street Sweeping	Implement a street sweeping program.	PWD, Street Supervisor					
		Establish a Clean Streets Task Group within Public Works and determine monitoring protocols.	PWMA, Street Supervisor					
		Collect data and monitor build-up of sediment and litter.	Street Supervisor					
Municipal Maintenance (Section VIII)		Task Group to identify where improved cleaning needed most, examine potential for coordinating schedule with garbage pickup routes to reduce trash; notification improvements so roads can be cleared of automobiles on sweeping days; methods to improve cinder cleanup; GIS in sweeper to improve measurements of sweeping miles traveled, and materials collected.	Street Supervisor					
		Task Group to develop cleaning plan and budget	Street Supervisor					
		Order additional equipment if necessary	Street Supervisor					

APPENDIX A--TABLE 1: ISWMP TASK SUMMARY AND PERMIT IMPLEMENTATION TRACKING

Program	BMP	Activity	Dept./ Person ¹	Date Due				
				YR1	YR2	YR3	YR4	YR5
		Implement cleaning plan	Street Supervisor					
	2. Parking Lot Sweeping	Establish a Clean Lots/Litter Task Group within Public Works	PWD , PWMA, Facilities Manager					
		Collect data and monitor build-up of sediment and litter.	Facilities Manager, Streets Manager, PWMA					
		Task Group to identify where improved cleaning needed most	Facilities Manager, Streets Manager, PWMA					
		Task Group to develop cleaning plan and budget	Facilities Manager, Streets Manager, PWMA					
		Order additional equipment if necessary	Facilities Manager, Streets Manager, PWMA, PWD					
		Implement cleaning plan	Facilities Manager, Streets Manager, PWMA					
Municipal Operations and Maintenance (Section VIII)	3. Litter Collection and Material Disposal	Establish a Clean Lots/Litter Task Group within Public Works	PWD , PWMA, Facilities Manager					
		Task Group to identify where improved cleaning needed most	Facilities Manager, PWMA,					
		Task Group to develop cleaning plan and budget	Facilities Manager, PWMA,					
		Order additional equipment if necessary	Facilities Manager, PWMA,					
		Implement cleaning plan	Facilities Manager, PWMA,					

APPENDIX A--TABLE 1: ISWMP TASK SUMMARY AND PERMIT IMPLEMENTATION TRACKING

Program	BMP	Activity	Dept./ Person ¹	Date Due				
				YR1	YR2	YR3	YR4	YR5
	4. Landscape Maintenance Practices	Establish a Landscaping Task Group within Public Works.	PWD, PWMA, Landscape Maintenance Supervisor, Large Landscape Specialist					
		Identify opportunities to improve practices	Landscape Maintenance Supervisor, Large Landscape Specialist					
		Develop landscaping guidance.	Landscape Maintenance Supervisor, Large Landscape Specialist					
		Host workshop and invite Bend Park and Rec., Old Mill, and HOA maintenance staff to hear overview of stormwater requirements and BMPs.	Landscape Maintenance Supervisor, Large Landscape Specialist, Process Manager					
Municipal Operations and Maintenance (Section VIII)		Implement improved practices.	Landscape Maintenance Supervisor, Large Landscape Specialist					
	5. Improved Catch Basin/ Storm Drain Facilities Cleaning	Establish a Catch Basin Task Group within Public Works	PWD, PWMA, Street Supervisor					

APPENDIX A--TABLE 1: ISWMP TASK SUMMARY AND PERMIT IMPLEMENTATION TRACKING

Program	BMP	Activity	Dept./ Person ¹	Date Due				
				YR1	YR2	YR3	YR4	YR5
		Identify opportunities to improve maintenance practices	Street Supervisor					
		Develop improved maintenance procedures	Street Supervisor					
		Implement improved procedures.	Street Supervisor					
	6. Spill Prevention, Response Materials, and Training	Establish a Spill Prevention and Response Task Group within Public Works	PWD , PWMA, Street Supervisor					
		Identify spill-prone locations	Street Supervisor, SWAT, PWMA					
		Develop improved spill prevention and response plan and procedures. Coordinate with ODOT as applicable.	Street Supervisor, PWMA, PWD					
		Provide spill response kits and training.	Street Supervisor, PWMA					
		Implement improved procedures.	Street Supervisor					
	7. Illicit Dumping	Identify City-owned or controlled property where illicit or illegal dumping occurs or is likely to occur and contaminate stormwater runoff.	PWD , PWMA, Facilities Manager, SWAT					
		Identify BMPs to prevent dumping	PWMA, Facilities Manager					
		Implement BMPs	Facilities Manager					
	Municipal Operations and Maintenance (Section VIII)	8. City-owned Corporation Yards, Industrial and Commercial Facilities	Identify City-owned or operated commercial and industrial facilities.	PWD , PWMA, Facilities Manager				
Establish task group to identify BMPs and develop schedule for implementation.			PWMA, Facilities Manager					
Implement BMPs			Facilities Manager					

