MULTNOMAH COUNTY
National Pollutant Discharge Elimination System Permit
Municipal Separate Storm Sewer System

Proposed Permit Evaluation Report and Fact Sheet
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Oregon Department of Environmental Quality
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SUMMARY OF PERMIT ACTION

Multnomah County owns and operates a storm sewer system that serves the following: a) small unincorporated urban pocket areas in the City of Portland (i.e., Westside Pockets) and City of Fairview (i.e., Interlachen-between Blue Lake and Fairview Lake), b) county-operated roadways in the Cities of Fairview (11 miles), Troutdale (13 miles) and Wood Village (4 miles), c) five county-operated Willamette River bridges (i.e., Sellwood, Hawthorne, Morrison, Burnside, Broadway), and isolated County-owned or operated facilities located in the Cities of Fairview, Gresham, and Troutdale. Pursuant to ORS Chapter 468B,050, 33 USC§ 1342, and 40 CFR §122.26, the County is required to obtain a National Pollutant Discharge Elimination System (NPDES) Permit for their municipal separate storm sewer systems (MS4s).

Multnomah County was previously included in both the Gresham and Portland group permits. The previous permits were issued on March 8, 2004 and were scheduled to expire on February 28, 2009. The previous permits were administratively extended when the permit renewal application was submitted on August 18, 2008 and September 2, 2008. This permit action renews the NPDES permit to Multnomah County to allow and regulate the discharge of stormwater runoff from the area within its jurisdiction.

This Permit Evaluation Report describes the basis and methodology used in developing the permit.

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MULTNOMAH COUNTY
NPDES MUNICIPAL SEPARATE STORM SEWER SYSTEM PERMIT
EVALUATION REPORT AND FACT SHEET

OVERVIEW

Multnomah County owns and/or operates a storm sewer system that serves the following: a) small unincorporated urban pocket areas in the City of Portland (i.e., Westside Pockets) and City of Fairview (i.e., Interlachen-between Blue Lake and Fairview Lake), b) county-operated roadways in the Cities of Fairview (11 miles), Troutdale (13 miles) and Wood Village (4 miles), c) five county-operated Willamette River bridges (i.e., Sellwood, Hawthorne, Morrison, Burnside, Broadway), and isolated County-owned or operated facilities located in the Cities of Fairview, Gresham, and Troutdale.

Three major drainage areas are within the permit area; these are subdivided further into three subbasins. The major receiving waters that accept stormwater drainage from the permit area are the Columbia River, Lower Willamette River, Johnson Creek, Sandy River, Fairview Creek, Fairview Lake, Blue Lake, Osburn Creek, No Name Creek, Salmon Creek, Beaver Creek, Arata Creek, Sweetbriar Creek, Fanno Creek, Balch Creek, and Tryon Creek.

The initial permit was issued on March 8, 2004 and expired on February 28, 2009. This permit renews the NPDES permit to Multnomah County in response to renewal Application Nos. 972521 and 972592, which was received by the Department on September 2, 2008 and August 18, 2008, respectively. This is the second renewal of this municipal NPDES stormwater permit.

The permit is issued pursuant to state law and implements applicable federal and state law. The federal requirements specific to NPDES permits for municipal stormwater systems are set out in 33 USC § 1342(p)(3)(B) and 40 CFR § 122.26. ORS 468.065 and ORS 468B.050 provide specific state authority for the permits. In addition, ORS 468B.035 authorizes the implementation of the federal Clean Water Act and regulations adopted under the Act.

LEGAL AND POLICY ANALYSIS

Antibacksliding Review

The principal mechanism for controlling the discharge of pollutants is the development and implementation of a stormwater management plan (SWMP). Both the previous and renewal permits require the SWMP to control pollutant discharges to the maximum extent practicable (MEP) standard. In addition, this renewal permit includes provisions that will lead to a SWMP that is even more effective than the program established under the previous permit.

Antidegradation Review

It is unclear whether the Antidegradation Policy in OAR 340-041-0004 applies to MS4 permits given that the Antidegradation Policy is part of the state's water quality standards (WQS), and the permit already requires controls to the MEP and the effective prohibition of non-stormwater discharges. Nevertheless, DEQ has performed an antidegradation review pursuant to the rule, and concluded that the measurable future discharge load authorized by the renewal permit does not exceed the discharge load allowed under the existing permit.

The Department's antidegradation policy in OAR 340-041-0004 protects waters of the state from unnecessary degradation from new or increased sources of pollution, and ensures protection of existing beneficial uses. Permit renewals imposing the same or more stringent requirements as the prior permit are not considered to lower water quality from existing water quality. Here, both the previous MS4 permit and this renewal permit require the permittee to reduce the discharge of pollutant loads to the MEP and to prohibit non-stormwater discharges into the storm sewer system.

As noted above, some of the receiving waters covered by the previous permit and this renewal permit are water quality limited. The Department has determined that the permit will satisfy the requirements of federal and Oregon law by requiring controls that effectively prohibit non-stormwater discharges and that reduce pollutants in stormwater discharges to the MEP. To the extent that water quality standards are not being met, the Department determines that implementation of the measures set out in the permit will reduce the relevant waste load contributions to the maximum extent practicable, as required by federal law. This permit also includes all available and reasonable controls as required by state law. Moreover, the renewal permit is not expected to result in an increased discharge load from that authorized under the previous permit.

With respect to receiving waters that are high quality waters or that attain water quality standards for some but not all relevant parameters, the renewal permit is not expected to allow a discharge of an increased load beyond that allowed in the prior permit because it requires the permittee to develop and implement plans to reduce overall pollutant loadings and address TMDL waste load allocations to the MEP.

The renewal permit requires the permittee to ensure that all new development and redevelopment follow local construction and post-construction stormwater regulations designed to minimize the discharge of polluted stormwater to the MS4. Although some increase in discharges might be expected from these new developments or redevelopments, the quantity and concentration of stormwater pollutants will be significantly less than if no stormwater management requirements were implemented. Further, the MS4 renewal permit requires the permittee to reduce stormwater pollution from existing developments to the maximum extent practicable, and develop a stormwater retrofit strategy intended to guide the reduction of stormwater pollution from existing developments in the future. Over the five-year permit term, a range of programs will be implemented and enhanced to minimize stormwater pollution discharges from existing residential, commercial, and industrial developments. These programs include roadway pollution reduction activities, education and outreach, and industrial stormwater technical assistance and regulatory programs. Thus, the combination of requirments to minimize new sources of pollution from new developments and the reduction in pollution from existing developments will result in a net decrease in stormwater pollution discharges to the MS4 during the permit period.

The law recognizes that stormwater discharges are highly variable in nature and difficult to control due to topography, land use and weather differences (e.g., intensity and duration of storms). Therefore, the law establishes an adaptive management process for reducing these discharges, and the permittee is required to regularly review and refine their best management practices to reduce pollutants to the maximum extent practicable. The goal of the permit is a net reduction in pollutant loadings over the five-year permit term. Therefore, no permit provisions are being proposed that will cause a decrease in water quality for the purpose of this antidegradation review.

The permit does allow for the revisions to the stormwater management plan (SWMP) through a prescribed process of adaptive management [see Schedule D(4)]. Such revisions are anticipated to improve the overall effectiveness of the SWMP and not contribute to increased degradation. Any revision to the SWMP that meets the criteria set forth in Schedule D will be subject to formal permit modification procedures.

State Agency Coordination Requirements

The Department determined that the renewal permit involves a substantial modification or intensification of the permitted activity related to the physical expansion of existing jurisdictional areas associated with County roadways and isolated County facilities in the Cities of Fairview, Troutdale, and Wood Village. Multnomah County submitted a LUCS for these areas on August 27, 2010.

State Statutory Permit Requirements

All water quality permits must meet the requirements of state law. Oregon statutes in general give the Environmental Quality Commission and the Department broad authority to impose

permit requirements needed to prevent, abate, or control water pollution. See ORS 468B.010, 468B.015, 468B.020, and 468B110. However, direct statutory requirements applicable to discharge permits are more limited. ORS 468B.020(2)(b) directs DEQ to require the use of all available and reasonable methods necessary to protect water quality and beneficial uses. The Department has determined that this permit and the requirement to control discharges of pollutants to the maximum extent practicable appropriately addresses Oregon's environmental policies and adequately protects the health, safety and welfare of Oregon citizens. ORS 468B.050 also requires that discharge permits specify applicable effluent limits. The effluent limits applicable to this permit are the effective prohibition on non-stormwater discharges and the requirement to control pollutants in stormwater discharges to the maximum extent practicable.

COVER PAGE

Receiving Stream Information

The front page of the permit includes information about the receiving stream(s) to which the permittee's MS4 discharges stormwater. In addition, a reference is made to the Total Maximum Daily Load (TMDL) that establishes wasteload allocations (WLAs) for urban stormwater in the Lower Willamette River, Clackamas River and Tualatin River subbasins. This reference does not create any permit requirements or represent numeric effluent limits. Rather, it is simply designed to acknowledge the existence of the EPA-approved TMDLs and associated stormwater WLAs. The methods by which the permittee is required to address TMDLs are described in Schedule A and Schedule D of the permit.

SCHEDULE A
Controls and Limitations for Stormwater Discharges from MS4s

Schedule A provides a summary of the required controls and limitations for stormwater discharges from permitted sources. Additional requirements related to some of the controls and limitations discussed in this Schedule can be found in other schedules of the permit. For example, Condition 2 states that the permittee will be in compliance with the maximum extent practicable standard (MEP) if the permittee complies with the permit requirements and implements its stormwater management plan (SWMP). The detailed requirements for SWMP development, implementation and modification are found in Schedules A, C and D.

Condition 1
Prohibit Non-Stormwater Discharges
This permit condition simply prohibits non-stormwater discharges into the MS4 that are not otherwise authorized, in accordance with federal regulations.[1]

[1] 40 Code of Federal Regulations § 122.26(d)(2)(iv)(B)(1)

Condition 2
Reduce Pollutants to the Maximum Extent Practicable
The permit condition reflects the underlying compliance standard for the permit and SWMP under federal and Oregon law. The permittee is required to implement controls to reduce the discharge of pollutants to the maximum extent practicable (MEP), in accordance with Section 402(p)(3)(B) of the federal Clean Water Act, 33 U.S.C. 1342 (p)(3)(B)(iii), and ORS Chapter 468B. The permittee is required to implement reasonable and available controls to satisfy the MEP requirement. Implementation of reasonable and available controls to reduce the discharge of pollutants to the maximum extent practicable will serve to protect, maintain and improve the quality of waters of the state and will protect the beneficial uses of such waters consistent with ORS 468B.015 and ORS 468B.020.

