

Attachment B

City of Seattle Program Evaluation and Other Activities Narrative for the 2008 Phase I Permit Annual Report Form

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I. Certification

I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly 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.



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This document contains the City of Seattle's (City) program narrative and other activities narrative (Attachment B) in support of the City's 2008 Phase I Permit Annual Report Form.

1. Changes in Authorization (G19.C)(S9.E.9)

There have been no changes to the duly authorized representative pursuant to G19.C at the City during 2008.

2. Actions Taken Pursuant to S4F (S9.E.3)

The City, through Seattle Public Utilities (SPU), provided notifications to the Department of Ecology under S4.F of potential water quality and/or sediment problems that may be related to discharges from the City's municipal separate storm sewer system (MS4). The City continues to apply and implement its programs for stormwater management and to seek improvement to those programs through increased understanding of stormwater impacts and mitigation tools. A summary of the notifications and the Washington Department of Ecology (Ecology) required actions under S4.F.2 are detailed below.

2.1 General Notification for MS4

This S4.F notification was submitted in 2007 and represented a general notification in regard to the City's MS4 and the possible influence of the MS4 upon the water quality problems in receiving waters, related to urbanized areas highly altered from a pre-developed state as a result of development and human activities. Ecology responded February 11, 2008, that the general notification under S4.F is not site-specific and that the City broadly stated that receiving waters do not meet all applicable standards, and that municipal stormwater may or may not be contributing to those conditions. Ecology went on to state that in accordance with the Phase I Permit, the City will submit a new S4.F notification when the City receives site-specific information that municipal stormwater is causing or contributing to a violation of Water Quality Standards. Ecology did not require a report under S4.F.2

2.2 Notification for Lower Duwamish River.

This S4.F notification was submitted in 2007 to notify Ecology of potential water quality and/or sediment problems that may be related to discharges from the City's MS4 for the Lower Duwamish River. Ecology determined that a report under S4.F.2.a was not necessary, with that determination conditioned on certain City actions. Ecology required the City, beginning with its Phase I Permit Annual Report for 2008, to include a summary of its stormwater management efforts in basins that discharge to the Lower Duwamish River. The City must notify Ecology if Seattle's involvement in CERCLA and associated Source Control Strategy processes change or new information becomes available regarding phthalate recontamination in the Lower Duwamish Waterway.

The Lower Duwamish River extends from approximately the north end of Harbor Island in the City of Seattle to the upper turning basin in the City of Tukwila. This area is subject to and is undergoing, contaminated sediment studies and cleanup actions governed by Federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and State Model Toxics Control Act (MTCA) cleanup laws. This area includes the East and West Waterway operable units of the Harbor Island Superfund site and the Lower Duwamish Waterway (LDW) Superfund site. The City of Seattle and others are conducting source control activities on adjacent upland public and private properties. As explained in the notification letter,

Source Control activities are organized and prioritized across drainage areas to minimize the possibility for recontamination of the waterway.

Regarding City stormwater management efforts in basins that discharge to the Lower Duwamish River, the City implements several source tracing programs with specific emphasis to the Lower Duwamish Waterway. These programs include:

- **Business Inspections:** In support of the clean-up effort, multi-media inspections are conducted, which cover stormwater pollution prevention, hazardous waste management and industrial waste management. In 2008, 98 inspections were conducted with the Lower Duwamish Waterway Basin (68 within the LDW and 30 within East Waterway (EWW)). Each business is inspected for compliance with the City's Stormwater Code and required to be brought into compliance with all relevant best management practices (BMP) for source control. Approximately 13 sites were referred to Ecology for potential NPDES Industrial Stormwater permit coverage.
- **Stormwater Facility Inspections:** While inspecting a business for source control BMPs, the flow control and/or treatment facility is also inspected. Within the LDW and EWW basins, 5 sites were inspected for Code compliance with regard to flow control and treatment system code requirements.
- **Illicit Discharge Detection and Elimination (IDDE):** SPU conducts sediment sampling of onsite catch basins, right of way catch basins and drainage system mainlines to identify sources of contamination and potential illicit discharges and illicit connections. Sampling is conducted in tandem with business inspections to identify and terminate sources of pollution. In 2008, SPU took 122 samples to assist in identifying and source tracing sources of pollution. Samples are analyzed for the LDW contaminants of concern, including TOC, SVOC's, TPH-Dx, select Metals, PCB's, Grain Size and occasionally site specific parameters, such as pH, additional metals, VOC's.
- **Water Quality Complaints:** Inspectors respond to complaints as they are received through the water quality hotline, web form or from agency referrals. In 2008, 26 water quality complaints were reported in the LDW and EWW basins. When a complaint is reported at a business, a full business inspection is completed.
- **Spill Response:** Spills are dispatched through the SPU Operations Response Center to on-call Spill Coordinators as they are received. In 2008, SPU responded to 16 spills within the LDW and EWW basins, including the 50,000 gallon tank failure at Industrial Plating, located at 2441 6th Avenue South (described in 2.3 below). When spills reach the MS4, a contractor is used to clean up and remove the contamination.
- **Education and Outreach:** SPU funds the Resource Venture, a conservation service for Seattle businesses. Resource Venture implements the City's Spill Kit Incentive Program, which provides free spill kits, assistance in developing spill plan and site specific technical assistance to Seattle businesses. Approximately 128 businesses in the LDW and EWW basins received spill kits, either stemming from a business inspection or through targeted outreach.

Surveys conducted of spill kit recipients statistically show that businesses who participate in this program show an improved understanding of stormwater pollution prevention.

2.3 Duwamish East Waterway Electroplating Wastewater Tank Spill

A 55,000 gallon wooden tank holding electroplating wastewater at a private business failed in March 2008. Following a call by SPU, Ecology personnel arrived on site. SPU issued a Notice of Violation for the spill and conducted a business inspection that resulted in a corrective action letter. Because the private business drained to the City's MS4, the City submitted an S4.F notification to Ecology in April 2008.

Ecology determined that Seattle's response to the incident occurred as required in Special Condition S5.C.8.b.,viii and that a report under S4.F.2.a is not necessary because the incident was a spill, which is typically a one time event, and Seattle has taken steps regarding the second wooden tank of the property to ensure that another such spill was unlikely to occur. Ecology stated that the City should prioritize this facility, and others like it, for annual source control inspections under S5.C.7.

The City has developed its initial list of businesses to be inspected under S5.C.7 and has prioritized facilities that have high pollution generating activities.

2.4 Coho Pre-Spawn Mortality

The City provided S4.F notification in regard to the coho salmon (*Oncorhynchus kisutch*) pre-spawn mortality phenomenon in creeks to which the City's MS4 drains, including the possible influence of the MS4 upon water quality problems in receiving waters. Notification was provided in May of 2008, following general notification in December 2007. The City has worked with NOAA Fisheries, by providing direct financial support and City staff resources, to collaboratively investigate the causes of coho pre-spawn mortality (PSM) for the period 2000-2008. Information about the possible causes of PSM is evolving. Experts cannot definitively say what is causing PSM in coho in urban streams in Seattle.

Ecology determined that a report under condition S4.F.2.a was not necessary because the correlation between coho PSM and stormwater discharges is based upon urbanization and/or arterial roads, and a link to any single or combination of parameters that would be potentially present in stormwater has not yet been found. Ecology's determination that a S4.F.2.a report was not necessary is conditioned, based in part, on the following: the City will continue to be involved in investigating causes and/or collecting data associated with the coho PSM phenomenon; when the City becomes aware of the exact cause(s) of PSM, Ecology must be notified immediately; and should parameter-specific information about the cause(s) or contribution(s) to pre-spawn mortality become available, Ecology Reserves the ability to require a response under S4.F.2.a. Beginning with the Phase I Permit Annual Report for 2008, Seattle must include a summary of the reporting year's studies or findings associated with the coho PSM phenomenon.

