CITY OF SHORELINE
2017 STORMWATER MANAGEMENT PROGRAM (SWMP) PLAN

Prepared February 2017

Figure 1. 32nd Ave NE and NE 147th St Greenworks Bioretention Project, Before and After

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CITY OF SHORELINE
2017 STORMWATER MANAGEMENT PROGRAM (SWMP) PLAN

Prepared February 2017

1 Introduction

Purpose of the Stormwater Management Program Plan

This document is the City of Shoreline's 2017 Stormwater Management Program (SWMP) Plan. The purpose of the document is to comply with requirements of the *Western Washington Phase II Municipal Stormwater Permit (*NPDES Permit). Specifically, under Section 5.C of the NPDES Permit (the Permit), the City of Shoreline must prepare the SWMP Plan to inform the public of the planned SWMP activities for the upcoming calendar year. This SWMP Plan covers the period between January 1, 2017 and December 31, 2017. It must be posted on the City's website by May 31, 2017.

The NPDES Program

The National Pollutant Discharge Elimination System (NPDES) is a program created under the Federal Clean Water Act, with authority over the Permit given to Washington State Department of Ecology (Ecology). Ecology issues Permits to governmental and private entities. The intent of the NPDES is to protect and restore water quality in lakes and streams so that they can support "beneficial uses" such as fishing and swimming. Governmental and private entities wishing to discharge water or wastewater to surface waters regulated by the Federal Government ("waters of the state") must obtain permits and comply with conditions of the permit.

The Western Washington Phase II Municipal Stormwater Permit

The City of Shoreline has been operating under an NPDES Permit since 2007. The current Permit covers the period from August 1, 2013 to July 31, 2018. The Permit allows municipalities to discharge stormwater from municipal systems into "waters of the state," as long as they implement programs to reduce pollutants in stormwater to the maximum extent practicable (MEP), apply all known and reasonable technologies (AKART) to address stormwater pollutants, and protect receiving waters from degradation.

This SWMP Plan follows the organization of Section 5.C of the Permit, and is broken into the five elements of the Permit:

- S5.C.1, Public Education and Outreach

- S5.C.2, Public Involvement and Participation
- S5.C.3, Illicit Discharge Detection and Elimination
- S5.C.4, Controlling Runoff from New Development, Redevelopment and Construction Sites
- S5.C.5, Municipal Operations and Maintenance

Coverage of Section 7, Compliance with Total Maximum Daily Load Requirements, and Section 8, Monitoring, is also included in this document.

In addition, the Permit requires the City to submit an Annual Report by March 31st of each year that details actions taken in the previous year to achieve compliance.

The full text of the Permit is available at: www.shorelinewa.gov/stormwaterpermit.

City Coordination and Responsibilities

Permit conditions require internal coordination and documentation of activities across several City departments. The Public Works Department Surface Water Utility staff will coordinate City efforts, and will meet with staff from other departments regularly to ensure that on-going and planned activities meet Permit requirements. It is anticipated that activities required for Permit compliance will be carried out largely by the Public Works, Information Technology, Planning and Community Development, Parks, City Manager's Office (City Attorney), and Administrative Services departments. The Fire/Building and Police departments will be involved to a lesser extent.

The Surface Water Management Utility – Other Activities

This SWMP Plan details planned activities and that fall under the purview of the Permit. Stormwater management is one part of the City's overall surface water management strategy. The Surface Water Utility conducts a suite of programs that reduce flooding, protect and improve water quality, and protect and restore aquatic habitat in the City's streams and lakes. Although not directly required, flood reduction and aquatic habitat restoration efforts can often further stormwater management goals. For details on Surface Water Utility activities beyond this SWMP Plan, see the City website at http://www.shorelinewa.gov/surfacewater or contact the Surface Water Division of the Public Works Department at (206) 801-2450.

Permit Implementation Timing

The Permit allows for phased implementation of stormwater management programs and actions. Table 1 provides a Permit implementation schedule and due dates. Shoreline will continue to implement ongoing activities throughout the remainder of the permit term.

Table 1. Timeline for Implementation of Stormwater Management Program

Western Washington Phase II Municipal Stormwater NPDES Permit Overview – 2013 to 2018

The timelines below provide an overview of major program components deadlines (**By Date** means"... no later than...") for implementing permit requirements of S5 Stormwater Management Program (SWMP) for Continuing City, Town and County Permittees. Other permit elements are listed on the next page. This is guidance only: please see the permit for additional detail and related requirements.

S5 Program Component	August 1, 2013 Ongoing program implementation	2014	2015	2016	2017	Jan-July 31, 2018
A. Stormwater Management Plan	Continue to track costs, actions and activities. Continue required internal and suggested external coordination and SWMP Plan submittal w/annual report. Update SWMP Plan annually.		**By March 31**: annual rpt includes description of internal coordination			
C.1 Public Education and Outreach	Continue public education and outreach program. Measure changes in behavior for 1 audience & 1 topic.	Create or partner w/others to create stewardship.		**By February 2:** use measures of behavior changes to improve program.		
C.2 Public Involvement	Continue to provide ongoing opportunities for the public to participate in SWMP decision-making. Post online annual reports and SWMP Plan for previous calendar year by 5/31 of each year.					
C.3 Illicit Discharge Detection and Elimination (IDDE)	Continue implementing the enforceable mechanism to prohibit illicit discharges, compliance strategy, IDDE and municipal staff training, citizen hotline and IDDE response, and maintain map of MS4.				**By Dec 31:** Field screen at least 40% of MS4 & on average 12% each year thereafter.*	**By Feb 2:** Update ordinance if needed.
C.4.a-f Control Runoff from New Develop't, Redevelop't Construction Sites	Continue to implement ordinance addressing construction/post-construx runoff controls; make NOIs for construction, industrial stormwater permits available; site plan review & permitting, requiring long-term maintenance; inspections; training; and enforcement.			**By Dec 31:** Update SW code to revised Appx 1 standards; review, revise, make effective develpmt codes to make LID preferred approach. **	**By March 31**: Submit summary of review & revision of codes to reduce impervious surface, protect vegetation, minimize SW.	Achieve at least 80% of scheduled inspections.
C.4.g Water-shed scale stormwater planning (selected permittees)	**(By Oct. 31, 2013** Phase I permittee notifies Ecology of selected basin and affected Phase II permittees; convenes planning process.)	**(By April 1:** Scope of work submitted to Ecology by Phase I watershed plan lead.)	Participate in planning process, if located within selected basin.	**By Oct 1:** Phase I lead submits final watershed scale stormwater plan to Ecology.		
C.5 Municipal Pollution Prevention, Operation and Maintenance	Continue implementation of MS4 maintenance; annually inspect SW trtmt & flow control BMPs/facilities; spot checks; O&M & SWPPPs for municipal lands & facilities; staff training			**By Dec 31:** Update maintenance standards to revised manual/ code standards.**	**By August 1:** Inspect all catch basins or document alternatives if used. Plan to complete inspections every 2 years thereafter.*	Achieve 95% of inspections for municipal stormwater treatment/flow control BMPs/facilities and catch basins.

S8 Monitoring and Assessment

S8 Monitoring	August 1, 2013	2014	2015	2016	2017	July 31, 2018
S8.A	Continue to provide description in each annual report of stormwater monitoring or stormwater- related studies conducted by permittee or others (except if related to S8.B or S8.C.					
S8.B Status and Trends Option #1	*PS Permittees ONLY*: **By Dec 31**: Notify Ecology which option selected for status and trends monitoring.	*PS Permittees ONLY* : **By Aug 15**: First annual payment to RSMP.				
S8.B Status and Trends Option #2		**By July 31**: Begin monitoring wadeable streams.	**Oct 1**: Begin monitoring nearshore marine (if applicable).	Annual reporting as per Ecology-approved QAPP.		
C. Effectiveness Option #1	**By Dec 31**: Notify Ecology which option selected for effectiveness monitoring.	**By Aug 15**: Option #1 first annual payment to RSMP.				
C. Effectiveness Option #2		**By Feb 2**: Submit QAPP to Ecology. **By Oct 1**: Begin flow monitoring.	**Oct 1**: Stormwater monitoring program fully implemented.	Annual reporting as per Appendix 9.		
S8.D Source ID & Diagnostic Monitoring		**By Aug 15**: First annual payment to RSMP.				

Other significant elements of the permit

This is guidance only: see the permit for additional detail and related requirements.

S1 Application for coverage	Co-Permittees can end or amend agreements at any time.
S4.F Response to violations of Water Quality Standards	Notification and possible adaptive management may occur at any time.
S7 Compliance with Total Maximum Daily Load (TMDL) Requirements	Comply with applicable TMDL requirements listed in Appendix 2 per individual timelines.
S9 Reporting	Keep all records related to the permit for at least five years. Beginning March 31, 2015, submit a report for the previous calendar year using WAWebDMR or form provided by Ecology.
G3 Notification of Discharge Including Spills	Report to Ecology within 24 hours any discharge into or from the MS4 which could constitute a threat to human health, welfare or the environment.
G.18 Duty to Reapply	Apply for permit renewal no later than Feb. 2, 2018 (180 days before permit expiration).
G20 Non-compliance Notification	Notify Ecology within 30 days of becoming aware of permit non-compliance.

2 Public Education and Outreach (S5.C.1)

The Permit requires the SWMP Plan to include a stormwater education and outreach program that will:

- Provide education and outreach to the public, including: school age children, businesses, residents, landscapers, property manager/owners, engineers, contractors, developers, and land-use planners.
- 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 planting, and education activities.
- Measure the understanding and adoption of behaviors for a target audience, and use this information to evaluate past programs and direct future programs.

The City of Shoreline's Surface Water and Environmental Services Division of Public Works has several programs in place to help residents and businesses understand stormwater pollution as a significant water quality concern. The City provides outreach to residents, schools, businesses, and government on ways to reduce actions that negatively impact our environment.

The City tracks education and outreach efforts, and informally tracks costs versus benefits of the efforts. Formal tracking information can be found in Appendix B of the 2016 Annual Report.

In addition to local programs and events, Shoreline is an active participant in regional education and outreach activities through Stormwater Outreach for Regional Municipalities (STORM) and Stormwater Outreach Group (SOG). Efforts of these groups include developing regional stormwater education campaigns and evaluation.

S5.C.1.a Targeted Stormwater Outreach

Table 2 (below) lists target audiences and behaviors that are currently being addressed by the City's education and outreach programs. These programs fulfill the Permit requirement to build general awareness. For the 2017 period, the City will continue its work in building general awareness about the stormwater problem.

Table 2. Education and Outreach Programs Planned Activities

Item	Target Audience	Goal and/or Behaviors Promoted
Surface Water and Environmental Services Website	General Public	Reduce contaminants entering the storm drain system through educational information accessible on the City's website.

Item	Target Audience	Goal and/or Behaviors Promoted
Earth Day Every Day/ Natural Yard Care Event	General Public; Homeowners	Promotion of natural yard care tools that help maintain lawns and gardens without chemical application and car washing techniques that minimize the amount of pollutants washed down storm drains.
Soak It Up Program	General Public; Land Owners	Continue rebate program for rain garden retrofits and native vegetation landscaping to community residents and businesses.
Storm Drain Marking Program	General Public	Awareness; prevention of discharge of non-stormwater materials into the stormwater system; resident participation by involvement of citizen organizations and residents in the storm drain labeling process.
Adopt-A-Drain Program	Homeowners; General Public	Raise awareness of stormwater impacts and ways that citizens can reduce these impacts.
Local Source Control/ Pollution Prevention Program	Businesses	Work with businesses to develop practical methods of reducing or eliminating discharge of non-stormwater materials into the stormwater system.
Clean and Green Car Wash Program	General Public	Awareness; Reduction of vehicle wash water entering the storm drain system.
“Did You Know” factoid in the City’s monthly Currents news publication	General Public	Raise awareness of stormwater impacts and ways that citizens can reduce these impacts.
Park signage and pet waste stations encouraging people to pick up their pet waste (park rule or ordinance cited)	General Public; Dog Owners	Increase awareness of the importance of picking up pet waste.
Workshops and presentations on rain gardens and native vegetation landscaping	General Public; Land Owners	Raise awareness of low impact development and incentives for these retrofits.

Item	Target Audience	Goal and/or Behaviors Promoted
Booths and displays at various special and on-going events on Basic Stormwater Education	General Public	Raise awareness of stormwater impacts and ways that citizens can reduce these impacts.
Environmental Mini Grant Program	General Public; Homeowners; Schools	Provides funding source for the general public to implement projects that increase awareness about the importance of using natural yard care, water conservation practices, keeping litter out of our waterways, and the importance of environmental stewardship.

S5.C.1.b Creating Stewardship Opportunities

The City will continue to offer its Storm Drain Marking and Adopt-A-Drain programs in 2017. Citizens, community groups, and school groups can volunteer to mark storm drains with “Dump No Waste" medallions. The City of Shoreline’s Adopt-A-Drain Program is a volunteer-based opportunity for residents to help care for Shoreline’s utility infrastructure of 7,000+ storm drains. Volunteers are provided with instructions and tools, by request, to care for a storm drain or multiple drains on their street or walking route. Tasks include monitoring and removing debris from the storm drain(s) approximately once a week during the storm season and tracking hours performed. The commitment term is for six months, October through March. The City also offers Environmental Mini-Grants to provide management and stewardship of our natural resources and environmental assets, in order to preserve, restore, and enhance their value for present and future generations.

S5.C.1.c Measuring Outreach Effectiveness

The City measured the understanding and adoption of the Soak It Up Low Impact Development (LID) Rebate Program through a survey conducted in 2015. Attachment A – “Memorandum: 2016 NPDES Annual Report Public Outreach S5.C.1.b Description” details how the survey results were used to direct education and outreach resources for the Soak It Up LID Rebate Program and includes the survey results.