ORS 468B.020 requires the use of all available and reasonable methods of control to achieve Oregon's water quality goals described in ORS 468B.015, and ORS 468B.048. In addition, ORS 468B.035 provides the EQC and the Department authority to implement federal regulations and guidelines established by the EPA in accordance with the Clean Water Act. With respect to the MS4 system at issue in this permit, the Clean Water Act and federal regulations require the permittee to control the discharge of pollutants that may be contained in municipal stormwater to the maximum extent practicable. DEQ interprets the MEP requirement to require all controls that are reasonable and available. The Department has further concluded that the permit conditions, including the requirement to control discharges to the MEP standard appropriately addresses Oregon's environmental policies and adequately protects the health, safety and welfare of Oregon's citizens. Accordingly, control measures meeting the MEP requirement satisfy the requirements in both Section 402(p)(3)(B) of the federal Clean Water Act, 33 USC 1342 (p)(3)(B)(iii) and ORS Chapter 468B. The Department has reviewed the SWMP submitted with the permit application and concluded that the program elements included in the permittee's SWMP, in conjunction with the provisions contained within the permit, will protect, maintain and improve the quality of the waters of the state for the protection of the designated beneficial uses of such waters and will serve to reduce the discharge of pollutants to the maximum extent practicable.

In recognition of the difficulties regulating discharges from municipal separate storm sewers, EPA has intentionally not provided a precise definition of MEP to allow flexibility in MS4 permitting. EPA does envision, however, that the evaluative process MS4s undertake to meet the MEP standard will: "...consider such factors as condition of receiving waters, specific local concerns, and other aspects included in a comprehensive watershed plan. Other factors may include MS4 size, climate, implementation schedules, current ability to finance the program, beneficial uses of receiving water, hydrology, ecology, and capacity to perform operation and maintenance."[2] The Department understands that what constitutes MEP for a particular permittee may change over time. Therefore, the Department has adopted monitoring and reporting requirements described in Schedule B to ensure continued compliance with the MEP standard.

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[2] December 8, 1999 Federal Register, Vol. 64, No. 235, Page 68754.

The Department has determined that the permit conditions, including the requirement to control pollutants in stormwater discharges to the MEP standard through SWMP implementation, conforms to OAR 340-041-0101 & 340-041-0340 (Columbia and Willamette River basins respectively), which require that water quality be managed to protect beneficial uses. Policy guidelines in OAR 340-042-0001 provide that the Department "will continue to manage water quality by evaluating discharges and activities, whether existing or a new proposal, on a case by case basis, based on information currently available and within the limiting framework of minimum standards, treatment criteria and polices ..." One such treatment criterion and policy guideline is set forth in OAR 340-041-0009(8), which provides that "Storm Sewer Systems subject to Municipal NPDES Stormwater Permits: best management practices must be implemented for permitted storm sewers to control bacteria, to the maximum extent practicable."

Condition 3
Implementat the Stormwater Management Plan (SWMP)
This permit condition references a specific file number to identify the location of the current SWMP and any future SWMP revisions. This reference will assist the public and other interested parties in obtaining access to the SWMP. In addition, SWMPs must be electronically available through direct incorporation into the permittee's website or accessible via a permittee weblink, or both. This permit condition also specifies that each permittee within a group permit is responsible for compliance within its own jurisdiction.

In this permit condition, the SWMPs are incorporated into the permit by reference. As a result, the elements of the SWMP are also permit conditions. The permittee submitted a SWMP during the finalization of the specific permit conditions identified throughout this permit. As a result, there may be discrepancies or conflict between information included in the SWMP, such as implementation dates for BMPs actions, and permit conditions described in the permit. The SWMPs must be modified by the permittee to address any conflict or discrepancy with the requirements described in the permit or address specific conditions highlighted in this section by the date identified in Schedule D.6 of the permit.

Condition 4
Stormwater Management Plan Requirements
The Department developed this permit condition for the 3rd generation of MS4 Phase I permits to reflect the Department's commitment to continued improvement with successive iterations of the MS4 permits. The broad requirement in this permit condition highlights the importance of the implementation of a SWMP that incorporates measurable goals for program elements identified in sections a. through h. of Condition 4. Sections a. through h. under this permit condition address the six minimum measures required in 40 CFR 122.34.

Measurable goals effectively replace the tracking requirements found in the existing (2004-2009) permit, including Total Maximum Daily Load (TMDL) performance measures and performance indicators. Measurable goals are functionally similar to the performance indicators in the previous permit. Measurable goals are objectives or targets that quantify the progress of SWMP implementation and outline the practices, techniques or provisions associated with protecting

water quality. Measurable goals are quantitative, prospective and, wherever possible, describe what the permittee intends to do and when they intend to do it. Measurable goals may be stated as a range.

USEPA has developed guidance related to the development and expression of measurable goals.[3] To maintain the flexibility for identifying, tracking and addressing measurable goals, the Department is not mandating specific types of goals or measurement tools. However, the permittee must consider USEPA's guidance when evaluating the appropriateness and effectiveness of the measurable goals that are identified in its SWMP.

Condition 4(a)
Illicit Discharge Detection & Elimination (IDDE) Program
Each MS4 permittee has implemented an IDDE program since the initial issuance of the MS4 permits in the mid-1990s. An IDDE program, including the enforcement of such program, is necessary to avoid illicit discharges or improper disposal. The Department expects the permittee to already be enforcing its illicit discharge ordinances or other regulatory mechanism. The enforcement response plan permit requirement is designed to ensure clarity and consistency in enforcement response actions by focusing enforcement resources on the most important violations and violators, and to reduce, with the goal to eliminate, the number of reoccurring violations or repeat offenders. The enforcement response plan or similar document must ultimately describe how the permittee will generally enforce its illicit discharge ordinance.

The permittee may also develop standardized response procedures for typical illicit discharges, such as cross-connections or illegal washing activities. The response procedures may be documented in the enforcement response plan or developed as a stand-alone document. The response procedures for typical discharges must describe the timeframe and process that the permittee will follow to remedy the illicit discharge. For illicit discharges that are not identified within a response procedure and that will take longer than 15 days to resolve, the Department is requiring the permittee to develop and implement an action plan that establishes a process and estimated timeframe for resolving the issue in an expeditious manner. In consideration of the type of technical, logistical or other reasonable issues, such as the need for a special budget approval due to a non-typical repair, that may impact the elimination of the illicit discharge, the Department has determined that the permittee should have adequate time to develop an appropriate action plan within 20 workings days of identifying the source of the illicit discharge.

The Department has also included permit requirements to promote improved communication between permittees to improve consistency and timely response to illicit discharges. For example, this permit condition requires a permittee to notify an authority with jurisdictional oversight if the source of an illicit discharge originates outside of the jurisdictional area of the permittee.

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[3] EPA's measurable goals guidance can be found on the web at:
http://cfpub.epa.gov/npdes/stormwater/measurablegoals/index.cfm

An effective IDDE program incorporates preventive management strategies as necessary, such as sanitary cross-connection reviews as part of building inspections, development and training of spill response standard operating procedures, and ongoing sanitary and storm sewer maintenance and replacement programs. An IDDE program may also include approaches and techniques to identify or detect illicit discharges or improper disposal, such as dry-weather screening inspections and televising sanitary or storm sewer systems, so the discharges do not turn into catastrophic discharges to receiving waterbodies.

The Department maintains that ongoing field screening activities play an important role in a comprehensive illicit discharge detection and elimination program. To enhance the existing permit language that generally requires a program to detect and remove illicit discharges and improper disposal into the storm sewer, the Department has incorporated specific permit language that requires the permittees to identify and prioritize annual field screening locations. The Department encourages the permittees to consider dry-weather field screening locations in areas of known or suspected illicit discharges, areas discharging to sensitive waterbodies, areas where the age of the structures or stormwater system are near the end of their design life, or other relevant areas that may have an increased likelihood for illicit discharges or improper disposal.

The Department has also included permit language to identify or develop dry-weather field screening pollutant parameter 'action levels' that, if exceeded, the permittee will conduct further investigation to identify sources of illicit discharges. In identifying or developing the 'action levels', the Department suggests the permittee review illicit discharge detection and elimination program guidance developed by the Center for Watershed Protection and referenced by the United States Environmental Protection Agency (http://www.epa.gov/npdes/pubs/idde_chapter-12.pdf).

As part of the permit renewal application process, the permittee submitted an evaluation of non-stormwater discharges. This evaluation was conducted by the permittee to determine if the non-stormwater discharges identified in Schedule A.4.a.xii. were being adequately addressed by its Best Management Practices (BMPs). The evaluation identified categories of non-stormwater discharges, and examined whether a non-stormwater discharge occurred within the jurisdictional area, whether the non-stormwater discharge required a BMP to reduce the discharge of pollutants, and what effective BMP was implemented to reduce the pollutants, if needed. Based on the Department's review of the permittee's evaluation, the Department determined the permittee was implementing effective BMPs to reduce the discharge of pollutants associated with the non-stormwater discharges identified in Schedule A.4.a.xii.

Condition 4(b)
Industrial and Commercial Facilities
Federal stormwater regulations envision states and municipal permittees cooperating in addressing pollutants in stormwater discharges to municipal storm sewers from industrial facilities.

Currently, Clean Water Services and the cities of Eugene and Portland, through Memoranda of Agreement (MOAs) with the Department, act as agents for industrial NPDES permits within their jurisdictions. The MOAs outline both the Department's and the agent's responsibilities in carrying out permit administration and compliance, and include a fee-sharing agreement. Agent's major responsibilities typically include processing new industrial NPDES permit applications and making permit registration decisions; assisting the Department with permit renewal; reviewing stormwater discharge monitoring reports; reviewing action plans; inspecting sites; and being the first-responder for complaints and permit compliance.

For those permittees that do not act as the Department's agent, this permit condition requires the permittee to screen existing and new businesses, and notify the facility and the Department when they identify businesses that may require a Department-issued industrial NPDES permit. Industrial activities that are subject to permitting requirements are determined by SIC codes listed in the federal regulations.[4] This requirement will assist the Department in identifying businesses that need an industrial stormwater NPDES permit and will assist the permittees in evaluating industrial stormwater discharges within their jurisdictions.