APPENDIX A--TABLE 1: ISWMP TASK SUMMARY AND PERMIT IMPLEMENTATION TRACKING

Program	BMP	Activity	Dept./ Person ¹	Date Due				
				YR1	YR2	YR3	YR4	YR5
	9. Detect and Correct Cross-connections and Leaks	Post cross-connection and leak detection and prevention information for sewer connections and septic systems on stormwater pollution prevention web site	PWD , Wastewater Supervisor, COM, PWMA					
		Establish cross-connection and leak detection and prevention team	PWMA, Wastewater Supervisor					
		Determine areas within City where septic systems are still in use	PWD , Wastewater Supervisor, County Sanitation (Health Dept.)					
		Provide education on septic system maintenance, how to determine and address leaks to septic system owners; and encourage hookup to City sewer.	PWMA. COM					
		Set up repair program for cross-connections and leaks as identified	Wastewater Supervisor					
	10. Promote Commute Alternatives for Municipal Employees and the Public	Implement a transportation demand management program for city staff to encourage alternative modes of transportation and reduce single occupancy vehicle trips.	CDD; Transit Manager					
	Plan and Implement mass transit service (e.g. bus service (BAT))	PWD, Transit Manager						
Municipal Operations and Maintenance (Section VIII)	11. Performance Standards	Draft performance standards for internal review, covering street sweeping, storm drain facilities, spill response, material disposal, litter control, corporation yards, road repair and maintenance, and open space areas.	PWD , PWMA, Streets Supervisor, SWAT and PAC committees					

APPENDIX A--TABLE 1: ISWMP TASK SUMMARY AND PERMIT IMPLEMENTATION TRACKING

Program	BMP	Activity	Dept./ Person ¹	Date Due				
				YR1	YR2	YR3	YR4	YR5
		Finalize performance standards for inclusion in permit reapplication package.	PWMA, SWAT and PAC committees, PWD					
Monitoring (Section IX)	1. Monitor Stormwater Discharges to Deschutes River	Fund * and implement Upper Deschutes Watershed Council monitoring plan	PWD , Water Supervisor					
		Analyze and report results	PWMA					
	2. Enhanced Drinking Water Well Monitoring	Form enhanced monitoring task group	PWD , PWMA, Water Supervisor					
		Develop enhanced monitoring plan	PWMA, Water Supervisor					
		Obtain funding for enhanced monitoring, as necessary	PWMA, Water Supervisor					
		Implement enhanced monitoring.	PWMA, Water Supervisor					
		Prepare semi-annual monitoring reports.	PWMA, Water Supervisor					
	3. Stormwater Monitoring for UICs	Form monitoring task group	PWD , PWMA					
		Develop monitoring plan	PWMA					
		Obtain funding for monitoring	PWMA					
		Implement monitoring.	PWMA					
		Prepare annual monitoring reports.	PWMA					
	Monitoring (Section IX)	4. Performance Standards	Draft performance standards for internal review.	PWD , PWMA, SWAT and PAC committees				
Finalize performance standards for inclusion in permit reapplication package.			PWMA, SWAT and PAC committees, PWD					

APPENDIX A--TABLE 1: ISWMP TASK SUMMARY AND PERMIT IMPLEMENTATION TRACKING

Program	BMP	Activity	Dept./ Person ¹	Date Due					
				YR1	YR2	YR3	YR4	YR5	
DWPA Investigation, Re-Delineation and Management (Section X)	1. Drinking Water Protection Area Delineation	Hire an expert to investigate the DWPAs delineation for two of the City's water wells.	PWD , Water Supervisor						
		Re-delineate the DWPAs for these two wells if the investigation so indicates.	Water Supervisor						
		If the above investigation so indicates, obtain a quote for investigating and re-delineating the rest of the DWPAs.	Water Supervisor						
		Obtain funding for additional investigations and delineations.	PWMA						
		Let contract for work	PWMA						
		Complete re-delineations	PWMA						
	2. Drinking Water Protection Plan		Form a DWPA task group of public and government stakeholders and experts.	PWD , Water Supervisor					
			Identify contaminant sources within the DWPAs.	Water Supervisor, PWMA					
			Develop targeted education materials.	Water Supervisor PWMA, Education Coordinator					
			Work to incorporate more stringent development design guideline as appropriate.	Water Supervisor, PWMA, Engineering Supervisor, CDD					
DWPA Investigation, Re-Delineation and		Distribute educational materials.	Water Supervisor, Education Coordinator						

APPENDIX A--TABLE 1: ISWMP TASK SUMMARY AND PERMIT IMPLEMENTATION TRACKING

Program	BMP	Activity	Dept./ Person ¹	Date Due				
				YR1	YR2	YR3	YR4	YR5
Management (Section X)		Review and refine emergency response standard operating procedures and communication pathways for threats within DWPAs.	Water Supervisor					
	3. Groundwater Vulnerability Study	Participate on COIC work group to review USGS Groundwater Vulnerability proposal.	PWMA					
		If appropriate, identify and help fund the proposed study.	PWMA, PWD					
		If appropriate review draft products and provide comment.	PWMA, Water Supervisor	TBD	TBD	TBD	TBD	TBD
		As appropriate, use results of final report to improve practices.	PWMA, Water Supervisor, PWD	TBD	TBD	TBD	TBD	TBD

Notes:

- CDD = Community Development Department Director
- COM = Communications Manager
- PAC = Public Advisory Committee
- PWD = Public Works Director
- PWMA = Public Works Management Analyst
- SWAT = Stormwater Action Team

**Appendix B:
Oregon's Drinking Water
Protection Process for Public
Water Systems**

Oregon's Drinking Water Protection Process for Public Water Systems (PWS)