The Soak It Up LID Rebate Program was created to promote LID best management practices and adhere to permit requirements. This opportunity became available to property owners in fall 2013, giving incentive to stormwater retrofits such as disconnecting downspouts into rain gardens and/or converting hard surfaces to native vegetation landscaping. Behavior change is measured by the number of projects that are installed each year, and more specifically, the square footage of contributing area treated (i.e. rooftop) and/or hard surface removed.

3 Public Involvement and Participation (S5.C.2)

The Permit requires the City to create opportunities for the public to participate in the decision-making processes involving the development, implementation and update of the City's Stormwater Management Program (SWMP) and to post the SWMP Plan and annual report on the City's website.

The City of Shoreline values public input on its stormwater programs. The City will provide ongoing opportunities for public involvement and participation through a variety of avenues.

S5.c.2.a-b Involving the Public in the SWMP

The City encourages the public to participate in the decision-making processes and updates related to the City's SWMP through open houses, public meetings, surveys, public review and comment periods, and City Council meetings. This SWMP Plan and the annual report will be posted on the City's website no later than May 31st of each year. Public comments can be made directly at www.shorelinewa.gov/stormwaterpermit.

Table 3. Public Involvement and Participation Planned Activities

Item	Description	Schedule
Post SWMP Plan on City website	The SWMP Plan outlines actions to be taken within the year to comply with the NPDES Permit. The SWMP Plan is open for public comment.	Annually, by May 31st
Post Annual Report on City website	Annual Report is submitted to Department of Ecology by March each year. The final Report is posted on the City's website.	Annually, by May 31st
Accept public feedback on the City's SWMP Plan via website, email, or any other written form	The City encourages public comment on the SWMP Plan.	Ongoing

Other avenues for public input include:

- Updates of the City's Surface Water Master Plan. The first plan was developed in 2005 and updated in 2011. The Plan is currently being updated. During the plan update process, the public can participate through several avenues, including open houses, public meetings, surveys, public review and comment periods and/or City Council meetings. One open house was conducted in September 2016 and another open is house is planned for spring 2017. In 2011, the public provided extensive comments on the City's Surface Water Master Plan, which helped shape its development.
- The public can give input each year to the capital improvement plan and budget that details programs outlined in the current Surface Water Master Plan.

4 Illicit Discharge Detection and Elimination (S5.C.3)

The Permit requires the City to have an ongoing program designed to prevent, detect, characterize, trace and eliminate illicit connections and illicit discharges into the City's stormwater drainage system.

One of the largest threats to the City's freshwater is illicit discharge. The City of Shoreline has an ongoing illicit discharge detection and elimination (IDDE) program to fulfill this requirement. The IDDE program has grown over the years and includes a variety of techniques and methods.

S5.C.3.a Municipal Stormwater Drainage System Map

The City maintains and updates a GIS database that contains all known outfalls, receiving water, stormwater facilities, and all known connections. Field staff are constantly verifying the mapped drainage system through the City's inspection programs and basin planning efforts.

S5.C.3.b IDDE Ordinance/Regulatory Mechanism

The City adopted and implemented an illicit discharge ordinance (SMC 13.10) that provides a list of prohibited and allowable discharges and enforcement procedures. In the vast majority of cases, the City seeks voluntary compliance through education and outreach to the general public and technical assistance to business owners through the Local Source Control/Pollution Prevention program.

S5.C.3.c-d Ongoing IDDE Program

The City currently has an ongoing IDDE program through the adoption of the *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments,* Center for Watershed Protection, 2004 manual. The City responds to and investigates reports of illegal dumping, spills, illicit discharges, and illicit connections. The City also maintains a spill response hotline (206.801.2700) for citizens to call and report illicit discharges or spill complaints. The hotline is advertised on the City's website at www.shorelinewa.gov/stormwaterpermit. In 2017, the City will finalize an Illicit Discharge Policies and Procedures Manual specific to the City, consistent with the *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments,* Center for Watershed Protection, 2004.

The City is required to screen 40% of its stormwater system by December 31, 2017, and on average 12% each year thereafter. The City will continue to fulfill this requirement through its inspection programs (commercial, right of way, regional/residential, and hot spots) and basin planning efforts.

S5.C.3.e Staff Training

The City coordinated IDDE/spill response training in 2016 for City staff. In 2017, the City will develop and coordinate in-house training in 2017 for City staff that may encounter water quality threats and/or respond to spills that may threaten water quality in the course of their routine work.

S5.C.3.f IDDE Program Recordkeeping

The City uses Cityworks – a Work Order software – to track efforts made in identifying, reducing, and eliminating spills, illicit discharges, and illicit connections.

5 Controlling Runoff from New Development, Redevelopment, and Construction Sites (S5.C.4)

S5.C.4 of the Permit requires that Shoreline implement and enforce a program to reduce pollutants in stormwater runoff from new development, redevelopment, and construction site activities. This area of the permit has some of the most significant changes from the 2007 permit term to the current permit term. Among other items addressed below, the Permit intends to make low impact development (LID) the preferred and commonly-used approach to site development.

Controlling pollutant loads and reducing peak flows from developed sites is a long term goal of S5.C.4 of the Permit. Ongoing maintenance of permanent stormwater facilities is critical in meeting this goal. To this end, under the NPDES Permit, stormwater facilities permitted since 2007 require proof of ongoing maintenance. To assure maintenance is completed, the City inspects several hundred stormwater facilities on a rotating inspection cycle. Through this inspection program, the City strives to assure that stormwater facilities are functioning as designed.

S5.C.4.a Controlling Runoff from New Development, Redevelopment, and Construction Sites Ordinance/Regulatory Mechanism

Shoreline Municipal Code (SMC) 13.10.200 adopts the 2014 update of the *2012 Stormwater Management Manual for Western Washington (SWMMWW)* and the Minimum Requirements found in Appendix 1 of the NPDES Phase II Permit. The City of Shoreline *Engineering Development Manual* (EDM) also addresses stormwater management as follows:

- Chapter 19 – Stormwater Manual Modifications: Modifies sections of Ecology's 2012 SWMMWW for the City.
- Chapter 21 – Low Impact Development (LID): Specifies LID principles and guideline recommended for site planning.
- Chapter 22 – Infiltration: Provide information on subsurface investigation, prohibition, setbacks, and verification testing.
- Chapter 23 – Surface Water Project Classifications: Defines the minimum submittal requirements for the following project classifications:
    - Small Impact Projects (MR #2 only)
    - Medium Impact Projects (MR #1 through #5)
    - Large Impact Projects (MR #1 through #9)
- Chapter 24 – Site Development Plan: Specifies criteria for project layout and site design.
- Chapter 25 – Stormwater Pollution Prevention Plan (SWPPP): Defines the requirement for MR #2.

S5.C.4.b Review and Inspect Development/Redevelopment Projects

The current permitting process includes site plan review, inspections, and enforcement mechanisms for compliance. The Site Development Permit Checklist currently includes the following stormwater requirements:

- Plan, details, and profile of drainage system
- Erosion control
- Downstream analysis

- Drainage calculations
- Soils information
- Geotechnical or soils report
- Drainage system maintenance information or manual

Additionally, construction SWPPPs are included as part of the approved Civil Engineering Plan (not currently called out on the Site Development Permit Checklist). In-field pre-construction and pre-demolition conference is required as part of the Demolition Permit submittal process before any ground-disturbing activity takes place.

S5.C.4.c Post Construction Operation and Maintenance

The City of Shoreline requires covenants for inspection and maintenance on all new stormwater facilities, following the 2014 update to the *2012 Stormwater Management Manual for Western Washington.* Inspections in the City are divided into two main groups: erosion control inspections (includes Right-of-Way [ROW] and Building inspectors) and private facility inspections. Erosion control inspections are conducted for public projects in the ROW, CIP projects, and private building projects. Private stormwater facility inspections require covenants to inspect private stormwater facilities, per the 2012 SWMMWW and the City Surface Water Code and EDM (the City acquired facilities from King County upon incorporation that do not have covenants but inspection access was included in the King County code).

S5.C.4.d Notice of Intent (NOI)

The City will continue to make copies of "Notice of Intent for Construction Activity" and "Notice of Intent for Industrial Activity" as required.

S5.C.4.e Staff Training

Training will be kept up to date for employees involved in any aspect of planning, development, inspection, or enforcement of stormwater runoff controls.

S5.C.4.f LID Code-Related Requirements

The City completed a review and Gap Analysis of the existing codes and standards – including the existing Shoreline Municipal Code, Engineering Development Manual, the Comprehensive Land Use Plan, and the Critical Areas Ordinance – for consistency with the requirement of LID principles and Best Management Practices. A summary of the review and Gap Analysis is provided in the Technical Memorandum "City of Shoreline Code, Standard, and Document Review" dated January 20, 2016, attached to last year's SWMP. The document was used to guide the City in the code revisions and policy updates for making LID the preferred and commonly used approach in the City. The City used a process similar to the one outlined in *Integrating LID into Local Codes: a Guidebook for Local Governments* (Puget Sound Partnership, 2012). The revisions to the codes were adopted and made effective in Ordinance 768 on December 12th, 2016 (Attachment B – "Ordinance No. 768").

6 Municipal Operations and Maintenance (S5.C.5)

The Permit requires the City to implement an operations and maintenance (O&M) program that includes a training component and has an ultimate goal of preventing or reducing pollutant runoff from municipal operations. The City of Shoreline currently operates its O&M programs with the goal of reducing potential impacts to water quality. These programs use a variety of methods to meet that goal. The Roads Division follows guidance from the ESA Regional Road Maintenance Program Guidelines. The Surface Water Division implements a rigorous stormwater system inspection, maintenance, and cleaning program. All City departments adhere to Shoreline Municipal Code (SMC) 20.80.085 for use of pesticides, herbicides and fertilizers on City-owned property. Additionally, all City Maintenance Yards operate under a Surface Water Pollution Prevention Plan and are regularly inspected to assure compliance with the SWPPP.

S5.C.5.a Maintenance Standards

The City continues to use the 2014 update to the *2012 Stormwater Management Manual for Western Washington* (SWMMWW) for maintenance standards as well as following the ESA Regional Roads Maintenance Program Guidelines.

S5.C.5.b Annual Inspection of Stormwater Treatment and Flow Control BMPs/Facilities

The City inspects and maintains all flow control and runoff treatment facilities owned and operated by the City to ensure they are maintained according to the standards per the Ecology 2012 SWMMWW through the City's Regional and Residential Inspection Programs. New stormwater treatment and flow control facilities are added to the inspection program once the City takes over ownership. In some cases, maintenance issues are sent to the City Surface Water Engineer to assess if the issue can be addressed for less than $25,000. If the repair exceeds $25,000, it is then considered a capital improvement project and is places on a list of prioritized capital stormwater repair needs.

S5.C.5.c Major Storm Event Inspections

The City continues to perform spot checks of known "hot spots" after major storm events.

S5.C.5.d Catch Basin Inspections

The City continues to inspect all municipally operated catch basins through its Right-of-Way inspection program, its Regional inspection program, and its Residential inspection program. The frequency of catch basin inspections for each program is detailed in Table 4 below, in order to achieve the permit requirement to inspect all municipally owned catch basins at least once by August 1, 2017.

S5.C.5.e Established Stormwater Inspection Program

The City has an established stormwater inspection program designed to inspect all sites (see Table 4) and achieving at least 95% of inspections through the following programs:

- Right-of-Way Inspections: includes catch basins and pipe networks that transfer surface water runoff from right-of-way pavement.
- Commercial Facility Inspections: involves visual checks of all stormwater infrastructure on site.

- Regional/Residential Facility Inspections: involves visual checks of all stormwater infrastructure on site.

City owned and operated pipes with a diameter of 12 inches or larger are assessed through the City's basin planning efforts.

Table 4. Stormwater Assets and Inspection Frequency

Inspection Program	Asset	Frequency of Inspection
Right-of-Way	Catch Basins	Every 3 years (1/3 annually) *Note: Aurora ROW CBs are inspected annually for the first 3 years*
	Ditch	
Regional	Catch Basins	Annually
	Facilities (ponds, tanks, wetlands, pump stations)	
	Culverts	
	Contech Filters	
	Aquafilter Vault	
	Vortechs	
	Ditch	
Residential	Catch Basins	Biennially
	Facilities (ponds, tanks, wetlands, pump stations)	
Commercial	Catch Basins	Annually or Biennially, depending on inspection history
	Facilities (ponds, tanks, ditches, swales, filters)	

S5.C.5.f Reduction of Municipal Operations Stormwater Impacts
The City of Shoreline is committed to using applicable BMPs associated with runoff control during routine maintenance. The City continues to follow the ESA Regional Roads Maintenance Program Guidelines and adheres to SMC 20.80.085.

S5.C.5.g Staff Training
The City coordinated a Certified Erosion and Sediment Control Lead (CESCL) training in 2016. City staff will be trained in 2017 as needed.

S5.C.5.h Stormwater Pollution Prevention Plans (SWPPPs)
The City has SWPPPs on file for all maintenance and storage yards and updates the SWPPPs as needed.

S5.C.5.i Maintenance Records
The City uses Cityworks (a Work Order software) to track inspections and maintenance/repair activities.

7 Compliance with Total Maximum Daily Load (TMDL) Requirements (Permit Section 7)

There are no TMDLs in the City of Shoreline.