This condition also requires that priorities and procedures for inspection and implementation of stormwater control measures be established for industrial and commercial facilities where site-specific information has identified a discharge that contributes a significant pollutant load to the MS4. Although this condition does not specifically require the permittees to evaluate all commercial and industrial sources within their jurisdiction that may potentially be subject to this program, the Department anticipates the current IDDE program, monitoring, and pollution prevention activities will identify the appropriate commercial and industrial sources. The Department anticipates this requirement will further strengthen and complement related stormwater management efforts, such as IDDE, education and outreach, operations and maintenance of structural controls, an existing fat, oil and grease (FOG) reduction program, or the identification of priority retrofit approaches or areas.

Condition 4(c)
Construction Site Runoff Control

The permittees, through ordinances or other regulatory mechanisms, must implement a program that prevents and/or controls the discharge of pollutants in stormwater runoff from construction sites associated with a minimum threshold of land disturbance. Even though construction sites that disturb one acre or more of land are covered by Department-issued construction stormwater NPDES permits, the construction site runoff control requirements in this permit are needed to induce more localized site regulation and enforcement efforts, and to enable the MS4 permittee to more effectively control construction site discharges into their MS4s.

The requirements in Conditions 4(c) (i) through (vi) describe the Department's minimum expectations for the permittee's construction stormwater program. The requirements are similar to those found in the previous permit, but are more specific about the actions that the permittee is required to perform. The main elements include having an ordinance to require controls and

[4] 40 Code of Federal Regulations § 122.26(b)(14) and (15).

impose sanctions, requiring implementation and maintenance of BMPs, preventing or controlling site construction wastes from impacting water quality, site plan review procedures, site inspection procedures, and enforcement procedures. The Department expects the permittee will describe within its site plan review, site inspection, and enforcement procedures the actions and activities the permittee will implement to ensure the discharge of pollutants in stormwater runoff from construction sites is prevented and controlled accordingly, including the approach the permittee will follow to ensure the development and implementation of construction site plans appropriately incorporate Low Impact Development or an equivalent planning, design, and construction approach.

The construction site minimum threshold identified in this condition reflects the Best Professional Judgment of the permit writer based on direct experience and an evaluation of multiple factors. These factors include: a) the level of resources (personnel, financial, time) needed to review, approve, inspection and enforce erosion prevention and sediment control plans; b) the number and type of potential construction projects; c) the potential for water quality impacts associated with typical construction projects; d) the permittee's current minimum threshold; and, e) the construction site minimum threshold incorporated into MS4 permits by other permitting authorities.

Condition 4(d)
Education and Outreach
The previous permit required the permittee to conduct educational activities to facilitate the proper management and disposal of used oil and toxic materials, provide educational opportunities for construction site operators, and consider using education programs to address the application of pesticides, herbicides and fertilizers. This permit condition consolidates these education and outreach program requirements under a single program element, and further clarifies and expands the education and outreach program minimum expectations.

Anticipating that the permittee will build upon previous education and outreach program implementation experiences, this permit condition requires implementation of an education and outreach program designed to achieve measurable goals based on target audiences, specific stormwater quality issues in the community, or identified pollutants of concern. The permittee has the flexibility to identify the audience(s) and pollutant(s) of concern that will be targeted, but the permittee must document and report the specific activities that will be conducted, and the individual or entity responsible for implementing the strategy. Due to the increasing importance of Low Impact Development and Green Infrastructure in reducing pollutants to the MEP, the Department expects the permittee to incorporate these approaches into its education and outreach strategy during this permit term.

The permit also identifies general education and outreach program requirements that must be met, including training of municipal employees involved in a variety of MS4-related activities. For example, stormwater pollution prevention and reduction training for municipal employees must, where appropriate, incorporate approaches or concepts, such as Low Impact Development, Green Infrastructure, urban ecology, water quality-sensitive landscape and soil practices,

integrated pest management principles, and watershed management.

This permit condition also requires the permittee to conduct or participate in a group effort to conduct an effectiveness evaluation to measure the success of public education activities during the permit term. The effectiveness evaluation will focus on quantifying and assessing changes in targeted behaviors, and should be conducted in a manner to provide a reasonable estimate of pollutant reductions that may be achieved through the implementation of a targeted education and outreach program. The Department expects the results of the evaluation will be used to adaptively manage the education and outreach programs, and provide information that can be incorporated in the permittee's TMDL waste load allocation (WLA) attainment assessment, pollutant reduction estimates and benchmark development efforts.

The Department acknowledges that conducting this evaluation may be difficult, particularly when identifying and isolating factors that may influence the effectiveness of an education and outreach program are considered. A recent Center for Watershed Protection and University of Alabama report provides guidance related to designing a quantitative study to monitor public education programs, particularly a defensible examination of a pollutant load reduction estimate achieved through the implementation of an education program.[5]

Condition 4(e)
Public Involvement and Participation
Federal regulations require MS4 permittees to establish a public involvement process for the development of their stormwater management program.[6] However, there is no explicit public involvement requirement in the federal regulations regarding the ongoing implementation and evaluation of the stormwater management program. The Department expects continued public involvement will assist the permittee in maintaining a high quality stormwater management program that meets MEP.

This condition of the permit specifies that the permittee must implement a public participation process that provides opportunities for the public to participate in the development, implementation and adaptive management of the permittee's stormwater management program. Specifically, the process must include provisions for receiving and considering public comments on the monitoring plan, annual reports, the SWMP and the TMDL pollutant load reduction benchmark. Although the Department excluded the addition of BMPs, and revision or updates to existing BMPs that do not change the nature and scope of the BMPs, from this permit condition, the Department anticipates the permittee may provide the public the opportunity to comment on such changes, particularly if the changes will impact the cost of providing the improved or increased service, and allow for comment as necessary.

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[5] Center for Watershed Protection. 2008. Monitoring to Demonstrate Environmental Results: Guidance to Develop Local Stormwater Monitoring Studies Using Six Example Study Designs. Center for Watershed Protection:Ellicott City, MD. pg.SD5-1to SD5-17.
[6] 40 Code of Federal Regulations §122.26 (d)(2)(iv)

Condition 4(f)
Post-Construction Site Runoff
This permit condition expands on the previous requirements by identifying minimum performance standards. The Department based these performance standards on its review of the current post-construction site runoff programs in Oregon, post-construction program requirements in other states, scientific literature, and comments and guidance from USEPA.

A post-construction program is an important component of a comprehensive municipal stormwater management program. Urban stormwater pollutant loading from developed areas is generally a function of increased stormwater runoff volume and flow rates resulting from increased impervious surfaces, and is related to the type and intensity of a land use activity. An effective post-construction management program reduces pollutant loading to receiving waters from developed areas if the program requires development projects to minimize impervious surfaces, reduce runoff volumes, and provide stormwater quality treatment.[7]

The threshold where the post-construction requirements become applicable to new development and redevelopment projects can have a substantial impact on the water quality benefit. For example, research in the Pacific Northwest indicates biological stream functioning may substantially degrade when the Total Impervious Area (TIA) in a watershed related to urbanization reaches a level between 5% and 10%.[8,9] If the requirements of a post-construction program do not apply to a majority of the projects creating new impervious surfaces, increased stormwater runoff volume and its ability to carry increasing pollutant loads will not be adequately addressed. This permit condition identifies a minimum threshold for each permittee that reflects an evaluation conducted by the permittee based on the goal to identify a minimum threshold that covers an estimated 90% of all new or replaced impervious surfaces within their jurisdiction and be implemented by January 1, 2014. The minimum threshold identified in this permit condition also considered factors such as minimum lot sizes, distribution of land uses, average impervious area associated with single-family dwellings, development patterns, additional or reallocated resource needs, and the overall benefit/cost of establishing a particular minimum threshold. If a permittee did not conduct the specific evaluation, the Department assigned the lowest minimum threshold identified by a [co]permittee within a group permit or other MS4 Phase I [co]permittee, as appropriate.[10]

The Department expects that the requirements for post-construction stormwater management will be tailored by the permittee in order to best accommodate local conditions, watershed priorities and achieve the Maximum Extent Practicable standard. The Department recognizes that time

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[7] National Research Council. 2008. Urban Stormwater Management in the United States. Washington, DC: National Academies Press.
[8] Booth, D. 1991. Urbanization and the Natural Drainage System–Impacts, Solutions and Prognoses. *Northwest Environ. J.* 7(1):93–118
[9] Waite, I.R., Sobieszczyk, Steven, Carpenter, K.D., Arnsberg, A.J., Johnson, H.M., Hughes, C.A., Sarantou, M.J., and Rinella, F.A., 2008, Effects of urbanization on stream ecosystems in the Willamette River basin and surrounding area, Oregon and Washington: U.S. Geological Survey Scientific Investigations Report 2006-5101-D, 62 p.
[10] Department of Environmental Quality memo. Guidelines for Determining the Post-Construction Impervious Area Minimum Threshold for the Municipal Separate Storm Sewer System (MS4) Phase I Permits. June 3, 2009.

and resources will be necessary to update and refine post-construction programs and related documents. As a result, this permit condition requires the permittee to continue implementation of the current post-construction program until the new requirements can be reflected and incorporated into the post-construction management program by January 1, 2014.

The post-construction requirements by and large follow a hierarchical structure in which the post-construction management program goals are identified, followed by enforceable guidelines for the post-construction stormwater quality management manual or equivalent document (e.g., ordinance). The program goals identified in this permit condition reflect a post-construction stormwater management approach that stresses the importance of stormwater runoff prevention first, followed by site-specific runoff reduction, and finally the capture and treatment of pollutants, as highlighted in the 2008 National Research Council report.[11]

The Department expects the permittee to identify how applicable new development and redevelopment projects can meet these program goals. To accomplish this, the Department expects the permittee's post-construction program, as reflected in its ordinances, design standards and design manuals, will incorporate Low Impact Development (LID), Green Infrastructure (GI) or an equivalent planning, design and construction approach. By prioritizing and incorporating LID, GI or an equivalent approach, the Department anticipates the other program conditions, such as optimizing onsite retention (i.e., infiltration, evapotranspiration, and water capture and reuse), targeting natural surface or predevelopment hydrologic functions, and minimizing hydrological and water quality impacts from stormwater runoff from impervious surfaces, will be substantially addressed.

The permittee will identify how the program goals can be achieved by developing or revising an enforceable stormwater management manual or equivalent document. Subsequently, the permittee will use the enforceable requirements in its review and approval of site-specific post-construction stormwater management plans for applicable new development and redevelopment projects.

