



**CITY OF DUVALL PHASE II NPDES
2011 STORMWATER MANAGEMENT
PROGRAM (SWMP)
Revised March 31, 2011**



***Prepared by:
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INTRODUCTION

The National Pollutant Discharge Elimination System (NPDES) Permit Program is intended to protect and restore surface water quality. The City of Duvall (City) was designated by the Environmental Protection Agency (EPA) as municipal separate storm sewer systems (MS4's) for inclusion in the Phase II NPDES Permit Program.

Coverage under the Phase II NPDES Permit (Permit) authorizes discharge of stormwater to waters of the state of Washington in accordance with the Federal Clean Water Act. Discharges covered under this Permit must effectively prohibit non-stormwater discharges into storm sewers that discharge to surface waters and must apply controls to reduce the discharge of pollutants. The Washington State Department of Ecology (DOE) is administering the Permit for the EPA.

The practices specified in the Permit are collectively referred to as the Stormwater Management Program (SWMP). The development and annual maintenance of the SWMP is required as part of Permit compliance and annual reporting requirements.

The City of Duvall SWMP document has been organized to reflect the structure of the February 16, 2007 Permit and addendums provided by the DOE. The SWMP summarizes compliance for requirements within sections of the Permit including:

- Authorized Discharges (Permit section S2).
- Responsibilities of Permittees (S3).
- Compliance with Standards (S4).
- Development and implementation of a SWMP to reduce discharge of pollutants (S5.A and S5.B).
- Public Education and Outreach (S5.C.1).
- Public Involvement and Participation (S5.C.2).
- Illicit Discharge Detection and Elimination (S5.C.3).
- Controlling Runoff from new Development, Redevelopment, and Construction (S5.C.4).
- Pollution Prevention and Operation and Maintenance for Municipal Operations (S5.C.5).
- Stormwater Management Program for Secondary Permittees (S6).
- Compliance with Total maximum Daily Load Requirements (S7).
- Monitoring (S8).
- Reporting Requirements (S9).
- The Annual Report Form from the previous year (Appendix A).

Various requirements are phased into effect throughout the five-year permit period that expires on February 15, 2012. The Permit requires the City to report on progress and submit related documentation on March 31st of each year during the Permit period. The annual reporting requirements include:

1. This SWMP demonstrates how the City has met the phased annual requirements and how the city plans to address future requirements within the Permit period.
2. Posting of the SWMP on the City website.

3. Submittal of an annual report documenting Permit compliance for the previous reporting year along with supporting documentation as required.

Implementation of the Permit and annual reporting is currently being championed by the Duvall Public Works Department with input and review by the Duvall Planning Department, Building Department, City Administration, consulted specialists and citizen comment and feedback.

Additional Permit information, including the Western Washington Phase II Municipal Stormwater Permit Special and General Conditions, Annual Report Form for Cities, Towns, and Counties, Acronyms and Definitions from the Permit, and Guidelines for City and County Annual reports are located on Ecology's website:

<http://www.ecy.wa.gov/programs/wq/stormwater/municipal/phaseIIww/wwphiipermit.html>

S2: AUTHORIZED DISCHARGES

The Permit authorizes the discharge of stormwater to surface waters and ground waters of the state from MS4's owned or operated by the City as covered by the Permit and described in this SWMP. In accordance with Section S2 of the Permit, the City shall allow authorized and permitted discharge into the stormwater system as summarized in this SWMP. The Permit does not relieve entities from responsibility or liability associated with oil spills or other hazardous substance spills.

Discharge to groundwater and non-stormwater flows are restricted in accordance with Section S2 of the Permit as follows: *Discharges to groundwater regulated under the Underground Injection Control Program (WAC Chapter 173-218) and other the State Water Pollution Control Act (RCW Chapter 90.48) are not covered under the permit. The permit authorizes discharge of non-stormwater flows to surface waters if:*

1. *The discharge is authorized by a separate NPDES permit or a State Waste Discharge permit.*
2. *The discharge is from emergency fire-fighting activities.*
3. *The discharge is from another source that is managed by the permittee that is:*
 - a. *Relatively small or natural per S5.C.3.b (i.e. footing drains, flow from wetlands).*
 - b. *Relatively small or natural for secondary permittees per S6.D.3.b (i.e. footing drains, flow from wetlands).*

S3: RESPONSIBILITIES OF PERMITEES

In accordance with Section S3 of the Permit, the City shall be responsible for compliance with the terms of the Permit as summarized in this SWMP.

S4: COMPLIANCE WITH STANDARDS

In accordance with Section S4 of the Permit, The City is responsible for compliance with the following standards as summarized within this SWMP:

- A. The discharge of toxicants to waters of the State of Washington (State) which would violate water quality standards is prohibited.
- B. The Phase II NPDES Permit does not authorize violation of the State water quality standards.

- C. The permittee shall reduce the discharge of pollutants to the Maximum Extent Possible (MEP).
- D. The permittee shall use All Known and Reasonable methods of prevention, control and Treatment (AKART) to prevent and control pollution to waters of the State.
- E. The permittee shall comply with all of the applicable requirements of the Permit.
- F. The permittee shall report and respond to any violations of any water quality standards in accordance with DOE requirements within the Permit.
- G. DOE may modify or revoke the Permit if DOE becomes aware of additional control measures, management practices, or other actions beyond what is required in the current Permit.

S5: STORMWATER MANAGEMENT PROGRAM

S5.A and S5.B: Development and Implementation of a SWMP to Reduce Discharge of Pollutants

S5.A: Permit Requirements

In accordance with Section S5.A of the Permit, each permittee shall develop and implement a Stormwater Management Program (SWMP). This SWMP is a set of actions and activities comprising the components listed in S5.B and S5.C.1 through S5.C.5. This SWMP is designed to reduce the discharge of pollutants from the City to the maximum extent practicable and to protect water quality.

1. This SWMP has been developed and implemented in accordance with the schedules contained within the Permit.
2. This SWMP serves as written documentation of the SWMP and is organized in accordance with the Permit and the program components in S5.C. This SWMP shall be updated at least annually for submittal along with the annual report to the DOE.
3. This SWMP includes ongoing programs for gathering, tracking, maintaining, and using information to evaluate SWMP development, implementation, permit compliance, and to set priorities.
 - a. The City has implemented cost tracking for development and implementation of each component of the SWMP using the City's SpringBrook financial software system. This information will be provided upon DOE's request.
 - b. The City has implemented tracking of the number of inspections, official enforcement actions, training, and public outreach activities as stipulated in the individual program components.
4. This SWMP supersedes SWMP descriptions developed by the City prior to the date of this Permit.
5. The City may elect to coordinate among other permittees to comply with certain conditions of the SWMP. Possible coordination activities including training, public outreach and education, and SWMP development have been identified at this time.

S5.B: Permit Requirements

In accordance with Section S5.B of the Permit, this SWMP is designed to reduce the discharge of pollutants to the maximum extent practicable (MEP), meet State AKART (All

Known Available and Reasonable Methods of Treatment) requirements, and protect water quality. Water quality protection activities will not be reduced in response to the Permit and SWMP requirements currently being completed in the City. Compliance activities already in effect will be continued regardless of the timeline contained with the Permit.

S5.C.1: Public Education and Outreach

Permit Requirements

In accordance with Section S5.C.1 of the Permit, this SWMP includes a public education and outreach program aimed at residents, businesses, industries, elected officials, policy makers, and employees of the City. The City public education and outreach program was implemented prior to the February 15, 2009 permit deadline. The goal of the education program is to reduce or eliminate behaviors and practices that cause or contribute to adverse stormwater impacts. Specifically, the City's public education and outreach program:

- a. Prioritizes and targets education and outreach activities to specified audiences to reduce or eliminate behaviors and practices that cause or contribute to adverse stormwater impacts. Education and outreach efforts are prioritized to target the following audiences and subject areas:
 - i) General public
 - General impacts of stormwater flows into surface waters.
 - Impacts from impervious surfaces.
 - Source control BMPs and environmental stewardship actions and opportunities in the areas of pet waste, vehicle maintenance, landscaping and buffers.
 - ii) General public, businesses, including home-based and mobile businesses
 - BMPs for use and storage of automotive chemicals, hazardous cleaning supplies, carwash soaps and other hazardous materials.
 - Impacts of illicit discharges and how to report them.
 - iii) Homeowners, landscapers and property managers
 - Yard care techniques protective of water quality.
 - BMPs for use and storage of pesticides and fertilizers.
 - BMPs for carpet cleaning and auto repair and maintenance.
 - Low Impact Development (LID) techniques, including site design, pervious paving, retention of forests and mature trees.
 - Stormwater pond maintenance.
 - iv) Engineers, contractors, developers, review staff and land use planners
 - Technical standards for stormwater site and erosion control plans.
 - LID techniques, including site design, pervious paving, retention of forests and mature trees.
 - Stormwater treatment and flow control BMPs.
- b. Includes an education and outreach program that is designed to achieve measurable improvements in the specified audience's understanding of stormwater issues and how they can improve stormwater quality. The resulting measurements are used to direct

education and outreach resources most effectively, as well as to evaluate changes in adoption of the targeted behaviors.

- c. Tracks and maintains records of public education and outreach activities.

Current Activities

Current public education and outreach activities include:

- Educational activities for children and adults at Earth Day and Public Works Open House Events.
- Presentations to local elementary school classes.
- City newsletter information and education updates.
- Distributing information at City Hall and specific events (Duvall Days, Farmer's Market).
- Education and outreach information and links on the City's NPDES web page.
- Annual City-sponsored recycling event including used motor oil and household hazardous waste recycling.
- Collaboration with the Stormwater Outreach for Regional Municipalities (STORM) campaign.
- Summarizing public education and outreach activities in the annual report.
- Ongoing utility bill inserts to reach all households within the City. Utility bill inserts will address various topics including the following:
 - Landscaping and Yard Care including design, plant selection, mulch, fertilizers, pesticides, herbicides, and compost/disposal.
 - Car washing and proper disposal of Household Waste including recycling, storm drain awareness, and proper disposal for specific pollutants such as paint, hydrocarbons, and antifreeze.
 - Measurement of audiences understanding of, and improvement with respect to, stormwater and how they can improve stormwater quality.
- Developing tracking and success monitoring programs including website and utility billing questionnaires.
- Updating the education and outreach program and the annual report.
- Stormwater Community Survey Program with other NPDES municipalities conducted by Hebert Research.