8 Monitoring and Assessment (Permit Section 8)

The Monitoring portion of the Permit has seen several significant changes for the new Permit term. Section 8 of the Permit covers Status and Trends Monitoring, Effectiveness Studies, and Source Identification and Diagnostic Monitoring (SIDM). In the first two categories, the City was given the option to either conduct its own qualifying Status and Trends Monitoring and/or Effectiveness Studies OR opt in to a regional collective fund. This fund will then be used to complete studies of regional significance. In the case of the SIDM, the City is required to pay into a collective fund.

One City staff is acting as an alternate on the Stormwater Work Group, a subgroup of the Puget Sound Ecosystem Monitoring Program. This group works to identify objectives for monitoring stormwater, to develop an approach to provide needed information about stormwater impacts and the effectiveness of stormwater management actions, and to share results in a way that helps the region make better decisions. See their webpage at www.ecy.wa.gov/programs/wq/psmonitoring/swworkgroup.html.

Opt In Decisions

In 2013, the City of Shoreline opted to contribute to the Regional fund for the Status and Trends Monitoring and Effectiveness Studies for the Permit term. The City will also contribute to the SIDM for the Permit term.

The Stormwater Work Group will be overseeing the work conducted with the regional collective funds. We expect to receive updates on this work periodically.

Attachment A. Memorandum: 2016 NPDES Annual Report Public Outreach S5.C.1.b Description

Memorandum

DATE: January 31, 2017

TO: Washington State Department of Ecology

FROM: City of Shoreline

RE: 2016 NPDES Annual Report Public Outreach S5.C.1.b Description

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As a requirement of its NPDES Phase II Municipal Stormwater, the City of Shoreline (City) is required to evaluate the public education and outreach components of its Stormwater Management Program (S5.C.1). Specifically, the City must measure understanding and adoption of a targeted behavior for at least one target audience in at least one subject area. To meet this requirement, the City has chosen to evaluate (as the targeted behavior) conversion of hard surfaces to native vegetation landscaping, and (as the targeted audience) Shoreline homeowners. In order to measure understanding and adoption, the City conducted public surveys regarding general stormwater requirements and the City's Soak It Up Low-Impact Development Rebate Program (Soak It Up program). The City requested that Brown and Caldwell complete a review of survey results to evaluate results and provide recommendations on potential program changes (see attached).

In 2016, various program improvements were implemented to direct education and outreach resources. These newly implemented actions include:

- Rain garden yard sign distribution (see attached)
    - Purchased and distributed to participants and those that completed a project in 2014 and inspected in 2016. These signs are durable, weather and UV resistant, and similar to City of Everett, Shoreline staff has found them useful in identifying and marking rain gardens as well as promoting the program.
- Soak It Up program maintenance guide development
    - Created (see attached) to provide simple details on maintaining installed rain gardens and native vegetation landscaping. The four-page guide has been provided to participants that had their projects inspected.

- Shoreline Community College Earth Week Outreach
    - Participated in the local community college's Earth Week events, by providing information about the program to a different audience. An interested student club shared ideas about their intent to build a demonstration rain garden.

Brown AND Caldwell

701 Pike Street, Suite 1200
Seattle, WA 98101

Phone: 206.624.0100
Fax: 206.749.2200

Technical Memorandum

Prepared for: City of Shoreline

Project Title: NPDES Permit Code Support

Project No.: 148124

Technical Memorandum

Subject: City of Shoreline Stormwater Public Education and Outreach Survey Evaluation

Date: January 20, 2016

To: Uki Dele, Surface Water and Environmental Services Manager

From: Patrick Weber, P.E.

Prepared by: Margaret Ales

Damon Diessner

Reviewed by: Patrick Weber, P.E.

Section 1: Introduction

As a requirement of its National Pollutant Discharge Elimination System (NPDES) Phase II Municipal Stormwater Permit issued by the Washington State Department of Ecology, the City of Shoreline (City) is required to evaluate the public education and outreach components of its Stormwater Management Program (S5.C.1). Specifically, the City must measure understanding and adoption of a targeted behavior for at least one target audience in at least one subject area. To meet this requirement, the City has chosen to evaluate (as the targeted behavior) conversion of hard surfaces to native vegetation landscaping, and (as the targeted audience) Shoreline homeowners. In order to measure understanding and adoption, the City conducted public surveys regarding general stormwater requirements and the City's Soak It Up Low-Impact Development Rebate Program (Soak It Up program). The City requested that Brown and Caldwell (BC) complete a review of survey results to evaluate results and provide recommendations on potential program changes.

This technical memorandum (TM) includes review and summary of information from two surveys conducted by the City. The first was a telephone survey of 400 randomly selected Shoreline homeowners (with a yard) performed in November 2015 by Elway Research (City 2015a). The telephone survey repeated key questions about general stormwater knowledge and awareness from a 2012 survey administered to Shoreline homeowners and also included new questions about the Soak It Up program.

The Web-based survey was administered to recent Soak It Up program participants who had either completed a project or scheduled a site visit with City staff. It was conducted in December 2015 using the Web-based survey tool, SurveyMonkey, and had 25 responses out of 54 recent program participants, resulting in a 46 percent response rate (City 2015b).

Section 2 of this TM summarizes the results of the surveys. Section 3 provides recommendations for improvements to the City's public education and outreach programs. Responses to both surveys are included in Attachment A.

Section 2: Results Summary

Key findings from the 2015 telephone and Web-based surveys are summarized below. Both surveys asked participants about the following topics:

- General stormwater understanding
- Rain gardens and native vegetation landscaping (in general)
- The City's Soak It Up program (in particular)

2.1 General Stormwater Understanding

The telephone survey asked respondents about the importance of stormwater and water pollution relative to other environmental threats, the significance of water pollution, the respondents' impact on water quality, and the respondents' understanding of stormwater dynamics. Key findings are summarized below:

- Stormwater runoff and water pollution were named by 10 percent each to be the single most important threat to the environment facing Shoreline today. Compared to a 2012 survey, water pollution is down 5 percent and stormwater runoff is up 4 percent. This shift may indicate an increased awareness of the relationship between runoff and overall water quality. The three top environmental issues facing Shoreline were listed as traffic (20 percent), climate change (15 percent), and land use/development (15 percent).

- In both the 2012 and 2015 survey, approximately 80 percent of the respondents indicated that their actions had an impact on local water quality. The number of respondents who believed they had a significant impact decreased from 42 percent in 2012 to 27 percent in 2015.
- In both 2012 and 2015 surveys, two thirds responded that runoff has a significant impact on local water quality.
- In both 2012 and 2015 surveys, when asked where the stormwater ends up eventually, nearly all understood that it ends up in local streams or the Puget Sound.
- The understanding that stormwater is not treated doubled from 2012 to 2015, from 25 percent to 50 percent.
- Those who said that there is a local water pollution problem were more likely to install a rain garden, consider/install native vegetation landscaping, or replace pavement with porous pavement.

The Web-based survey asked similar questions on general stormwater understanding, but many were open-ended questions, and were directed to a targeted group that had already expressed knowledge and interest in the rain garden and native vegetation landscaping principles of the Soak It Up program. Key findings are summarized below:

- Similar to the telephone survey, when asked about the single most important threat to the environment facing Shoreline today, the issues with the highest response were development/loss of vegetation (nearly 50 percent) with climate change and soil/water quality being about 25 percent each.
- The great majority of respondents believed that water pollution is a significant problem and that their actions have a significant impact on local water quality.
- Nearly all respondents understood that runoff drains to local waterways and eventually to Puget Sound.
- None of the Web-based survey respondents believed that all runoff is treated before entering local waterways. Twenty percent believed that some stormwater is treated and some is not; most believed that runoff is not treated.

2.2 Soak It Up Program Understanding

The telephone survey also asked participants about the concepts of native vegetation landscaping and rain gardens, and about the City's Soak It Up program. The survey looked at three key areas: (1) residents' familiarity with the Soak It Up program, (2) their willingness to participate in the program, and (3) motivations and barriers to installing rain gardens or native vegetation. The results are presented below:

- Half of the respondents reported that they were familiar with the concept of rain gardens. Another 19 percent had heard the term, but were not familiar with the concept. Just under half would consider installing a rain garden. Those most likely to install had also perceived that there is a water pollution problem and that they contributed to it.
- Two thirds were familiar with native vegetation landscaping. Another 15 percent had heard of it but were not familiar with it. Nearly 6 in 10 would consider installing native vegetation. Similar to rain gardens, those most likely to install were those familiar with it and those who perceived a significant water pollution problem that they contributed to.
- More than half of the respondents indicated that cost was the chief barrier (55 percent) to rain gardens and native vegetation landscaping, with maintenance and aesthetics also considered to be a barrier by 28 percent, each. Half would be more likely to install a rain garden or native vegetation with the opportunity for a rebate.
- Fewer than 20 percent of the respondents had heard of the Soak It Up program. For those who had heard about the program, about 80 percent recalled hearing about it from a City-sponsored event or through City-published materials.

- About 50 percent of the respondents would be interested in replacing existing pavement on their property with porous pavement if they were offered a rebate to do so.

The Web-based survey questions focused on the Soak It Up program specifically, rather than the general concepts and understanding of rain garden and native vegetation landscaping. Key findings are summarized below:

- More than two thirds of the participants heard about the program through City-sponsored publishing or a City-sponsored event.
- Most participants would recommend the program to a friend or colleague.
- Cost and opportunity for rebate were significant issues for program participants. Benefit to the environment, aesthetics, and effort to install and maintain were also important considerations.
- Nearly 80 percent of the respondents would be interested in replacing existing pavement on their property with porous pavement if they would be offered a rebate to do so.

Section 3: Summary and Recommendations

The telephone survey results indicate that general awareness of stormwater and water quality issues is quite high; however, many of the respondents do not understand that urban runoff is not treated for pollutant removal prior to discharge. A comparison between the 2012 and 2015 survey results show that the public awareness gap for this is narrowing. The telephone survey also indicates that respondents who perceived local water quality as a significant issue or believe that they have an impact on water quality are more likely to participate in activities such as the Soak It Up program. The Web-based survey demonstrated that the participants are willing to recommend the program to friends and colleagues, but have concerns about cost, maintenance, and aesthetics.

One recommendation for general public awareness is for the City to work with regional partners to help focus efforts to address the public misconception that all stormwater is treated.

Specific recommendations for the Soak It Up program include enhancement of the existing program and addressing cost and aesthetics concerns, as identified below.

Program enhancements include:

- With significant percentages of telephone survey respondents willing to pursue both native vegetation planting/restoration and rain garden installation, it appears that there could be benefits to enhancing Soak It Up program funding. Staffing levels needed for program expansion should be understood before proceeding with increased project funding.
- The program could be modified to allow for plantings/improvements by contractors rather than by program participants for those physically unable to perform the work themselves. Such a program modification could be emphasized in future public outreach efforts.
- The program could be expanded to include porous pavement installations. Participants in both surveys indicated that they would be interested in a porous pavement rebate, especially those who said that local water pollution is a problem.

Efforts to address cost and aesthetics concerns include:

- Some potential native vegetation planting program participants see aesthetics as a problem. The City could explore ways to make it clearer that native planting areas can be attractive, perhaps through visual examples (e.g., photographs) or access to more successful demonstration project examples in the field.

- Securing endorsements for native plants as desirable landscaping from well-known regional experts such as Ciscoe Morris or Ed Hume could enhance the aesthetic acceptability of native plantings.
- Another potential way to address the aesthetics concerns could be to expand the allowable plants list to include some additional desirable plant materials for both native vegetation plantings and rain gardens. Following up with specific individuals having expressed opinions on this subject as well as consulting with regional experts could prove effective.
- As cost is a significant consideration for both telephone and Web-based survey respondents with respect to all potential Soak It Up program projects, it may be helpful to develop typical unit costs for native planting and rain garden installations, or suggest approaches for implementing projects in a cost-effective manner.
- Cost considerations could also be addressed by providing estimates of long-term maintenance cost reductions resulting from conversion from turf to native vegetation through the reduced use of chemicals, irrigation, mowing, etc.

Section 4: References

City of Shoreline (City). 2015a. *Stormwater Awareness, Attitudes and Behavior*, Elway Research, November.

City. 2015b. *2015 Soak It Up Program Survey*, SurveyMonkey administered by City of Shoreline, December.

Attachment A: Survey Reports

City of Shoreline, *Stormwater Awareness, Attitudes and Behavior*, Elway Research November 2015

City of Shoreline, *2015 Soak It Up Program Survey*, SurveyMonkey administered by City of Shoreline, December 2015

CITY OF SHORELINE

STORMWATER AWARENESS, ATTITUDES & BEHAVIOR

DECEMBER 2015

ELWAY RESEARCH, INC.

CITY OF SHORELINE

STORMWATER AWARENESS, ATTITUDES & BEHAVIOR

DECEMBER 2015

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ELWAY RESEARCH, INC.

CITY OF SHORELINE

STORMWATER AWARENESS, ATTITUDES & BEHAVIOR

DECEMBER 2015

INTRODUCTION

This report summarizes the results of a telephone survey, conducted on behalf of the City of Shoreline to assess homeowners' awareness of, and attitudes about issues related to stormwater. It also sought to gauge willingness to participate in city programs designed to ameliorate stormwater runoff into nearby creeks.

A total of 400 homeowners, selected at random from lists of addresses in Shoreline, were interviewed by telephone November 23-30, 2015. Respondents were screened to ensure that they were homeowners and that they have a yard at their home.

Specifically, the survey was designed to assess:

- Where water pollution and stormwater rank among respondents' list of important threats to the environment in Shoreline;
- Respondents' evaluation of the significance of local water pollution;
- Perceived impacts of their own activity on water quality;
- Understanding of stormwater dynamics – where it goes, the extent of harm caused by runoff;
- Familiarity with the city's Soak It Up Program and sources of information about it;
- Familiarity with and willingness to install rain gardens, native vegetation landscaping, and porous pavement to mitigate runoff problems;
- Motivations and barriers to installing rain gardens and native vegetation landscaping.

