

**Stormwater Management Program
Snohomish County, Washington**

March 2013

**Prepared in partial fulfillment of requirements of the
National Pollutant Discharge Elimination System
(NPDES) Municipal Stormwater Permit**

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Introduction

This Stormwater Management Program, or SWMP, describes the actions that Snohomish County will take in 2013 to meet the requirements set forth in Section S5 of the National Pollutant Discharge Elimination System Phase 1 municipal stormwater permit (NPDES permit) in calendar year 2013. There are two NPDES permits that will be effective in 2013, both of which were issued on August 1, 2012. One permit is effective from September 1, 2012 to July 31, 2013, and the other is effective August 1, 2013 to July 31, 2018. For calendar year 2013, Snohomish County's actions under these permits are virtually identical.

The rest of this introductory section presents a basic background and history of the NPDES municipal stormwater permit. Each programmatic requirement of the permit is then discussed in turn.

The permit also contains specific requirements based in Total Maximum Daily Load plans, or TMDL plans. The permit states that a discussion of the County's responses to these requirements was to be contained in separate chapters or appendices to this SWMP. However, since virtually all of the TMDL requirements involve specific conditions placed on programs in the SWMP, the TMDL requirements are discussed in the SWMP.

The NPDES Phase 1 Municipal Stormwater Permit

The NPDES Phase 1 municipal stormwater permit was first issued in 1995 by the Washington State Department of Ecology (Ecology) to five municipalities: Snohomish County, King County, Pierce County, the City of Seattle, and the City of Tacoma. The permit was also issued to the Washington State Department of Transportation. In 1999, Ecology brought Clark County under coverage of the 1995 permit. In February 2007, Ecology reissued the Phase 1 permit, and also issued Phase 2 municipal stormwater permits, which have a reduced scope of requirements relative to the Phase 1 permits, to over 100 cities and counties in Washington.

In August 2012, Ecology reissued two sequentially effective Phase 1 permits: one with an effective period from September 1, 2012 to July 31, 2013, and one with an effective period of August 1, 2013 to July 31, 2018.

Both Phase 1 permits issued in August 2012 were appealed to the Washington State Pollution Control Hearings Board. All appeal issues and decisions are presented on the Ecology web site at:

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

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The Stormwater Management Program document

The permit requires the preparation and annual update of a Stormwater Management Program document. The main purpose of the SWMP document is to inform various audiences about the permit and what the County will do to comply with it. These audiences include the Department of Ecology, County elected officials, and the public.

The SWMP is not intended to serve as a single operational manual for all actions under the permit. Numerous other documents, such as Quality Assurance Plans for monitoring, maintenance standards for drainage systems, and specific field procedures for storm sewer inspections have been developed. Some of these are noted in the SWMP, and many of these documents are on the Snohomish County NPDES web site at:

http://www1.co.snohomish.wa.us/Departments/Public_Works/Services/NPDES/default.htm

The SWMP document is organized according to the sequence of requirements in condition S5C of the permit:

1. Legal Authority
2. Municipal Separate Storm Sewer System Mapping and Documentation
3. Coordination
4. Public Involvement and Participation
5. Controlling Runoff from New Development, Redevelopment, and Construction Sites
6. Structural Stormwater Controls
7. Source Control Program for Existing Development
8. Illicit Connections and Illicit Discharges Detection and Elimination (IDDE)
9. Operation and Maintenance Program
10. Education and Outreach Program

In addition to the operational or programmatic requirements contained in permit section S5, which pertains to the SWMP, monitoring requirements are contained in permit section S8, and in Appendix 2 of the permit which pertains to Total Maximum Daily Load (TMDL) Requirements. While not technically part of the SWMP requirements, actions taken pursuant to these monitoring requirements are discussed in section 11 of this SWMP.

For each requirement, the SWMP contains a summary of the permit requirements followed by the related actions Snohomish County will take, with a focus on actions to be taken in the current year (in this case, 2013). The summaries may not contain all details of the permit requirements, as the summaries are intended to facilitate general understanding by the targeted audiences, with a focus on the intended outcomes of the programs, or on programs with which the public is likely to come into contact or may

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wish to provide input. For example, several permit requirements involve administrative or recordkeeping processes, or state that all County staff who perform a task shall receive appropriate training. Typically, such requirements have not been included in the summaries. All permits and appendices are posted on Ecology's website at

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

In addition to the requirements listed above, which apply to the entire unincorporated portion of Snohomish County, the permit contains some more specific requirements pursuant to Total Maximum Daily Load plans, referred to herein as TMDLs. TMDLs are developed by the Washington State Department of Ecology in response to documented violations of specific state water quality standards in specific water bodies. For Snohomish County, the NPDES permit that expires on July 31, 2013 contains TMDL requirements related to fecal coliform bacteria in North Creek, Swamp Creek, and Snohomish River Tributaries. The permit effective August 1, 2013 to July 31, 2018 contains requirements for fecal coliform bacteria in these water bodies plus Little Bear Creek, and adds requirements related to fecal coliform bacteria, dissolved oxygen, pH, and mercury for the Stillaguamish River basin. These requirements are set forth in Appendix 2 of the NPDES permit. Each of the TMDL requirements is essentially an area-specific and pollutant-specific version of one of the programmatic requirements of the NPDES permit, Snohomish County has presented descriptions of the TMDL response actions in the SWMP. For reference, Table 1 shows the requirements of the TMDLs.