This permit condition further clarifies the minimum performance standards that the post-construction program must meet by requiring that the stormwater management manual or equivalent document(s) include methods, approaches and requirements to reduce pollutants and mitigate the volume, duration, time of concentration and rate of stormwater runoff from new development and redevelopment projects. This general language in the permit condition, along with more specific requirements related to what must be incorporated into a stormwater management manual or equivalent document(s), will allow the permittee the flexibility to identify the most effective and understandable approach for the development community and general public. For example, this permit condition requires the permittee to identify a minimum design storm or an acceptable method to conduct a continuous simulation to appropriately determine the benefits (i.e., pollutant reductions) of implementing site specific stormwater control measures. In this example, if the design storm approach was identified by the permittee

[11] National Research Council. 2008. Urban Stormwater Management in the United States. Washington, DC: National Academies Press.

as the preferred approach, the Department anticipates that one method the permittee could use to ensure pollutants are reduced and the volume, duration, time of concentration and rate of stormwater runoff is mitigated is through the identification of a volume-based (*e.g., first ½ inch of a 24hr. event*), storm event percentile-based (*e.g., 95th percentile storm event),* or annual average runoff-based (*e.g., 80% of annual average runoff*) minimum that must be retained on the development site. In other words, the permittee would identify the performance standard that targets natural surface or pre-development hydrologic function and reduces pollutant loading (i.e., both general conditions of the post-construction program requirements), while providing a clear, understandable target for project design and compliance with the local post-construction program requirements.

This permit condition also specifically requires that new development and redevelopment projects are designed to capture and treat a minimum of 80% of the annual average runoff. The average annual runoff can be calculated based on site runoff estimates and using rain event characteristics appropriate for the region or locality. This performance standard is based upon a review of the requirements currently employed by the MS4 Phase I jurisdictions. In addition, if represented as a design storm for the permittee, this performance standard reflects a range between a one and two inch/24-hour storm event, which is similar to a design storm recently identified in technical guidance for federal projects under Section 438 of the Energy Independence and Security Act. In this USEPA technical guidance the 95th percentile storm event for the Portland area (*i.e., 1.00" daily precipitation*) is highlighted as the performance standard.[12] Ultimately, the Department anticipates many development sites may achieve the requirement to capture and treat 80% of the annual average runoff solely by using site design methods and approaches that mitigate the volume, duration, time of concentration and rate of stormwater runoff, such as Low Impact Development and Green Infrastructure.

The prioritization, inclusion and implementation of LID, GI or equivalent stormwater management approaches as part of an enforceable standard is a key requirement of this permit condition, and reinforces the overall goal of the stormwater management programs "*to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods.*"[13] LID and GI are a set of management approaches and technologies that utilize and/or mimic the natural hydrologic cycle processes of infiltration, evapotranspiration and reuse, and are becoming increasingly prevalent in Oregon and across the country. These approaches consider site planning, design and construction that seek to integrate hydrologically functional design with pollution prevention measures by using small-scale, decentralized practices that infiltrate, evaporate, retain for reuse, and transpire stormwater.[14] This permit condition requires applicable and practical uses of LID, GI or equivalent approaches be identified, and the identification of conditions where these

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[12] USEPA. Dec. 2009. "Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act". EPA 841-B-09-001. Office of Water : Washington D.C.

[13] Clean Water Act Section 402(p)(3)(B)(iii)

[14] Prince George's County, Maryland. Department of Environmental Resources. 1999. "Low Impact Development Design Strategies: An Integrated Design Approach."

approaches may be impracticable. For example, the use of infiltration in an area highly susceptible to landslide hazards may be identified by the permittee as being impracticable.

To support LID and GI as important components of post-construction stormwater management, the Department has included a post-construction permit condition that requires the permittee to review, identify, and minimize or eliminate any code or development standard barriers within their legal authority that inhibit design and implementation techniques or approaches intended to minimize impervious surfaces and reduce stormwater runoff. This review and modification will occur simultaneously with the review, development or revision of the code and development standards to incorporate the other requirements of this condition by January 1, 2014. The Department acknowledges that many of the permittees may have already completed a similar review to address the state's land use laws. As a result, this condition also requires that if a code or development standard barrier is brought to the attention of the permittee in the future, the permittee will minimize or eliminate the barrier within three years of becoming aware of the barrier.

This condition also requires the permittee to incorporate Best Management Practices (BMPs) into an enforceable stormwater management manual by January 1, 2014, including a description of site-specific design requirements to meet the conditions of this permit and pollutant removal efficiency performance goals that maximize the reduction in discharge of pollutants. The Department anticipates that the BMPs, if properly designed and constructed in accordance to identified BMP specifications, will be presumed to have met the related permit conditions. The Department acknowledges that actual pollutant removal performance will vary based on individual site conditions, rainfall patterns, the inflow concentration of pollutants, and maintenance.

This permit condition identifies the minimum performance standard that must be achieved by the permittee. However, a permittee may need to tailor the local requirements based on local issues or water resource and planning priorities. If there are receiving waters or land uses of concern, more stringent criteria may be developed to provide greater protection. For example, several permittees currently implement requirements for a 65% reduction in phosphorus from new development. These local requirements are designed to address water quality issues in the Tualatin River basin.

Where site-specific conditions make the post-construction requirements infeasible, a permittee's program must require an equivalent approach to reduce pollutant loads, such as off-site stormwater quality management. The Department expects that these alternative options will be granted by the permittee on a project-by-project basis. In some cases, water quality benefits may be realized when off-site mitigation projects are implemented in place of on-site practices, depending on a variety of factors, such as the location and nature of the regional projects and the ancillary benefits they offer (habitat, recreation, open space, flood control, etc.).

Condition 4(g)
Pollution Prevention for Municipal Operations
The permit requires stormwater programs to reduce the discharge of pollutants from the operation and maintenance of public streets, roads and highways and in the management of operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste. In addition, controls for application of pesticides, herbicides and fertilizers in public right-of-ways and at permittee-owned facilities are required. These permit conditions consolidate and expand the conditions under the pollution prevention for municipal operations program element, and includes requirements intended to prevent or reduce pollutants from properties owned or operated by the permittee.

The types of properties or facilities the Department envisions to be included under this program include parks and open spaces, fleet and building maintenance facilities, transportation systems and fire-fighting training facilities for which the permittee has authority. The actions, activities and approaches related to this permit condition important since the permittee has direct control of these types of operations, and the actions, activities and approaches may play a role as a broader example of the type of efforts that can be done. In addition, the results of an ongoing flood control project retrofit assessment will complement the stormwater retrofit strategy development requirement identified in Schedule A, Condition 6.

Condition 4(h)
Structural Stormwater Control, Operation and Maintenance Activities
The long-term operational performance of structural stormwater controls and management facilities hinges on ongoing, effective maintenance. Regular maintenance will ensure that facilities continue to function properly and achieve their design objectives, whether it is infiltration, flow control, pollutant removal or a combination of objectives. The intent of this permit condition is to have the permittee establish or refine a long-term maintenance program that ensures structural stormwater controls and management facilities are maintained and operated in a manner that ensures they function properly over time.

The Department reviewed the MS4 Program Evaluation Guidance[15] developed by USEPA to identify the types of questions to ask and information needed to have an effective long-term operation and maintenance program. Based on this review, the Department determined that, at a minimum, a long-term maintenance program must have legal authority, the ability to identify and track stormwater management facilities, and include inspection and maintenance requirements, which are reflected in this permit condition.

The operation and management of permittee owned stormwater management facilities is currently addressed in the permittee's SWMP. This requirement expands on these efforts to include privately owned stormwater facilities, and further clarifies the expectations for the permittee owned facilities.

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[15] USEPA. January 2007. "*MS4 Program Evaluation Guidance*". Office of Wastewater Management: Washington D.C.

The Department recognizes that it may be infeasible for permittees to track every stormwater treatment facility. For example, the smaller and potentially numerous privately-owned or operated structures or facilities, such as raingardens installed at single family residences without direct oversight by the municipality or catchbasins in parking lots at multi-family or commercial properties, may be costly and difficult to identify, and the benefits of constant and direct oversight of these types of facilities may be of limited value. As a result, the Department differentiated the requirements between publicly-owned and operated facilities, and those facilities that are owned or operated by a private entity. The Department, however, encourages each permittee to maintain a general requirement under its legal authority that stormwater treatment facilities be properly operated and maintained.

The requirements related to the permittee-owned or operated stormwater quality facilities include inventory, mapping, inspection, maintenance and related criteria, priorities and record-keeping procedures. The Department anticipates additional efforts related to this requirement will be minimal as a result of previous permit requirements (Schedule D.2.c.i.1.) related to municipal operation pollution prevention activities.

The requirements for privately-owned or operated stormwater controls or facilities are similar, but with some clarifications. For example, this permit condition only requires inventory and mapping of new privately-owned or operated facilities, controls required under the post-construction program, any facility or control used to estimate the TMDL pollutant load reduction or other major facility. As a result, only these types of facilities will be specifically subject to the inspection criteria and procedures, and operation and maintenance requirements. The Department expects the permittee to define "major private stormwater facility or structural control" as it relates to its jurisdiction, along with the rationale for including or excluding specific types of private stormwater facilities or structural controls" under its definition. In considering what types of private stormwater facilities or structural controls should be included under the definition of major, the permittee must consider the magnitude of the impact to water quality if the facility or control was not adequately or properly maintained.

Condition 5
Hydromodification Assessment

A principle goal of the Clean Water Act is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[16] However, attainment of this goal has been partially limited as a result of the alteration of hydrologic characteristics, or hydromodification[17], caused by urbanization. The Department has determined that hydromodification impacts associated with urbanization, including impacts related to changes in the volume, velocity, duration and quality of stormwater runoff, are a significant water quality issue. Therefore the Department has included requirements in this permit condition to gather information regarding existing efforts and conceptually develop proposed actions to address hydromodification where applicable.

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[16] 33 U.S.Code § 1251(a).

[17] U.S. Environmental Protection Agency. 1993. Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters. EPA-840-B-92-002B. Washington, D.C.

The Department acknowledges that addressing hydromodification issues has not previously been required by the MS4 permits. The Department appreciates the challenges, complexities, cost and resource issues that a permittee faces as it attempts to understand and address hydrologic modifications caused by urbanization. Therefore, the Department has developed hydromodification requirements that reflect and account for the existing local hydromodification focus or knowledge, and recognize that there may be existing knowledge gaps or uncertainty that will vary by permittee. However, the Department also presumes the permittee will need to consider a variety of issues as it addresses the hydromodification-specific requirements. These issues may include, but are not limited to, the local variables causing hydromodification, the severity of hydromodification impacts on local streams, the risk or susceptibility of waterbodies to current and future hydromodification, and existing data or knowledge gaps and the role of Low Impact Development, Green Infrastructure or equivalent planning, design and construction approaches in addressing hydromodification.