Demographic information was collected so as to compare and contrast answers.

The survey was administered by Elway Research, Inc. The questionnaire was designed to repeat key questions from a survey conducted in 2012 as well as to ask about the new city programs.

The report includes Key Findings, followed by annotated graphs summarizing the results to each question. The full questionnaire and a complete set of crosstabulation tables are presented under separate cover.

METHODS

SAMPLE: 400 Shoreline homeowners with a yard.

TECHNIQUE: Telephone Survey with live interviewers. 23% were interviewed via cell phone.

FIELD DATES: November 23-30, 2015.

MARGIN OF ERROR: ±5% at the 95% level of confidence. That is, in theory, had all similarly qualified homeowners been interviewed, there is a 95% chance the results would be within ±5% of the results in this survey.

DATA COLLECTION: Calls were made during weekday evenings and weekend days. Trained, professional interviewers under supervision conducted all interviews. Up to six attempts were made to contact a voter at each number in the sample before a substitute number was called. Questionnaires were edited for completeness, and a percentage of each interviewer's calls were re-called for verification.

It must be kept in mind that survey research cannot predict the future. Although great care and the most rigorous methods available were employed in the design, execution and analysis of this survey, these results can be interpreted only as representing the answers given by these respondents to these questions at the time they were interviewed.

RESPONDENT PROFILE

In interpreting these findings, it is important to keep in mind the characteristics of the people actually interviewed. This table presents a profile of the respondents in the survey.

NOTE: Here and throughout this report, percentages may not add to 100%, due to rounding.

GENDER:	48%	Male
	52%	Female
AGE:	5%	18-35
	24%	36-50
	33%	51-64
	36%	65+
	2%	No Answer
INCOME:	17%	$50,000 or less
	18%	$50 to $75,000
	18%	$75-100.000
	11%	$100-125,000
	16%	$125,000+
	20%	No Answer

KEY FINDINGS

- **Traffic, climate change and development were cited as the top "threats to the environment" in Shoreline.**
  - Stormwater and water pollution were named by 10% each to rank tied for #4.
- **Half (50%) said that local water pollution is a "significant problem."**
- **1 in 5 (22%) said their household has a "significant impact" on local water quality.**
- **Nearly all were aware that stormwater ends up in local waters (46%) and/or Puget Sound (41%).**
  - 67% said that runoff has a "significant harmful effect" on local water quality.
  - 50% were aware that stormwater runoff is not treated.

RAIN GARDENS & NATIVE VEGETATION LANDSCAPING

- **Half (51%) said they are familiar with the concept of rain gardens.**
  - Another 19% had heard the term, but were not familiar with the concept.
- **Just under half (46%) would consider installing a rain garden.**
  - Most likely to install a rain garden were those who were familiar with them and those who perceived a significant water pollution problem that they contributed to.
- **Two-thirds (68%) were familiar with native vegetation landscaping.**
  - Another 15% had heard of it but were not "familiar' with it.

- **Nearly 6 in 10 (57%) would consider installing native vegetation landscaping.**
  - As with rain gardens, those most likely to install native vegetation landscaping were those who were familiar with it and those who perceived a significant water pollution problem that they contributed to.

- **Cost was the chief barrier – by far – to rain gardens and native vegetation landscaping.**
  - 55% named cost as the most important consideration for them 28% each cited the amount of work required to maintain it and how attractive it would be on their property.
  - Half (51%) said that rebates would make them more likely to install a rain garden or native vegetation landscaping on their property.

- **Perception of water quality problems was related to willingness to consider mitigating installments.**
  - Respondents 1) who said the local water problem was significant, 2) who said their household contributed to the problem, and 3) who said runoff was doing significant harm to local water quality were in each case more willing than those who did not see those problems to install rain gardens, native vegetation landscaping, and porous pavement.

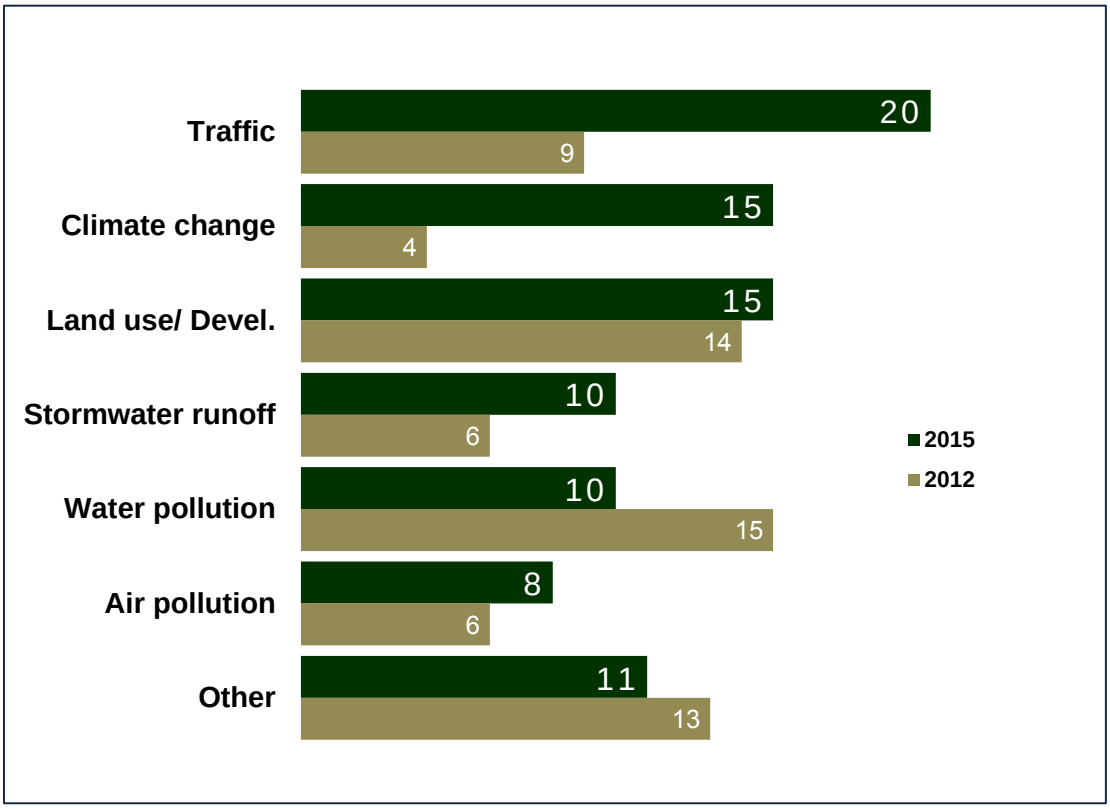
SOAK IT UP

- **Nearly 1 in 5 (18%) had heard of the Soak It Up Rebate Program.**
  - Top sources named for having heard about the program were the *Currents* newsletter (34%), Neighborhood Associations (20%), and city-sponsored events (14%).

FINDINGS

- This section presents the survey findings in the form of annotated graphs.
- Bullet points indicate significant or noteworthy differences among population subgroups.

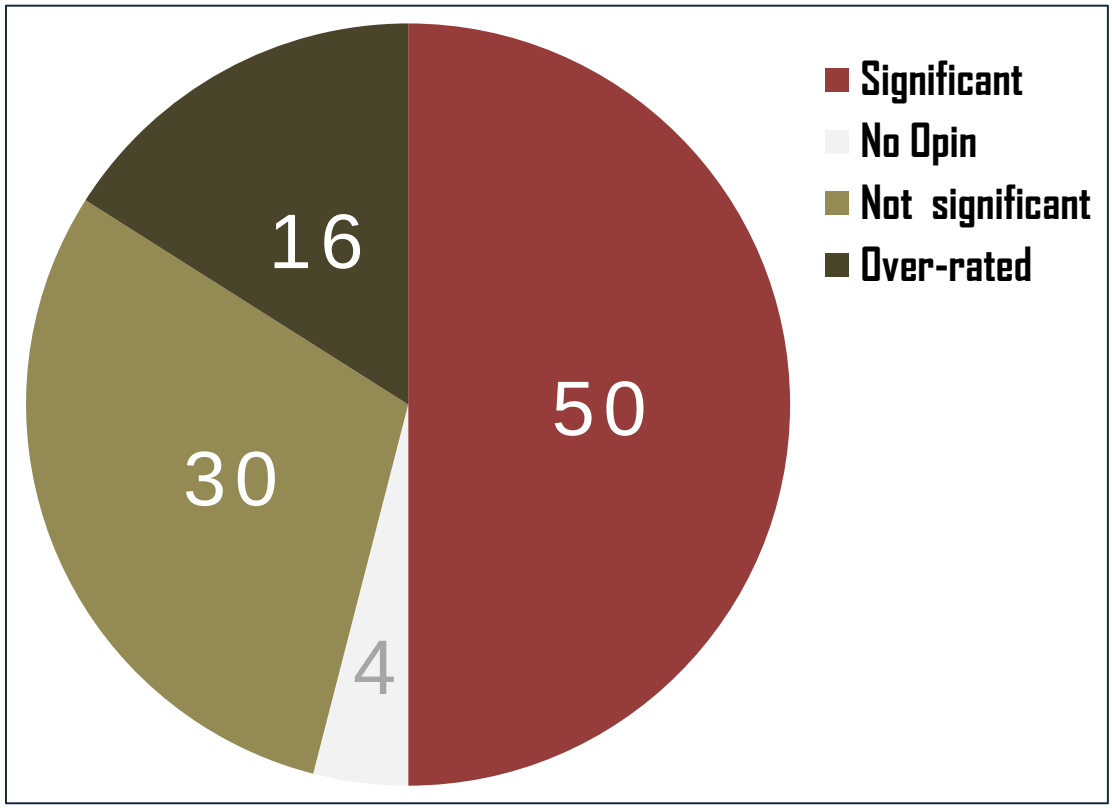
Traffic, Climate Change & Development Named as Top Environmental Issues



Q1 What do you think is the single most important threat to the environment facing Shoreline today? [OPEN]

- **20% of respondents volunteered traffic as the "most important threat to the environment facing Shoreline today."**
  - This is more than twice as many as mentioned traffic in 2012.
- **Stormwater and water pollution were named by 15% each.**
  - Stormwater mentions were up 4 points over the 2012 survey;
  - Water pollution mentions were down 5 points.
  - This shift may indicate a growing awareness of the relationship of runoff to overall water quality.

Half Said Local Water Pollution is a "Significant Problem"



Q2 In your opinion, is pollution in local waterways – like streams, rivers, lakes, and Puget sound …
1) A significant problem; 2) A problem, but not that significant; 3) Over-rated as a problem

- **Respondents were generally split over the significance of pollution in local waterways:**

  50% said it was a "significant problem," while

  46% said it was either "not that significant" (30%) or "over-rated as a problem" (16%).

- **Belief that local water pollution was significant went up with a sense of personal reasonability for water quality:**

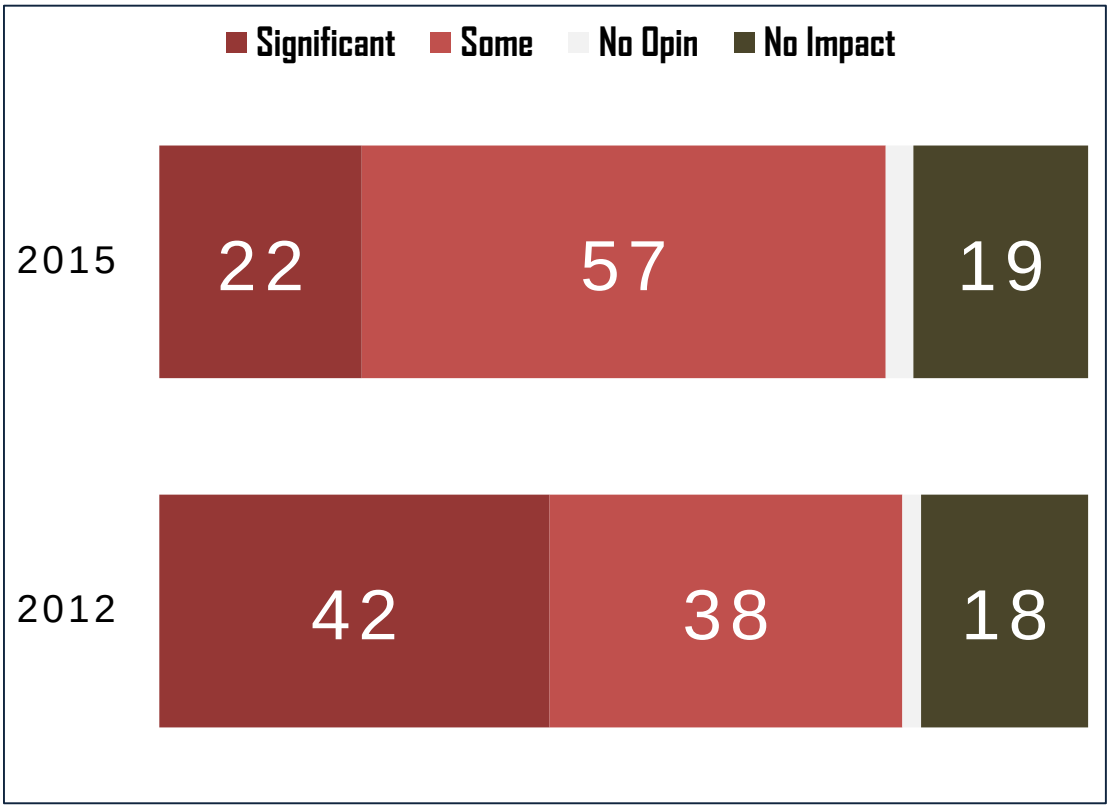
  67% of those who believed their actions had a significant impact on local water quality said that water pollution was a significant problem, compared to

  50% of those who thought their actions as only an insignificant impact on water quality, and

  30% of those who said they had no impact on local water quality.