For further discussion of any of the County's NPDES programs, please contact Bill Leif at (425) 388-3148 or b.leif@snoco.org.

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Table 1 - NPDES permit TMDL Requirements

Snohomish Tributaries / North Creek / Swamp Creek	Little Bear Creek	Stillaguamish River	
<p><u>Business Inspections</u> Inspect all commercial composting facilities and commercial animal handling facilities in TMDL area to ensure implementation of stormwater pollution source control BMPs by August 1, 2016. Inspect facilities with identified fecal coliform problems every three years thereafter.</p>	<p><u>Business Inspections</u> Inspect all commercial composting facilities and commercial animal handling facilities in TMDL area to ensure implementation of stormwater pollution source control BMPs by August 1, 2016. Inspect facilities with identified fecal coliform problems every three years thereafter.</p>	<p><u>Business Inspections</u> Inspect all commercial composting facilities and commercial animal handling facilities in TMDL area to ensure implementation of stormwater pollution source control BMPs by August 1, 2016. Inspect facilities with identified fecal coliform problems every three years thereafter.</p>	
<p><u>Public Education and Outreach</u> Conduct public education and outreach activities to increase awareness of bacterial pollution problems and promote proper pet waste management behavior.</p>	<p><u>Public Education and Outreach</u> Conduct public education and outreach activities to increase awareness of bacterial pollution problems and promote proper pet waste management behavior, and install animal waste collection and/or education stations at County properties expected to have substantial dog and/or horse use.</p>	<p><u>Public Education and Outreach</u> Conduct public education and outreach activities to increase awareness of bacterial pollution problems and promote proper pet waste management behavior.</p>	
<p><u>IDDE Field Screening</u> Include fecal coliform bacteria in IDDE field screening performed in subbasins of the TMDL watersheds.</p>	<p><u>IDDE Field Screening</u> Conduct IDDE field screening for fecal coliform bacteria sources in high priority subbasins, or combine this work with surface water monitoring in accordance with the QAPP for the microbial water quality assessment program.</p>	<p><u>IDDE Field Screening</u> Conduct IDDE field screening for fecal coliform bacteria sources in 50% of rural subbasins, or combine this work with surface water monitoring in accordance with the QAPP for the microbial water quality assessment program. Implement source identification and elimination actions in MS4 subbasins, and implement required actions under S5.C.8.</p>	

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Table 1 - NPDES permit TMDL Requirements, continued

<p><u>Targeted Source Identification and Elimination</u></p> <p>By February 2, 2014, review fecal coliform data collected in accordance with the QAPP approved under the 2007 NPDES permit, and identify at least one high priority area for fecal coliform source identification and elimination. This requirement can be combined with surface water monitoring in accordance with the QAPP for the microbial water quality assessment program</p> <p>By August 1, 2014, begin to implement source identification and elimination actions in MS4 subbasins, and implement required actions under S5.C.8.</p>	<p><u>Targeted Source Identification and Elimination</u></p> <p>[No TMDL requirement]</p>	<p><u>Targeted Source Identification and Elimination</u></p> <p>[No TMDL requirement]</p>
<p><u>Surface Water Monitoring</u></p> <p>Review fecal coliform data collected in accordance with the QAPP approved under the 2007 NPDES permit and select at least one surface water monitoring location for continued characterization and long term trend evaluation of fecal coliform bacteria concentrations.</p> <p>By Feb 2, 2015, submit QAPP to Ecology.</p> <p>By August 1, 2015, begin sampling per QAPP</p> <p>Submit data to Ecology annually by May 31</p>	<p><u>Surface Water Monitoring</u></p> <p>Select at least one surface water monitoring location for continued characterization and long term trend evaluation of fecal coliform bacteria concentrations.</p> <p>By Feb 2, 2015, submit QAPP to Ecology.</p> <p>By August 1, 2015, begin sampling per QAPP</p> <p>Submit data to Ecology annually by May 31</p>	<p><u>Surface Water Monitoring</u></p> <p>Select at least one surface water monitoring location for continued characterization and long term trend evaluation of fecal coliform bacteria concentrations.</p> <p>By Feb 2, 2015, submit QAPP to Ecology.</p> <p>By August 1, 2015, begin sampling per QAPP</p> <p>Submit data to Ecology annually by May 31</p>

1. Legal Authority

Permit requirements

Snohomish County is required to demonstrate that it can operate pursuant to legal authority that authorizes or enables the County to control discharges to and from municipal separate storm sewers owned or operated by the County. This legal authority, which may be a combination of statute, ordinance, permit, contracts, orders, interagency agreements, or similar means, shall authorize or enable the County, at a minimum, to:

- Control through ordinance, order, or similar means, the contribution of pollutants to municipal separate storm sewers owned or operated by the County from stormwater discharges associated with industrial activity, and control the quality of stormwater discharged from sites of industrial activity;
- Prohibit through ordinance, order, or similar means, illicit discharges to the municipal separate storm sewer owned or operated by the County;
- Control through ordinance, order, or similar means, the discharge of spills and the dumping or disposal of materials other than stormwater into the municipal separate storm sewers owned or operated by the County;
- Control through interagency agreements among co-applicants, the contribution of pollutants from one portion of the municipal separate storm sewer system to another portion of the municipal separate storm sewer system;
- Require compliance with conditions in ordinances, permits, contracts, or orders; and,
- Within the limitations of state law, carry out all inspection, surveillance, and monitoring procedures necessary to determine compliance and non-compliance with permit conditions, including the prohibition on illicit discharges to the municipal separate storm sewer and compliance with local ordinances.