Future Activities

The City is currently evaluating possible future public education and outreach activities. Future public education and outreach activities may include:

- Installing storm drain buttons and completing storm drain stenciling including "Adopt a Drain" neighborhood stenciling and "Puget Sound Starts Here" storm drain button programs.
- Developing an Illegal Dumping and Littering program including additional awareness, signage, and trash receptacles.
- Developing natural yard care education programs.

- Providing additional used motor oil and hazardous waste recycling events.
- Developing additional elementary school education programs or events.
- Developing a LID education and outreach program. LID measures commonly utilized in Duvall are presented in Appendix B, "Low Impact Development (LID)".
- Developing theme-based education events (i.e. Clean Water Awareness Month).
- Continued collaboration with other NPDES municipalities to develop program elements and evaluation techniques.
- Continued collaboration with other programs and citizen groups to provide community activities, outreach, and volunteer activities.

S5.C.2: Public Involvement and Participation

Permit Requirements

In accordance with Section S5.C.2 of the Permit, this SWMP provides ongoing opportunities for public involvement through advisory councils, watershed committees, participation in developing rate structures, stewardship programs, environmental activities, and other similar activities. The City implemented the public involvement and participation program prior to the February 15, 2008 permit deadline. Section S5.C.2 requires the City to:

- a. Create opportunities for the public to participate in the decision making process involving the development, implementation, and update of the City's entire SWMP.
- b. Make the SWMP, the annual Permit report, and the all other submittals available to the public. The City posts the latest annual report and the SWMP submitted with the latest annual report on the City's NPDES web page.

Current Activities

Current public involvement and participation activities include:

- Stormwater Community Survey Program with other NPDES municipalities conducted by Hebert Research.
- Implementation of a public hot-line comment and reporting number posted at City Hall and the City's NPDES web page to provide and document public involvement and participation.
- Soliciting public involvement and participation using newsletter articles.
- Completing public notices, City Council presentations, and other public presentations to collect, document, and implement public feedback.
- Public notice requesting review and comment of the draft annual report and SWMP and posting of the documents on the City website with copies available at City Hall.
- Posting of the latest annual report and the SWMP submitted with the latest annual report on the City's NPDES web page following public review and submittal to the DOE.
- Summarizing public involvement and participation activities in the annual report.
- Making the SWMP, the annual Permit report, and the all other submittals available to the public on the City's NPDES web page.
- Continue support of the "Adopt-a-Road" program to promote this anti-litter and litter cleanup program.

Future Activities

The City is currently evaluating possible future public involvement and participation activities. Future public involvement and participation activities may include:

- Developing a public comment section within the City's NPDES web page to provide an on-line avenue for public involvement and participation.
- Completing storm drain stenciling including "Adopt a Drain" neighborhood stenciling and "Puget Sound Starts Here" storm drain button programs.
- Develop a Neighborhood or Home Owner Association Volunteer monitoring program.

S5.C.3: Illicit Discharge Detection and Elimination (IDDE)

Permit Requirements

In accordance with Section S5.C.3 of the Permit, this SWMP includes an ongoing illicit discharge detection and elimination (IDDE) program to detect and remove illicit discharge, illicit connections, illicit discharges, improper disposal, including any spills into the municipal separate storm sewer system owned or operated by the City. In accordance with the Definitions and Acronyms section of the Permit, an illicit connection means any man-made conveyance that is connected to a municipal separate storm sewer without a permit (examples include sanitary sewer, floor drain, channels, pipelines, conduits, inlets or outlets), excluding roof drains and other similar type connections. In accordance with the Definitions and Acronyms section of the Permit, an illicit discharge means any discharge to the municipal storm sewer system that is not composed entirely of stormwater except discharges pursuant to another NPDES Permit or fire fighting activities. The City's ongoing IDDE program is summarized in Appendix G of the City Stormwater Pollution Prevention Plan (SWPPP, see <http://www.duvallwa.gov/departments/publicworks/npdes.html>). Section S5.C.3 requires the City to:

- a. Develop a storm sewer map no later than February 15, 2011. The City has developed a storm sewer map in a Geographic Information System (GIS) base. The storm sewer map shall be periodically updated and shall include the following information:
 - i. The location of all known storm sewer outfalls, receiving waters, and structural stormwater BMP's owned, operated, or maintained by the City. All storm sewer outfalls with a 24-inch nominal diameter or equivalent cross-sectional area are mapped to include tributary conveyance (type, material, and size), associated drainage areas, and land use.
 - ii. Develop and maintain a map of all authorized or allowed connections to the separate storm sewer system after the effective date of the Permit.
 - iii. Geographic areas served by the City that do not discharge stormwater to surface waters.
 - iv. The map shall be made available to the DOE upon request.
 - v. The map shall be provided to co-permittees and secondary permittees as possible.
- b. Develop and implement an ordinance prohibiting non-stormwater, illegal discharges, and/or dumping into the storm sewer system to the maximum extent allowable under State and Federal law. The City Ordinance No. 1090 was adopted August 13, 2009 prior to the August 15, 2009 permit deadline.

- c. Develop and implement an on-going illicit discharge detection program. The City program was implemented prior to the August 19, 2011 permit deadline.
- d. Develop and implement an on-going program to inform the public employees, businesses, and the general public about the hazards associated with illegal discharge (in coordination with S.5.C.1). The City program was implemented prior to the August 19, 2011 permit deadline and the City established a public hotline prior to the February 15, 2009 permit deadline.
- e. Adopt and implement on-going procedures for program evaluation, assessment, and tracking of illicit discharge, inspections, and public education feedback to be included in the annual report. The City procedures were adopted and implemented prior to the August 19, 2011 permit deadline.
- f. Develop and implement an ongoing training program for IDDE response staff and document and maintain records of the training provided and staff trained. The City program was implemented prior to the August 15, 2009 permit deadline and IDDE identification and response training was provided for all municipal field staff prior to the February 15, 2010 permit deadline.

Current Activities

Current IDDE activities include:

- Updating the GIS storm sewer map based on existing in-house information and field mapping as required.
- Maintain an IDDE public hotline posted at City Hall and the City's NPDES web page.
- Implementing an "Illicit Discharge Detection and Elimination Program" summarized in Appendix G of SWPPP February 2010 for IDDE response staff for IDDE identification and all municipal field staff. The City shall document and maintain records of the training provided and staff trained.

Future Activities

The City is currently evaluating possible future IDDE activities. Future IDDE activities will include:

- Additional updating of the GIS storm sewer map based on existing in-house information and field mapping as required.
- Additional IDDE public outreach.

S5.C.4: Controlling Runoff from New Development, Redevelopment, and Construction Sites

Permit Requirements

In accordance with Section S5.C.4 of the Permit, this SWMP includes a program to control runoff from new development, redevelopment, and construction sites. This program is intended for all sites that disturb a land area of one acre or greater including projects less than one acre that are part of a larger common plan of a development. The City program to control runoff is summarized in Appendix H of the City of Duvall SWPPP (see <http://www.duvallwa.gov/departments/publicworks/npdes.html>). Section S5.C.4 requires the City to:

- a. Develop and adopt an ordinance or other enforceable mechanism or program that addresses runoff from new development, redevelopment, and construction sites. The City Ordinance No. 1090 was adopted August 13, 2009 prior to the August 15, 2009 permit deadline.
- b. Develop and implement a permitting process with plan review, inspections, and enforcement capabilities in accordance with the Permit, including the minimum requirements in Appendix 1 of the Permit. The permitting process was implemented by the City prior to the August 15, 2009 permit deadline.
- c. Develop and implement a program to verify adequate long-term operation and maintenance of post-construction stormwater facilities and BMP's. The City program was implemented prior to the August 15, 2009 permit deadline.
- d. Develop and implement a program for keeping and maintaining records of inspections and enforcement actions. The City maintains records of inspections and enforcement actions.
- e. Make available copies of the "Notice of Intent for Construction Activity" and the "Notice of Intent for Industrial Activity". The City makes available copies of the "Notice of Intent for Construction Activity" and the "Notice of Intent for Industrial Activity" upon request.
- f. Verify that all staff responsible for implementation of the program to control runoff from new development, redevelopment, and construction are trained to complete these activities. The City training program was implemented prior to the August 15, 2009 permit deadline.

Current Activities

Current activities to control runoff from new development, redevelopment, and construction sites include:

- Standards and Code requirements that address runoff from new development, redevelopment, and construction sites.
- An existing permitting program that includes review of stormwater runoff from new development, redevelopment, and construction sites. Elements of the review program are based on the King County Surface Water Design Manual (KCSWDM) and NPDES requirements for sites one acre or greater.
- An existing program to verify adequate long-term operation and maintenance of post-construction stormwater facilities.
- Maintaining a spreadsheet-based record keeping system in conjunction with the storm sewer map from Permit Section S5.C.3.
- Availability of the "Notice of Intent for Construction Activity" and the "Notice of Intent for Industrial Activity" on the City's NPDES web page and as requested by the applicant during the permitting process.
- Summarizing activities to control runoff from new development, redevelopment, and construction sites in the annual report.
- Updated and provided training for field staff twice in 2010.

Future Activities

The City is currently evaluating future activities to control runoff from new development, redevelopment, and construction. Future activities to control runoff from new development, redevelopment, and construction may include:

- Developing a GIS based record keeping system in conjunction with the storm sewer map from Permit Section S5.C.3.