- **Those who thought that runoff does significant harm to water quality were almost 3 times as likely to rate local water pollution as significant (61% v. 23%).**

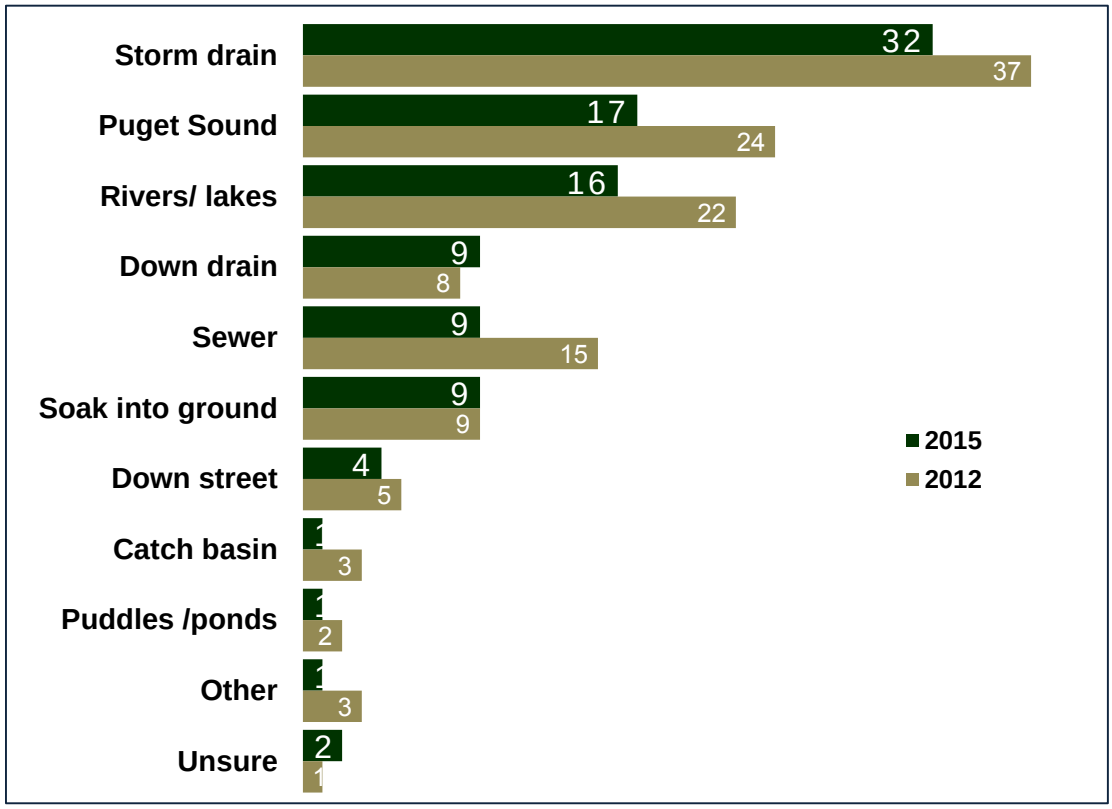
1 in 5 Said They Have a "Significant Impact" on Local Water Quality



Q3 To what degree do you believe that actions you and your family take affect the health of local streams, rivers, lakes, and Puget Sound? Would you say your household has…
1) A significant impact on the water quality in local waterways
2) Some impact but not significant
3) No impact on the water quality in local waterways

- **Overall, 79% of respondents believed that their actions have an impact on the health of local waters, including 22% who said their impact was "significant."**
- **The overall result is almost identical to the results when the same question was asked in 2012 (80% then, 79% now), however**
  - The proportion who said their impact is "significant" was just half of what it was in 2012 (22% v. 42%).

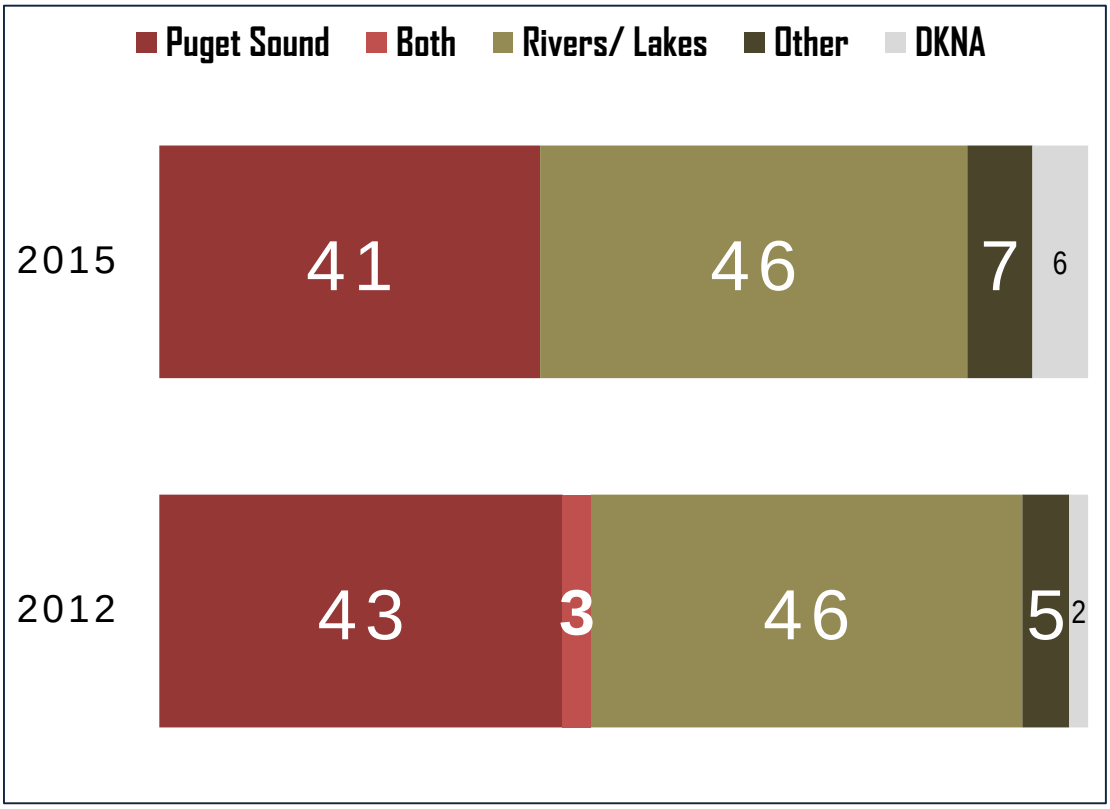
Most Aware that Stormwater Goes into Storm Drain and into Local Waters



Q4 When it rains, a lot of water runs off of roofs, driveways, parking lots, and streets. As you understand it, where does that water go?

- **When asked in an open-ended question where runoff water goes, the top three answers volunteered were**
  - Storm drain (32%)
  - Puget Sound (17%)
  - Creeks, rivers and lakes (16%)
- **The apparent decline in the proportion citing each category is a result of coding, not changes in respondents' awareness. Respondents in 2012 were allowed multiple answers. This year, only one answer was recorded and coded, resulting in lower percentages for each answer.**
  - The main finding here is that the categories are cited in the same order as in 2012, with the exception that relatively fewer people thought that runoff goes down the sewer.

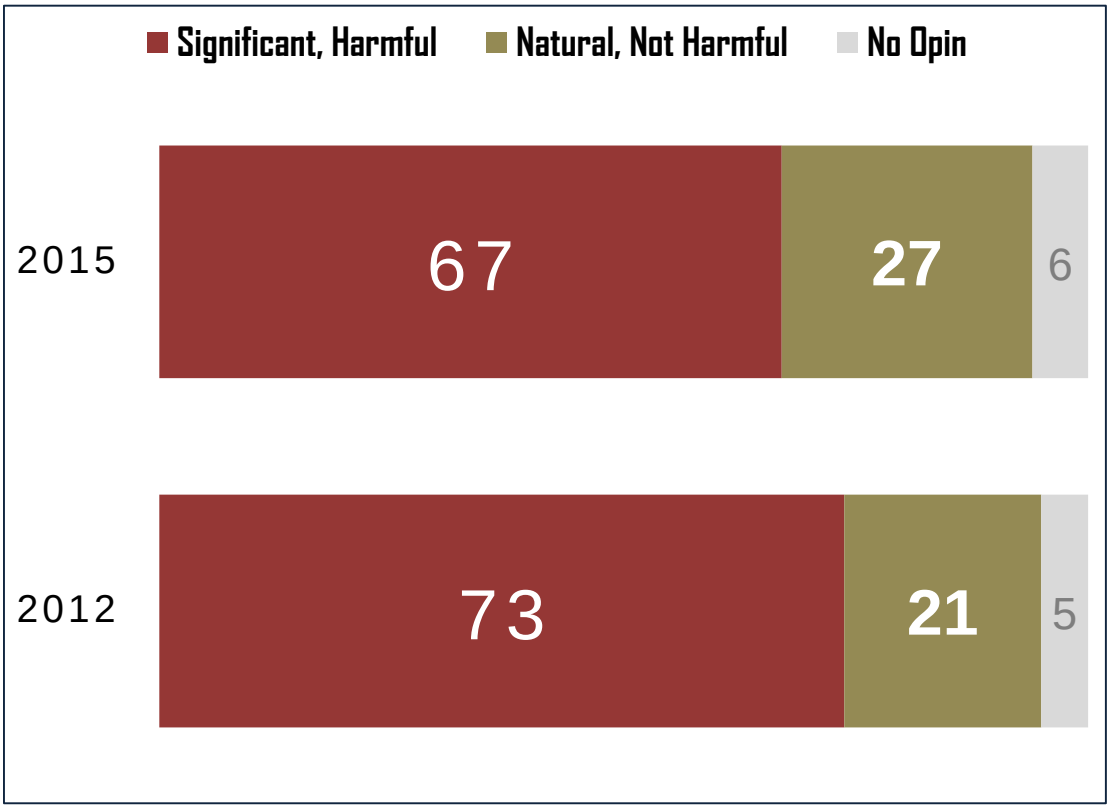
Nearly All Understood that Stormwater Ends Up in Local Waters and Puget Sound



Q4.1 Where does it end up eventually?

- **Respondents who had not named local rivers or Puget Sound in the previous question, but gave answers like "down the storm drain" or "soaks into the ground" were asked where the water ends up eventually.**
- **9 in 10 respondents were aware that stormwater runoff eventually finds its way to local creeks and lakes (46%), and/or to Puget Sound (43%).**
  - These numbers are essentially unchanged since 2012.

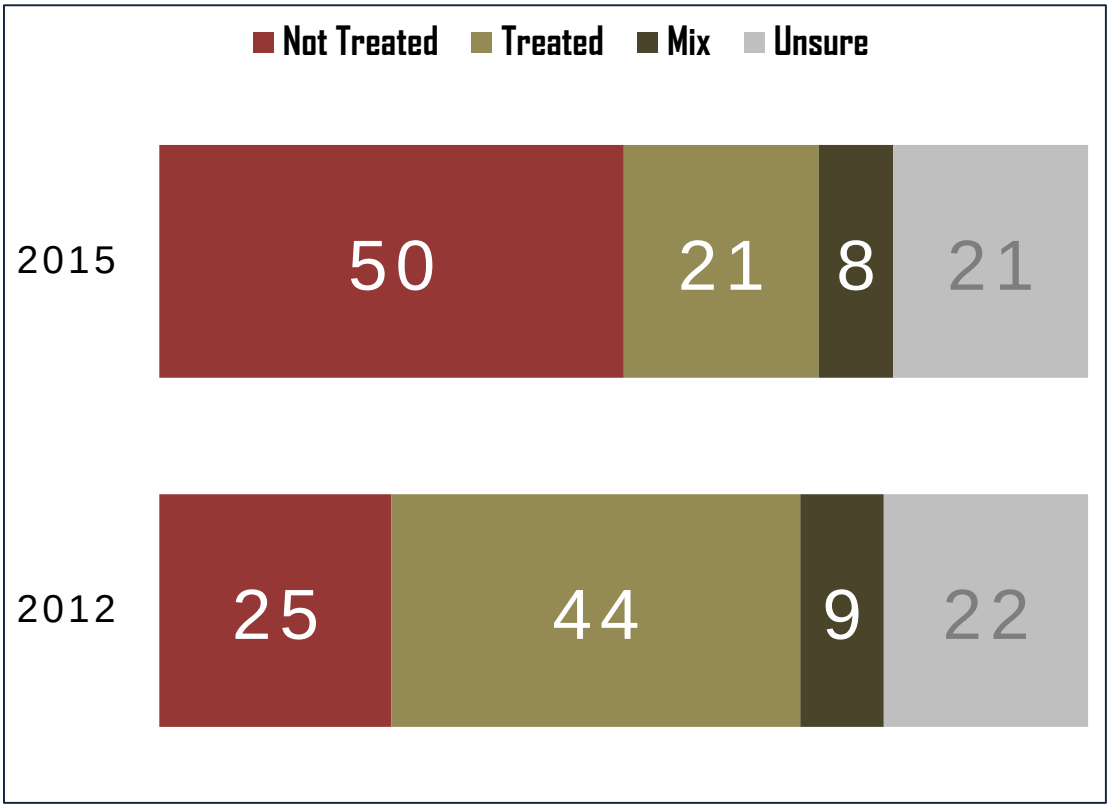
2 in 3 Said That Runoff has "Significant Harmful Effect" on Local Water Quality



Q5 Which of the following views is closest to your opinion about the impact of runoff or stormwater?
A) Stormwater runoff has a significant harmful effect on water quality in local streams, lakes, and rivers.
B) Stormwater runoff is part of the natural way of things. Any harm to water quality from stormwater is not enough to worry about.