The Department anticipates this effort may be refined within the permittee's adaptive management process, and may serve as the initial phase for identifying and conducting additional and more targeted hydromodification assessments and studies. Likewise, the Department considers this hydromodification requirement to be part of an iterative MS4 permitting approach, and anticipates the results of the assessment will serve as the foundation for future hydromodification permit requirements. Furthermore, the Department anticipates the hydromodification assessment will assist in the development of the post-construction performance standards, and may be used to inform and complement the development of the stormwater retrofit strategy.

An adequate initial assessment, must explain how current MS4 efforts reduce hydromodification. The Department will review the information submitted in the report for adequacy to determine if future or additional action is necessary. As part of the adaptive management approach employed by the permittee, the permittee must consider how future or additional action will be incorporated into their stormwater management program, and the Department anticipates coordination with the permittees, as necessary.

Condition 6
Stormwater Retrofit Strategy Development

The historic focus of stormwater management in urban areas in Oregon was generally related to drainage problems and flooding. As a result, water quality impacts caused by urbanization and the related stormwater quality management issues have increasingly been documented. Stormwater retrofits help improve water quality by providing stormwater treatment in locations where practices previously did not exist or were ineffective, including urban areas such as parking lots, residential streets, conveyance systems, and landscaped areas. The Department acknowledges that it may take decades or longer to address the water quality impacts from existing urban development. This permit condition reflects this fact by requiring the permittee to develop a stormwater retrofit strategy, including objectives and rationale. In addition, the permit requirements direct the permittee to summarize current efforts and costs, evaluate new

stormwater control measures, identify high priority retrofit areas and stormwater control measure projects or approaches, and provide an estimated timeline and cost if the retrofit strategy were to be implemented.

The Department acknowledges that the permittees may be at different stages of information gathering, development, and implementation of a comprehensive stormwater retrofit strategy. The Department expects the permittee's efforts to address this permit condition will reflect current status, with the understanding that the development and implementation of a retrofit strategy will require an ongoing, systematic evaluation, modification, and implementation over multiple NPDES permit cycles. The information that is identified in the retrofit strategy plan will be used in the development of stormwater retrofit requirements in subsequent permits, and the plan will be adjusted as new information, costs, opportunities, technology and timelines become available.

The Department expects the permittee will consider a variety of issues and concepts in developing the stormwater retrofit strategy, including how stormwater quality problems or pollutants of concern will be targeted, consideration of local development factors and existing conditions, potential construction, operation and maintenance cost implications, and how implementation of the retrofit strategy will complement other resource, restoration or municipal planning efforts. The Department anticipates the permittee will incorporate Low Impact Development, Green Infrastructure or an equivalent planning, design and construction approach in the development of its retrofit strategy. The Department encourages the permittee to promote public involvement early and often throughout the retrofit strategy development process. The Department suggests the permittee review and use existing urban retrofit guidance, such as guidance from the Center for Watershed Protection.[18]

This permit condition also requires the permittee to identify and implement or construct a stormwater quality improvement project during the permit term. Although the Department has only required a minimum of one project be completed during this permit term, the Department expects the permittee will consider and implement or construct additional projects during this permit term based on the implementation of its adaptive management approach.

Condition 7
Implementation Schedule
The Department has included an implementation schedule summarizing the due dates for completion of new program element activities or tasks required in Schedule A or the submittal date for information or reports related to these tasks. The implementation dates reflect the Department's consideration and analysis of the resources (personnel, financial, time) needed to complete each action or activity, the current status and future capacity of the local MS4 stormwater management programs and DEQ's municipal stormwater program, and discussions with USEPA Region 10 and stormwater programs in other states.

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[18] Center for Watershed Protection. July 2007. *Urban Stormwater Retrofit Practices, Version 1.0.* Urban Subwatershed Restoration Manual #3.

SCHEDULE B
Monitoring and Reporting Requirements

Condition 1
Monitoring Program

The results of the monitoring program are used to evaluate the effectiveness of the stormwater management program in reducing the discharge of pollutants to the maximum extent practicable. Although knowledge of stormwater management is continually increasing, significant knowledge gaps remain. In an ongoing effort to reduce the knowledge gaps as they relate to MS4 program management in Oregon, the requirements in Schedule B provide flexibility for implementing a monitoring program to improve adaptive program management while identifying an appropriate monitoring approach for gathering specific information about stormwater program effectiveness.

The Department reviewed a recent National Research Council report that evaluated urban stormwater management in the United States prior to the development of the Schedule B permit conditions.[19] Many of the report's monitoring suggestions are broad in scope and involve cooperation among regulated entities to improve efficiencies and work toward watershed-based programs. The MS4 monitoring section of the report discusses the need to structure monitoring programs to address monitoring objectives. The Department has interpreted this to mean that MS4 permittee should have flexibility to make the most efficient use of resources in addressing specific monitoring objectives.

The report also focused on monitoring methods, increasing the value of storm event data sets, and elements of site characterization. In addition, statistical approaches to assess monitoring goals and developing a baseline determination of site characterization are suggestions in the NRC report.

The Department also considered the extensive resources necessary to conduct a monitoring program to produce quality data, and the importance of appropriately balancing the expenditure of limited program resources between implementation and verification of program effectiveness. The Department expects a suitable level of environmental monitoring (i.e., field monitoring) be conducted, along with the identification and evaluation of supplemental data/information, in order to continue to build datasets and knowledge for the adaptive management of the stormwater programs.

This permit condition continues to require that the monitoring programs incorporate six monitoring objectives similar to the monitoring objectives listed in the existing permits, with minor modifications for clarification. The six monitoring objectives establish the foundation for a broad monitoring program intended to address complex issues related to stormwater management, including source evaluation, best management practice effectiveness, pollutant discharge characterization, and the related status and trends in water quality.

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[19] National Research Council. 2008. Urban Stormwater Management in the United States. Washington, DC: National Academies Press.

This permit condition also continues to require an appropriate level of environmental monitoring be conducted during the permit term to ensure ongoing collection of monitoring data to support effective stormwater management decision-making and the identification of water quality improvements. The environmental monitoring requirements identified in Table B-1 are based on the Department's review of the permittee's proposed monitoring program, and reflect a commitment that the environmental monitoring activities will contribute to addressing select monitoring objectives. Table B-1 also ensures that data collection for applicable 303(d) and TMDL pollutant parameters is continued, monitoring approaches and collection methods that will allow for appropriate statistical analysis are utilized, and data related to pesticides in urban stormwater is collected. Table B-1 includes instream biological monitoring (e.g., macroinvertebrate survey) to provide a more comprehensive assessment of water quality.

Table B-1 also includes a pesticide monitoring requirement not previously included in the 2004 permit. The Special Conditions portion of Table B-1 lists the most commonly used urban pesticides in Oregon, as identified by the state's Water Quality Pesticide Management Team. At a minimum, the permittee must consider the pesticides on this list in preparation of the monitoring plan to address the pesticide monitoring requirement in Table B-1, and in the final selection of the pesticides that the permittee will incorporate into its environmental monitoring activities. The permittees are not required to, or limited to, selecting pesticides from the list, but the permittee must provide the rationale for why the pesticides identified on this list were either incorporated or excluded from its environmental monitoring activities. The Department anticipates it will assist the permittee during the first three months subsequent to permit issuance with the development of the pesticide selection rational, and the ultimate selection of pesticides that will be monitored.

The monitoring requirements in Table B-1 become effective when the monitoring plan has been developed and implemented by the permittee in accordance with the Schedule B requirements, and no later than July 1, 2011. The previous permit requirement to conduct program monitoring, including monitored activities and performance indicator metrics, has been removed from this permit condition, and has been effectively replaced by the measurable goals requirements identified in Schedule A, Condition 4, as previously discussed.

Condition 2
Monitoring Plan

The development and implementation of a comprehensive monitoring plan is required by this permit condition. The monitoring plan must be designed to guide the permittee in addressing the monitoring program objectives and serve as a key component in the adaptive management of the stormwater program. Addressing the six monitoring objectives will typically require a different monitoring strategy or project design, and resource availability often limits the number of sample events, sample locations and pollutant parameters that can reasonably and cost-effectively collected and analyzed during a permit term. As a result, this permit condition allows the permittee some discretion on the types of information that can be used to support the evaluation of program effectiveness. The Department anticipates the permittee will use a variety of information sources and environmental monitoring activities to address the monitoring program

objectives, including measurable goals, historical monitoring data, stormwater pollutant load modeling, national stormwater monitoring data, academic stormwater research, and/or results from coordinated monitoring efforts conducted through intergovernmental agreements.

This permit condition specifically requires the identification of how each of the six monitoring objectives is addressed. For example, a permittee must document in a monitoring objectives matrix or similar document what sources of information, stormwater program best management practices or environmental monitoring projects or tasks will be used to address the six monitoring objectives.

The permit no longer incorporates the monitoring plan by reference, but prescribes specific conditions that must be met for permit compliance. This approach will provide the permittees the flexibility to design, implement, and modify a monitoring program, particularly specific environmental monitoring projects or tasks, based on changing conditions or additional information without necessitating a formal permit modification. Modifications to the permittee's monitoring plan will still require the permittee to request and receive Department approval unless the specific conditions highlighted in this section are met.

This permitting approach will result in more detailed monitoring plans, which will provide additional transparency into the collection, analysis, assessment, and use of monitoring data. The Department also expects this approach will provide the public with a reasonable assurance that the development and implementation of the monitoring program is based on the outlined permit requirements, and can be appropriately used to evaluate program effectiveness.