In addition to this generally stated legal authority requirement, the permit requires the County to adopt new legal requirements related to land development by June 1, 2015, and new legal requirements related to pollution source control and illicit discharge control by February 2, 2018.

Stormwater management program

Snohomish County relies on a mixture of codes, contracts, and interlocal or interagency agreements to meet the basic requirements set forth in permit section S5C1. This requirement is essentially the same as that of the previous permit.

Stormwater regulations related to new development and redevelopment are embodied in several chapters of Snohomish County Code (SCC) Title 30, in the County's Engineering Design and Development Standards, and in the Snohomish County Drainage Manual. The stormwater permit effective on August 1, 2013 requires significant revisions to

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existing County regulations by June 15, 2015. The County began revising the regulations in 2012.

County stormwater regulations related to water quality, prevention of water pollution, and requirements for stormwater facility maintenance are contained in Chapter 7.53 SCC and Volume IV of the Snohomish County Drainage Manual. Minor revisions to Chapter 7.53 SCC are required by February 2, 2018. The County began the required revisions in 2012, and anticipates adoption of the regulations by the end of April 2013.

All chapters of Snohomish County Code are available at:

http://www1.co.snohomish.wa.us/County_Services/county_code.htm

The Snohomish County Engineering Design and Development Standards are available at:

http://www1.co.snohomish.wa.us/Departments/Public_Works/Divisions/TES/ProgramPlanning/EDDS/

The Snohomish County Drainage Manual is available at:

http://www1.co.snohomish.wa.us/Departments/Public_Works/Divisions/SWM/Work_Areas/drainagemanual.htm

The County is not a co-applicant with any other NPDES municipal permittee and thus does not have any related interlocal agreements.

2. Municipal Separate Storm Sewer System Mapping and Documentation

Permit requirements

The County must have an ongoing program to map and document the County's municipal storm sewer, including known County storm sewer outfalls, receiving waters (other than groundwater), stormwater treatment and flow control facilities owned, operated, or maintained by the County, geographic areas served by the County's storm sewer that do not discharge stormwater to surface water, certain tributary conveyances and connections described in the permit, connections between the County storm sewer and storm sewers of other municipalities or public entities, and connections authorized or allowed by the County after February 16, 2007.

Mapping of certain tributary conveyances and connections specified in the permit must be performed by December 31, 2017.

Stormwater management program

Snohomish County is implementing an ongoing program as described above. Further, the County developed a GIS-based map and database system containing information about the drainage system within the unincorporated urban growth areas. This system includes information about storm sewer structures and facilities, including their location, elevation, material, type, size, and condition. Schematic maps of the County drainage system are available on the internet at:

http://www.co.snohomish.wa.us/PWApp/SWM/drainage_maps/index.html.

3. Coordination

Permit requirements

Snohomish County must implement coordination mechanisms among County departments to eliminate barriers to compliance with the terms of this permit.

The County must also coordinate stormwater-related policies, programs and projects with other NPDES municipal permittees with which the County shares one or more watersheds.

Stormwater management program

On February 4, 2008, the Snohomish County Executive issued Executive Order 2008-49 requiring department directors or their designees to attend twice-annual meetings at which NPDES issues will be discussed. These meetings are typically held in April and October.

Snohomish County participates in a variety of coordination efforts with other NPDES municipal permittees. Permit coordinators from the seven Washington State Phase 1 permittees meet bimonthly to discuss permit implementation issues. Also, Snohomish County meets in a separate bimonthly meeting that includes the NPDES Phase 2 permittees in or adjacent to Snohomish County, Ecology staff, and other Phase 2 permittees from the north Puget Sound area.

4. Public Involvement and Participation

Permit requirements

Snohomish County must provide ongoing opportunities for the public to participate in processes involving the development, implementation and update of the SWMP, including a process for consideration of public comments on the SWMP. The County must make the SWMP and all other submittals required by this permit available to the public, and must post the SWMP and annual reports on the County website.

Stormwater management program

The County performs the actions described above. SWMPs and annual reports are posted on the County's NPDES website at:

http://www1.co.snohomish.wa.us/Departments/Public_Works/Services/NPDES/default.htm

5. Controlling Runoff from New Development, Redevelopment, and Construction Sites

Permit requirements

The permit effective on August 1, 2013 requires extensive and specific revisions to County codes, engineering standards, and the County Drainage Manual, primarily to expand implementation of low impact development (LID) practices. These code revisions, described in detail in Special Condition S5C5 of that permit, must be effective by July 1, 2015.

In addition to the code revisions described above, the County must review its development codes to identify revisions that would facilitate making LID as the preferred and commonly used development approach. The range of issues considered in this review must include those outlined in *Integrating LID into Local Codes: A Guidebook for Local Governments* (Puget Sound Partnership, 2011).

Finally, the County must conduct a watershed-scale stormwater planning project to identify a stormwater management strategy or strategies that would result in hydrologic and water quality conditions that fully support “existing uses” and designated uses” as defined in Washington Administrative Code (WAC) 173-201A-020. This project, described in detail in Special Condition S5.C.5.c of the permit, must be completed and documented by October 1, 2016.

Stormwater management program

As described in Section 1 – Legal Authority, Snohomish County is in the process of revising its land development regulations to meet the requirements of the permit.

The County is also in the early stages of developing a stormwater basin plan that meets the requirements of the permit.