- **There was a slight drop compared to 2012 in the proportion of respondents who said that "stormwater has a significant harmful effect" on local water quality (67% v. 73%).**
  - The difference is not statistically significant (p.>.05).
- **Belief that there was a significant harmful effect went down with age, from**
  80% among those under age 35, to
  59% among those over 65.

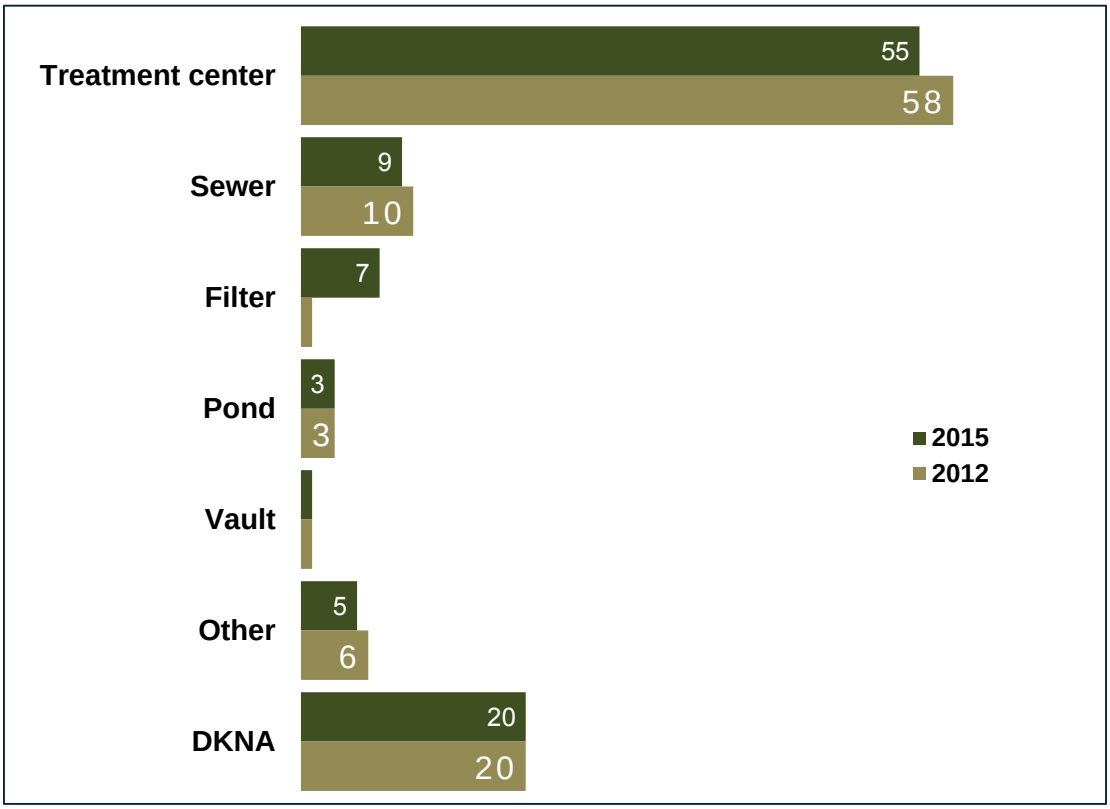
Half Aware that Stormwater Runoff is Not Treated



Q6 To the best of your knowledge, is runoff water in Shoreline treated before it goes back into local waters? Or is runoff water not treated?

- **Twice as many respondents in this survey as in 2012 were aware that stormwater is not treated (50% v. 25%).**

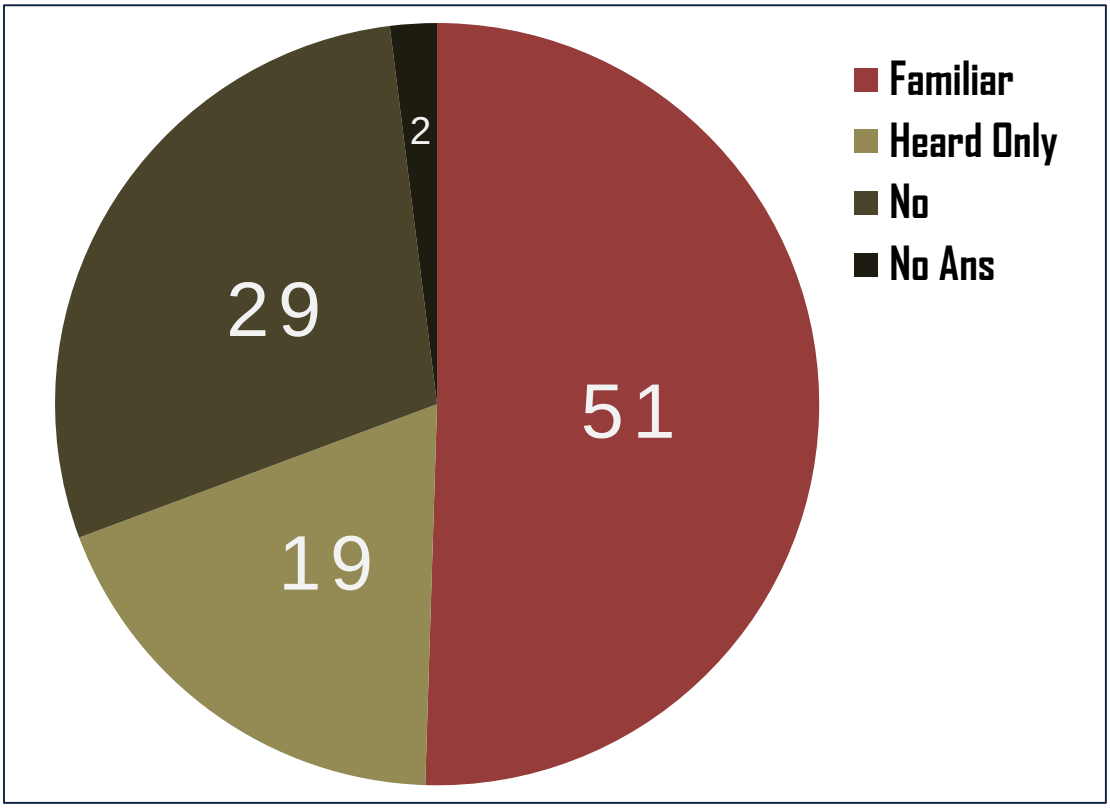
Most Who Said Runoff is Treated Believed it Goes to a Treatment Center



Q6.1 Where does it go for treatment?

- **Those who thought that stormwater was treated were asked where the water went for treatment.**
  - More than half (55%) said it went to a treatment center.
  - 20% did not know
  - These numbers are essentially the same as in 2012.

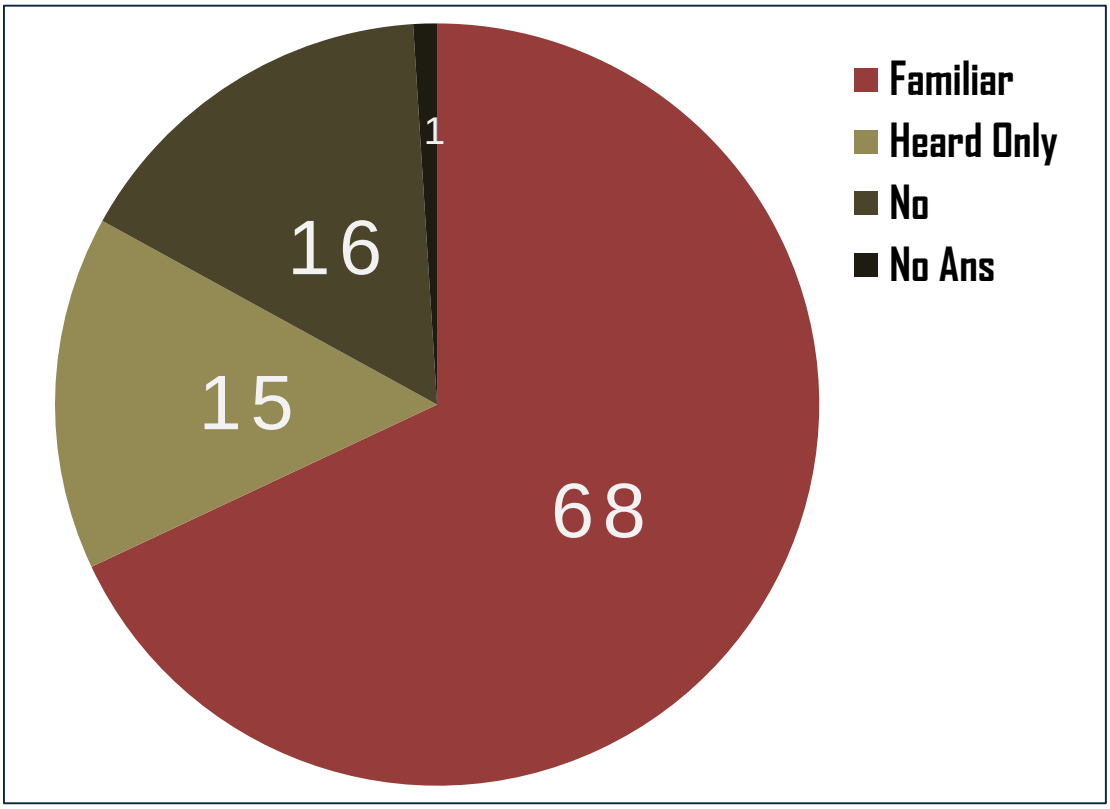
Half Report Familiarity with Rain Gardens



Q7 Are you familiar with the concept of rain gardens?

- **70% of respondents had heard of rain gardens and 51% said they were "familiar" with the concept.**
  - Respondents under age 35 were least likely to have heard of them: 55% had not heard of them, whereas
  - 55% of those between the ages of 36-65 were "familiar' with them as were 49% of those over 65.

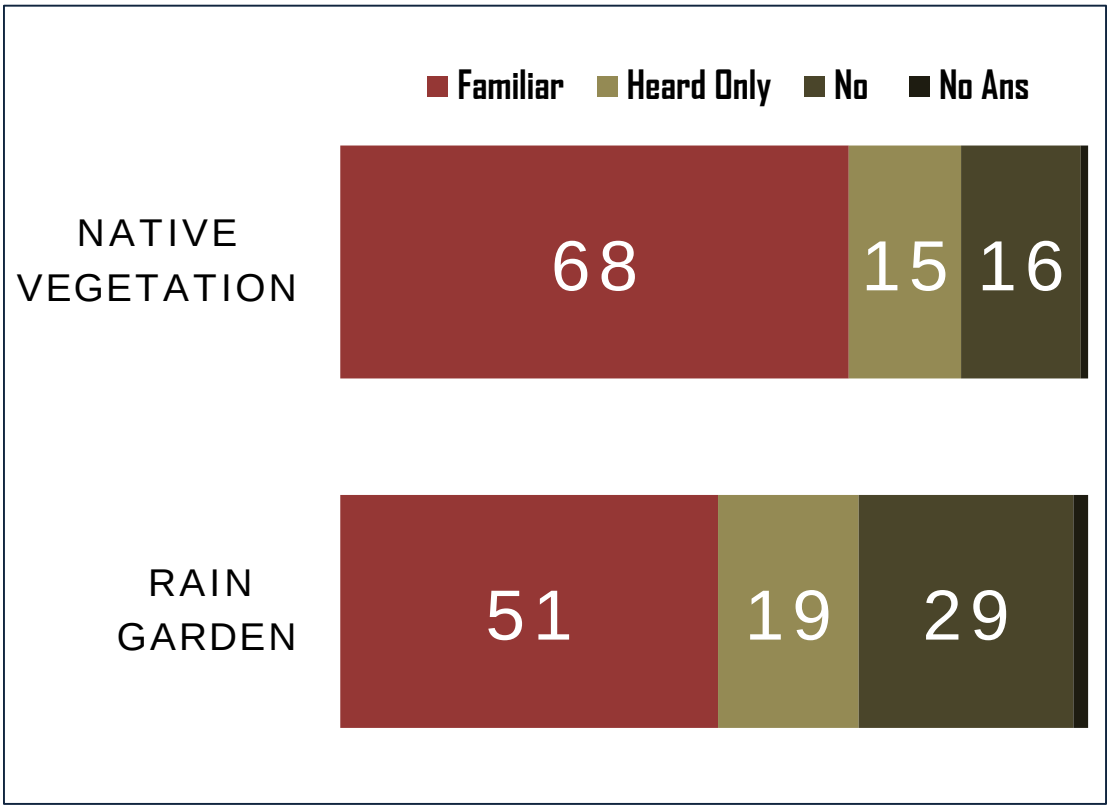
2 in 3 Report Familiarity with Native Vegetation Landscaping



Q8 Are you familiar with the concept of native vegetation landscaping?

- **A significantly higher proportion of respondents had heard of native vegetation landscaping:**
  83% had heard of that, including
  68% who said they were familiar with the concept.
- **As with rain gardens, respondents between the ages of 36-64 were most likely to be familiar with this concept:**
  81% of those 36-50 were familiar with it, as were
  71% of those 51-64; compared to
  61% of those over age 65 and
  55% of those under 35.