S5.C.5: Pollution Prevention and Operation & Maintenance for Municipal Operations

Permit Requirements

In accordance with Section S5.C.5 of the Permit, this SWMP includes a pollution prevention and operation and maintenance for municipal operations program. This City program went into effect prior to the February 15, 2010 permit deadline and includes a training component with the ultimate goal of preventing or reducing runoff from municipal operations. The City program to control runoff is summarized in Appendix I of the City of Duvall SWPPP (see <http://www.duvallwa.gov/departments/publicworks/npdes.html>). Section S5.C.5 requires the City to:

- a. Establish maintenance standards that are at least as proactive as the adopted stormwater manual.
- b. Complete annual inspection and maintenance (if required) of permanent stormwater treatment or flow control facilities other than catch basins. The annual inspection requirement may be reduced based on inspection records.
- c. Complete spot checks and maintenance (if required) of potentially damaged stormwater treatment or flow control facilities after major storm events (greater than 24-hour, 10-year recurrence interval rainfall).
- d. Inspect all catch basins and inlets and cleaning (if required) at least once before the end of the Permit term.
- e. Comply with above inspection requirements to achieve inspection of 95 percent of all sites.
- f. Establish and implement practices to reduce stormwater impacts associated with runoff from streets, parking lots, and roads owned or maintained by the City along with road maintenance activities completed by the City.
- g. Establish and implement policies and procedures to reduce pollutants in discharge from property owned or maintained by the City.
- h. Develop and implement an on-going training program for maintenance staff with job functions that may impact stormwater quality.
- i. Develop and implement a Stormwater Pollution Prevention Plan (SWPPP) for heavy equipment maintenance or storage yards and material storage facilities owned or operated by the City.
- j. Record inspections and maintenance or repair activities.

Current Activities

Current pollution prevention and operation and maintenance for municipal operations program activities include:

- Compliance with the King County Surface Design Manual.
- Annual inspections of stormwater treatment or flow control facilities.
- Emergency inspection of stormwater treatment or flow control facilities following major storm events.
- An existing annual catch basin cleaning program.
- Operations, maintenance, and BMP training for the field crew.
- Updating the SWPPP for heavy equipment maintenance or storage yards and material storage facilities owned or operated by the City.
- Implementing an on-going training program for maintenance staff with job functions that may impact stormwater quality.
- Baseline evaluations and yearly inspection and maintenance (unless reduced frequency is determined and documented by the City) of all permanent stormwater treatment or flow control facilities other than catch basins. Evaluations, inspections, and maintenance shall be documented using spreadsheets or the GIS based record keeping system in conjunction with the storm sewer map from Permit Section S5.C.3.
- Inspection and documentation program for spot checks and maintenance (if required) of potentially damaged stormwater treatment or flow control facilities after major storm events. The spot check inspections and maintenance (if required) shall be documented using spreadsheets or the GIS based record keeping system in conjunction with the storm sewer map from Permit Section S5.C.3.
- Catch basin inspection, mapping, and cleaning program. The catch basin inspection, mapping, and cleaning program shall be documented using spreadsheets or the GIS based record keeping system in conjunction with the storm sewer map from Permit Section S5.C.3.
- Implementing and documenting practices to reduce stormwater impacts associated with runoff from streets, parking lots, and roads owned or maintained by the City along with road maintenance activities completed by the City.
- Implementing, and documenting policies and procedures to reduce pollutants in discharge from property owned or maintained by the City.

Future Activities

The City is currently evaluating future pollution prevention and operation and maintenance for municipal operations program activities. Future pollution prevention and operation and maintenance for municipal operations program activities may include:

- Recording inspections and maintenance or repair activities using the GIS based record keeping system in conjunction with the storm sewer map from Permit Section S5.C.3.

S6: STORMWATER MANAGEMENT PROGRAM FOR SECONDARY PERMITEES

Requirements from Section S6 of the Permit do not apply to the City because the City is not a secondary permittee to a primary permittee. There are no secondary permittees to the City.

S7: COMPLIANCE WITH TMDL REQUIREMENTS

Total Maximum Daily Load (TMDL) requirements from Section S7 of the Permit do not apply to the City because there are no TMDL's listed for the City within Appendix 2 of the Permit.

S8: MONITORING

Permit Requirements

In accordance with Section S8 of the Permit, each permittee is responsible for compliance with the following monitoring requirements:

- A. Permittees are not required to conduct water sampling or other testing unless associated with TMDL requirements or illicit discharge.
- B. The annual report shall include a description of any completed monitoring or studies and an assessment of the appropriateness of the BMP's identified for each component of the SWMP.
- C. Permittees shall prepare for participation in a long term monitoring program, if required in the future as part of the Permit (required for 4th year annual report).

Current Activities

Current monitoring activities include:

- Summarizing monitoring activities in the annual report. Currently, no stormwater sampling or monitoring activities are being completed by the City.
- Conducting SWMP effectiveness monitoring preparation no later than December 31, 2010. The effectiveness monitoring preparation included identification of at least two suitable questions concerning the effectiveness of the SWMP and selection of sites where stormwater monitoring will be completed to evaluate the effectiveness questions as summarized in Appendix C, "Proposed SWMP Effectiveness Monitoring Plan." However, the City is considering participation within the proposed group SWMP effectiveness monitoring proposed by the "Stormwater Monitoring Workgroup".

Future Activities

The City is currently evaluating future monitoring activities. Future monitoring may include:

- Identifying outfalls or conveyances where stormwater sampling may be conducted. However, because the City's population is less than 10,000, sampling is not required by the Permit.
- Completing SWMP effectiveness monitoring if required. Alternatively, the City will participate in SWMP effectiveness monitoring as part of the "Stormwater Monitoring Workgroup".
- Summarizing monitoring activities in the annual report.

S9: REPORTING REQUIREMENTS

The City is complying with the following reporting requirements in accordance with Section S9 of the Permit:

- A. The City shall submit an annual report no later than March 31 of each year beginning March 31, 2008.

- B. Two printed copies and one electronic copy shall be submitted.
- C. Records related to the Permit and SWMP shall be retained for at least five years.
- D. Records related to the Permit and SWMP shall be made available to the public at the Public Works Office during business hours.
- E. Each annual report shall include a copy of the updated SWMP, Submittal of Appendix 3 form titled "Annual Report Form for Cities, Towns, and Counties" and associated required documents.
- F. Secondary permittees shall submit the Appendix 4 form titled "Annual Report Form Secondary Permittees" and associated required documents. The City is not a secondary permittee and submittal of the Appendix 4 form titled "Annual Report Form Secondary Permittees" and associated required documents is not required.

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APPENDIX A: ANNUAL REPORT FORM

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I. Permittee Information	
Permittee Name City of Duvall	Permittee Coverage Number WAR04-5512
Contact Name Boyd Benson, City Engineer	Phone Number 425.788.3434
Mailing Address PO Box 1300	
City Duvall	State Zip + 4 WA 98019-1300
Email Address boyd.benson@duvallwa.gov	

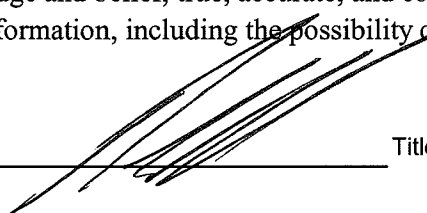
II. Regulated Small MS4 Location							
Jurisdiction City of Duvall	Entity Type: Check the box that applies						
	<table border="1"> <thead> <tr> <th>County</th> <th>City/Town</th> <th>Other</th> </tr> </thead> <tbody> <tr> <td></td> <td>X</td> <td></td> </tr> </tbody> </table>	County	City/Town	Other		X	
County	City/Town	Other					
	X						
Major Receiving Water(s) Snoqualmie River							

III. Relying on another Governmental Entity	
<p>If you are relying on another governmental entity to satisfy one or more of the permit obligations, list the entity and briefly describe the permit obligation(s) they are implementing on your behalf below. <i>Attach a copy of your agreement with the other entity to provide additional detail.</i></p>	
Name of Entity:	Permit Obligation(s):
NA	

IV. Certification

All annual reports must be signed and certified by the responsible official(s) of permittee or co-permittees. Please print and sign this page of the reporting form and mail it (with an original signature) to Ecology at the address noted below. An electronic signature will not suffice.

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

Name  Title Mayor Date 3/29/11

Name _____ Title _____ Date _____

Name _____ Title _____ Date _____

Name _____ Title _____ Date _____

Name _____ Title _____ Date _____

PLEASE indicate reporting year and your jurisdiction in Line 1, above.

PLEASE refer to the INSTRUCTIONS tab for assistance filling out this table.

NOTE: Items that have future compliance dates must still be answered to indicate status.

NOTE: For clarification on how to answer questions, place cursor over cells with red flags.

NOTE: Highlighted items indicate requirements that are due in 2010.

PLEASE review your work for completeness and accuracy. Save this worksheet as you go!

Question	Y/N/NA	#	Comments (50 word limit)	Name of Attachment & Page #, <u>if applicable</u>
1. Attached annual written update of Permittee's Stormwater Management Program (SWMP), including applicable requirements under S5.A.2 and S9?	Y			City of Duvall Phase II NPDES 2009 Stormwater Management Program (SWMP) Revised March 31, 2011
2. Attached a copy of any annexations, incorporations or boundary changes resulting in an increase or decrease in the Permittee's geographic area of permit coverage during the reporting period, and implications for the SWMP as per S9.E.3?	NA		There were no annexations or boundary changes in 2010.	
3. Implemented an ongoing program for gathering, tracking, maintaining, and using information to evaluate SWMP development, implementation and permit compliance and to set priorities? (S5.A.3)	Y		On-going program has been implemented at this time with respect to the SWMP development.	
4. Began tracking costs or estimated costs of the development and implementation of the SWMP? (<i>Required</i> no later than January 1, 2009, S5.A.3.a)	Y		Financial tracking implemented in the city's Springbrook Financial Software System.	