6. Structural Stormwater Controls

Permit requirements

[Note: the following description is from the permit effective August 1, 2013. The requirements for the current permit are similar.]

Snohomish County must implement a Structural Stormwater Control Program to prevent or reduce impacts to waters of the state caused by discharges from the County's storm sewer system. The program shall address disturbances to watershed hydrology and stormwater pollutant discharges, and shall consider impacts caused by stormwater discharges from areas of existing development, including runoff from highways, streets and roads owned or operated by the County, and areas of new development where impacts are anticipated as development proceeds.

The County must consider projects such as:

- New flow control facilities, including LID BMPs;
- New water quality treatment or combined treatment and flow control facilities;
- retrofitting existing stormwater flow control or treatment or combined facilities;
- property acquisition for water quality and/or flow control benefits (not associated with future facilities);
- maintenance with capital construction costs equal to or greater than \$25,000.

The program should also consider other means to address impacts such as:

- riparian habitat acquisition;
- restoration of forest cover and riparian buffers;
- floodplain reconnection projects on water bodies that are not flow control exempt per Appendix 1;
- capital projects related to the MS4 which implement an Ecology-approved basin or watershed plan; and
- other actions to address stormwater runoff into or from the MS4 not otherwise required in Special Condition S5.C.

In-stream culvert replacement or channel restoration projects are not eligible to count towards compliance with this permit requirement.

The Structural Stormwater Control program may also include a program designed to implement small scale projects that are not planned in advance.

The planning process used to develop the program shall include:

- geographic scale of the planning process;
- issues and regulations addressed;
- steps in the planning process;
- types of characterization information considered;
- implementation budget;

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- public involvement process; and the prioritization process, procedures, and criteria used to select the projects comprised by the program.

Stormwater management program

The 2013 Structural Stormwater Control Program is described in a stand-alone document available on the Snohomish County NPDES Home Page at the link titled "Stormwater Management Program documents and annual reports." The NPDES Home Page is at:

http://www1.co.snohomish.wa.us/Departments/Public_Works/Services/NPDES/default.htm

7. Source Control Program for Existing Development

Permit requirements

Snohomish County must implement a program to reduce pollutants in runoff from areas that discharge to the County storm sewer. The program has three main elements. First, the County must include implementation and enforcement of Chapter 7.53 SCC – Water Pollution Control and Snohomish County Drainage Manual Volume IV – Source Control. Second, the County must develop an inventory of businesses and properties that have the potential to generate polluted discharges to the County’s storm sewer, and must annual conduct a number of inspections equal to 20% of the number of businesses and properties in the inventory. The County may select which businesses and properties to include in the inspection program each year, and is not required to inspect all businesses and properties in the inventory within the 5-year term of the permit. Third, the County must investigate all businesses and properties identified through legitimate complaints.

Stormwater management program

Snohomish County is revising SCC Chapter 7.53 to contain several minor revisions required by the permit effective August 1, 2013. These revisions should be adopted by early May 2013.

The County continues to implement a business inspection that complies with the permit and to investigate all legitimate water quality complaints.

8. Illicit Connection and Illicit Discharge Detection and Elimination

Permit requirement

The County must continue implementation of a program to prevent, detect, characterize, trace, and eliminate discharges and connections to the County storm sewer that are prohibited by County code. The program must include a “field screening” program to detect prohibited connections and discharges to the storm sewer. Field screening is the term used in the permit to mean a systematic dry-weather inspection of a location in the storm sewer, including both visual inspection of the storm sewer and chemical analysis of water if it is present. During the 5-year term of the permit effective August 1, 2013, the County must screen all storm sewer conveyances within the urban / higher density rural subbasins that were not screened between February 2007 and July 31, 2013.

The County must also continue to operate a water quality complaint phone line.

The County must investigate a report of a prohibited connection within 21 days of the report, and must use enforcement authority in a documented effort to eliminate the prohibited connection within 6 months. All prohibited connections to the MS4 must be eliminated. In addition, the County must contact Ecology immediately upon discovering a prohibited connection that presents a severe threat to human health or the environment.

The County must have either begun participation in a regional emergency response program, or have developed and implemented procedures to investigate and respond to spills and improper disposal into the County’s storm sewer.

Stormwater management program

As noted above, Snohomish County is in the process of revising Chapter 7.53 SCC to meet the requirements of the permit effective August 1, 2013. The County’s field screening and pollution investigation program are described in the Source Control Program document posted at:

http://www1.co.snohomish.wa.us/Departments/Public_Works/Services/NPDES/default.htm

Members of the public can report potential or observed water quality problems by calling the dedicated water quality complaint phone number at 425-388-6481. In addition, the County has placed information about water quality and water pollution at:

http://www1.co.snohomish.wa.us/Departments/Public_Works/Divisions/SWM/Work_Areas/Water_Quality/

This web page contains an e-mail link for communicating with a staff member of Snohomish County Surface Water Management.

9. Operation and Maintenance Program

Special Condition S5.C.9 contains requirements for operation and maintenance of stormwater facilities, roads, and properties owned and operated by Snohomish County. There are six main requirements, each discussed below in concert with the County's associated SWMP actions.

A) Adoption of stormwater facility maintenance standards

Permit requirements

Snohomish County must implement maintenance standards equivalent to those specified in Chapter 4 of Volume V of the 2005 Stormwater Management Manual for Western Washington. For existing facilities which do not have maintenance standards, the County shall develop a maintenance standard.