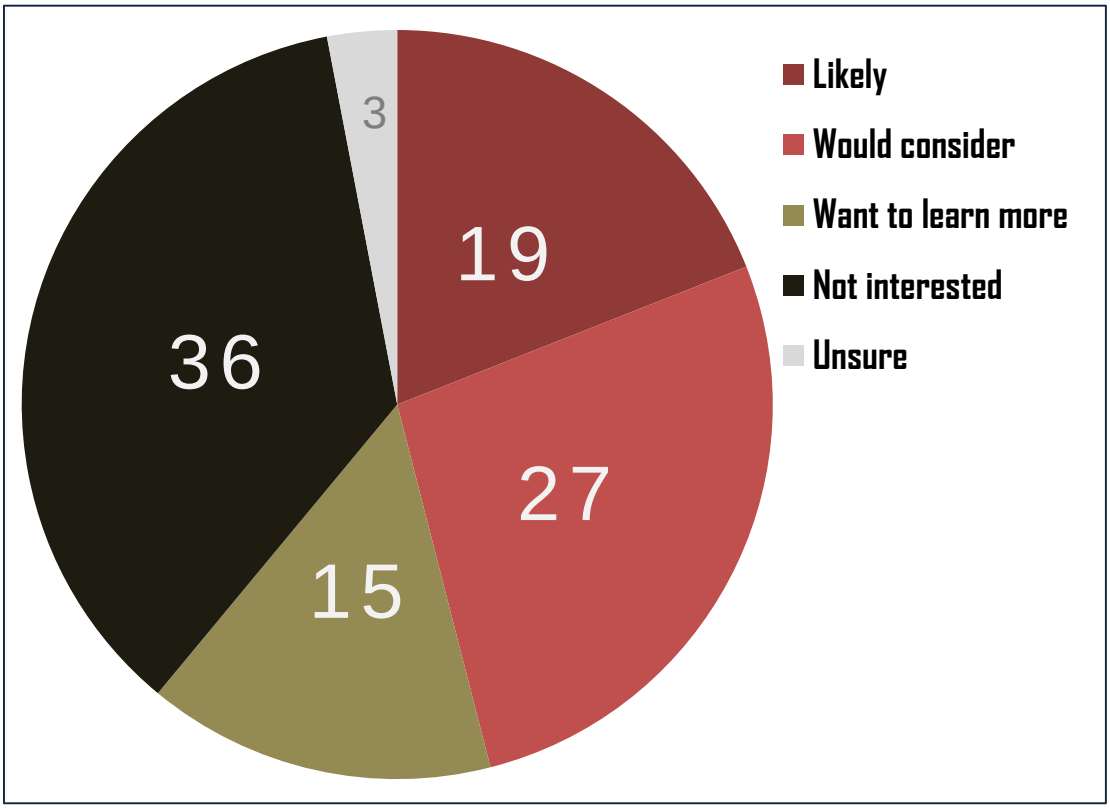
Comparison of Familiarity with Native Vegetation Landscaping & Rain Gardens



Q7 & Q8 Comparison

- **In total, 89% of respondents had heard of at least one of these concepts:**
  - 45% said they were "familiar" with both concepts;
  - 15% were "familiar" with one, but had not heard of the other;
  - 6% had heard of both but were not "familiar" with either;
  - 8% had heard of one, but not the other.

Just Under Half Would Consider Installing a Rain Garden



Q9 A rain garden is a planted, shallow depression that captures stormwater runoff and allows it to soak into the ground. Native vegetation landscaping means replacing lawn or pavement with native plants and compost-amended soils. Both methods filter stormwater before it gets into nearby streams and lakes. Is installing a rain garden something you would: 1) Be likely to do on your property; 2) Would consider for your property 3) Want to learn more about; 4) Not be interested in.

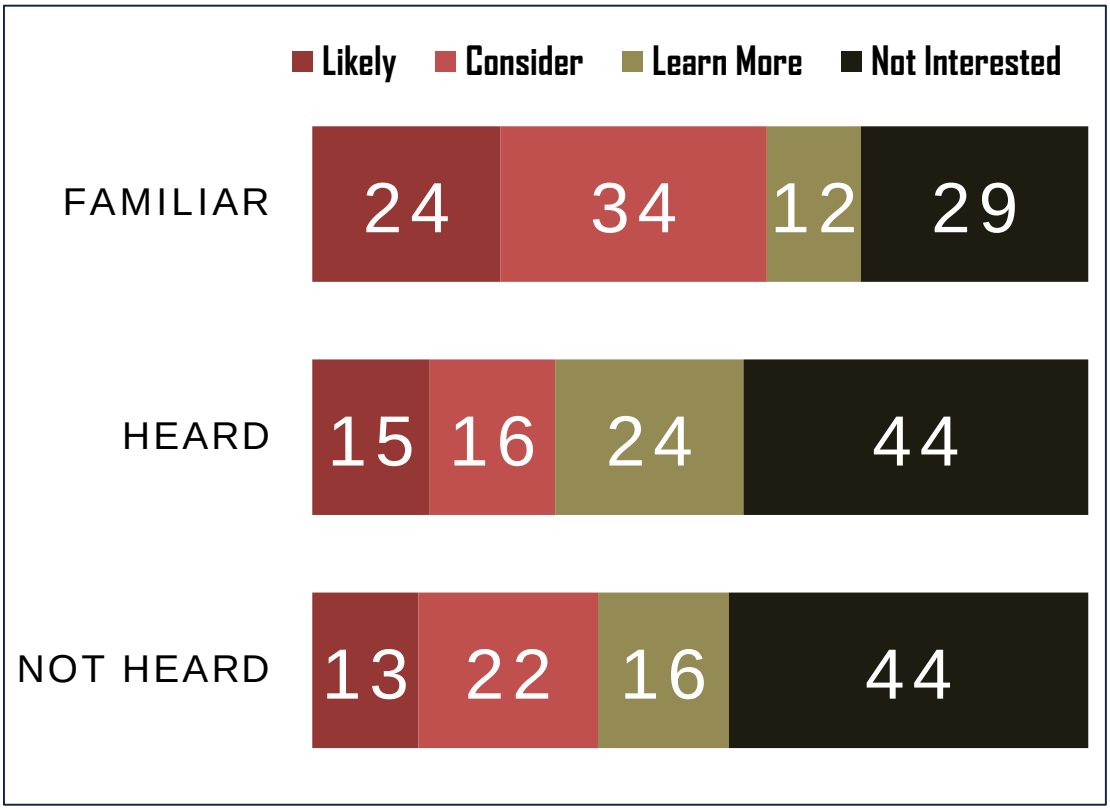
- **46% said they would at least consider a rain garden for their property, including 19% would be "likely" to install one.**
- **Respondents who said they have no impact on water quality were much less interested in rain gardens than those who believed they were having an impact:**

  62% of those who said their household had no impact on local water quality were not interested; whereas

  72% of those who said they had a significant impact on water quality were at least interested to learn more; as were

  66% of those who believed that made some impact.

Most Familiar with Rain Gardens Most Likely to Install One



Likelihood to install by level of familiarity

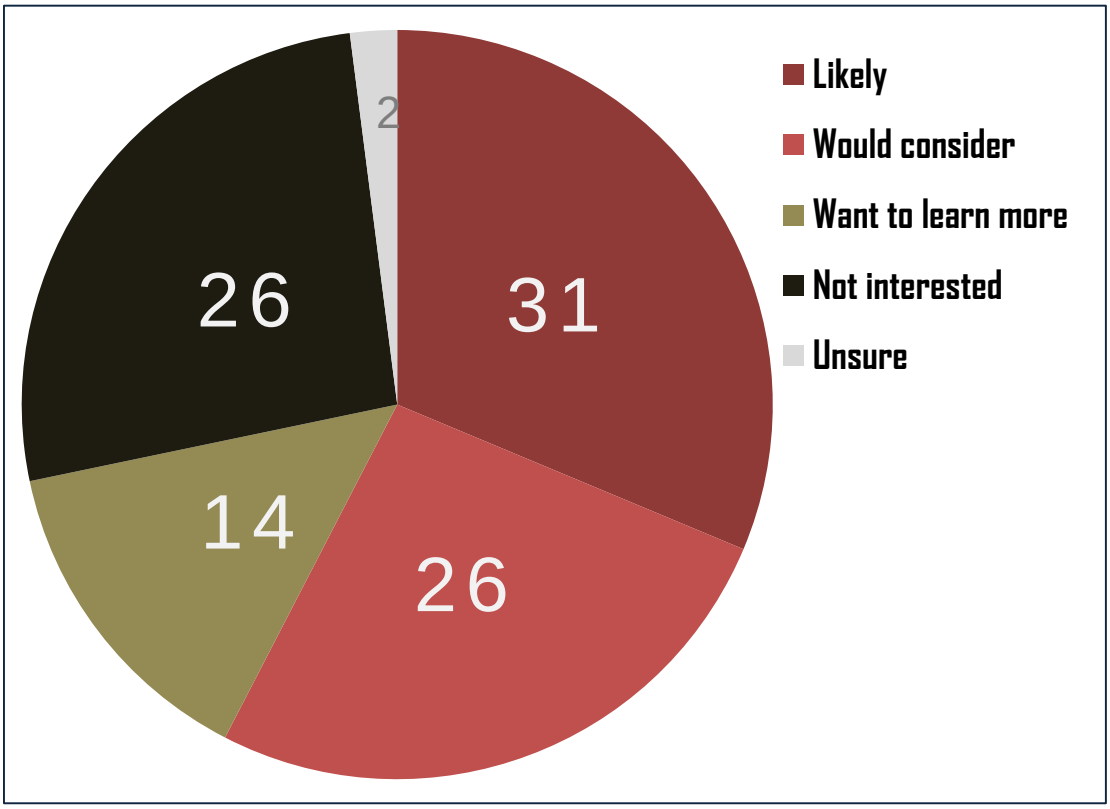
- **Not surprisingly, people familiar with rain gardens were more likely to say they would install one, including:**

  24% of those "familiar" with the concept; versus
  15% of those who had only heard of them; and
  13% of those who had not heard of them.

- **There was little difference between those who had heard of rain gardens and those who had not:**

  15% of those who had only heard of them said they were likely to install versus
  13% of those who had never heard of them. Meanwhile,
  44% of each category said they were not interested.

Nearly 6 in 10 Would Consider Installing Native Vegetation Landscaping



Q10 Is installing native vegetation landscaping something you would: 1) Be likely to do on your property; 2) Would consider for your property; 3) Want to learn more about; 4) Not be interested in.

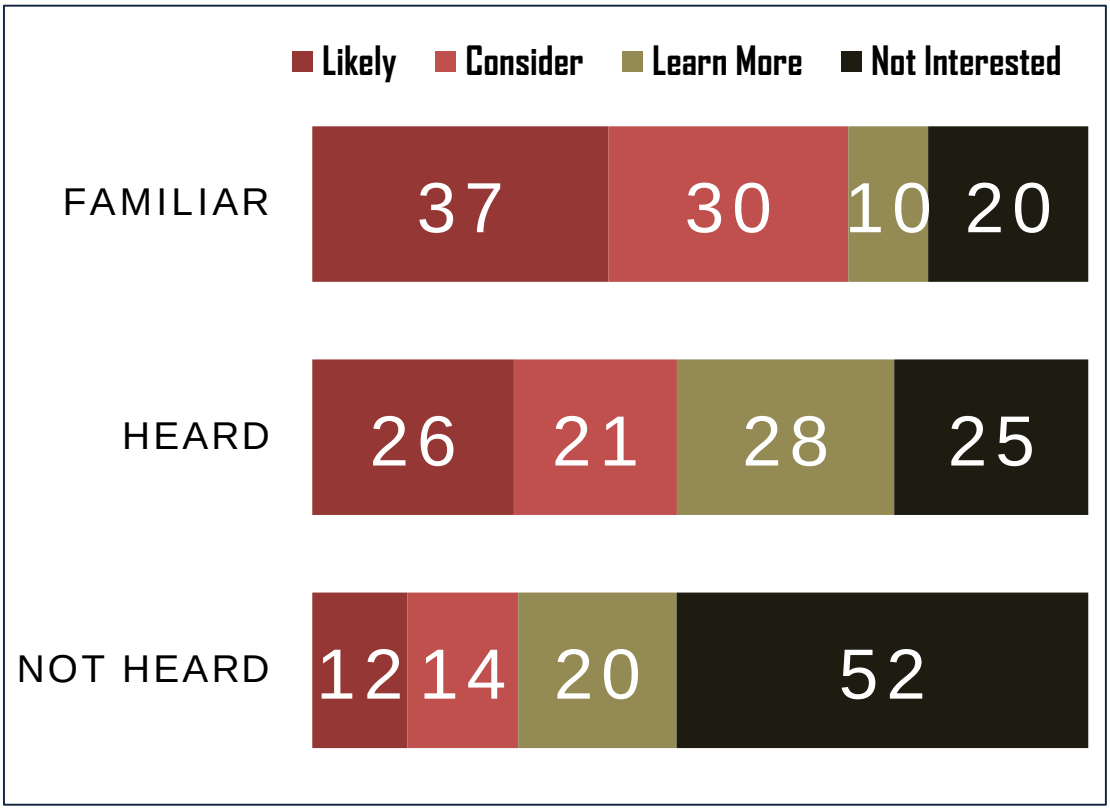
- **46% said they would at least consider native vegetation landscaping for their property, including 19% would be "likely" to install it.**
- **Respondents who said they have no impact on water quality were much less interested in native vegetation landscaping than those who believed they were having an impact:**

  62% of those who said their household had no impact on local water quality were not interested; whereas

  72% of those who said they had a significant impact on water quality were at least interested to learn more; as were

  66% of those who believed that made some impact.