As to such summary, in 2008, daily surveys of Longfellow creek produced 12 female coho of known spawning condition, of which 67% died prior to spawning, and predation did not appear to be the cause of death. The annual coho PSM rate in Longfellow Creek observed during 2002-2008 has ranged from 67% to 89%. Weekly spawning surveys were performed Thornton Creek but not in Longfellow Creek during 2008. The survey determined that there was only one confirmed coho PSM out of five adult coho carcasses (males and females).

Wild Fish Conservancy, under contract to SPU, has performed weekly surveys in five creeks in the City from 2002 to 2007. The observed rate of coho PSM from 2002 to 2007 averaged 82% for Thornton, 72% for Longfellow, 49% Piper's, and 39% for Fauntleroy. The adult coho entries have been too low in Taylor Creek to determine if coho PSM is occurring.

2.5 Seattle Creeks

The City in May 2008 provided S4.F notification to Ecology with regard to the possible influence of the MS4 upon water quality problems in urban creeks within the Seattle City limits. Recent reports had indicated that some creeks within the City did not meet all desired numeric and narrative water quality objectives. While not conclusive, specific information was provided for situations where there was a possible relationship between stormwater runoff from the MS4 and subsequent adverse impact to the receiving water.

Ecology determined in June 2008 that a report under condition S4.F.2.a is not necessary. Ecology observed, "Ecology recognizes that stormwater runoff is the number 1 water pollution problem in the urban areas of our state," and "The stormwater management program requirements and the associated minimum performance measures described in the Phase I Permit are intended to address the type of general stormwater pollution problems described in [the letter]." Ecology did not require any additional actions. Ecology stated, "Seattle must submit S4.F notifications whenever parameter-specific MS4 discharge data indicate a definitive cause or contribution to a water quality standard violation."

2.6 Seattle Small Lakes

The City in May 2008 provided S4.F notification to Ecology with regard to the possible influence of the MS4 upon water quality problems in small lakes within the Seattle City limits. Recent reports had indicated that some small lakes within the City did not meet all desired numeric and narrative water quality objectives. While not conclusive, specific information was provided for situations where there was a possible relationship between stormwater runoff from the MS4 and subsequent adverse impact to the receiving water.

Ecology determined in June 2008 that a report under condition S4.F.2.a is not necessary. Ecology observed, "Ecology recognizes that stormwater runoff is the number one water pollution problem in the urban areas of our state," and "The stormwater management program requirements and associated minimum performance measures described in the Phase I Permit are intended to address the type of general stormwater pollution problems described in [the letter]." Ecology did not require any additional actions. Ecology stated, "Seattle must submit S4.F notifications whenever parameter-specific MS4 discharge data indicate a definitive cause or contribution to a water quality standard violation."

2.7 Notification for Illicit Connections and/or Discharges

The City provided three (3) separate monthly notifications (May, June and July 2008) to Ecology with regard to illicit connections and discharges to the MS4 that may have caused or contributed to a violation of water quality standards in the receiving water body. The notifications stated that due to the nature of these discharges (i.e., small volume, short duration), many of these situations could not be traced to the MS4 outfall receiving water discharges so there is uncertainty as to whether the discharges had the potential to cause or contribute to a water quality problem in the receiving water.

Ecology determined that a report(s) under condition S4.F.2.a is not necessary. The stormwater management program requirements and associated minimum performance measures described in the Phase I permit for illicit connection discharge detection & elimination and for source control address the situation described in the notifications. Ecology did not require any additional actions.

2.8 Ravenna Creek Sewage Discharge

The City provided notification to Ecology about two (2) King County Wastewater Division discharges of sewage that reached a state waterway, Ravenna Creek, via the City's MS4. Sewage was discharged from a trunk line through a diversion gate during King County construction activities. The City contacted King County and issued a Notice of Violation to King County for the illicit discharge.

Ecology determined that a report under condition S4.F.2.a is not necessary because the City's response to this incident occurred as required in Special Condition S5.C.8.b.viii and the City had taken steps to ensure that the potential for future misuse of the diversion gate was minimized.

Ecology suggested that the City should evaluate the appropriateness of posting visible complaint reporting signage in potential trouble spot locations where public uses in the vicinity are likely. In addition, Ecology stated that Seattle must include an evaluation of the appropriateness of the City's publicizing of the citizen complaint hotline in the Phase I Annual Report for 2008.

As to publicizing the citizen complaint hotline, an evaluation of the City's water quality hotline was conducted during 2008 to determine if operating a citizen complaint hotline is an appropriate program to help the City identify spills, illicit discharges and other related complaints. The evaluation team contacted 85 citizens who had called the water quality hotline during 2007 to determine; the demographics of the caller, how they had heard about the water quality hotline, the primary reason for their call; and their awareness of the MS4 and water quality impacts from illicit discharges.

The results indicate that most callers are white male residents from all parts of the City and less than five percent identified themselves as business owners. Twenty one percent callers learned about the water quality hotline from the web site, while 11% from other people in the community and 5% found it in advertisements. Over half the callers reported illegal dumping and spills (54%). Approximately 16% of respondents called because they noticed negative effects of water quality or toxic substances. Other respondents reported a drainage problem (9%), contaminated or construction runoff (8%), or a sewage problem (4%). The evaluation found that most callers expressed an understanding of water quality incidents that warrant a report to the hotline.

The water quality hotline is an appropriate BMP as it provides a mechanism for the public to take an active role in stormwater pollution prevention and help the City increase awareness of activities that have negative impacts on stormwater. This BMP has resulted in over 1,466 resolved cases from 2,066 calls to the hotline over the last 7 years showing that making a hotline number available to the public is one of the BMP the City can use to identify and resolve illicit discharges. The evaluation indicated that the hotline program may not be reaching as wide of an

audience as hoped and the City will work to target a more diverse audience in response to the survey results.

3. Assessment of Best Management Practice Appropriateness (S9.E.6 and S8.B.2)

This section provides an assessment of the appropriateness of the City's program design and/or specific BMPs identified for each component of the SWMP, including any changes made or anticipated to be made, and why.

3.1 Public Involvement and Participation (S5.C.4)

The permit requires the City to develop and implement a process to create opportunities for the public to participate in the development of the Stormwater Management Program (SWMP) Documentation by August 16, 2007. The City's BMP used for public involvement and participation is to create opportunities for the public to learn about, comment on and question the City's approach to the management of stormwater. Public participation is encouraged by providing multiple opportunities for public involvement. These include, but are not limited to opportunities to comment on funding allocation for the NPDES related programs and projects, to give input and review codes describing the technical standards for control of stormwater discharges and enforcement of impacts to the MS4, and opportunities to review and comment on the ongoing development of stormwater management activities. Additional opportunities for the public to learn about the City's stormwater program are provided on the City's web site: (http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/Plans/StormwaterManagementProgram/index.htm). Over 900 people viewed this web page during 2008. The web site contains the email address, swmp@seattle.gov that the public can use to email questions and comments to the City about stormwater management. Public presentations on the SWMP were made at the City's Restore our Waters Stakeholders meetings and at the City's Creeks, Drainage and Wastewater Advisory Committee meetings.

The City has found that these methods of soliciting public comments are the most appropriate BMP for public participation because they reach a wide audience. The City received many emails during 2008 regarding the SWMP. The presentations to the Restore our Waters stakeholder meeting and Creeks, Drainage and Wastewater Advisory Committee meeting were well attended and generated many questions and comments. Additional information on public involvement and participation can be found in the City's SWMP, submitted as Attachment A of the City's 2008 Phase I Permit Annual Report Form.