Stormwater Management Program

Snohomish County adopted maintenance standards in the form of revisions to the 2010 Snohomish County Drainage Manual, and will continue to implement those standards.

B) Maintenance of privately-owned stormwater facilities that drain to the County's storm sewer

Permit requirements

Snohomish County must implement regulations requiring maintenance, according to the adopted standards, of privately-owned stormwater flow control facilities, treatment facilities, and catch basins that discharge to the County's storm sewer. These regulations must require annual inspections of those structures. The County must either perform the inspections and needed maintenance, or ensure that such work was done by means of credible documentation, provided that these responsibilities are limited to facilities to which the County can legally gain access.

The County must also implement a program to inspect all new permanent stormwater treatment and flow control facilities, including catch basins, in new residential developments every 6 months during the period of heaviest construction, and enforce compliance with maintenance standards as needed.

Stormwater Management Program

The County has implemented such a program and will continue to do so in 2013.

C) Maintenance of stormwater facilities owned or operated by Snohomish County

Permit requirements

Snohomish County must implement a program to annually inspect all of its permanent stormwater treatment and flow control facilities (other than catch basins), and maintain them in accordance with adopted standards. The annual inspection requirement may be reduced based on inspection records as described above.

The County must implement a program to conduct spot checks of potentially damaged permanent treatment and flow control facilities (other than catch basins) after major storm events (defined as those with a 24-hour duration and a 10-year recurrence interval). If spot checks indicate widespread damage/maintenance needs, the County must inspect all stormwater treatment and flow control facilities that may be affected, and conduct repairs or take appropriate maintenance actions.

Stormwater Management Program

The County has implemented such a program and will continue to do so in 2013.

D) Maintenance of catch basins owned or operated by Snohomish County

Permit requirements

Snohomish County must implement a program to annually inspect catch basins and inlets owned or operated by the County. Inspections may be conducted on a “circuit basis” whereby a sampling of catch basins and inlets within each circuit is inspected to identify maintenance needs. If such inspections indicate maintenance is needed, the County must clean all catch basins within the circuit. Alternatively, the County may inspect all catch basins, and clean only catch basins where cleaning is needed to comply with maintenance standards.

The County must dispose of “vactor decant water” (water collected from stormwater facilities by eductor or “vactor” trucks) in accordance with the requirements of Appendix 6 of the permit.

Stormwater Management Program

The County has implemented such a program and will continue to do so in 2013.

E) Operation and maintenance of County roads

Permit requirements

Snohomish County must implement practices to reduce stormwater impacts associated with runoff from its parking lots and roads. The established practices must address:

- pipe cleaning;
- cleaning of culverts that convey stormwater in ditch systems;
- ditch maintenance;
- street cleaning;
- road repair and resurfacing, including pavement grinding;
- snow and ice control;
- utility installation;
- maintenance of roadside areas, including vegetation management;
- dust control; and
- pavement striping maintenance.

Stormwater Management Program

The County has implemented such a program and will continue to do so in 2013.

F) Operation and maintenance of County properties

Permit requirements

Snohomish County must establish and implement policies and procedures to reduce pollutants in discharges from properties owned or maintained by the County that are subject to this permit. Such properties include parks, open space, road right-of-ways, maintenance yards, and stormwater treatment and flow control facilities. The policies and procedures must address:

- application of fertilizer, pesticides, and herbicides, including the development of nutrient management and Integrated Pest Management Plans;
- sediment and erosion control;
- landscape maintenance and vegetation disposal;
- trash management; and
- building exterior cleaning and maintenance.

The County must develop and implement a Stormwater Pollution Prevention Plan (SWPPP) for all County heavy equipment maintenance or storage yards and County material storage facilities located in areas subject to this permit, that are not covered under by another Ecology issued stormwater discharge permit. Implementation of non-structural BMPs shall begin immediately after the pollution prevention plan is developed. A schedule for implementation of structural BMPs shall be included in the SWPPP. Generic SWPPPs that can be applied at multiple sites may be used to comply with this

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requirement. The SWPPP shall include periodic visual observation of discharges from the facility to evaluate the effectiveness of BMPs.

Stormwater Management Program

The County has implemented such a program and will continue to do so in 2013.

10. Education and Outreach Program

Permit requirements

The permit effective between January 1, 2013 and July 31, 2013 requires continuation of the education and outreach program required under the previous permit. The permit effective between August 1, 2013 and December 31, 2013 requires a very similar program, described below.

The County shall implement or participate in an education and outreach program that uses a variety of methods to target the audiences and topics listed below. The outreach program shall be designed to educate each target audience about the stormwater problem and provide specific actions they can follow to minimize the problem.

To build general awareness, the County shall target the following audiences and subject areas:

(1) General public (including school age children), and businesses (including home-based and mobile business):

- General impacts of stormwater on surface waters.
- Impacts from impervious surfaces.
- Impacts of illicit discharges and how to report them.
- LID principles and LID BMPs.
- Opportunities to become involved in stewardship activities.

(2) Engineers, contractors, developers, and land use planners:

- Technical standards for stormwater site and erosion control plans.
- LID principles and LID BMPs.
- Stormwater treatment and flow control BMPs/facilities.

To effect behavior change, Permittees shall target the following audiences and BMPs:

(1) General public (which may include school age children) and businesses (including home based and mobile businesses):

- Use and storage of automotive chemicals, hazardous cleaning supplies, carwash soaps, and other hazardous materials.
- Equipment maintenance.
- Prevention of illicit discharges.