Question		Y/N/NA	#	Comments (50 word limit)	Name of Attachment & Page #, if applicable
5.	SWMP includes an education program aimed at residents, businesses, industries, elected officials, policy makers, planning staff and other employees of the Permittee? <i>(Required to begin by February 15, 2009, S5.C.1)</i>	Y		Developed a NPDES website for the city targeted at all audiences that utilize the website. Specific information sent to targeted audiences.	http://www.duvallwa.gov/departments/publicworks/npdes.html
6.	Distributed appropriate information to target audiences identified in the area served by the MS4? <i>(Required to begin by February 15, 2009, S5.C.1.a)</i>	Y		All users are targeted through the city's website, mailings and other information outlets that could include public events and E102hearings.	
7.	Tracked the types of public education and outreach activities implemented. <i>(Required to begin by February 15, 2009, S5.C.1.c)</i>	Y		Developed a spreadsheet to track public education and outreach.	
7b.	Number of activities implemented:		6		
8.	Measured the understanding and adoption of the targeted behaviors among at least one targeted audience in at least one subject area. <i>(Required to begin by February 15, 2009, S5.C.1.b)</i>	Y		The city hired Hebert Research to conduct a community survey to measure the public's knowledge and practices regarding stormwater.	
9.	Provided opportunities for the public to participate in the decision making processes involving the development, implementation and updates of the Permittee's SWMP? <i>(Required by February 15, 2008, S5.C.2.a)</i>	Y		Public participation includes a presentation at City Council meeting, an opportunity to respond to information within the city's NPDES website and request for participation in the city's newsletter.	
10.	Developed and implemented a process for public involvement and consideration of public comments on the SWMP? <i>(Required by February 15, 2008, S5.C.2.a)</i>	Y		NPDES and the SWMP were discussed at a City Council meeting. Information was posted on the City's NPDES website. The 2009 SWMP was posted on the website for comment.	

Question		Y/N/NA	#	Comments (50 word limit)	Name of Attachment & Page #, if applicable
11.	Made the most current version of the SWMP available to the public. (S5.C.2.b)	Y		The 2010 version of the SWMP was posted on the city's NPDES website on March 31, 2010. Copies are also available at City Hall and Public Works.	
12.	Posted the SWMP and latest annual report on your website. (S5.C.2.b)	Y		The 2010 version of the SWMP was posted on the city's NPDES website on March 31, 2010.	
12b.	NOTE website address in <i>Attachment</i> field:				http://www.duvalwa.gov/departments/publicworks/npdes.html
13.	Initiated or implemented an ongoing program to detect and remove illicit connections and illegal discharges into the Permittee's MS4? (Required August 19, 2011, S5.C.3)	Y		Included in "Illicit Discharge Detection and Elimination Program" Summarized in Appendix G of SWPPP.	
14.	Developed and currently maintain a map of your MS4? (Required by February 16, 2011, S5.C.3.a)	Y		A storm drainage map of the city is being maintained as part of the GIS-based mapping program. Updating of the map will continue.	
14b.	Initiated a program to develop and maintain a map of all connections to the MS4 authorized or allowed by the Permittee after the Permit effective date? (S5.C.3.a.ii)	Y		A storm drainage map of the city is being maintained as part of the GIS-based mapping program. Updating of the map will continue.	
15.	Map shows the location of all known municipal separate storm sewer outfalls, receiving waters and structural stormwater BMPs owned, operated, or maintained by the Permittee? (Required by February 16, 2011, S5.C.3.a.i)	Y		A storm drainage map of the city is being maintained as part of the GIS-based mapping program. Updating of the map will continue.	

Question		Y/N/NA	#	Comments (50 word limit)	Name of Attachment & Page #, if applicable
16.	Map shows all storm sewer outfalls with a 24 inch nominal diameter or larger, or an equivalent cross-sectional area for non-pipe systems and includes tributary conveyances, associated drainage areas and land use? <i>(Required by February 16, 2011, S5.C.3.a.i)</i>	Y		A storm drainage map of the city is being maintained as part of the GIS-based mapping program. Updating of the map will continue.	
17.	Map shows geographic areas served by the Permittee's MS4 that do not discharge stormwater to surface waters? <i>(Required by February 16, 2011, S5.C.3.a.iii)</i>	Y		A storm drainage map of the city is being maintained as part of the GIS-based mapping program. Updating of the map will continue.	
18.	Map has been made available upon request? <i>(S5.C.3.a.iv)</i>	Y		Map will be made available upon request.	
19.	Developed and implemented regulatory actions necessary to effectively prohibit non-stormwater, illicit discharges into the Permittee's MS4? <i>(Required by August 15, 2009, S5.C.3.b)</i>	Y		Ordinance 1090 adopted August 13, 2009.	
20.	Developed and implemented an ongoing program to detect and address non-stormwater illicit discharges, including spills, and illicit connections into the Permittee's MS4? <i>(Required by August 19, 2011, S5.C.3.c)</i>	Y		Included in "Illicit Discharge Detection and Elimination Program" Summarized in Appendix G of SWPPP.	http://www.duvalwa.gov/departments/publicworks/npdes.html

Question		Y/N/NA	#	Comments (50 word limit)	Name of Attachment & Page #, if applicable
21.	Developed procedures for locating priority areas likely to have illicit discharges, including at a minimum: evaluating land uses and associated business/industrial activities present; areas where complaints have been registered in the past; and areas with storage of large quantities of materials that could result in illicit discharges, including spills? (<i>Required</i> by August 19, 2011, S5.C.3.c.i)	Y		Included in "Illicit Discharge Detection and Elimination Program" Summarized in Appendix G of SWPPP.	http://www.duvallwa.gov/departments/publicworks/npdes.html
22.	Implemented field assessment activities, including visual inspection of priority outfalls identified during dry weather, and for the purposes of verifying outfall locations, identified previously unknown outfalls, and detected illicit discharges? (<i>Required</i> by August 19, 2011, S5.C.3.c.ii)	Y		Included in "Illicit Discharge Detection and Elimination Program" Summarized in Appendix G of SWPPP.	http://www.duvallwa.gov/departments/publicworks/npdes.html
23.	Prioritized receiving waters for visual inspection? (<i>Required</i> by February 16, 2010, S5.C.3.c.ii)	Y		Included in "Illicit Discharge Detection and Elimination Program" Summarized in Appendix G of SWPPP.	http://www.duvallwa.gov/departments/publicworks/npdes.html
24.	Conducted field assessments for three high priority water bodies? (<i>Required</i> by February 16, 2011, S5.C.3.c.ii)	Y		Dry weather screening completed at 3 major outfalls leading to high priority water bodies.	
25.	Conducted field assessments on at least one high priority water body? (<i>Required</i> annually after February 16, 2011, S5.C.3.c.ii)	Y		Dry weather screening completed at 3 major outfalls leading to high priority water bodies.	

Question		Y/N/ NA	#	Comments (50 word limit)	Name of Attachment & Page #, <u>if applicable</u>
26.	Developed and implemented procedures for characterizing the nature of, and potential public or environmental threat posed by, any illicit discharges found by or reported to the Permittee? (<i>Required</i> by August 19, 2011, S5.C.3.c.iii)	Y		Included in "Illicit Discharge Detection and Elimination Program" Summarized in Appendix G of SWPPP.	http://www.duvallwa.gov/departments/publicworks/npdes.html
27.	Developed and implemented procedures for tracing the source of an illicit discharge; including visual inspections, and when necessary, opening manholes, using mobile cameras, collecting and analyzing water samples, and/or other detailed inspection procedures? (<i>Required</i> by August 19, 2011, S5.C.3.c.iv)	Y		Included in "Illicit Discharge Detection and Elimination Program" Summarized in Appendix G of SWPPP.	http://www.duvallwa.gov/departments/publicworks/npdes.html
28.	Developed and implemented procedures for removing the source of the discharge, including notification of appropriate authorities; notification of the property owner; technical assistance for eliminating the discharge; follow-up inspections; and escalating enforcement and legal actions if the discharge is not eliminated? (<i>Required</i> by August 19, 2011, S5.C.3.c.v.)	Y		Included in "Illicit Discharge Detection and Elimination Program" Summarized in Appendix G of SWPPP.	http://www.duvallwa.gov/departments/publicworks/npdes.html
29.	Informed public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste? (<i>Required</i> by August 19, 2011, S5.C.3.d)	NA		Requirement deadline not yet due. Will be part of public outreach.	
30.	Distributed appropriate information to target audiences identified pursuant to S5.C.1? (<i>Required</i> by August 19, 2011, S5.C.3.d.i)	NA		Requirement deadline not yet due. Will be part of public outreach.	

Question		Y/N/ NA	#	Comments (50 word limit)	Name of Attachment & Page #, if applicable
31.	Publicized a hotline or other local telephone number for public reporting of spills and other illicit discharges? (<i>Required</i> by February 15, 2009, S5.C.3.d.ii)	Y		Posted hotline and emergency contact numbers on NPDES website and at City Hall.	
31b.	Number of hotline calls received:		2		
31c.	Number of follow-up actions taken in response to calls:		2		
32	Maintained a hotline or other reporting number for public reporting of illicit discharges, including spills? (<i>Required</i> by February 15, 2009, S5.C.3.d.ii)	Y		Posted hotline and emergency contact numbers on NPDES website and at City Hall.	
32b.	NOTE hotline number in <i>Comments</i> field			Business Hours: 425.788.3434 ext. 226 After Hours: 206.977.8417	
33	Tracked the number of illicit discharges, including spills, identified? (<i>Required</i> by August 19, 2011, S5.C.3.e)	Y		Spreadsheet has been developed to track number and type of illicit discharges.	
33b.	Number of illicit discharges identified:		2	Hotline calls and associated response	
34	Tracked the number of inspections made for illicit connections? (<i>Required</i> by August 19, 2011, S5.C.3.e)	Y		Developed a spreadsheet to track illicit connections.	
34b.	Number of inspections:		0	No illicit connections identified for inspections	
35	Received feedback from IDDE public education efforts? (<i>Required</i> by August 19, 2011, S5.C.3.e)	NA		Requirement deadline not yet due.	
36	Attached report on IDDE public education efforts? (<i>Required</i> by August 19, 2011, S5.C.3.d, S5.C.3.e)	NA		Requirement deadline not yet due.	