3.2 Controlling Runoff from New Development, Redevelopment and Construction Sites (S5.C.5)

The 2007 NPDES Phase I Municipal Stormwater Permit required the City to implement the following elements of the program for controlling runoff from new development, redevelopment and construction sites: begin a local program that adopts by ordinance or other enforceable document equivalent to Appendix 1 of the permit; establish legal authority to inspect private stormwater facilities and enforce maintenance standards for all new and redevelopment, implement a process of permits, plan review, inspections and enforcement; make available copies of Ecology's documents: "*Notice of Intent for Construction Activities*" and "*Notice of Intent for Industrial Activities*"; and train staff to properly implement the program to control stormwater runoff from new development, redevelopment and construction sites.

The City continued to implement its existing program to control runoff from new development, re-development and construction sites. This program, documented in Section III.5 in the City's SWMP, submitted as Attachment A of the City's 2008 Phase I Permit Annual Report Form, is led by the Department of Planning and Development (DPD). This program has conducted 4,238 temporary sediment and erosion control (TESC) inspections and 87 enforcement actions. DPD is working with SPU to adjust and revise the existing program to continue to meet the 2007 Permit requirements.

Ecology has determined that the revised draft Stormwater Code dated March 16, 2009, is equivalent to Appendix 1 of the permit, Minimum Technical Requirements for New Development and Redevelopment. The determination of equivalency by Ecology indicates that the revised Stormwater Code is appropriate for implementation of the minimum requirements in Appendix 1, and 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).

SPU will prepare the approved draft Stormwater Code for public review and adoption by City Council and the associated Directors' Rules for approval by SPU and DPD in 2009. It would be premature to assess the appropriateness of the code and the Directors' Rules because they have not yet been formally adopted.

During 2008, DPD made copies of Ecology's documents: "*Notice of Intent for Construction Activities*" and "*Notice of Intent for Industrial Activities*" available to the public. These documents were made available to the public at the DPD Applicant Services Center (ASC), which is located on the 20th floor of Seattle Municipal Tower at 700 Fifth Avenue in downtown Seattle. Providing the documents at the ASC is appropriate because the majority of people who seek permits from the City visit the ASC and have the opportunity to view and learn about the Ecology NOI requirements.

All staff whose primary job duties are implementing the program to control stormwater runoff from new development, redevelopment, and construction sites, including permitting, plan review, construction site inspections, and enforcement, are trained to conduct these activities. In addition, all site inspectors have had Certified Erosion and Sediment Control Lead (CESCL) training. This level of training is appropriate because it is BMP 160 in the Stormwater Management Manual for Western Washington.

Information on how the City will implement the 2008 minimum performance measures for controlling runoff from new development, redevelopment and construction sites can be found in the City's SWMP, submitted as Attachment A of the City's 2008 Phase I Permit Annual Report Form.

3.3 Structural Stormwater Controls (S5.C.6)

The 2007 NPDES Phase I Municipal Stormwater Permit required the City to implement the development of a structural stormwater control program (SSCP).

The City has implemented a SSCP, which is appropriate because it uses a comprehensive planning process to support the SSCP. The geographic scale of the program is the area served by

the City's MS4 and the MS4-related receiving water bodies. The SSCP projects are prioritized using asset management principles. Asset management is the process by which projects are evaluated for their whole-life cycle cost benefit including social, economic, and environmental factors (known at SPU as the "triple bottom line"). Projects are prioritized by SPU staff based on an assessment of receiving water body conditions, anticipated benefits of the project, regulatory compliance needs, opportunity, and application of asset management principles that have been adopted by SPU under the guidance of the Asset Management Committee (AMC). Projects must pass through several AMC evaluation screens and funding allocation phases before they are formally approved by SPU management for implementation.

Information on how the City will implement the 2008 minimum performance measures for the structural stormwater controls program can be found in the City's SWMP, submitted as Attachment A of the City's 2008 Phase I Permit Annual Report Form.

3.4 Source Control Program for Existing Development (S5.C.7)

The 2007 NPDES Phase I Municipal Stormwater Permit required the City to implement the following elements of the source control program for existing development during 2008: adopt and enforce the Seattle Municipal Code and Directors' Rules; create an inventory or listing of the businesses using the categories in Appendix 8 and establish a complaint-based response to identify other pollutant generating sources such as mobile or home-based businesses.

Ecology has determined that the revised draft Stormwater Code dated March 16, 2009, is equivalent to Appendix 1 of the permit, Minimum Technical Requirements for New Development and Redevelopment. The determination of equivalency by Ecology indicates that the revised Stormwater Code is appropriate for implementation of the minimum requirements in Appendix 1, and 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).

SPU will prepare the approved draft Stormwater Code for public review and adoption by City Council and the associated Directors' Rules for approval by SPU and DPD in the second quarter of 2009. It would be premature to assess the appropriateness of the code and the Directors' Rules because they have not yet been formally adopted.

The City has established a list of businesses that have the potential for outdoor pollution generating sources. The list is based on a comparison of the most current list of businesses, which was compared to Appendix 8. This list resulted in identification of over 4,400 businesses that have the potential to have outdoor pollution generating sources.

A review of the list against the business inspection database determined that a number of businesses have common urban land uses that lack pollutant generating sources or activities. Consequently, these businesses have been removed from the list, leaving approximately 3,790 businesses eligible for inspection. Each of these groups of businesses removed are summarized below along with rationale for excluding them from the list.

- Personal Services – Standard Industry Code Industry Group 723 and 724, Beauty Shops (7231) and Barber Shops (7241). The City has screened and inspected this sector in previous

years and determined that these industry groups do not conduct outdoor pollution generating activities and that stormwater source control requirements are not relevant to this sector. The facilities generally do not have loading docks - shipments are hand carried through the front door and there is no outdoor storage of either product or waste. These facilities do not have wastes that could impact stormwater. Any sites with private drainage systems (flow control or treatment) will be inspected through the Stormwater Facility Inspection Program.

- Transportation Services – Standard Industry Code Industry Group 4121, Taxicabs. Within the City of Seattle, individual taxicab drivers must obtain a business license in order to drive for a taxicab company. Due to this licensing process, the licensed business address is actually the private residence of the individual and these locations are not pollution generating with regards to the targeted activity. Within this grouping, there are taxicab maintenance facilities, and these businesses will be kept on the list and inspected.

SPU used a portion of the Local Government Stormwater Grant it received from Ecology to hire a consultant (R. W. Beck) to review the evaluation of business stormwater runoff pollution potential that was completed by SPU for their Source Control program. SPU used federal guidelines based on the Standard Industrial Code (SIC) to rank each business as having low, medium-low, medium, or high stormwater runoff pollution potential. Based on its ranking, each business was assigned one of four levels of action within SPU's Source Control program. The intent is to assign a higher or more thorough level of action for businesses that have higher stormwater runoff pollution potential.

R. W. Beck's review of SPU's evaluation of business stormwater runoff pollution potential considered three factors:

- Were business sites ranked consistently based on land use/SIC code?
- Was the ranking reasonable based on federal and state guidelines?
- In general, does the ranking of business sites seem reasonable?

R.W. Beck's review determined that SPU's ranking of business stormwater runoff pollution potential is appropriate for implementing the business inspection program. Following initial implementation of the program and follow-up evaluation of its effectiveness, SPU may modify these rankings based on the activities observed at sites and ability to implement appropriate BMPs.