(2) Residents, landscapers and property managers/owners:

- Yard care techniques protective of water quality.
- Use and storage of pesticides and fertilizers and other household chemicals.
- Carpet cleaning and auto repair and maintenance.
- Vehicle, equipment, and home/building maintenance.

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- Pet waste management and disposal.
- LID principles and LID BMPs.
- Stormwater facility maintenance.
- Dumpster and trash compactor maintenance.

The County shall create stewardship opportunities and/or partner with existing organizations to encourage residents to participate in activities such as stream teams, storm drain marking, volunteer monitoring, riparian plantings and education activities.

The County shall measure the understanding and adoption of the targeted behaviors for at least one targeted audience in at least one subject area. No later than February 2, 2016 the County shall use the resulting measurements to direct education and outreach resources most effectively as well as to evaluate changes in adoption of the targeted behaviors. The County may meet this requirement individually or as a member of a regional group.

Stormwater management program

A) Overview

Snohomish County is developing its core NPDES stormwater education program around the following emphasis areas:

1. Residential Behaviors and Practices:
 - a. Pet Waste Management
 - b. Natural Yard Care
 - c. Septic Systems
 - d. Streamside Landowner Practices
2. Business Behaviors and Practices:
 - a. Mobile Business Practices
 - b. Home-Occupation Business Practices
3. General Public Understanding and Awareness:
 - a. Stormwater Outreach for Regional Municipalities
 - b. Puget Sound Starts Here Campaign
 - c. ECO-Net

These emphasis areas were developed through analysis of audiences and practices described in section S.5.C.10 of the 2007 Phase I Municipal Stormwater Permit, analysis of leading contaminants and the primary practices and audiences that produce those contaminants, and evaluation of various program implementation and management strategies.

The residential and business emphasis areas apply a social marketing approach to promote Best Management Practices (BMPs) among defined audiences. Since the 1970s,

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this approach has been used in many contexts including disease prevention, social services, and public safety.

Beginning in 2000, Snohomish County increasingly focused its efforts to apply a social marketing approach to non-point source pollution BMPs. Those early efforts, which were developed and implemented largely with funding from the Department of Ecology Centennial Clean Water Fund, produced substantive increases in adoption of specific BMPs among residents.

The stormwater permit mandates measurable changes in understanding and behavior among a broad suite of target audiences. The success of those previous social marketing efforts, and the quantitative results they produced, suggest that this strategy is the most efficient and the most likely to succeed in meeting the permit goals.

B) Emphasis areas and targets

1) Residential Behaviors and Practices

1a) Pet Waste Management

Target pollutants and limiting factors:

- Bacteria
- Non-bacterial pathogens
- Nitrogen and phosphorus

Target audiences:

- Dog owners in high density residential areas
- Veterinary professionals

Target practices:

- Pet waste cleanup in backyards and disposal

1b) Natural Yard Care

Target pollutants and limiting factors:

- Primary:
 - Pesticides – herbicides, insecticides, rodenticides
 - Nitrogen and phosphorus – fertilizers, animal waste
- Secondary:
 - Temperature
 - Bacteria
 - Non-bacterial pathogens
 - Flow/volume

Target audiences:

- Primary:
 - Homeowners - single family residential
 - Renters - single family residential
 - Nurseries and related businesses
- Secondary:
 - Landscaping businesses, gardeners

Target practices:

- Primary:
 - Landscaping, gardening, yard care
- Secondary:
 - Stormwater infiltration

1c) Septic Systems

Target pollutants:

- Bacteria
- Non-bacterial pathogens
- Nitrogen and phosphorus

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Target audiences:

- On-site sewage disposal system owners outside Urban Growth Areas

Target practices:

- On-site sewage disposal system operation and maintenance

1d) Streamside Landowner Practices

Target pollutants and limiting factors:

- Bacteria
- Non-bacterial pathogens
- Pesticides – herbicides, insecticides, rodenticides
- Nitrogen and phosphorus – fertilizers, animal waste
- Temperature
- Dissolved oxygen
- Sediment
- Flow/volume

Target audiences:

- Owner/residents of streamside properties in the Lake Washington and Snohomish River Watersheds

Target practices:

- Stream shoreline management
- Riparian vegetation management
- Development activity
- Landscaping, gardening, yard care
- Livestock management
- Impervious surfaces
- Erosion control
- Stormwater infiltration/detention

2) Business Behaviors and Practices

2a) Storefront Business Education

Target pollutants and limiting factors:

- Petroleum
- Solid waste
- Manure

Target audiences:

- Commercial and industrial facilities
- Multi-family, condo and mobile home facilities
- Churches, schools and similar facilities that involve uses of property for other than residential purposes
- Commercial animal handling

Target practices:

- Spill kits

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- Spill plan
- Training for employees
- Emergency spill procedures
- Proper work (BMP) practices
- Manure removal
- Drainage control
- Solid waste discharge

2b) Home-Occupation and Mobile Business Practices

Target pollutants and limiting factors:

Business Type	Organics	Sediment	Trash & Debris	Oil & Grease	Nutrients	Metals	Solvents/ Soap/ Cleaners	Bacteria
Auto Detailing & Fleet Washing		x	x	x		x	x	
Carpet Cleaning	x	x					x	x
Window Washing		x					x	
Janitorial Services	x	x	x	x	x	x	x	x
Drain/Gutter Cleaning	x	x	x		x	x		
Pressure Washing & Steam Cleaning	x	x	x	x	x	x	x	x
Restaurant Vent Cleaners	x		x	x	x	x	x	x
Grease Recyclers	x		x	x	x			x
Swimming Pool Cleaners	x	x			x		x	x
Construction-Related (Drywall/Painters/Masonry)		x	x					
Landscapers	x	x	x	x	x	x	x	x

Figure 1. Common Pollutants by Industry Type.