Question		Y/N/NA	#	Comments (50 word limit)	Name of Attachment & Page #, if applicable
37	Municipal field staff responsible for identification, investigation, termination, cleanup, and reporting of illicit discharges, improper disposal and illicit connections are trained to conduct these activities? <i>(Required by August 15, 2009, S5.C.3.f.i)</i>	Y		Training provided for all public works crew members.	
37b.	Number of trainings provided:		1	One Training session with 12 Staff	
37c.	Number of staff trained:		12	One Training session with 12 Staff	
38	Provided follow-up training as needed to address changes in procedures, techniques or requirements? <i>(Required by August 15, 2009, S5.C.3.f.i)</i>	Y			
38b.	Number of trainings provided:		0	No training because of no change in procedures	
38c.	Number of staff trained:		0	No training because of no change in procedures	
39	Developed and implemented an ongoing training program on the identification of an illicit discharge/connection, and on the proper procedures for reporting and responding to the illicit discharge/ connection for all municipal field staff, which, as part of their normal job responsibilities, might come into contact with or otherwise observe an illicit discharge or illicit connection to the storm sewer system? <i>(Required by February 16, 2010, S5.C.3.f.ii.)</i>	Y		Included in "Illicit Discharge Detection and Elimination Program" summarized in Appendix G of SWPPP.	
39b.	Number of trainings provided:		1	One Training session with 12 Staff	
39c.	Number of staff trained:		12	One Training session with 12 Staff	

Question	Y/N/ NA	#	Comments (50 word limit)	Name of Attachment & Page #, if applicable
40 Developed, implemented and enforced a program to reduce pollutants in stormwater runoff to a regulated small MS4 from new development, redevelopment and construction site activities? (<i>Required</i> by February 16, 2010, S5.C.4)	Y		See "Program to Control Run-off from New Development, Redevelopment and Construction Sites (SWPPP Appendix H).	
41 Applied stormwater runoff program to all sites that disturb a land area 1 acre or greater, including projects less than one acre that are part of a larger common plan of the development or sale? (<i>Required</i> by February 16, 2010, S5.C.4)	Y		NOI/NPDES General Stormwater permits are required as part of permitting for any activities that cause land disturbance of 1 acre or greater, including projects less than 1 acre that are part of a larger project. See "Program to Control Run-off from New Development, Redevelopment and Construction Sites (SWPPP Appendix H).	
42 Applied stormwater runoff program to private and public development, including roads? (<i>Required</i> by February 16, 2010, S5.C.4)	Y		Stormwater run-off program (KCSWDM, NOI/NPDES General Stormwater Permit for sites 1 acre or great) is required for all public and private development. See "Program to Control Run-off from New Development, Redevelopment, and Construction Sites (SWPPP Appendix H).	
43 Applied the Technical Thresholds in Appendix 1 to all sites 1 acre or greater, including projects less than one acre that are part of a larger common plan of the development or sale? (<i>Required</i> by February 16, 2010, S5.C.4)	Y		Technical thresholds from KCSWDM and NOI/NPDES General Stormwater Permits are required as part of permitting for any activities that cause land disturbance of 1 acre or greater, including projects less than 1 acre that are part of a larger project. See "Program to Control Run-off from New Development, Redevelopment, and Construction Sites (SWPPP Appendix H).	
44 Adopted and implemented regulatory mechanism (such as an ordinance) necessary to address run-off from new development, redevelopment and construction site activities? (<i>Required</i> by February 16, 2010, S5.C.4.a)	Y		Ordinance 1090 adopted August 13, 2009 as summarized in "Program to Control Run-off from New Development, Redevelopment, and Construction Sites (SWPPP Appendix H).	

Question		Y/N/NA	#	Comments (50 word limit)	Name of Attachment & Page #, if applicable
45	Retained existing local requirements to apply stormwater controls at smaller sites or at lower thresholds than required pursuant to S5.C.4? (S5.A.4)	Y		Existing stormwater requirements, including use of BMPs and KCSWDM requirements, have been retained and enforced.	
46	The ordinance or other enforceable mechanism includes the minimum requirements, technical thresholds, and definitions in Appendix 1 (or an equivalent approved by Ecology under the NPDES Phase I Municipal Stormwater Permit) for new development, redevelopment, and construction sites? (<i>Required</i> by February 16, 2010, S5.C.4.a.i)	Y		Ordinance 1090 adopted August 13, 2009 as summarized in "Program to Control Run-off from New Development, Redevelopment, and Construction Sites (SWPPP Appendix H).	
47	The ordinance or other enforceable mechanism includes exceptions and variance criteria equivalent to those in Appendix 1? (<i>Required</i> by February 16, 2010, S5.C.4.a.i., and Section 6 of Appendix 1)	Y		Ordinance 1090 adopted August 13, 2009 as summarized in "Program to Control Run-off from New Development, Redevelopment, and Construction Sites (SWPPP Appendix H).	
48	Were exceptions or variances to the minimum requirements in Appendix 1 granted? (<i>Required</i> by February 16, 2010, S5.C.4.a.i., and Section 6 of Appendix 1)	N			
48b.	If so, how many were granted?		0		

Question	Y/N/NA	#	Comments (50 word limit)	Name of Attachment & Page #, if applicable
49 The ordinance or other enforceable mechanism includes a site planning process and BMP selection and design criteria that, when used to implement the minimum requirements in Appendix 1 (or equivalent approved by Ecology under the Phase I Permit) will protect water quality, reduce the discharge of pollutants to the maximum extent practicable and satisfy the State requirement under Chapter 90.48 RCW to apply all known, available and reasonable methods of prevention, control and treatment (AKART) prior to discharge? (Required by February 16, 2010, S5.C.4.a.ii)	Y		Ordinance 1090 adopted August 13, 2009, as summarized in DMC 9.06, and as summarized in "Program to Control Run-off from New Development, Redevelopment, and Construction Sites (SWPPP Appendix H).	
49b. Cite documentation to meet this requirement in Attachment field:			Appendix H of SWPPP.	Appendix H of SWPPP.
50 The ordinance or other enforceable mechanism provides the legal authority, through the approval process for new development, to inspect private stormwater facilities that discharge to the Permittee's MS4? (Required by February 16, 2010, S5.C.4.a.iii)	Y		Ordinance 1090 adopted August 13, 2009 as summarized in "Program to Control Run-off from New Development, Redevelopment, and Construction Sites (SWPPP Appendix H).	

Question	Y/N/ NA	#	Comments (50 word limit)	Name of Attachment & Page #, <u>if applicable</u>
51 The ordinance or other enforceable mechanism allows non-structural preventive actions and source reduction approaches such as Low Impact Development (LID) Techniques to minimize the creation of impervious surfaces and minimize the disturbance of native soils and vegetation? (<i>Required</i> by February 16, 2010, S5.C.4.a.iv)	Y		Ordinance 1090 adopted August 13, 2009 as summarized in DMC 9.06 and as summarized in "Program to Control Run-off from New Development, Redevelopment, and Construction Sites (SWPPP Appendix H).	
52 If the ordinance or regulatory mechanism allows construction sites to apply the Erosivity Waiver in Appendix 1, Minimum Requirement #2, does it include appropriate, escalating enforcement sanctions for construction sites that provide notice to the Permittee of their intention to apply the waiver but do not meet the requirements (including timeframe restrictions, limits on activities that result in non-stormwater discharges, and implementation of appropriate BMPs to prevent violations of water quality standards) to qualify for the waiver? (If waiver is allowed, the qualification is <i>required</i> by February 16, 2010, S5.C.4.a.v)	Y		Ordinance 1090 adopted August 13, 2009 as summarized in DMC 9.06 and summarized in "Program to Control Run-off from New Development, Redevelopment, and Construction Sites (SWPPP Appendix H).	

Question	Y/N/ NA	#	Comments (50 word limit)	Name of Attachment & Page #, if applicable
53 Developed and implemented a permitting process to address runoff from new development, redevelopment and construction site activities with plan review, inspection, and enforcement capability? <i>(Required by February 16, 2010, S5.C.4.b)</i>	Y		Ordinance 1090 adopted August 13, 2009 as summarized in DMC 9.06 and summarized in "Program to Control Run-off from New Development, Redevelopment, and Construction Sites (SWPPP Appendix H).	
54 Applied permitting process to all sites that disturb a land area 1 acre or greater, including projects less than one acre that are part of a larger common plan of the development or sale? <i>(Required by February 16, 2010, S5.C.4.b)</i>	Y		Ordinance 1090 adopted August 13, 2009 as summarized in DMC 9.06 and as summarized in "Program to Control Run-off from New Development, Redevelopment, and Construction Sites (SWPPP Appendix H).	
55 Reviewed Stormwater Site Plans for new development and redevelopment projects? <i>(Required by February 16, 2010, S5.C.4.b.i)</i>	Y		Site plans reviewed as part of existing process.	
55b. Number of site plans reviewed during the reporting period:		5		
56 Inspected, prior to clearing and construction, all known development sites that have a high potential for sediment transport as determined through plan review based on definitions and requirements in Appendix 7 Determining Construction Site Sediment Potential? <i>(Required by February 16, 2010, S5.C.4.b.ii)</i>	Y		Inspections required during construction at all development sites as part of existing permitting and construction process.	
56b. Number of qualifying sites inspected prior to clearing and construction during the reporting period:		2		

Question		Y/N/ NA	#	Comments (50 word limit)	Name of Attachment & Page #, if applicable
57	Inspected construction-phase stormwater controls at all known permitted development sites during construction to verify proper installation and maintenance of required erosion and sediment controls? (<i>Required</i> by February 16, 2010, S5.C.4.b.iii)	Y		Inspection required during construction at all development sites as part of existing permitting and construction process.	
57b.	Number of sites inspected during the construction phase for the reporting period:		2		
58	Enforced as necessary based on the inspection at new development and redevelopment projects? (<i>Required</i> by February 16, 2010, S5.C.4.b.iii)	Y		Current city inspections include requiring corrections for any observed inadequate stormwater BMPs or improvements.	
58b.	Number of enforcement actions taken during the reporting period:		0		
59	Inspected qualifying permitted development sites upon completion of construction and prior to final approval or occupancy to ensure proper installation of permanent stormwater controls such as stormwater facilities and structural BMPs? (<i>Required</i> by February 16, 2010, S5.C.4.b.iv and v)	Y		Final inspection required at all development sites prior to final approval as part of existing permitting and construction process.	
59b.	Number of qualifying sites known during the reporting period:		0	No finals with stormwater facilities during 2010	
59c.	Number of qualifying sites inspected during the reporting period:		0	No finals with stormwater facilities during 2010	
60	Verified a maintenance plan is completed and responsibility for maintenance is assigned for qualifying projects? (<i>Required</i> by February 16, 2010, S5.C.4.b.iv)	Y		Maintenance plan required at all development sites prior to final approval as part of existing permitting and construction process.	