The City's complaint based response program includes the water quality hotline, business inspections, and illicit discharge, detection and elimination programs. The City staffs a 24-hour water quality hotline to allow citizens and businesses to report illicit discharges into the MS4. Businesses, including mobile and home-based, and citizens who are found to be causing illicit discharges, receive education and are potentially subject to enforcement actions if they refuse to voluntarily correct the problem. During 2008, the City conducted an evaluation of the water quality hotline to determine if it is an effective program for identifying other pollutant generating sources via a complaint-based program. The evaluation determined that the majority of callers reporting incidents to the water quality hotline were calling primarily because they witnessed dumping or a spill (54%), with the rest calling to report negative environmental impacts or drainage problems.

The City's complaint based response program is appropriate BMP as it provides a mechanism for the public to take an active role in stormwater pollution prevention and help the City increase awareness of activities that have negative impacts on stormwater.

3.5 Illicit Connections and Illicit Discharge Detection and Elimination (S5.C.8)

The 2007 NPDES Phase I Municipal Stormwater Permit required the City to implement the following elements of the Illicit Connection and Illicit Discharge Detection and Elimination (IDDE) program during 2008: continue implementation of an on-going IDDE program; evaluate and updated existing ordinances or other regulatory mechanisms to effectively prohibit non-stormwater, illegal discharges and/or dumping into the MS4; ensure that all staff who are responsible for IDDE are trained to conduct the required activities, and develop and implement procedures to investigate and respond to spills and improper disposal into the MS4.

During 2008, SPU continued to lead the City's illicit connection and IDDE, which was first implemented to meet the requirements of the 1995 NPDES Municipal Stormwater permit. Citizens can report spills and complaints which may lead to a discharge to the City's MS4 by either calling the publicly listed 24 hour "water quality hotline" phone number or by using the internet-based form on the City website. In 2008 the hotline received 166 surface water quality calls. The water quality hotline and web based reporting mechanism enable the general public to take an active role in stormwater pollution prevention and enhance the City's ability to prevent illicit connections and discharges. This management practice has resulted in over 1,466 resolved cases from 2,066 calls to the hotline over the last 7 years showing that making a hotline number available to the public is an appropriate BMP to identify and resolve illicit discharges. As described in Section 3.4 above, the water quality hotline is an appropriate BMP for detecting and eliminating illicit connections and discharges. An evaluation of the water quality hotline can be found in sections 2.7 and 3.7.2.4.

There were three illicit connections reported during 2008 which resulted in three enforcement actions. The City notified Ecology of the IDDE events by way of the Environmental Response Tracking System (ERTS). All three illicit connections were eliminated within six months. The City has a procedure in place that specifies when and how Ecology should be contacted regarding illicit connections and discharges. However, there were no referrals of IDDE violations to Ecology from the City in 2008; none were necessary.

The SPU Spill Response Program is staffed by a Senior Spill Coordinator and a network of on-call Spill Coordinators. Spill Coordinators work in 3 or 4 day on-call shifts and are available 24 hrs/ 7 days a week. Spill Response calls are dispatched through the Operations Response Center (ORC) and are received via a publicly-available phone number 206-386-1800. The water quality hotline advises citizens who are reporting an active spill to call the ORC to report the spill. Once a spill call is received, the Dispatcher contacts the on-call Spill Coordinator and advises them of the situation. Spill Coordinators follow written procedures for investigation, clean-up and reporting to appropriate agencies.

Each of the major departments at the City has a spill prevention and response program that includes procedures on how to respond and report spills and training to keep staff involved in spill response current on how to conduct their responsibilities. Each department's procedure includes instructions on when and how to report spills that enter the MS4.

Resource Venture, a contracted consultant of SPU, provides free site visits, spill kits and education to Seattle businesses to assist them with development of a spill prevention plan and proper clean-up and disposal of spills. The spill kit program is promoted on the Resource Venture web site and a workshop for high risk potential polluters group is offered each year. Spill Plans are reviewed by Resource Venture and businesses receive training with the spill kit. Resource Venture is an effective method of providing businesses with BMPs so they can voluntarily comply with the City's Stormwater Code.

The City conducted an evaluation of the spill kit program to determine if it is an appropriate BMP. The evaluation included a survey of kit recipients since 2004 to assess their understanding of stormwater pollution prevention and their use of spill plans and kits. A previous survey was conducted among Seattle businesses in 2005. A new survey in 2008 of spill kit recipients included many elements of the previous survey to examine changes since 2005. The majority of those surveyed were auto repair and maintenance businesses (24%). Industry, restaurants and sales made up the next highest business types (~14% each).

Among respondents who reported experiencing spills that require spill kit materials, more respondents in 2008 said that they utilize spill kits to clean-up routine spills. Similar percentages of respondents in 2008 and 2005 said that their business had written and posted a plan for dealing with a spill, but more respondents in 2008 said that the plan was posted near the spill kit.

Respondents in 2008 expressed similar confidence to respondents in 2005 about their ability to clean-up spills quickly, knowledge of whom to contact for help containing or cleaning up a spill, stock of spill clean-up materials on hand, and knowledge of where to obtain and dispose of clean-up material. However, respondents in 2008 expressed higher levels of agreement that having a spill plan and clean-up kit makes their employees more aware of surface water pollution and how their business practices can help reduce impacts on water quality.

This evaluation indicates that spill kits are an appropriate BMP for spill prevention and clean-up and verified that information provided directly to the general public helps to reduce behaviors that cause or contribute to adverse stormwater impacts.

Ecology has determined that the revised draft Stormwater Code dated March 16, 2009, is equivalent to Appendix 1 of the permit, Minimum Technical Requirements for New Development and Redevelopment. The determination of equivalency by Ecology indicates that the revised Stormwater Code is appropriate for implementation of the minimum requirements in Appendix 1, and 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).

SPU will prepare the approved draft Stormwater Code for public review and adoption by City Council and the associated Directors' Rules for approval by SPU and DPD in 2009. It would be premature to assess the appropriateness of the code and the Directors' Rules because they have not yet been formally adopted.

All staff involved in the IDDE program receive the following basic training which are appropriate because they are the industry standards and taught by instructors that are certified by

the respective sponsoring organization; EPA Basic Inspector Training: Overview of all aspects of inspection preparation, conduct, and follow-up and various federal environmental laws and regulations, 40 Hour Hazardous Waste Operations and Emergency Response, 24 Hour Hazmat Emergency Spill Response, Blood-borne Pathogens, Confined Space Entry, First Aid and Traffic Control and Flagging Certification. In addition, all IDDE staff will receive the following program-specific training: IDDE Standard Operating Procedures – field and laboratory training, Field Hazards and Illicit Drug Lab Identification.

The City, in 2008, provided training to 953 City staff members who, as part of their normal job responsibilities, might come into contact with or otherwise observe an illicit discharge or illicit connection to the MS4. The City is working to develop an on-going training program to meet this requirement. This training was appropriate because it provided examples of actual illicit discharges/connections to the students and provided them with instruction on how to properly report these violations.

Information on how the City will implement the 2008 minimum performance measures for the illicit connection and illicit discharge detection and elimination program can be found in the City's SWMP, submitted as Attachment A of the City's 2008 Phase I Permit Annual Report Form.

3.6 Operation and Maintenance Program (S5.C.9)

The 2007 NPDES Phase I Municipal Stormwater Permit required the City to implement the following elements of the operation and maintenance program during 2008: establish maintenance standards for stormwater facilities, adoption and enforcement of the Seattle Municipal Code and Directors' Rules, development of an initial inspection schedule for all known, permanent stormwater treatment and flow control facilities regulated by the Permittee, establish practices to reduce stormwater impacts associated with runoff from parking lots, streets, roads, and highways owned or operated by the Permittee, and road maintenance activities conducted by the Permittee and establish and implement policies and procedures to reduce pollutants in discharges from lands owned or maintained by the Permittee.