In the development of this condition, the Department determined the permittee will need additional time immediately following permit issuance to incorporate the monitoring requirements into the monitoring plan. The monitoring plan must be submitted to the Department by May 1, 2011 for review, and the Department expects that monitoring plans that incorporate the applicable monitoring plan requirements will be approved accordingly by July 1, 2011,

This permit condition outlines the specific information that must be included in the monitoring plan for each environmental monitoring project or task, including those necessitated by the requirements identified in Table B-1. This permit condition generally requires documentation of the planning, implementation, and assessment procedures, including specific quality assurance and quality control activities, which are necessary to obtain the type and quality of environmental data and information needed for its intended use. As a result, the Department anticipates the environmental monitoring will begin upon monitoring plan approval, and no later than July 1, 2011. The Department has developed a template as an example of an acceptable format for documenting the procedures.[20] This documentation is of particular importance since the environmental monitoring projects or tasks will often be conducted to address the permit

[20] Department of Environmental Quality. January 20, 2010. Quality Assurance Project Plan (QAPP) Template. Version 2.4. DEQ04-LAB-0029-TMPL.

requirements identified in Table B-1. Likewise, this permit condition further strengthens the relationship between monitoring and stormwater program decision-making by requiring the permittee to identify the relationship between permit-term monitoring activities (e.g., environmental monitoring) and a long-term monitoring strategy. Identifying this relationship will further ensure that monitoring data is collected and prioritized to iteratively manage the stormwater programs.

Condition 3
Sampling and Analysis
The sampling and analytical requirements presented in this permit condition establish the provisions for collection and analysis of environmental monitoring data to ensure appropriate data are available to support adaptive stormwater management. In-stream monitoring supports an overall assessment of receiving water body health, and can be used to determine water quality status and trends. Although the permit allows in-stream monitoring during the dry season in western Oregon, which is useful for seasonal comparisons, this permit condition requires at least 50% of all instream monitoring will be conducted during the wet-season, when discharges from the MS4s are more prevalent. A minimum time period between in-stream monitoring events has also been established to address potential auto correlation in the monitoring data. The intent of this requirement is not to discourage continuous or frequent sampling. but to ensure that sampling events are spread out to represent varying conditions when sampling is less frequent. Similarly, the stormwater sampling requirements specify what conditions qualify as an acceptable storm event.

Sample collection for stormwater monitoring must be conducted via the flow proportional composite method during stormwater runoff producing events that represent the local or regional rainfall frequency and intensity. Due to the cost associated with mobilizing for stormwater monitoring, and considering the type of rainfall events in western Oregon, the Department is providing the permittee with flexibility to target a variety of rainfall events. The rainfall events that are targeted should include rainfall events that may yield high pollutant loads/concentrations by representing a range in types of expected events based on factors such as rainfall intensity and duration, and antecedent dry period.

This condition allows the permittee to employ a time-composite or grab sampling method if the flow proportional composite method is shown to be infeasible or scientifically unwarranted. In allowing this flexibility, the Department acknowledges a specific monitoring project or pollutant parameter may warrant the use of the time-composite or grab sampling method, but ultimately requires the permittee to document their rationale in the monitoring plan that must be reviewed and approved by the Department. The most recent publication of 40 CFR 136 is referenced in this section of the permit. Although it contains multiple EPA approved and standard methods for the examination of water and wastewater, some methods may not be specified. In those cases, the permittees may use alternative methods with consultation and approval by the Department.

Condition 4
Coordinated Monitoring
This permit condition specifies the requirements that must be met for a permittee to use coordinated monitoring as a means to address their environmental monitoring requirements. The environmental monitoring requirements are identified in Table B-1. In light of the fact that environmental monitoring data must be collected and analyzed in accordance with a monitoring plan that reflects the requirements in Schedule B.2.d., the Department has established a requirement that an agreement is established prior to the coordinated environmental monitoring being conducted. The Department does not, however, expect the agreement to be formal, such as a signed contract or intergovernmental agreement, as long as each party participating in the coordinated monitoring activity understands its roles and responsibilities, and the agreement is documented.

Condition 5
Annual Reporting Requirement
The annual reporting requirements are similar to the previous permit requirements and are largely derived from the federal stormwater regulations.[21] This permit condition has been modified to add clarity and reflect updated permit language, such as reporting progress towards meeting measurable goals, and has added requirements to report the status of any education and outreach effectiveness evaluation and proposed modifications to the monitoring plan.

The permit condition requires the annual report be made available electronically as part of the formal submittal to the Department and on the permittee's website or other similar method approved by the Department to further enhance the transparency of the stormwater programs.

Condition 6
MS4 Permit Renewal Application Package
The permittee must submit a permit renewal application 180 days prior to the permit expiration date to continue permit coverage for MS4 stormwater discharges in the event the permit has not been renewed prior to expiration. This permit condition describes the information that must be provided in the renewal application. Renewal applications must contain the modifications to the stormwater program the permittee proposes to make, including proposed alterations to the SWMP. The Department anticipates that the permittee will provide a narrative summary of the proposed SWMP modifications in the renewal application, and will formally update their SWMP or other documents to reflect the Department's determination of the adequacy of the SWMP in reducing pollutants to the MEP prior to public notice of the draft permit or in accordance with new permit conditions once the permit has been renewed. The Department will evaluate the SWMP based upon the information submitted with the permit renewal application and all other relevant information, such as annual reports, Total Maximum Daily Load (TMDL) pollutant load reduction evaluation, applicable scientific studies, federal requirements, and guidance from USEPA.

[21] 40 Code of Federal Regulations § 122.42(c)

This permit condition differs from the previous permit condition in that it includes a requirement for the permittee to provide the Department with the information and analysis necessary to support the Department's independent determination that the permittee's stormwater management program reduces pollutants in stormwater discharges to the MEP, including an evaluation of the management practices, control techniques and other provisions using three MEP general evaluation factors (*i.e., effectiveness, local applicability, and program resources*). Since each MS4 stormwater management program is unique in how they achieve the MEP standard, often employing different BMPs or emphasizing different program areas, this requirement calls for the use of a defined set of standardized and objective criteria for each of the three MEP evaluation factors. Using a permittee-defined set of objective criteria will ensure a consistent application and equitable assessment of the stormwater programs, and a reasonable certainty that the stormwater programs are achieving the MEP standard. The Department encourages the permittee to coordinate the identification and development of the objective criteria with other MS4 permittees, and involve the Department early in the permit term to guarantee the appropriateness and usefulness of the objective criteria for the Department's independent evaluation.

The MS4 permit renewal package must also include a proposed monitoring program objectives matrix and proposed changes to the monitoring plan. The monitoring objectives matrix and proposed changes to the monitoring plan should complement the long-term monitoring strategy identified in the existing monitoring plan, as required in the monitoring plan permit conditions, and should consider the type of additional environmental monitoring data that is needed in the implementation of the adaptive management process. The Department anticipates that the permittee may be notified during the permit term about monitoring approaches, pollutants of concern or other factors the permittee should consider when updating their monitoring objectives matrix and proposed changes to the monitoring plan. The Department anticipates the proposal will be used in future development of the specific monitoring requirements to be incorporated into Table B-1.

The remaining requirements in this permit condition generally reflect the existing permit requirements, except the submittal of the water quality trends analysis and the evaluation to determine progress towards applicable TMDL wasteload allocations or previously developed TMDL benchmarks (i.e., TMDL pollutant load reduction evaluation), which will be submitted as part of the 4th year annual report.

SCHEDULE C
Compliance Conditions and Dates

Compliance dates and conditions have not been included.

SCHEDULE D
Special Conditions

Condition 1
Legal Authority
The language in this condition requires the permittee to maintain adequate legal authority to implement and enforce the provisions of the permit. The permit language was simplified from the existing permits, which reflected permit requirements derived directly from the federal regulations[22], and required the permittee demonstrate adequate legal authority in six specific areas. Although the six specific areas and each stormwater program element are not specifically identified in this condition, the Department considers the general permit language adequate to reflect the complexity of this third-generation permit and captures the objective of this condition.

Condition 2
303(d) Listed Pollutants
This permit condition requires the permittee to evaluate 303(d) listed pollutants for those waterbodies for which TMDLs have not yet been approved by USEPA and that the MS4 discharges. The requirements of this condition are similar to the existing permit requirements, and include an evaluation to determine the likelihood that discharges from the MS4 cause or contribute to the water quality degradation, an assessment of the effectiveness of the permittee's SWMP BMPs in addressing and reducing the applicable 303(d) listed pollutants, and an identification of SWMP revisions that may be necessary to address and reduce the 303(d) pollutants to the MEP. The permittee must also evaluate impairment pollutants that are on the 2010 303(d) list if the list is approved by EPA within three years of permit issuance.

The Department reviewed the 2005 annual report submitted by the permittee that summarized the permittee's 303(d) list evaluation during permit development. The Department also considered whether additional impairment pollutants were subsequently added to the 303(d) list after this evaluation, and examined the relationship between the proposed BMPs in the permittee's SWMP and the applicable 303(d) pollutants. Based on this review, the Department determined that the SWMP included a range of BMPs that address and reduce the applicable 303(d) listed pollutants associated with MS4 discharges to the MEP.

If the permittee or Department identifies that stormwater discharges from the MS4 continue to cause or contribute to water quality degradation based on the updated evaluation required by this condition, the permittee must review existing BMPs or identify new BMPs effective in reducing the discharge of the identified pollutants to the maximum extent practicable, and make appropriate changes to their stormwater management program and/or SWMP. This condition ensures that MS4s will consider and undertake actions to address pollutants of concern in the short term for those waterbodies that are water quality limited, as required by an adaptive management approach.

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[22] 40 Code of Federal Regulations §122.26(d)(2)(i), 40 Code of Federal Regulations §122.34(b)(3)(ii)(B), (b)(4)(ii)(A), and (b)(5)(ii)(B).

The Department expects that many of the modifications the permittee makes to its stormwater management program and/or SWMP to address the 303(d) pollutants may be similar to modifications made in response to the TMDL conditions of this permit. Where applicable, the Department anticipates the permittee may be "credited" for the reductions of 303(d) pollutants for new or modified BMPs implemented between the approval date of new TMDLs and the incorporation of new TMDL pollutant reduction permit requirements if the permittee identifies a 303(d) pollutant loading baseline and completes a pollutant load reduction estimate representing the new or modified BMPs that have been implemented. In this instance, the TMDL benchmarks established in the following permit cycle will reflect the reductions made in previous years.

Condition 3
Total Maximum Daily Loads (TMDLs)
The Department has developed TMDLs for "water quality limited" or "impaired" waterbodies in accordance with Oregon Administrative Code.[23] The TMDLs define how much of an identified pollutant a specified waterbody can receive and still meet water quality standards.