Question		Y/N/NA	#	Comments (50 word limit)	Name of Attachment & Page #, if applicable
61	Enforced regulations as necessary based on the inspection? (<i>Required</i> by February 16, 2010, S5.C.4.b.iv)	Y		Enforcement required at all development sites as part of existing permitting and construction process.	
61b.	Number of enforcement actions taken during the reporting period:		0		
62	Developed and implemented an enforcement strategy to respond to issues of non-compliance with the regulations for qualifying projects? (<i>Required</i> by February 16, 2010, S5.C.4.b.vi)	Y		Ordinance 1090 adopted August 13, 2009 as summarized in DMC 9.06 and as summarized in "Program to Control Run-off from New Development, Redevelopment and Construction Sites (SWPPP Appendix H).	
63	Did the Permittee choose to allow construction sites to apply the Erosivity Waiver in Appendix 1, Minimum Requirement #2? (S5.C.4.b.vii)	N			
63b.	If yes, how many waivers were allowed ?				
64	Developed and implemented a long-term operation and maintenance (O&M) program for post-construction stormwater facilities and BMPs? (<i>Required</i> by February 16, 2010, S5.C.4.c)	Y		Ordinance 1090 adopted August 13, 2009 as summarized in DMC 9.06 and as summarized in "Program to Control Run-off from New Development, Redevelopment and Construction Sites (SWPPP Appendix H).	
65	Adopted an ordinance or other regulatory mechanism that clearly identifies the party responsible for maintenance, requires inspection of facilities and establishes enforcement procedures? (<i>Required</i> by February 16, 2010, S5.C.4.c.i)	Y		Ordinance 1090 adopted August 13, 2009 as summarized in DMC 9.06 and as summarized in "Program to Control Run-off from New Development, Redevelopment and Construction Sites (SWPPP Appendix H).	
66	Inspected post-construction stormwater controls, including structural BMPs, at new development and redevelopment projects? (<i>Required</i> by February 16, 2010, S5.C.4.c)	Y		Formal post-construction inspection at performance and maintenance bond release, and as summarized in "Program to Control Run-off from New Development, Redevelopment and Construction Sites (SWPPP Appendix H).	

Question		Y/N/NA	#	Comments (50 word limit)	Name of Attachment & Page #, if applicable
66b.	Number of sites inspected during the reporting period:		1	1 Stormwater Facility Bond Release	
66c.	Number of structural BMPs inspected during the reporting period:		1	1 Stormwater Facility Bond Release	
66d.	Number of enforcement actions taken during the reporting period:		0		
67	Established maintenance standards that are as protective, or more protective, of facility function as those specified in Chapter 4 of Volume V of the 2005 Stormwater Management Manual for Western Washington ? (<i>Required</i> by February 16, 2010, S5.C.4.c.ii)	Y		Adopted+E113 KCSWDM and associated maintenance standards as summarized in Ordinance 1090 adopted August 13, 2009 as summarized in DMC 9.06 and also summarized in "Program to Control Run-off from New Development, Redevelopment and Construction Sites (SWPPP Appendix H).	
68	Performed timely maintenance as per S5.C.4.c.ii? (<i>Required</i> by February 16, 2010, S5.C.4.c.ii)	Y			
68b.	Attached documentation of any maintenance delays. (<i>Required</i> by February 16, 2010, S5.C.4.c.ii)	NA		No delays	
69	Established program to annually inspect all stormwater treatment and flow control facilities (other than catch basins) permitted by the Permittee according to S5.C.4.b. unless there are maintenance records to justify a different frequency? (<i>Required</i> by February 16, 2010, S5.C.4.c.iii)	Y		Annual inspection and maintenance completed at all facilities as summarized in Ordinance 1090 adopted August 13, 2009 as summarized in DMC 9.06 and also summarized in "Program to Control Run-off from New Development, Redevelopment and Constructions Sites" (SWPPP Appendix H).	
70	If using reduced inspection frequency, Attached documentation as per S5.C.4.c.iii? (<i>Required</i> by February 16, 2010, S5.C.4.c.iii)	NA		No reduced inspection frequency at this time.	

Question	Y/N/ NA	#	Comments (50 word limit)	Name of Attachment & Page #, if applicable
71 Inspected all new stormwater treatment and flow control facilities owned or operated, including catch basins, for new residential developments that are a part of a larger common plan of development or sale, every 6 months during the period of heaviest house construction (i.e., 1 to 2 years following subdivision approval) to identify maintenance needs and enforce compliance with maintenance standards as needed? (<i>Required</i> by February 16, 2010, S5.C.4.c.iv)	Y		Inspection completed at all facilities during construction and prior to approval at this time as summarized in Ordinance 1090 adopted August 13, 2009 as summarized in DMC 9.06 and also summarized in "Program to Control Run-off from New Development, Redevelopment, and Construction Sites" (SWPPP Appendix H).	
71b. Number of facilities inspected during the reporting period:		3		
72 Implemented a procedure for keeping records of inspections and enforcement actions by staff, including inspection reports, warning letters, notices of violations, other enforcement records, maintenance inspections and maintenance activities? (<i>Required</i> by February 16, 2010, S5.C.4.d)	Y		Developed a spreadsheet to track enforcement, inspection, and maintenance activities.	
73 Provided copies of the Notice of Intent for Construction Activity and Notice of Intent for Industrial Activity to representatives of proposed new development and redevelopment? (S5.C.4.e)	Y		Link to NOI provided on city's NPDES website and provided, if requested, during permitting process.	

Question	Y/N/NA	#	Comments (50 word limit)	Name of Attachment & Page #, if applicable
74 All staff responsible for implementing the program to control stormwater runoff from new development, redevelopment, and construction sites, including permitting, plan review, construction site inspections, and enforcement were trained to conduct these activities? (Required by February 16, 2010, S5.C.4.f)	Y		Program summarized in "Operations and Maintenance Program to Prevent or Reduce Run-off from Municipal Operations" (SWPPP Appendix I).	
74b. Number of trainings provided:		1	One Training session with 12 Staff	
74c. Number of staff trained:		12	One Training session with 12 Staff	
75 Developed and implemented an operations and maintenance (O&M) program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations? (Required by February 16, 2010, S5.C.5)	Y		Program summarized in "Operations and Maintenance Program to Prevent or Reduce Run-off from Municipal Operations" (SWPPP Appendix I).	
76 Adopted maintenance standards as protective, or more protective, of facility function as those specified in Chapter 4 of Volume V of the 2005 <i>Stormwater Management Manual for Western Washington</i> ? (Required by February 16, 2010, S5.C.5.a)	Y		Adopted KCSWDM and associated maintenance standards as summarized in Ordinance 1090 adopted August 13, 2009, as summarized in DMC 9.06, and also summarized in "Program to Control Run-off from New Development, Redevelopment, and Construction Sites" (SWPPP Appendix H).	
77 Performed timely maintenance as per S5.C.5.a.ii? (Required by February 16, 2010, S5.C.5.a.ii)	Y		Inspection completed at all facilities at this time. Program summarized in "Operations and Maintenance Program to Prevent or Reduce Run-off from Municipal Operations" (SWPPP Appendix I).	
77b. Attached documentation of any maintenance delays. (Required by February 16, 2010, S5.C.5.a.ii)	NA		No Maintenance Delays	

Question		Y/N/NA	#	Comments (50 word limit)	Name of Attachment & Page #, if applicable
78	Designed a program to annually inspect and maintained all stormwater treatment and flow control facilities (other than catch basins)? (Required by February 16, 2010, S5.C.4.c.iii)	Y		Program summarized in "Operations and Maintenance Program to Prevent or Reduce Run-off from Municipal Operations" (SWPPP Appendix I).	
78b.	Number of known facilities:		82	~22 tanks & pipes, ~ 29 ponds, ~21 vaults, ~6 bioswales, 3 filter vaults, 1 sand filter vault	
78c.	Number of facilities inspected during the reporting period:		82		
79	If using reduced inspection frequency, Attached documentation as per S5.C.5.a.ii? (Required by February 16, 2010, S5.C.5.b)	NA		No reduced inspection frequency at this time.	
80	Conducted spot checks of stormwater facilities after major storms? (Required by February 16, 2010, S5.C.5.c)	Y		Program summarized in "Operations and Maintenance Program to Prevent or Reduce Run-off from Municipal Operations" (SWPPP Appendix I).	
80b.	Number of known facilities:		82	~22 tanks & pipes, ~ 29 ponds, ~21 vaults, ~6 bioswales, 3 filter vaults, 1 sand filter vault	
80c.	Number of facilities inspected during the reporting period:		82		
81	Inspected municipally owned or operated catch basins at least once before the end of the Permit term? (Required by February 16, 2010, S5.C.5.d)	Y		Program summarized in "Operations and Maintenance Program to Prevent or Reduce Run-off from Municipal Operations" (SWPPP Appendix I).	
81b.	Number of known catch basins:		1590	Approximately based on developing map effort.	
81c.	Number of inspections:		1510		
81d.	Number of catch basins cleaned:		715	clean half each year	