Ecology has determined that the revised draft Stormwater Code dated March 16, 2009, is equivalent to Appendix 1 of the permit, Minimum Technical Requirements for New Development and Redevelopment. The determination of equivalency by Ecology indicates that the revised Stormwater Code is appropriate for implementation of the minimum requirements in Appendix 1, and 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).

SPU will prepare the approved draft Stormwater Code for public review and adoption by City Council and the associated Directors' Rules for approval by SPU and DPD in the second quarter of 2009. It would be premature to assess the appropriateness of the code and the Directors' Rules because they have not yet been formally adopted.

The Source Control and Monitoring (SCM) group at SPU is responsible for inspecting private stormwater facilities regulated by the City. During a facility inspection, all aspects of the system are inspected: flow control devices, catch basins, etc. When any part of that system (including

catch basins) is found to be out of compliance with Stormwater Code requirements for maintenance, a corrective action letter is sent to the facility owner and the owner or contractor must certify that the work has been completed. Random samples of these sites are re-inspected. The City has established an initial inspection schedule for privately-owned stormwater treatment and flow control facilities and inspected 82 private facilities during 2008. The private stormwater facility inspection procedures will be revised during 2009 to incorporate changes from the revised Stormwater Code and Directors' Rules. Because the revised draft Stormwater Code and Directors' Rules have not been adopted, it is impossible to assess the appropriateness of the stormwater facility inspection program at this time.

The Seattle Department of Transportation (SDOT) is the lead City agency for establishing practices to reduce stormwater impacts associated with runoff from streets, parking lots, roads or highways owned or operated by the City. In addition to the revised draft Stormwater Code and Directors' Rules, SDOT has developed Maintenance Management Systems Performance Sheets that reference BMPs and elements of the Regional Road Maintenance Initiative to meet Endangered Species Act (ESA) and NPDES requirements. These BMPs have been adopted by 23 different agencies in Western Washington so it is appropriate that the City use these BMPs.

Parks, FFD and SCL will follow the revised draft Stormwater Codes and Directors' Rules to reduce pollutants in discharges from lands owned or maintained by the City. The departments follow the current Stormwater Code and use appropriate BMPs when conducting construction and maintenance activities on or near streets, parking lots and roads. The responsible department for Stormwater Code compliance and BMPs City managed capital. The individual City departments have and will continue to implement a spill program and provide training on spill and source control. Because the revised draft Stormwater Code and Directors' Rules have not been adopted, it is impossible to assess their appropriateness.

The City, in 2008, provided training to 953 City staff members who have primary construction, operations or maintenance job functions that could impact stormwater quality. The City is working to develop an on-going training program to meet this requirement. This training was appropriate because it provided examples of actual BMPs for sediment and erosion control from construction sites to the students and provided them with instruction on how to properly install, inspect and maintain these BMPs to reduce impacts to stormwater quality.

Information on how the City will implement the 2008 minimum performance measures for the operation and maintenance program can be found in the City's SWMP, submitted as Attachment A of the City's 2008 Phase I Permit Annual Report Form.

3.7 Education and Outreach Program (S5.C.10)

The 2007 NPDES Phase I Municipal Stormwater Permit directs the City of Seattle to implement a program for conducting education and outreach to specific audiences on specific topics. The City has prepared an education and outreach program of work to meet these requirements over the term of the Permit and is therefore the best management practice for managing stormwater by education and outreach. The following sections include a brief description of the education and outreach activities associated with each of the BMPs and what strategies are in place to track improvements in the target audience's understanding of the problems.

3.7.1 Audience: General Public

3.7.1.1 The Urban Watershed School Programs - Conducted on Longfellow, Thornton and Piper's Creeks, these programs educate the general public about the impacts of storm water flows into surface waters and the impacts associated with impervious surfaces. This program is conducted via a partnership between Seattle Public Utilities, Seattle Parks, Homewaters Project and Seattle Public Schools.

The Urban Watershed field trips consist of a field trip to a local urban stream where children explore hydrologic concepts and the impacts of urbanization on lotic systems. In 2008, 1,527 children attended urban watershed trips at Piper's Creek, 593 at Thornton Creek and 225 at Longfellow Creek. Fifty- two different public, private and parochial schools participated in 2008. One hundred and sixty children participated in a follow-up interview activity as homework to carry program messages into the community.

The City feels that this program is the most appropriate BMP because it reaches a large diverse geographic audience and engages the public in hands on learning. The program links closely with school science curriculum to reinforce target messages which illustrate the concepts with real local examples. The take home component is designed for the students to engage an adult in a two way interview to gather baseline information on behaviors about stormwater and to provide a vehicle to disseminate the program messages. The City evaluated the results of the interviews in an effort to measure understanding and adoption of the impacts of stormwater flows into surface waters and the impacts associated with impervious surfaces. The interview results indicate that approximately 25% of the adults "don't know" where their stormwater ends up. While most adults are aware that urban runoff could have negative impacts on water quality, responses indicating a willingness to adopt new behaviors were highly variable. The percentage of respondents willing to pick up their pets waste every time ranged from 42% to 71%. The percentage of respondents who were willing to always take their car to a car wash ranged from 28% to 51%.

3.7.1.2 Doo Diligence Pet Waste Program – The City's pet waste program (including Mutt Mitts) was implemented in public places city-wide and is used to educate and engage the public on the topic of source control BMPs, environmental stewardship actions and opportunities in the area of pet waste. In 2008, the City distributed 2,220 educational brochures in brochure dispensers at 49 pet stores and veterinary offices. The brochure describes the impacts of pet waste on water quality and BMPs for pet waste disposal. A new brochure was designed in 2008 to emphasize key educational and motivational messages. The City and volunteers also stocked 31,200 pet waste collection bags in 32 dispensers around the city. The program has been expanded to include 6 new locations in an effort to reach more neighborhoods through community based social marketing (CBSM) strategies such as partnering with Block Watch groups. The 2008 recruitment letter targeted neighborhoods near sensitive water bodies. At Piper's Creek, temporary signs warning about bacteria were installed, and an interagency partnership for permanent signs at recreational water bodies around the city was initiated.

This program is the most appropriate BMP to address pet waste because it makes educational material accessible to the target audience and provides them with a means to

personally implement a BMP. Signage in public places and on the web explains the impacts of bacteria from pet waste on water quality. The program was expanded in 2008 to include new partners and is continuing to evolve strategies in 2009.

3.7.1.3 *Planting Strip Pilot* – The Parking Strip Pilot, now called the *Streetside Rain Garden Demonstration Project* (SRGDP) combines homeowner education with physical changes to landscapes. The program is designed to explore how the city can manage stormwater by working with Seattle residents to install and maintain rain gardens in street side public right-of-way or parking strips. Project outcomes include reference materials on construction and maintenance, training and cost documentation.

Locating appropriate sites for the SRGDP was a challenge in 2008. However, a short list of potential sites was identified and installation is on track for summer 2009 with evaluation of the rain garden performance in early 2010.

Selecting the SRGDP as the BMP for educating the public about low impact development (LID) was not appropriate because the program is in the early stages of development and several physical landscape constraints hindered site selection and limited public outreach. However, in 2008, the SRGDP was integrated into the Utilities *RainWise* program, which is a technical assistance program to empower residential customers to adopt practices and technologies that reduce stormwater flows and improve their quality. *RainWise* will be implemented in 2009 to provide education and outreach on how to slow, spread, filter and infiltrate stormwater, including the SRGDP.