Target audiences:

- Home occupations that have the potential to generate pollution as part of the business activity
- Carpet cleaners
- Window washers
- Pressure washers

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- Steam cleaning
- Fleet managers
- Auto detailing
- Duct cleaning
- Mobile businesses that have potential to pollute surface water

Target practices:

- BMP knowledge and implementation.
- Discharges of contaminants
- Industry specific BMPs

C) Phasing

The emphasis programs are intended to follow a common programmatic path:

1. Formative Research
2. Program Development
3. Pilot Program Fielding and Evaluation
4. Program Refinement for Landscape Level Implementation
5. Landscape Level Program Fielding and Adaptive Management

At this point in time, each emphasis program is at a different stage on that path (Figure 1).

The long term goal is to implement each emphasis program at the landscape level. At that point ongoing education and adaptive management will guide program refinement over time.

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		2009	2010	2011	2012	2013
Residential	Streamside Landowners	Implement- ation	Implement- ation	Follow-up	Implement- ation	Follow-up
	Pet Waste Management	Implementation				
	Natural Yard Care	Program dev.	Program dev./piloting	Implementation		
	Septic Systems	Piloting		Implementation		
Business	Mobile Businesses		Program dev.	Piloting		Implement- ation
	Home Occupation & Mobile Business	Piloting		Implementation		
Awareness and Understanding	STORM	Implementation				
	Puget Sound Starts Here	Prog dev.	Implementation			
	ECO-Net	Implementation				

Figure 2. Implementation schedule.

D) Education to Achieve Behavior Change

Section S.5.C.10 of the stormwater permit mandates a program that goes beyond conventional education to one that motivates and measures behavior changes in targeted audiences. Awareness programs play a key role in any comprehensive education program. The permit’s goal of behavior change, however, requires a heightened approach since the prevailing body of evidence indicates that awareness alone rarely produces desired changes in behaviors and practices.

The emphasis programs are, therefore, designed not as conventional education programs with the goal of conveying information and awareness, but rather as behavior change programs with the goal of motivating BMP implementation by target audiences.

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In cases where full audience understanding of an issue is not necessary to produce BMP implementation, the County will focus on other motivators, beyond awareness and understanding, to produce the desired behavior change.

In other cases, awareness and understanding of an issue is an essential step on the path to behavior change. In those instances, the County will rely on conventional education as just one of several steps. It occurs within a progression from 1) *information/awareness* to 2) *education/understanding* to 3) *technical assistance/facilitated action* to 4) *sustained independent BMP implementation*.

Programs developed and implemented under this plan are intended to methodically address entire target audiences rather than self-selected subsets. Examples of this strategy include Snohomish County's Streamside Landowner Program, which has produced repeated contact with every residential streamside property owner in Snohomish County, and the County's pet waste management program, which is designed to contact every veterinarian and every homeowner within the target area.

This is in contrast to most conventional education programs, which serve self-selected audiences instead of the broader populations mandated by the permit.

The County's large and geographically diverse population requires a landscape-scale approach. In this approach, the County anticipates conducting direct contact with strategic portions of certain audiences in phases, while relying on standard marketing practices to disseminate messages across broader populations.

E) Education to Promote Public Awareness and Understanding

Section S.5.C.10 of the stormwater permit mandates a program designed to improve general public understanding and awareness of stormwater issues. To that end, and to ensure that County efforts, messages, recommended practices, and communications are consistent with other stormwater entities, Snohomish County is an active participant in the STORM Coalition.

STORM (STormwater Outreach for Regional Municipalities) is a coalition of more than sixty county and city governments collaborating to implement stormwater permit public education efforts at regional and local scales. Snohomish County staff co-chairs the coalition. Funding for the work of STORM came from the Department of Ecology, with match furnished by the partnering municipalities in the form of staff time. In 2008, STORM combined resources with the Puget Sound Partnership to launch the *Puget Sound Starts Here* public education campaign.

On behalf of the STORM coalition, Snohomish County applied for and was awarded a Municipal Stormwater Grant of Regional or Statewide Significance by the Department of Ecology to continue and expand the work of STORM and the *Puget Sound Start Here* campaign.

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Snohomish County also co-chairs with WSU Extension, the Snohomish County ECO-Net group. ECO-Net is the Puget Sound Partnership's local coordination and communication network. The Snohomish County ECO-Net, which includes Snohomish County, WSU Extension, Snohomish Conservation District and other local organizations, is engaged and fostering partnerships on several stormwater awareness projects.

F) Program Evaluation

Implementation monitoring utilizes activity measures designed to evaluate whether activities were implemented as planned (Figure 2). These measures are typical of conventional education programs and are generally easy to apply. Typical measures include counts of site visits, workshops, participants, materials distributed, and the like. While activity measures do not provide a basis to measure progress toward the program goals, they are nonetheless valuable when evaluating program methods, efficiency, and finances. They are essential when evaluating task and program effectiveness, since variance in implementation may directly impact effectiveness.