Question	Y/N/ NA	#	Comments (50 word limit)	Name of Attachment & Page #, <u>if applicable</u>
82 Established and implemented practices to reduce stormwater impacts associated with runoff from streets, parking lots, roads or highways owned or maintained by the Permittee, and road maintenance activities conducted by the Permittee? <i>(Required by February 16, 2010, S5.C.5.f)</i>	Y		Program summarized in "Operations and Maintenance Program to Prevent or Reduce Run-off from Municipal Operations" (SWPPP Appendix I).	
83 Established and implemented policies and procedures to reduce pollutants in discharges from all lands owned or maintained by the Permittee and subject to this Permit, including but not limited to: parks, open space, road right-of-way, maintenance yards, and stormwater treatment and flow control facilities? <i>(Required by February 16, 2010, S5.C.5.g)</i>	Y		Program summarized in "Operations and Maintenance Program to Prevent or Reduce Run-off from Municipal Operations" (SWPPP Appendix I).	
84 Implemented an operations and maintenance (O&M) program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations? <i>(Required by February 16, 2010, S5.C.5.h.)</i>	Y		Program summarized in "Operations and Maintenance Program to prevent or Reduce Ron-off from Municipal Operations" (SWPPP Appendix I).	
84b. Number of trainings provided:		1	One Training session with 12 Staff	
84c. Number of staff trained:		12	One Training session with 12 Staff	

Question	Y/N/ NA	#	Comments (50 word limit)	Name of Attachment & Page #, if applicable
85 Implemented a Stormwater Pollution Prevention Plan (SWPPP) for all heavy equipment maintenance or storage yards, and material storage facilities owned or operated by the Permittee in areas subject to this Permit that are not required to have coverage under the Industrial Stormwater General Permit? (Required by February 16, 2010, S5.C.5.i)	Y		Program summarized in "Operations and Maintenance Program to Prevent or Reduce Run-off from Municipal Operations" (SWPPP Appendix I).	http://www.duvallwa.gov/departments/publicworks/npdes.html
86 Is there an approved Total Maximum Daily Load (TMDL) applicable to stormwater discharges from a MS4s owned or operated by the Permittee?	N		There are no TMDL's listed in Appendix 2 of the permit.	
87 Complied with the specific requirements identified in Appendix 2? (S7.A)	NA		There are no TMDL's listed in Appendix 2 of the permit.	
88 Attached status report of TMDL implementation? (S7.A)	NA		There are no TMDL's listed in Appendix 2 of the permit.	
89 Where monitoring was required in Appendix 2, did you conduct the monitoring according to an approved Quality Assurance Project Plan? (S7.A)	NA		There are no TMDL's listed in Appendix 2 of the permit.	
90 Took appropriate action to correct or minimize discharges into or from the MS4 which may constitute a threat to human health, welfare, or the environment? (G3)	NA		The city is not aware of any instances of discharge or permit non-compliance which may cause or contribute to a threat to human health or environment.	
90b. Attached a summary of the status of implementation of any actions taken pursuant to S4.F and the status of any monitoring, assessment, or evaluation efforts conducted during the reporting period? (S4.F.3.d)	NA		The city is not aware of any instances or actions taken with respect to violations of water quality standards pursuant to permit section S4.F.	

Question	Y/N/ NA	#	Comments (50 word limit)	Name of Attachment & Page #, <u>if applicable</u>
91 Notified Ecology of the failure to comply with the permit terms and conditions within 30 days of becoming aware of the non-compliance? (G20)	NA		Based on our review of the permit, all permit terms and conditions have been met and no non-compliance notification is required.	
92 Notified Ecology immediately in cases where the Permittee becomes aware of a discharge from the Permittees MS4 which may cause or contribute to an imminent threat to human health or the environment? (G3)	NA		The city is not aware of any instances of discharge or permit non-compliance which may cause or contribute to a threat to human health or environment.	
93 Attached a summary of identified barriers to the use of low impact development (LID) and measures to address the barriers (Required to be submitted by March 31, 2011, S9.E.4.a)	Y		See SWMP Appendix B	See SWMP Appendix B
94 Attached a report describing LID practices currently available and that can be reasonably implemented, potential or planned non-structural actions and LID techniques to prevent stormwater impacts, goals and metrics to identify, promote, measure LID; and schedules to require and implement non-structural and LID techniques on a broader scale (Required to be submitted by March 31, 2011, S9.E.4.b)	Y		See SWMP Appendix B	See SWMP Appendix B

VII. Information Collection, BMP Evaluation, and Monitoring

Complete Part A for all annual reports.

NOTE: Please note in Row 1 of the table if you have no information to report.

NOTE: Please limit your entries to 255 characters per cell. You may include additional information in your Supplemental Documentation attachment and reference it below with the page number.

A. Information Collection

Briefly describe any stormwater monitoring, studies, or type of information collected and analyzed during the reporting period. (S8.B.1)	Who/how to contact for additional information?
1. No information to report.	
2.	
3.	
4.	
5.	
6.	

VII. Information Collection, BMP Evaluation, and Monitoring

Complete Part B for all annual reports.

B. SWMP Evaluation (S8.B & S9)

You are required to assess the appropriateness of the BMPs you have selected to implement your SWMP. This evaluation is necessary to evaluate whether the MEP standard set by the permit is protective of water quality in your receiving water bodies. This assessment may be entirely qualitative. Answer **NA** if you are not yet implementing BMPs for a component of the SWMP. (S8.B.2 and S9)

Question	Y/N/NA	Comments (50 word limit)
1. Are the BMPs selected and implemented for Public Outreach appropriate to minimize pollutants in the MS4 to the MEP?	Y	
2. Are the BMPs selected and implemented for Public Involvement appropriate to minimize pollutants in the MS4 to the MEP?	Y	
3. Are the BMPs selected and implemented for Illicit Discharge Detection and Elimination appropriate to minimize pollutants in the MS4 to the MEP?	Y	
4. Are the BMPs selected and implemented for Construction Stormwater Pollution Prevention appropriate to minimize pollutants in the MS4 to the MEP?	Y	
5. Are the BMPs selected and implemented for Post-Construction Runoff Management appropriate to minimize pollutants in the MS4 to the MEP?	Y	
6. Are the BMPs selected and implemented for Good Housekeeping for Municipal Operations appropriate to minimize pollutants in the MS4 to the MEP?	Y	

VII. Information Collection, BMP Evaluation, and Monitoring

Complete Part C for all annual reports.

C. Changes in BMPs or objectives (S8.B)

If any of the BMPs or objectives is being changed, list the old BMP and objective, the new BMP and objective, and a justification for the change below. (S8.B.2., and S9)

NOTE: You may choose to attach additional documentation justifying Changes in BMPs or objectives. Note such attachments in the *Justification for change* field.

	Old BMP	Old Objective	New BMP	New Objective	Justification for Change
1	NA				
2					
3					
4					
5					
6					
7					

VII. Information Collection, BMP Evaluation, and Monitoring

D. Preparation for future, long-term monitoring

Complete section D for the fourth annual report only.

Question	Y/N/NA	Comments (50 word limit)	Name of Attachment? Page Number?
1. Identified outfalls or conveyances for long-term stormwater monitoring? (S8.C.2.a)	NA	S.8.C.1.a requires that City's with populations greater than 10,000 shall identify sites for long term monitoring. The City of Duvall population is less than 10,000 and is exempt from this requirement.	
1b. Attach site maps and descriptions. (S8.C.2.a)	y		See SWMP Appendix C for effectiveness monitoring locations.
2. Identified at least two questions for SWMP effectiveness monitoring and developed monitoring plans? (S8.C.2.b)	Y	See SWMP Appendix C for effectiveness monitoring questions.	
2b. Attach the proposed questions and monitoring plans for SWMP effectiveness monitoring. (S8.C.2.a.ii)	y		See SWMP Appendix C.
3. Monitoring plan developed for each question? (S8.C.1.b.iii)	Y	See SWMP Appendix C for effectiveness monitoring plan.	
3b. Attach a copy of the monitoring plan.	y		See SWMP Appendix C.
4. Identified sites in preparation for future, long-term monitoring? (S8.C.1.a., and S8.C.2.b)	NA	S.8.C.1.a requires that City's with populations greater than 10,000 shall identify sites for long term monitoring. The City of Duvall population is less than 10,000 and is exempt from this requirement.	
4b. Attach a summary of the status of site identification for long-term stormwater monitoring; proposed questions for SWMP effectiveness monitoring; and status of developing the SWMP effectiveness monitoring plans.	y		See SWMP Appendix C.

APPENDIX B: LOW IMPACT DEVELOPMENT (LID)

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LOW IMPACT DEVELOPMENT (LID)

Introduction

In accordance with Section S9.E.4 "Reporting Requirements" of the Permit, each permittee is responsible for evaluating the use of Low Impact Development (LID) measures. LID is a planning and engineering stormwater management approach applied at the parcel and subdivision scale that emphasizes conservation and use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely mimic pre-development hydrologic functions.

The City of Duvall (City) supports the use of LID measures. The City uses the King County Stormwater Design Manual (KCSWDM) to evaluate required stormwater improvements for development activities on the parcel and subdivision scale. The KCSWDM requires matching developed stormwater run-off to particular pre-development flow conditions. The KCSWDM also encourages LID practices by awarding credits/incentives that allow for the downsizing of flow control facilities required under King County's Core Requirement #3, Flow Control. The credits allow the designer to assume conditions that produce less runoff, thereby requiring smaller facilities. The use of LID components in small projects is also required as described in KCSWDM Appendix C, "Small Project Drainage Requirements."