3.7.1.4 *Automotive Maintenance Program (AMP)* - To implement an education and outreach program on vehicle maintenance BMPs for the general public, the City started a new program, which is still in development, and is designed to educate car owners about the link between vehicle maintenance and water quality. The program will offer BMPs for behaviors and products related to auto maintenance by providing education and incentives through pre-existing retail and service locations. In 2008 the program was focused on collecting baseline information. A survey targeting 150 do-it-yourself car owners at three Schuck's locations in Seattle gathered data on auto maintenance behaviors and barriers to BMP implementation. After taking the survey, respondents were provided with an education flyer on vehicle maintenance BMPs, and a coupon for products from Schuck's to support those activities. In 2008 the program made partnerships with two substantial new audience access points for outreach to do-it-yourselfers and those who hire auto service.

This new program is an appropriate education outreach strategy for vehicle maintenance BMPs for the general public because it targets the use, storage and disposal of car products. Survey work in 2008 has helped to identify knowledge and behavior gaps about leaks and the impact of auto fluids on water quality. Specific results indicate that people surveyed are not recycling oil, antifreeze and oil filters because they don't know where to take them. This information is guiding outreach and education strategies for effecting knowledge and behavior change in the target audience.

3.7.2 Audience: General Public & Business

3.7.2.1 Spill Kit Program - Resource Venture, an SPU funded conservation service, provides free site visits, spill kits and education to Seattle businesses to assist them with development of a spill prevention plan and proper clean-up and disposal of spills.

The City conducted an evaluation of the spill kit program to determine if it is an appropriate program for use and storage of automotive chemicals, hazardous cleaning supplies and other hazardous materials. The evaluation included a survey of kit recipients since 2004 to assess their understanding of stormwater pollution prevention and their use of spill plans and kits. A previous survey was conducted among Seattle businesses in 2005. A new survey in 2008 of spill kit recipients included many elements of the previous survey to examine changes since 2005. The majority of those surveyed were auto repair and maintenance businesses (24%). Industry, restaurants and sales made up the next highest business types (~14% each).

Among respondents who reported experiencing spills that require spill kit materials, more respondents in 2008 said that they do not wash any spills away with a hose (85% in 2008 and 65% in 2005). In addition, fewer respondents say they wash away oil or coolant (2% in 2008 and 8% in 2005).

Similar percentages of respondents in 2008 and 2005 said that their business had written and posted a plan for dealing with a spill, but more respondents in 2008 said that the plan was posted near the spill kit.

Respondents in 2008 express similar confidence to respondents in 2005 about their ability to clean-up spills quickly, knowledge of whom to contact for help containing or cleaning up a spill, stock of spill clean-up materials on hand, and knowledge of where to obtain and dispose of clean-up material. However, respondents in 2008 expressed higher levels of agreement that having a spill plan and clean-up kit makes their employees more aware of surface water pollution and how their business practices can help reduce impacts on water quality.

The high percentage of positive behaviors by those surveyed suggests that the Spill Kit Program is an appropriate BMP for reducing or eliminating behaviors and practices that cause or contribute to adverse stormwater impacts and bringing businesses into Code compliance. In addition, the program is an effective stormwater education tool. The program will continue for the foreseeable future and will continue to be used for education and outreach and compliance.

3.7.2.2 Car Wash Kit Program – Resource Venture also provides free car wash kits and educational information to individuals and organizations on proper disposal of car wash water. In addition various organizations, such as city offices, community centers, high schools, and nonprofits host the car wash kits and make them available for community organizations to check out for use at car wash events. The car wash kits capture car wash water and direct it to the sanitary system rather than allowing the wash water to flow into the MS4. Kits are available to the public from a variety of locations throughout the City. Car Wash kits are advertised on the Resource Venture website, and

in Camp Long & Carkeek Park seasonal program brochures and web, education and flyers are posted at common carwash businesses.

To evaluate the appropriateness of this BMP, car wash kit lenders and car wash fundraiser event coordinators from Seattle public schools were targeted for key informant interviews. The interviews were intended to assess their attitudes regarding the program and their knowledge of car wash kits as well as to determine the current availability of the kits. Eight lenders were contacted in July and August 2008, resulting in five lender interviews. In September 2008, 12 school event coordinators were contacted, which resulting in five borrower informant interviews about the car wash kits. Interviews were conducted by telephone, and some respondents provided feedback by e-mail.

The limited interviews determined that in its current state, the Car Wash Kit program may not be the most appropriate BMP for use and storage of car wash soaps because most lenders are not actively participating in the program, potential borrowers are largely unaware of the program and the kit is difficult to use. The City will continue to evaluate this program and identify how to effectively target the audiences understanding of the problem and what they can do to solve it.

3.7.2.3 Environmental Justice Network in Action – This program provides outreach, education and resources on the use and storage of hazardous cleaning supplies for the general public, and specifically immigrant and refugee populations (providing the additional benefit of supporting the City’s Race and Social Justice Initiative). The information and resources provided help to reduce behaviors that cause or contribute to adverse stormwater impacts.

In 2008 pre and post program surveys were used to gather data from the target audiences on baseline knowledge and behaviors, adoption of the BMPs, and effectiveness of program delivery strategies. ECOSS staff administered 131 pre-surveys and 56 post-surveys during 72 home visits, 35 ECOSS office drop-ins and a class presentation. The EJNA program participated in 8 additional community events.

This is an appropriate BMP for use and storage of hazardous cleaning supplies, because resources and information are provided directly to the general public. In surveys conducted in 2008, and 65% of respondents were aware of the environmental risks from improper disposal of cleaning products and 6% of respondents were un-aware of the environmental risks from improper disposal. Surveys of those who received the education program revealed that after receiving the education program, they had a better understanding of stormwater and BMPs for protecting it versus those who did not receive the education program: for example in pre surveys 49% did not know where storm drains lead, compared to 1% in post surveys.

3.7.2.3 Water Quality Hotline – The City staffs a 24-hour water quality hotline to allow citizens and businesses to report illicit discharges into the MS4. Businesses and citizens who are found to be causing illicit discharges receive education, and potentially enforcement actions, if they refuse to voluntarily correct the problem.

During 2008, the City conducted an evaluation of the water quality hotline to determine if it is an appropriate program to educate the general and businesses, including mobile, about the impacts of illicit discharges and how to report them. The evaluation team contacted 85 citizens who had called the water quality hotline in the previous year to determine; the demographics of the caller, how they had heard about the water quality hotline, the primary reason for their call and their awareness of the MS4 and water quality impacts from illicit discharges.

The results indicate that most callers are white male residents from all parts of the City and less than five percent identified themselves as business owners. The majority of callers learned about the water quality hotline from the web site (21%), from other people in the community (11%) or advertisements (5%). Over half the callers reported illegal dumping and spills (54%). Approximately 16% of respondents called because they noticed negative effects of water quality or toxic substances, such as a foam or film on the water or dead birds and grass. Other respondents reported a drainage problem (9%), contaminated or construction runoff (8%), or a sewage problem (4%). The evaluation found that most callers expressed an understanding of water quality incidents that warrant a report to the hotline.

This BMP is appropriate as it provides a mechanism for the public to take an active role in stormwater pollution prevention and help the City increase awareness of activities that have negative impacts on stormwater. This BMP has resulted in over 1,466 resolved cases from 2,066 calls to the hotline over the last 7 years. This shows that making a hotline number available to the public is one of the BMP the City can use to identify and resolve illicit discharges. The evaluation indicated that the program may not be reaching as wide of an audience as hoped and the City will work to target a more diverse audience in response to the survey results.

3.7.3 Audience: Homeowners, landscapers, and Property Managers

3.7.3.1 Green Gardening Program - The Green Gardening Program specifically targets the homeowners, landscapers and property manager permit audiences as well as horticulture students in training. This program utilizes CBSM strategies and multiple languages broadening the audience and addressing the city's goals for Race and Social Justice Initiative (RSJI). The program promotes BMPs for environmentally-sensitive landscaping practices, with particular emphasis on reducing pesticide use, conserving water, and reusing/recycling landscaping materials.