Effectiveness monitoring is more challenging to accomplish, but is key to fulfilling the stated permit objectives for measurable behavior change. This type of monitoring is based on outcome measures, and will constitute the core of our program evaluation strategy.

Outcome measures are generally designed to evaluate whether program tasks produced the desired result. These measures, for example, would enable the County to determine if landowners are motivated to implement best management practices as a result of a workshop. This level of monitoring presumes that the expected outcome of program tasks will eventually lead toward achievement of the program's goals. In the case of stormwater BMPs the County will presume, based on a substantive body of peer-reviewed scientific research, that certain BMPs applied across a landscape will eventually lead to specific desired results (i.e., reduced bacterial contamination or lower turbidity).

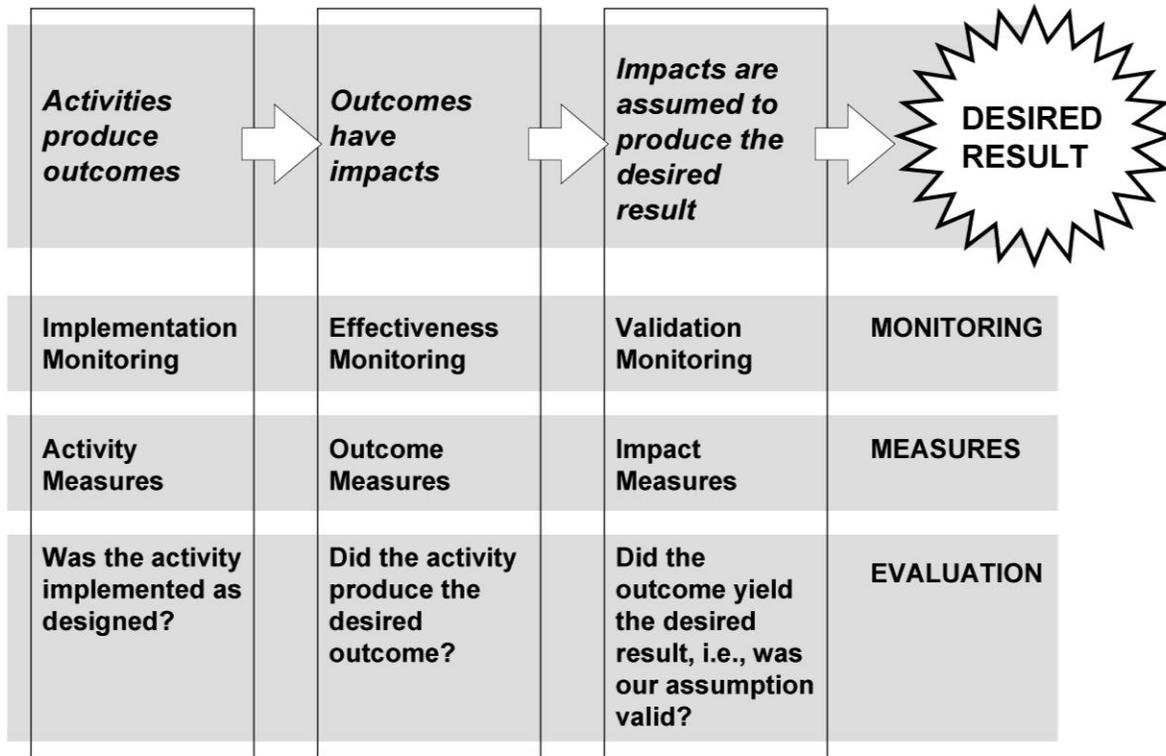


Figure 3. Monitoring measures and their relationships to a desired result.

These measures are generally more challenging to develop than activity measures because they often measure behavior patterns (in contrast to objects or tasks) and activities that are not verifiable through direct observation, and because the number of variables affecting the outcome often makes detection of direct correlations impossible.

Where possible, we will apply the following strategies to overcome these challenges:

- Use multiple measures to collectively evaluate progress.
- Avoid reliance on one measure for any given outcome.
- Use both qualitative and quantitative measures.
- Apply both task-level and program-level measures.
- Build measures directly into tasks where possible.
- Apply proxy measures where direct measures are not possible or practical.

Validation Monitoring focuses on impact measures designed to evaluate if the assumptions upon which the program tasks are based have validity. For example, such monitoring can be used to check the assumption that a specific BMP applied across a landscape will produce a desired water quality result. Where possible, the County will to build impact measures into the emphasis programs. However, the greater part of the County’s validation monitoring efforts are included in the program effectiveness monitoring required in permit section S8.

11. Monitoring (Permit Condition S8 and TMDL Requirements)

Permit requirements

The permit requires several kinds of stormwater monitoring in Special Condition S8. Monitoring for fecal coliform bacteria in streams is also required or suggested in Appendix 2 of the permit, which pertains to TMDLs.

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Monitoring under Special Condition S8

Monitoring for the permit that terminated in August 2012 has been completed, and all required reports were transmitted to Ecology. These reports are available at

http://www1.co.snohomish.wa.us/Departments/Public_Works/Services/NPDES/npdesreports_03-Dec-2010_07-28-09.htm

Monitoring pursuant to TMDL requirements

The current permit, which is effective until July 31, 2013, requires continuation and /or completion of TMDL-related monitoring as set forth in the previous permit. The permit that becomes effective on August 1, 2013 requires submittal of a draft Quality Assurance Project Plan in 2013 by February 2015 for monitoring that must begin no later than August 1, 2015.