The City goal is to promote the use of LID measures for all development projects. This goal is being pursued by identifying, promoting, and measuring LID use during the development design and permitting process. However, because of financial and physical constraints, there is no plan to require implementation of non-structural and LID techniques on a broader scale in the future beyond what is required in the KCSWDM.

LID Practices that are currently available

All LID practices identified in the KCSWDM are currently available for use within the City. Such development practices include:

- Full dispersion.
- Full infiltration.
- Limited infiltration.
- Basic dispersion.
- Rain gardens.
- Permeable pavement (non-grassed).
- Grassed modular grid pavement.
- Rainwater harvesting.
- Vegetated roofs.
- Wheel strip driveways.
- Minimum disturbance foundation.
- Open grid decking over pervious area.
- Native growth retention.
- Perforated pipe connections.
- Others as identified.

The City has also identified potential non-structural actions and LID techniques to reduce stormwater impacts. These actions include:

- Prioritization of resources for cleaning streets and catch basins. The City plans to evaluate stormwater pollutant removal effectiveness from street sweeping and catch basin cleaning as part of the next permit cycle. This evaluation will help better prioritize street sweeping and catch basin cleaning to more effectively use resources to remove pollutants from the stormwater system.
- Use of check dams and vegetation within open stormwater conveyances.

Possible Future Incentives to Promote LID Practices

The City of Duvall supports the use of LID practices and has considered potential incentives to promote LID implementation. The City plans to evaluate possible future incentives that could include:

- Providing maximum credits and flexibility for storm water systems as allowed within the KCSWDM and City codes, standards, and requirements.
- Priority permit processing for projects that include LID approaches.
- Adjustments to required landscape components to provide additional area for LID implementation.

Identified Barriers to the use of LID

In accordance with Section S9.E.4, the City of must identify barriers to the use of LID and provide measures to address each barrier. Several of the more frequently used LID measures are not generally feasible within the City because of local geologic, topographic, and hydrologic conditions. The City has identified the following barriers and methods to address each barrier in the following table:

LID Measure	Potential Barrier	Method to Address
Infiltration	-Relatively impermeable till soils (includes rain gardens).	Continue to recommend that developers consider infiltration if suitable soils are present.
Dispersion	-Steep slopes -lack of vegetated flow path	Continue to recommend that developers consider dispersion if adverse impacts from steep slopes are minimized and vegetated flow paths can be maintained.
Permeable Pavement	-Lack of longevity when compared with standard treatments -Higher maintenance and replacement costs	Continue to recommend that developers consider use of permeable pavements in low impact areas such as parking lots, trails or internal pathways.

APPENDIX C: PROPOSED SWMP EFFECTIVENESS MONITORING PLAN

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APPENDIX C: PROPOSED SWMP EFFECTIVENESS MONITORING PLAN

Introduction

In accordance with Section S8 "Monitoring" of the Permit, each permittee is responsible for compliance sampling and monitoring requirements. The City of Duvall's sampling and monitoring plan is based on guidance within the Department of Ecology (DOE) document titled "Monitoring and Reporting Guidance Phase II Municipal Stormwater Permits" (<http://www.ecy.wa.gov/pubs/1010030.pdf>, Publication no. 10-10-030, May 2010). Based on the guidance document and Permit:

- S8.A states that permittees are not required to conduct water sampling or other testing unless associated with TMDL requirements or illicit discharge. The TMDL requirements from Section S7 of the Permit do not apply to the City of Duvall (City) because there are no TMDL's listed for the City within Appendix 2 of the Permit. In addition, no water sampling has been required for illicit discharges to date.
- S8.B states that the annual report shall include a description of any completed monitoring or studies and an assessment of the appropriateness of the BMP's identified for each component of the SWMP. Based on the Permit and guidance document, the City is not required to complete any monitoring or studies.
- S.8.C states that the City shall prepare to participate in the implementation of a comprehensive long term monitoring program.
- S.8.C.1.a requires that City's with populations greater than 10,000 shall identify sites for long term monitoring. The City population is less than 10,000 and is exempt from this requirement.
- S.8.C.1.b requires that each city, town and county shall prepare to conduct monitoring to determine the effectiveness of the Permittees SWMP at controlling stormwater-related problems that are directly addressed by actions in the SWMP. The City has prepared a Proposed SWMP Effectiveness Monitoring Plan to address this requirement.

Proposed SWMP Effectiveness Monitoring Plan

The City has prepared a proposed SWMP Effectiveness Monitoring plan to satisfy the Permit S.8.C.1.b requirements. The plan includes identification of two suitable questions concerning the effectiveness of the SWMP and selection of sites where stormwater monitoring will be completed to evaluate the effectiveness questions. However, the City is considering participation in SWMP effectiveness monitoring proposed by the "Stormwater Work Group" (<http://www.ecy.wa.gov/programs/wg/psmonitoring/swworkgroup.html>). If approved by the DOE, the "Stormwater Work Group" approach includes group participation and funding to address overall questions concerning SWMP effectiveness to satisfy the Permit S.8.C.1.b requirements. The City would not complete evaluation of two effectiveness questions if it participates in the Stormwater Work Group" approach.

The City has identified two proposed questions concerning the effectiveness of the SWMP:

- 1) Can catch basin cleaning be prioritized to more effectively remove stormwater pollutants?
- 2) Is street sweeping more effective than catch basin cleaning for removal of stormwater pollutants?

The effectiveness monitoring plans for each of the two questions are presented below:

Question #1	Can catch basin cleaning be prioritized to more effectively remove stormwater pollutants?
Hypothesis	Catch basin sediment accumulation rates are directly affected by land use, road type, and street sweeping.
Location and Duration	The study location is throughout the entire City of Duvall. The study duration is expected to be 4 to 6 years.
Parameter to be measured	The parameter to be measured is sediment thickness in catch basins. Currently, approximately 95% of all catch basins within the City are inspected each year by the Public Works Department. The inspections include "stabbing" (measuring sediment thickness with an iron rod) and identifying catch basins with more than 6 inches of sediment for cleaning. This process will be revised to document annual measured catch basin sediment thickness at each catch basin and the sediment thickness remaining if cleaned. Annual changes in measured sediment thickness will be used to develop sediment accumulation rates for each catch basin.
Variables	Variables including land use, road type, and street sweeping will be characterized in the office using GIS mapping. Possible land use variables could include age (maturity) of adjacent development and density and type of adjacent development. Possible road type variables could include curb/gutter type, presence of landscape strips and/or sidewalks, and pavement age or condition. Possible Street Sweeping variables could include frequency and timing of street sweeping.
Evaluation of Hypothesis	The hypothesis will be tested by developing sediment accumulation rates at all catch basins from annual measurements over a period of years. The long term accumulation rates will then be evaluated with respect to identified variables to look for relationships between the variables and accumulation rates. Other variables identified during the evaluation will also be considered.
Anticipated results	The project will result in an understanding of catch basin sediment accumulation rates within the City. This understanding will allow catch basin cleaning prioritization for areas where catch basins have relatively high sediment accumulation rates. The study may result in general relationships between catch basin sediment accumulation rates and land use, road type, and street sweeping variables that could be utilized in other cities.
Anticipated Cost over 4 to 6 years	80 hours/year of Public Works Department time to more closely measure sediment thickness at the approximately 1,600 catch basins within the City. 100 hours/year of office time to develop sediment accumulation rates and characterize variables. 60 hours/year of office time to summarize results and create priority and frequency maps.
Expected Modification to SWMP	Expected modifications to the SWMP and management actions could include revisions to the catch basin cleaning schedules. Stormwater pollution control effectiveness may be increased by additional catch basin cleaning in areas with high sediment accumulation rates and reduced catch basin cleaning in areas with low sediment accumulation rates

Question #2	Is street sweeping more effective than catch basin cleaning for removal of stormwater pollutants?
Hypothesis	Street sweeping is relatively more effective than catch basin cleaning at removing silt and hydrocarbon pollution from the stormwater system.
Location and Duration	The study location is throughout the entire City of Duvall. Street sweeping is completed monthly in Duvall and the study duration is expected to be 12 months.
Parameter to be measured	The parameters to be measured are sediment grain size and hydrocarbon content. Sediment and hydrocarbon sampling will be completed each month immediately following sweeping activities. A representative bulk sample will be collected from the fresh sweepings each month (total of 12 samples per year). Representative samples will also be collected from material removed as part of our annual catch basin cleaning (one sample for each day of catch basin cleaning with at minimum of 6 samples). The presence of hydrocarbons within the bulk samples will be quantified using a PID (Photo Ionization Detector) or other laboratory testing. The presence of fine grained material (silt, clay, and organics) will be evaluated by laboratory grain size testing.
Variables	Variables may include the weather or season in which the sweeping samples were collected and possibly other variables not identified at this time. Variables that may be tracked include temperature and precipitation data.
Evaluation of Hypothesis	The hypothesis will be tested by comparing the mass of pollutants collected and removed by sweeping and the mass of pollutants collected and removed during catch basin cleaning. For the purpose of this study, the stormwater pollutants evaluated include only fine grained material (silt, clay, organics) and hydrocarbons. The total mass of pollutants collected will be based on the total volume of material collected (cubic yards) and percent concentration of evaluated pollutants.
Anticipated results	We anticipate that the project result will demonstrate that monthly street sweeping collects more fine grained materials and hydrocarbons than that removed from catch basins as part of the annual catch basin cleaning program. We also anticipate that the results will show that the material removed from catch basins as part of annual catch basin cleaning mainly consist of coarser grained materials (sand and gravel) which would suggest that fine grained and hydrocarbon pollutants are flushed from the storm system to enter downstream receiving waters.
Anticipated Cost	\$4,500 for laboratory evaluations (18 samples at \$250/sample for grain size and hydrocarbon evaluation). 60 hours of office time to summarize results.
Expected Modification to SWMP	Expected modifications to the SWMP and management actions could include more effective stormwater pollution removal by increasing street sweeping during periods where high pollutant levels are measured and possibly reductions in catch basing cleaning.