Trainings in 2008 included 122 staff members at 8 nurseries (2 in Seattle), 5 trainings for 93 horticulture students (two held in Seattle at South Seattle Community College, (SSCC)), two foreign language landscaper trainings for 27 students (SSCC and Rainier Vista Community Center) and at an annual Integrated Pest Management (IPM) professional training/certification held at SSCC which reached 274 attendees. For the first time in 2008 the program offered discounted fees as an incentive to suspected high-pesticide-using-landscape companies.

This is an appropriate BMP for yard care techniques protective of water quality as it provides the target audience with information on how to change their behaviors to

improve stormwater quality. The Green Gardening Program uses both exit and follow-up surveys to evaluate program effectiveness and guide future work. In exit surveys 74% of horticulture students and 82% of nursery staff attending the programs said they would use the information they learned or make behavior changes. Survey work from foreign language participants indicates that they are an important target audience.

3.7.3.2 *Natural Yard Care Neighbors* – This program is targeted at homeowners and property managers. It focuses on reducing water and pesticide use on lawns and gardens. In 2008 the program held four workshops in Seattle neighborhoods (Genessee, Beacon Hill, Green Lake, and High Point). The neighborhoods were selected using SPU and City priorities with a focus on RSJI and proximity to sensitive water bodies. The four workshops were attended by 237 people. At each location, BMPs for water conservation, pest and weed control, soil building, natural lawn care, plant selection and compost/veggies were taught in three evening sessions. Most workshop attendees (72%) came to more than one class.

This program is an appropriate BMP because the workshops provide information and resources to the public that inform them on how to change their behaviors to reduce the impact of their yard on stormwater quality. The Program Managers have been evaluating effectiveness and evolving strategies for several years based on exit strategies, baseline pre-workshop surveys and longitudinal surveys. Those surveys indicate that attendees are receiving valuable new information. Follow up surveys revealed that stormwater BMPs are among the most common behavior changes reported when asked for behaviors they started or increased as a result of the workshop.

3.7.3.3 *Green Your Rug* – The City developed and implemented two programs directed towards educating homeowners and property managers about BMPs for carpet cleaning. The Green Your Rug residential pilot program was aimed at the homeowners who rent do-it-yourself carpet cleaning machines. The second part of the Green your Rug program included developing a baseline measurement of property manager awareness, understanding of, and adoption of proper disposal of used wash water from carpet cleaning.

3.7.3.3.1 *Green Your Rug Residential* - The residential portion of the Green Your Rug was run as a pilot to determine the public's level of knowledge about the issue and determine if a larger education and outreach project is warranted. Three do-it-yourself carpet cleaner machine rental locations in the north end of Seattle agreed to participate in the green your rug pilot program. The program consisted of a survey to gather baseline data on residential carpet cleaner wastewater disposal behaviors and an educational flyer containing information on proper carpet cleaning wash water disposal. Analysis of survey results indicate that 77% of individuals who rented carpet cleaners reported disposing of their carpet cleaner machine wastewater in a toilet, sink, or tub; 18% percent reported disposing of it outdoors on a pervious surface or into a dumpster; and 5% percent reported dumping it directly into a storm drain.

A review of Home Depot's do-it-yourself carpet cleaning rental instructions revealed that they were instructing people to dispose of their carpet cleaning wastewater into storm drains. The City contacted Home Depot headquarters to inform them of the

improper instructions. Home Depot has changed their instructions and do-it yourself carpet cleaners nationwide will be instructed on proper disposal of their wash water due to this City program.

The pilot project will not be continued because the majority of individuals surveyed had a good understanding that the proper BMP for carpet cleaning wash water was to dispose it in the sanitary sewer system and were engaging in this behavior. With such a high percentage of correct responses it is ineffective to continue a specific education and outreach program for this BMP. The City will continue to provide education and outreach to the public on proper BMPs for carpet cleaning through Resource Venture, and the water quality hotline.

3.7.3.3.2 Green Your Rug for Property Managers - To develop the baseline assessment about property managers understanding and behaviors about BMPs for carpet cleaning, we surveyed property managers of multifamily and commercial buildings regarding their carpet cleaning practices. The following information was gathered for the baseline assessment and reporting; average frequency of carpet cleanings by type of tenant (e.g., multifamily, type of business), typical timing of carpet cleaning, disposal practices for used wash water among property managers and cleaning contractors, property manager awareness of proper disposal practices, property manager awareness of storm drainage system (linkage to water bodies) and effect of used wash water on stormwater and property manager awareness of responsibility for contractors' proper disposal practices.

The evaluation determined that half of property managers know that they are legally responsible for the proper disposal of wash water (54%) and that water disposed in an outside drain flows to a creek, lake, or other surface water (55%). Nearly three quarters (72%) know that the best place to dispose wash water is a sink or toilet. In practice, most property managers (83%) say that wash water from general cleaning is properly disposed into an indoor drain when either they or contractors clean; however, 13% of managers do not know where general cleaning contractors dispose of wash water. Most property managers also say that wash water from carpet cleaning is disposed into an indoor drain (37%) or hauled away for disposal elsewhere (19%), but another 33% do not know where the water is disposed.

The results of this evaluation indicate that it is not appropriate for the City to direct additional education and outreach resources to create a program for property managers on BMPs for carpet cleaning. The use of existing City programs (business inspection program, Resource Venture and the water quality hotline) are appropriate BMPs to educate property managers about BMPs for carpet cleaning.

Business Inspections – SPU inspects businesses, including mobile businesses and works with them to prevent pollutants from entering private and public storm drains. Inspections include responses to complaints and concerns on the Water Quality Hotline. Inspections are focused on High-Risk Pollution Generating Activities and provide education and outreach on City Code requirements and use of BMPs. This BMP is appropriate because it provides information and resources directly to businesses at their

location that educate them on how to change their behaviors to comply with City Code and reduce the impact of their activities on stormwater quality.

In 2009, the business inspection program will continue. However, the auto maintenance program described in 3.7.1.4 will be used to educate homeowners and property managers about BMPs for auto repair and maintenance.

3.7.3.4 *Planting strip pilot* – Please see the description in 3.7.1.3.

3.7.3.5 *Natural Landscaping Professional Development* – This program is a series of well attended professional workshops (and supporting guides and web content) focused on low impact development (LID) techniques: including sustainable site design, soil BMPs and retention of native vegetation, plant selection and maintenance options that reduce pesticide and fertilizer use, and Natural Drainage/LID strategies for on-site stormwater management, stormwater treatment and flow control. These workshops specifically target engineers, design professionals, landscape contractors (including Spanish-speakers), developers, builders, and land use planners. The program is built on extensive barriers and opportunities survey and focus group work with these professionals and customers. Professionals who attend the workshops incorporate LID techniques into their designs and pass on information to the homeowners, landscapers and property managers that they work with. Participants fill out in-class evaluations and they identify (pledge) the actions they intend to take as a result of the training.

In 2008 the program fielded 41 LID and Natural Landscaping training events, in collaboration with professional organizations and the Puget Sound Partnership, that were attended by a total of 1,785 professionals from around the Puget Sound region. Training was provided in English, Spanish and Vietnamese. The program worked collaboratively with the Washington Organic Recycling Council to launch a new web site and mailed flyers to 8,000 builders to promote Ecology’s soil quality and depth BMPs, at www.buildingsoil.org, which received 5,000 hits/downloads in the first 4 months. The City and Ecology created a state-wide version of the program’s popular *Natural Yard Care* guide for use by other jurisdictions, as well as a regional version of the professional Natural Landscaping guide, and Landscape Management Plan guidance for maintaining LID facilities. The City Worked with the ASLA/USGBC Sustainable Sites Initiative to incorporate these LID methods into national LEED green building standards.