The TMDL wasteload allocations (WLA) are the identified maximum load of pollutants an identified point source is allocated to discharge into a particular waterway that will allow the goals identified in the TMDL to be achieved. The NPDES permits serve as the mechanism to require point sources subject to the MS4 permit requirements to address the WLAs.[24]
The objective of these conditions is to ensure a timely pollutant reduction response to TMDLs. Since requirements of this condition include compliance dates for submitting information (i.e., the wasteload allocation attainment assessment; the TMDL pollutant load reduction evaluation; and the permit renewal application), the permittee will likely need to begin a comprehensive program evaluation to address specific pollutants or pollutant sources identified in the TMDL and develop appropriate revisions to the stormwater management program and SWMP several years in advance of permit expiration.

The Department has determined that the permit conditions (including completion of at least one retrofit project), BMPs identified in the SWMP, and implementation of the adaptive management process will reduce the applicable TMDL WLA pollutants to the MEP. In addition, this permitting approach is supported by recent USEPA guidance, which describes that numeric effluent limits reflecting TMDL WLAs are only expected to be incorporated into MS4 permits when feasible.[25]

The narrative effluent limits requiring implementation of BMPs to reduce pollutants to the maximum extent practicable, as identified in the permit conditions and SWMPs, the identification and tracking of BMP measurable goals, the use of an adaptive management

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[23] Oregon Administrative Rule 340-042-0040
[24] Oregon Administrative Rule 340-045-0015 (2)
[25] Hanlon, J.A. and D. Keehner. Nov. 12, 2010. Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs." United States Environmental Protection Agency Memo. Office of Water.

process, and the requirements in this condition to conduct a pollutant load reduction evaluation and a water quality trend analysis will reduce the applicable WLA pollutants to the MEP.

To determine if numeric effluent limits are feasible, the Department considered a variety of factors. The Department considered the underlying technical work and the vague expectations expressed in the TMDLs, the nature of stormwater discharges from MS4s, the geographical extent and spatial scale of the MS4s, the number of MS4 stormwater outfalls, available monitoring data (including land use characterization, instream, and catchment specific water quality data), the results of pollutant load reduction modeling and a water quality trend analysis, and applicable scientific literature and stormwater qualitative evaluations (e.g., BMP effectiveness, bacteria source studies). For example, a numeric effluent limit that is based on a specific load reduction for a municipal outfall would require a detailed analysis of each catchment area associated with the outfall, historical flow and mass data sufficient to establish a baseline from which to calculate reductions as well as, a specific timeframe for achieving the water quality goals.

In its evaluation, the Department identified that numerous factors, such as the variable nature of stormwater discharges, the varying number and size of stormwater catchments and associated outfalls, the varying land use characteristics and methods used to determine such characteristics, limitations to current models and modeling methods (e.g., non-structural BMP effectiveness, estimating future development or redevelopment), and unpredictability associated with stormwater monitoring (e.g., storm-chasing), continue to limit the Department's ability to develop an objective, representative and appropriate numeric effluent limits for MS4 permits at this time. As a result, the Department determined that narrative effluent limits (i.e., BMP-based) continue to be the appropriate approach for addressing TMDL WLAs in the MS4 permits at this time.

The requirements of this condition apply to receiving waters to which a jurisdiction discharges where TMDLs have been approved by USEPA at the time of permit issuance or within three years of the date of issuance of this permit. If a new or modified TMDL is approved after the beginning of the fourth year of this permit cycle, the subsequent permit will include specific requirements to address the TMDL WLAs. In addition, it is important to note that TMDLs are issued as Department orders. Should the Department determine that other implementation requirements or time frames are appropriate and incorporated into the TMDL, this permit can be subsequently re-opened during the permit cycle.

A. Summary of Applicable TMDLs

The TMDL documents relevant to discharges from this jurisdiction are the Willamette Basin TMDLs, approved by the EPA September 2006, the Sandy River Basin TMDL, approved by the EPA April 2005, and the Columbia Slough TMDL approved by the EPA April 1998. The TMDL waterbodies that receive stormwater discharges from the jurisdictions are the Sandy River, Willamette River, and the lower Willamette subbasin tributaries including the Columbia Slough, Johnson Creek, and Fairview Creek.

Johnson Creek TMDL pollutants include bacteria (E. Coli indicator), DDT/DDE, and dieldrin. A bacteria TMDL was developed for Fairview Creek. The WLAs of these TMDLs were broadly assessed for MS4s and are expressed as percent reductions. No differentiation was made between waste load and load for Johnson Creek or Fairview Creek bacteria allocations. Results of TMDL data analysis did not substantiate specifying unique point and nonpont percent reductions. Similarly, the Johnson Creek DDT/DDE WLA is specified as a percent reduction. DDT is to be used as surrogate for dieldrin in Johnson Creek, "ODEQ assumes that allocations and/or surrogate measures developed to meet the DDT criterion will also be protective of the dieldrin criterion." As stated in the TMDL, water quality standards for bacteria will be achieved in approximately 20 years. It is predicted that DDT/DDE and dieldrin chronic fresh water criteria will be achieved in the "near term", with human health achieve criteria achieved by 2025 for DDT/DDE and 2045 for dieldrin.

Mercury was broadly addressed in TMDL covering the Willamette River and its tributaries. The Water Quality Management Plan associated with the Willamette Basin TMDLs states that, because the mercury TMDL does not identify source specific WLAs for mercury, "mercury is not considered to be a TMDL pollutant under the Phase I MS4 permit provisions. However, mercury is a 303(d) listed pollutant in the Willamette Basin and is therefore subject to requirements found in Schedule D of the MS4 permit."

A bacteria (E. Coli as indicator) TMDL was developed for the Sandy River. An identical percent reduction applies to urban and rural land uses. The TMDL analysis evaluated the necessary percent reduction and to achieve instream numeric criteria. This percent reduction was then applied as a load allocation and the waste load allocation for MS4s. Specific timelines were to be established by the designated management agency. The TMDL acknowledges that an iterative process maybe be necessary to attain water quality goals.

The Columbia Slough TMDL pollutants include dissolved oxygen (biological oxygen demand, BOD_5, as indicator), phosphorus, pH, bacteria (E. Coli as an indicator), lead, DDT/DDE, dieldrin, dioxin (2,3,7,8 TCDD), and PCBs. No specific timelines for attainment of water quality goals were identified in the TMDL. Urban stormwater was analyzed as an aggregate for the pollutant analyses. Only for the analysis of BOD_5 was the urban stormwater WLA proportioned between the grouped DMAs and industrial stormwater sources. No allocation was developed for pH. Control strategies are outlined for the designated management agencies (DMAs) relative to each pollutant with a WLA for DMAs. Organic toxics including DDT/DDE, dieldrin, dioxin (2,3,7,8 TCDD), and PCBs were addressed in the same control strategy. Regarding BOD_5, the TMDL states that, "The DMA WLA will not be included as an effluent limit." Implementation of BMPs will achieve the BOD_5 WLA. For bacteria, BMPs are to be implemented to the maximum extent practicable (MEP) for urban stormwater. As a part of the lead control strategy, the TMDL states that DMAs must "identify and implement BMPs in the municipal NPDES permits that will be effective in controlling lead storm water inputs." Relative to organic toxics, the DMAs are to establish a relationship between TSS and organics in stormwater which will allow TSS to be used as an indicator. BMPs identified in the MS4 permits must be implemented

and monitored for effectiveness of TSS removal. The TMDL does not identify timelines to attain water quality goals.

B. Waste Load Attainment Allocation Assessment

The Department envisions that the reasonable estimate of the number, type, pollutant load reduction, and associated cost information related to the BMPs identified by the permittee as part of the wasteload allocation attainment assessment will be evaluated by the Department to identify an appropriate number of retrofit projects, percent of additional effective impervious area to be removed or receiving treatment by a structural stormwater control, or some other objective measure that can be assessed using available technologies (i.e. pollutant reduction models, GIS).

The previous permit required each permittee to "review their SWMP to determine its adequacy in reducing TMDL pollutant discharges to the maximum extent practicable and develop pollutant load reduction benchmark(s)."[26] This permit condition continues to require the permittee to reduce pollutant discharges from the MS4 to the MEP, and expands this requirement by including a wasteload allocation attainment assessment that requires the permittee to estimate the type and extent of BMPs, and associated resources necessary to attain the existing WLAs. This information will aid the Department in its determination regarding the adequacy and appropriateness of the progress being made towards the TMDL WLA during the next permit cycle.

The Department believes that the completion of a wasteload allocation attainment assessment will add clarity to the attainability of the TMDL WLA based on current environmental, technological, and socio-economic factors, and it will assist the Department in reevaluating TMDLs. In conducting this analysis the permittee will use pollutant load reduction modeling, evaluation of monitoring data, reviews of BMP pollutant removal effectiveness and appropriate use, cost-benefit analysis and other assessment techniques to identify a reasonable estimate of the type, extent and resources necessary to achieve the TMDL WLAs. The wasteload allocation attainment assessment may also complement or serve as a key component of the permittee's stormwater retrofit strategy.

C. TMDL Pollutant Load Reduction Evaluation and TMDL Benchmarks

The TMDL pollutant load reduction evaluation must be conducted at least once during the permit term, and submitted with the annual report completed for the 4th year of permit cycle (i.e., November 1, 2014). The evaluation must be based on an empirical pollutant load reduction model, water quality status and trends analysis, and other applicable and acceptable quantitative and qualitative assessment approaches. The evaluation should reasonably estimate and reflect the land use, stormwater runoff, pollutant loading, and effectiveness of stormwater control measures implemented at the time when the evaluation is conducted.

[26] Schedule D.2.d.v.

The TMDL pollutant load reduction evaluation must incorporate an estimate of the load reduction achieved through the implementation of structural stormwater control measures (e.g., vegetative filter swale, rain garden), and an estimation or consideration of non-structural BMPs (e.g., education and outreach). The pollutant reduction model used by the permittee to estimate pollutant load reductions must reflect generally accepted scientific modeling practices and approaches (e.g., Simple Method, Stormwater Management Model 'SWMM'). The methodology and rationale for the model must be described in the evaluation report, including any data or model limitations, data input assumptions, the estimated effectiveness of structural BMPs, and the estimation or consideration of non-structural BMPs. The permittee may incorporate pollutant reduction credit for any structural BMPs in this evaluation if operation and maintenance of the structural BMP is covered by their Structural Stormwater Control Operation and Maintenance Activities program required in Schedule A.4.h. If pollutant load reductions achieved through implementation of the education and outreach program activities are incorporated into the pollutant reduction model, credit for pollutant reduction must reflect the effectiveness evaluation used to measure the success of public education activities completed during the term of this permit.

The TMDL pollutant load reduction evaluation must also incorporate the results of a water quality trends analysis and summarize the relationship of this analysis and municipal stormwater discharges. The water quality trends analysis must be completed for each waterbody for which sufficient data have been collected. The waterbodies must reflect a reasonable representation of all of the waterbodies the permittee discharges to with applicable TMDLs, and includes a consideration of the resources that are required to collect adequate monitoring data to complete a water quality statistical trends analysis.

Finally, as part of the TMDL pollutant load reduction evaluation, the permittee is required to provide a narrative summarizing progress towards applicable WLAs and TMDL benchmark(s). A permittee may not have been previously required to develop a TMDL benchmark as a result of final TMDL approval timing, as discussed earlier in this section, or a determination by the Department that an applicable WLA has been achieved. If the permittee estimates that TMDL WLAs are currently achieved with existing BMP implementation, a statement supporting this conclusion must be provided as well.

The Department will evaluate the TMDL pollutant load reduction evaluation, and determine whether the TMDL WLAs have been achieved based on the submitted information and implementation of existing BMPs. If the Department determines that TMDL WLAs are met for certain parameters, the permittee does not need to set pollutant load reduction benchmarks for those parameters for the next permit cycle. The Department anticipates it will notify a permittee within 90 days of receiving the TMDL pollutant load reduction evaluation whether the Department concurs with the permittee's conclusion that the existing BMP implementation achieves the applicable TMDL WLAs.

If the TMDL pollutant load reduction evaluation demonstrates that TMDL WLAs are not met for certain parameters, the permittee must develop pollutant load reduction benchmarks for those parameters as part of the permit renewal submittal. The benchmarks should reflect structural and, where effectiveness information is available, nonstructural controls implemented as part of the permittee's current stormwater management program, as well as any additional reductions expected to result from BMPs proposed for the five year permit term.

The TMDL benchmarks are not numeric effluent limits, and the Department expects the TMDL benchmarks to be permit-cycle (i.e., 5-year) targets used to assess progress towards meeting the WLA. The Department anticipates the MS4 permittee will continue to iteratively manage its MS4 stormwater programs to reduce pollutants, and identify the TMDL benchmarks accordingly.

Condition 4
Adaptive Management
This permit condition continues to require the use of an adaptive management approach to support and improve the management of the municipal stormwater programs, including showing progress towards applicable TMDL wasteload allocations. The Department acknowledges that "the term 'adaptive management' can be understood from a variety of vernacular and technical perspectives, and at many scales."[27] In the scientific literature related to resource management, the adaptive management approach has generally been outlined as a structured, iterative process that facilitates knowledge through experimental inquiry into defined goals and associated objectives. This inquiry is conducted in the context of a defined monitoring program, and the results of the monitoring are critically assessed to re-evaluate the policy or management approach that initiated the inquiry. The Department has included a definition of 'adaptive management' in Condition 6 of this section to provide additional clarity regarding the meaning of adaptive management in the context of the municipal stormwater permit program.

The adaptive management approach generally accepts that knowledge of resource systems is incomplete and often elusive, and action should not be postponed until the necessary information to 'fully' inform the decision exists.[28,29,30] As a result, it is recognized that there is always risk involved in resource management decision-making, and the adaptive management process, if properly designed and implemented, should provide feedback to the decision-maker in a timely manner to reduce the risk from the uncertainties. Consequently, the Department considers the continued use of adaptive management very important to managing the municipal stormwater

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[27] Allan, C. and A. Curtis. 2005. "Nipped in the Bud: Why Regional Scale Adaptive Management is Not Blooming". Environmental Management. Vol. 36(3). pp. 414-425.
[28] Lee, K.N. 1999. Appraising Adaptive Management. Conservation Ecology 3(2):3. Online URL: http://www.consecol.org/vol3/iss2/art/.
[29] Ralph, S.C. and G.C. Poole. 2003. Putting Monitoring First: Designing Accountable Restoration and Management Plans. In: Restoration of Puget Sound Rivers, Mongomery D.R., S. Bolton and D.B. Booth, editors. University of Washington Press : Seattle, WA.
[30] USEPA. 2003. Watershed Analysis and Management (WAM) Guide for States and Communities. EPA Watershed Analysis and Management Project. EPA-841-B-03-007.

programs to address the variability in stormwater quality, complexities related to local resource issues, and the ongoing insights and improvements to stormwater management.

The potential for effective feedback, improved 'learning' and process transparency can diminish when the adaptive management approach is not clearly described.[31] This permit language clarifies existing permit conditions by requiring the permittee to submit a description of the adaptive management approach the permittee intends to use. The adaptive management approach the permittee submits to the Department must be used to routinely assess its stormwater program's effectiveness in addressing water quality and protection of beneficial uses. The Department has identified five operational 'phases' that the Department anticipates the permittee will consider when identifying its adaptive management approach. The five operational 'phases' include 1) implementing a stormwater program, 2) collecting data and information, 3) evaluating the stormwater program, 4) assessing and identifying stormwater program needs, and 5) developing or modifying the existing program.

If the adaptive management approach is identified, documented and followed, the benefits of adaptively managing the stormwater programs, including the effective modification of management practices, control techniques and systems, and design and engineering methods, will be more clearly understood. This includes considering how monitoring data will be collected, analyzed, evaluated, and principally used, since this feedback is critical to informing decision-makers during the evaluation 'phase' of the adaptive management approach (i.e., what has occurred and what is likely to happen in the future).[32,33] The stormwater monitoring program requirements identified in Schedule B will complement and support the adaptive management approach identified by the permittee. Therefore, the Department has provided the permittees the flexibility in Condition 6 of Schedule B to develop and propose a monitoring program as part of the permit renewal application process that addresses monitoring objectives and information needs that will be used in future implementation of their adaptive management approach.

The Department expects that the permittee has already developed the foundation for the continued implementation of an effective adaptive management approach that addresses the five operational 'phases' based on the existing permit requirements, such as evaluating the stormwater program and reporting annually. However, the Department acknowledges the timeframe necessary for obtaining the type of information that would lead to a SWMP revision is typically greater than one year. Consequently, the permittee will identify an adaptive management approach that will be followed annually for examining some elements of its

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[31] Stankey, George H.; Clark, Roger N.; Bormann, Bernard T. 2005. Adaptive management of natural resources: theory, concepts, and management institutions. Gen. Tech. Rep. PNW-GTR-654. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

[32] Stankey, George H.; Clark, Roger N.; Bormann, Bernard T. 2005. Adaptive management of natural resources: theory, concepts, and management institutions. Gen. Tech. Rep. PNW-GTR-654. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

[33] Bernard T. Bormann, Patrick G. Cunningham, Martha H. Brookes, Van W. Manning, and Michael W. Collopy, 1994, Adaptive Ecosystem Management in the Pacific Northwest, Pacific Northwest Research Station, General Technical Report PNW-GTR-341, Forest Service, U.S. Department of Agriculture.

stormwater program, while a more comprehensive adaptive management approach will be completed at the end of the permit cycle (i.e., permit renewal application process).

Condition 5
SWMP Modifications
The SWMP identifies the structural and nonstructural actions and activities the permittee will use to reduce the discharge of pollutants from the MS4 to the maximum extent practicable. The SWMP is incorporated into the permit by reference; therefore, the actions and activities identified in the SWMP are permit conditions subject to permit modification process in accordance with Oregon Administrative Rule 340-045-0040 and 0055. These actions and activities often address the program elements required in Schedule A and other permit conditions.

Implementation of an adaptive management approach provides the structure to identify alterations to the stormwater program or modifications to the SMWP, but the application of an adaptive management approach does not absolve the Department from adhering to federal and state requirements associated with modifying permit conditions.

In the development of this permit condition, contemplated how to allow the permittee the flexibility to efficiently change the SWMP actions and activities while providing a reasonable assurance that the public has the opportunity to comment on modifications that would change the "nature and scope" of the permit condition. In this condition, the Department clarified that revisions to the SWMP that add, reduce, replace or eliminate BMPs, controls or requirements constitute a permit modification. The Department also clarified that revisions that substantially change the nature or scope of the BMP component, control or requirement will be considered major modifications. This permit condition requires the permittee to submit notice of all proposed SWMP revisions to the Department prior to initiating the SWMP revision, and outlines a series of conditions and timelines.

The Department did not include specific criteria related to the basis for determining a substantial change in the nature or scope of the SWMP because the Department concluded the range of potential SWMP revisions could not be addressed with detailed criteria.

In the Department's review of historical SWMP modifications, the Department determined that modifications that would change the "nature and scope" of the permit conditions were rare, and therefore did not initiate the permit modification process. The Department anticipates most substantial changes to the stormwater program requiring a modification of the SWMP will occur near the end of the permit term, and will be addressed during the permit renewal process accordingly.

The Department may also initiate changes to the SWMP based on concerns about water quality impacts of stormwater, a need to maintain compliance with federal or state regulations, or if information demonstrating that certain BMPs are no longer appropriate becomes available. This

permit condition describes the actions the Department will take to initiate a SWMP modification and the permittee's opportunity to respond.

Condition 6
SWMP Measurable Goals
As referenced in Schedule A.3.a.i., the requirements of this condition are related to the SWMP measurable goals. Based on the Department's review of the permittee's SWMP measurable goals that were related to municipal operations and maintenance, development, capital improvements, retrofitting, and hydromodification (determined to be BMPs of highest priority), the Department identified measurable goals that did not identify specific objectives or targets. To clarify expectations related to BMP implementation, the Department has included these conditions that must be incorporated into the SWMP by April 1, 2011.

Condition 7
Implementation Schedule
The Department has included an implementation schedule summarizing the due dates for completion of new program element activities or tasks required in Schedule B and Schedule D, or the submittal date for information or reports related to these activities or tasks. The implementation dates reflect the Department's consideration and analysis of the resources (personnel, financial, time) needed to complete each action or activity, the current status and future capacity of the local MS4 stormwater management programs and DEQ's municipal stormwater program, and discussions with USEPA Region 10 and stormwater programs in other states.

Condition 8
Definitions
The definitions provided in this permit condition provide additional clarification related to MS4-related terms, and generally reflect commonly understood and agreed upon descriptions to municipal stormwater concepts.

SCHEDULE F
General Conditions

The general conditions that are applicable to all NPDES permits are included in this section. They address operation and maintenance, monitoring and record-keeping, and reporting requirements. The Department recognizes that some of these conditions do not readily apply to municipal stormwater discharges. However, the stormwater permits are NPDES permits, and these conditions are required for all such permits. Where a conflict exists, the general conditions included in this section are superseded by the conditions in Schedules A and D.