Evaluation results from post-workshop surveys of professionals indicated that 94% of participants rated the training “good” or “excellent”, 87% said the training was at the right technical level for their professional needs and 73% “pledged behavior change”, saying they would take specific actions as a result of the training (most often, adopting one or more of the BMPs/specifications into their daily practice). In addition, every professional organization trained has asked for ongoing training offerings in 2009. The evaluations helped to identify barriers including: local regulatory barriers; lack of technical knowledge; awareness and “buy-in” of other professions; cost concerns; and customer/client resistance that will help refine and improve the program.

3.7.3.6 *Private Facility Inspections* – SPU conducts inspections of private stormwater and flow control facilities to ensure that they are installed and maintained to City Code. In

additions to conducting the inspection, SPU provides education and outreach on how to change their behaviors to comply with City Code and maintain their facility to function properly and reduce the impacts to water quality. Outreach materials include handouts on BMPs and codes. Inspections are tracked and reviewed. This program will continue into 2009.

The SCM group tracks private facility inspection and enforcement records through a Microsoft Access database and file management system. The database tracks information for both source control inspections and drainage system maintenance inspections. Records are managed in accordance with the State record keeping codes. Enforcement actions are tracked both in the database and electronically in a separate folder on the City network. Any enforcement paperwork is kept with the file.

The City evaluated the appropriateness of using the private facility inspection program as a method to meet the education and outreach requirement for educating homeowners, landscapers and property managers about stormwater treatment and flow control BMPs and determined that this education and outreach requirements is better served by the RainWise program described in 3.7.1.3.

3.7.4 Audience: Engineers, Contractors, Developers, Review staff and Land Use Planners.

3.7.4.1 Temporary Erosion and Sediment Control – the Department of Planning and Development (DPD) provides short courses to engineers, contractors, developers on appropriate BMPs for temporary erosion and sediment control from new development and re-development sites. This training exposes professionals to City Code requirements and is an appropriate BMP for the control of sediment and erosion.

Five TESC classes were held in 2008. Seventy-one class evaluations were returned from participants. Ninety-five percent of the evaluations gave the class the highest possible overall rating of 5 - *More than I expected* or 4- *Very helpful to my needs*. Class content materials and instruction were rated on a scale of 1-5 in nine questions. Ninety percent of the evaluations rated all the elements higher at 4- *Provided real insight* or 5- *Met my needs*. Despite the high ratings and comments from attendees fifteen percent (11) of those who filled out evaluations felt they needed additional help mastering the competencies.

Temporary Erosion and Sediment Control training provided by DPD is appropriate because it provided examples of actual BMPs for sediment and erosion control from construction sites to the students and provided them with instruction on how to properly install, inspect and maintain these BMPs to reduce impacts to stormwater quality.

3.7.4.2 Natural Landscaping Professional Development – Please see the description in section 3.7.3.5.

4. Information on Structural Stormwater Controls Program (S5.C.6)

The Structural Stormwater Controls Program is described in Section III.6 of the City's SWMP documentation, submitted as Attachment A of the City's 2008 Phase I Permit Annual Report Form.

5. Summary of Actions Taken to Comply with Applicable TMDL Requirements (S9.E.4)

There are no applicable Total Maximum Daily Loads (TMDL) listed in Appendix 2 of the 2007 NPDES Phase I Municipal Permit for receiving waters to which the City's MS4 drains. Therefore, compliance with this permit such as implementation of the actions comprising the components outlined in the City's SWMP, submitted as Attachment A of the City's 2008 Phase I Permit Annual Report Form, constitutes compliance with any applicable TMDLs not listed in Appendix 2 of the permit (S7.B).

6. Stormwater Monitoring Summary (S9.E.6)

In accordance with S8.B.1, this section provides a brief description of the stormwater monitoring or related monitoring studies conducted during 2008 by or for the City:

6.1 Water Quality

Pollutant Source Control Sampling - This monitoring was conducted by SPU in support of and associated with the Water Quality Hotline, IDDE, and business inspections for source control from existing development.

Lower Duwamish source sediment samples - In 2008, SPU continued to collect source sediment samples (i.e., catch basins, inline sediment traps, and inline grab samples) to support the source control program for the Lower Duwamish Waterway superfund site. In 2008, SPU took 122 samples, which were analyzed for the LDW contaminants of concern, including TOC, SVOC's, TPH-Dx, select Metals, PCB's, Grain Size and occasionally site specific parameters, such as pH, additional metals, VOC's.

Catch Basin Research – the goals of this monitoring work are to develop a mosquito species population profile found in catch basins and monitoring the effectiveness of the mosquito larvicide treatment during the summers of 2007 and 2008. In addition to sampling larvae and emerging adult mosquitoes, researchers recorded pH, DO, water temperature, water and sediment depth and conductivity.

The Piper's Creek Microbial Source Tracking (MST) – the goals of this study are too; identify sources of fecal coliform bacteria, measure bacteria concentrations and stream discharge, calculate annual bacteria loading for subbasins of Piper's Creek and evaluate how bacteria sources and concentrations vary by location, season and flow.

The study design includes a total of 18 monitoring locations – five on main stem Piper's Creek, two on Venema Creek, two on Mohlendorph Creek, and one each on nine unnamed tributaries to Piper's Creek. Bacteria data is being collected at each of the 18 stations; bacteria DNA data is being collected at four locations (3 on Piper's Creek and one on Venema Creek). The bacteria DNA data is anticipated to allow for the identification of sources of the bacteria contamination. Manual discharge is being measured at 15 locations; continuous discharge data is also being collected at three SPU stream gauging stations. A total of 24 monitoring events are to be conducted over a one-year period – 12 base flow events and 12 storm flow events.

6.2 Natural Drainage Systems

Green Roof Facility Monitoring – During 2008, SPU completed roof runoff flow monitoring for green roofs on the Ballard Library and Ross Park Shelter House. Flow monitoring continued on Woodland Park Zoomazium, and was initiated at Fire Station 10. Data collected from Ballard Library and Woodland Park Zoomazium was reviewed according to the QA/QC plan. These data will be used to calibrate the green roof modeling methodology in 2009 which is intended to allow for more appropriate information for Code compliance. If funding is secured for additional work in 2009, the future data from the Zoomazium and Fire Station 10 will augment the existing data set and provide further opportunity to update the stormwater credit modeling methodologies in 2010 and beyond.

Bioretention Facility Monitoring – SPU conducted this monitoring in bioretention swales in the Broadview Green Grid located in Northern Seattle to determine what level of flow control is provided by bioretention facilities.

Natural Drainage System (NDS) Monitoring – SPU worked with the University of Washington to completed monitoring of the Broadview Green Grid and document the performance of NDS as a means of meeting our surface water requirements.

7. Operation and Maintenance Schedules

7.1 Justification of Reduced Inspection Frequency

Because this is the second year of the Permit, there are no data available to justify reducing the inspection frequency pursuant to Permit conditions S5.C.9.b.ii(3), S5.C.9.b.iii(1) and S5.C.9.b.iv(2).

7.2 Stormwater Facility Maintenance or Repairs greater than \$25,000 (S5.C.9.b.v)

The City did not conduct any stormwater facility maintenance or repair greater than \$25,000 during 2008. Information on the operation and maintenance program can be found in the City's SWMP, submitted as Attachment A of the City's 2008 Phase I Permit Annual Report Form.

8. Notification of any Annexations, Incorporations, or Jurisdictional Boundaries (S.9.E.8)

There were no annexations, incorporations or changes in jurisdictional boundaries in the geographic area served by the City's MS4 during the 2008 reporting period.