Those Who Had Heard of Native Vegetation Landscaping Wanted to Know More



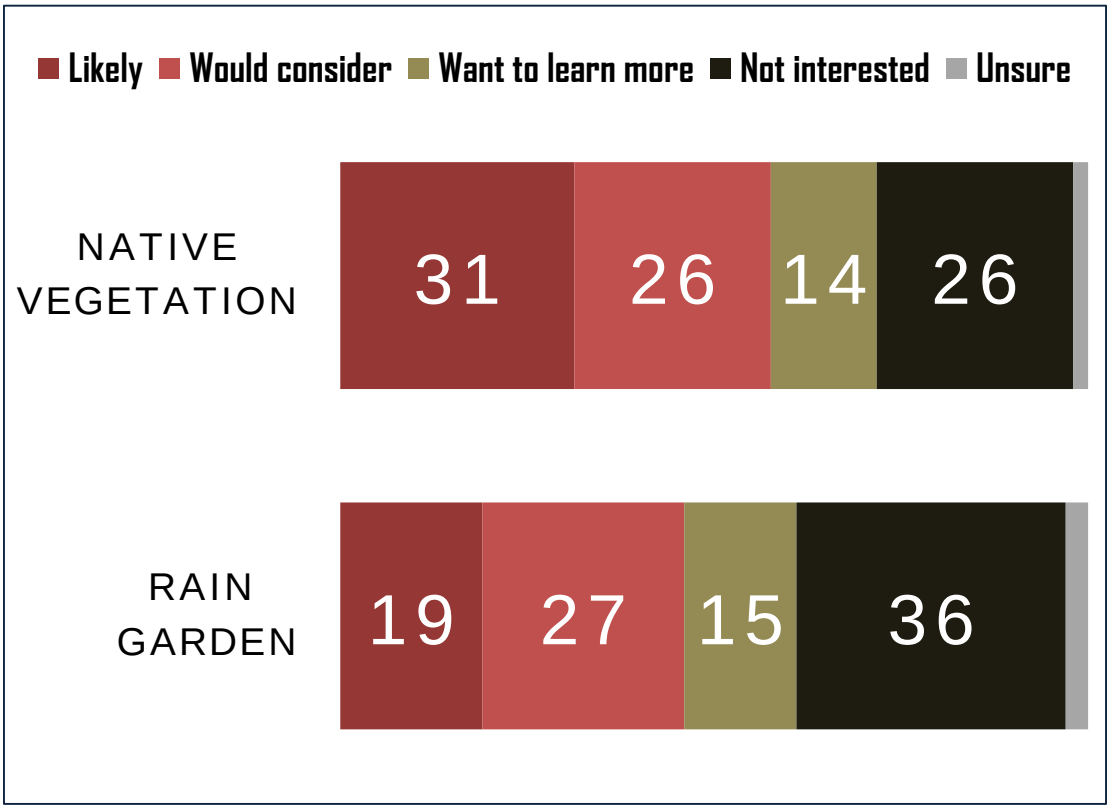
Likelihood to install by level of familiarity

- **As with rain gardens, respondents most familiar with native vegetation landscaping were most likely to say they would try it, including:**

  37% of those "familiar" with the concept versus
  26% of those who had only heard of it; and
  12% of those who had not heard of it.

- **Unlike the rain garden response, there was a significant difference between those who had heard of native vegetation landscaping and those who had not:**
  - Those who had not heard of the concept were twice as likely as those who had to say they were "not interested" to learn about it
    52% of those who had not heard of it were not interested, compared to
    25% of those who had heard about it, but were not familiar with the concept.

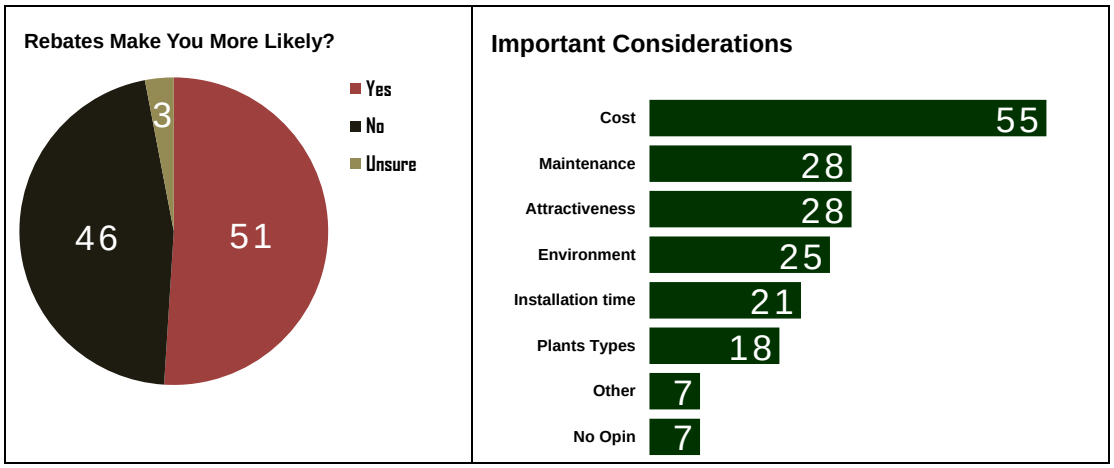
Comparison of Likelihood to Install Native Vegetation Landscaping & Rain Garden



Q9 & Q10 Comparison

- **Overall, respondents were more receptive to native vegetation landscaping than to rain gardens.**
  - 71% were at least interested in native vegetation landscaping versus 61% for rain gardens.
  - 57% would at least consider native vegetation landscaping, including 31% who said they were likely to install it.
  - 46% would at least consider a rain garden, including 19% who said they were likely to install it.
- **40% said they would at least consider both, including 15% who said they were likely to install both. Only 22% were not interested in either.**

Cost Concerns Were the Chief Barrier to Considering Rain Gardens & Native Vegetation Landscaping



Q12 The Soak it Up Program provides rebates to property owners for installation of rain gardens and native vegetation landscaping. Would getting a rebate from the city make you more likely to install a rain garden or native vegetation landscaping? Or would a rebate not make any difference?

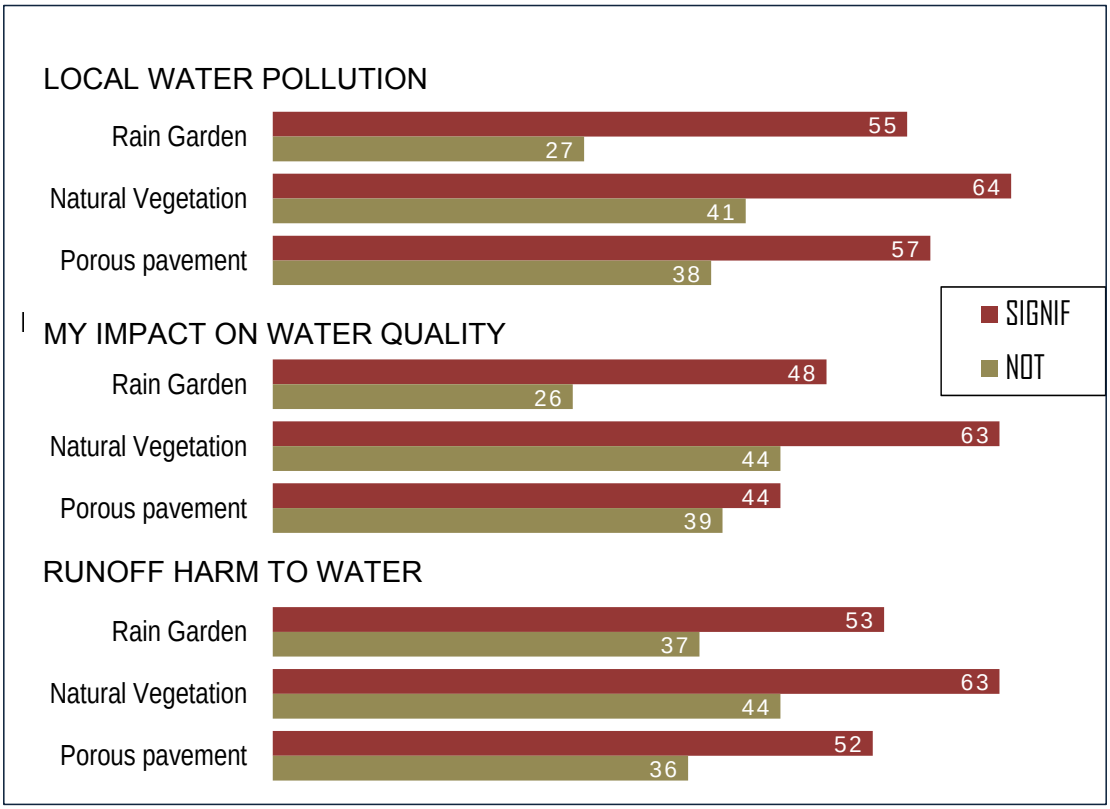
Q13 Which of the following would be important considerations for you in deciding whether or not to install a rain garden or native vegetation landscaping?

- **Cost concerns were the #1 consideration in deciding whether or not to install a rain garden or native vegetation landscaping.**
  - Cost was named by more than half of respondents (55%) and nearly twice as many as the next highest-ranked consideration: maintenance (28%) and attractiveness (28%).
- **Given that, it is not surprising that half (51%) said rebates would make them more likely to install native vegetation landscaping or a rain garden.**
  - For rain gardens, a rebate would make installation more likely for:
    69% of those who would consider one;
    62% of those who wanted to learn more; and
    23% of those who initially that they were not interested.
  - For native vegetation landscaping, a rebate would make installation more likely for:
    70% of those who would consider it;
    53% of those who wanted to learn more; and
    19% of those who initially that they were not interested.
- **Rebates were potentially more effective for people at higher incomes:**

  62% of those with incomes over $100,000 sad a rebate would make them more likely to install, compared to

  39% of those with incomes under $50,000.

Willingness to Consider Mitigations by Perception of Water Quality Problem

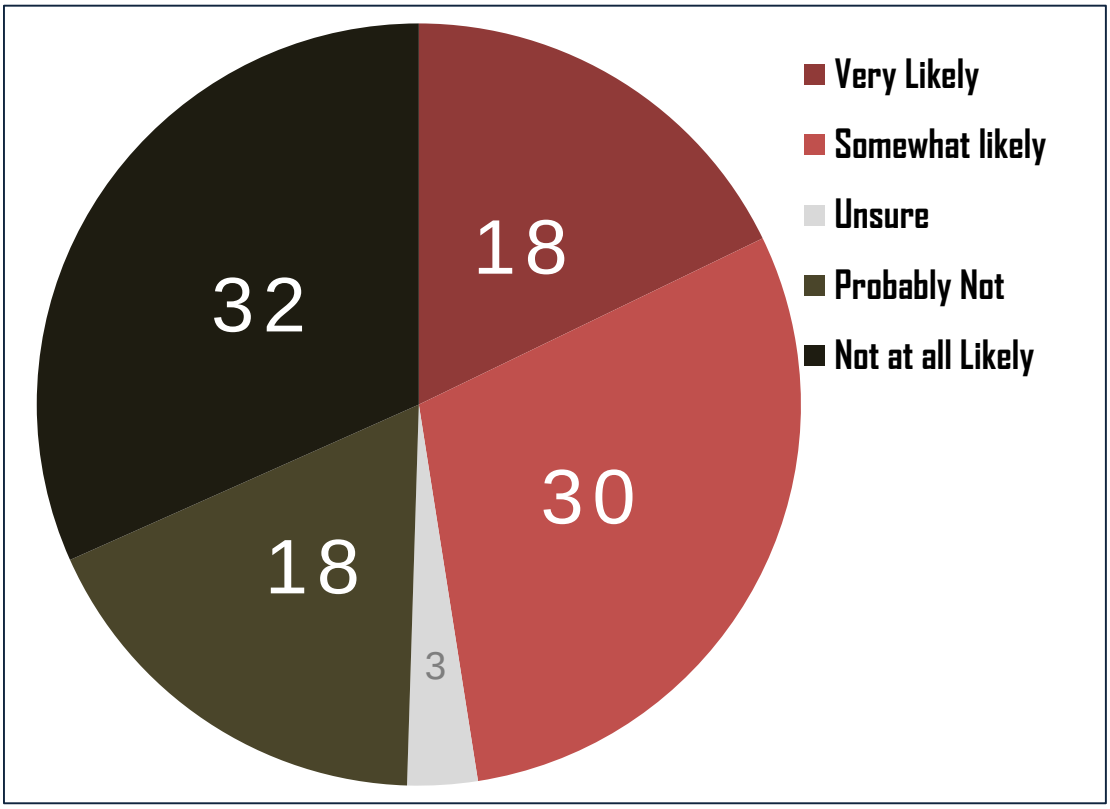


1) Is local water pollution significant?
2) Does my household significantly impact water quality?
3) Does runoff cause significant harm to local water quality?

This graph shows the difference in willingness to consider the potential mitigations discussed in this survey between those who perceive a problem with water quality and those who do not.

- **For every potential mitigation, respondents who perceived a significant problem were more willing than those who did not to consider or install the mitigation.**
- **For example, those who said that local water pollution is a significant problem were more likely than those who did not see it as a problem to:**
  - Consider or install a rain garden (55% v. 27% of those who did not consider water pollution to be a problem);
  - Consider or install native vegetation landscaping (64% v. 41%);
  - Replace pavement with porous pavement (57% v. 38%).

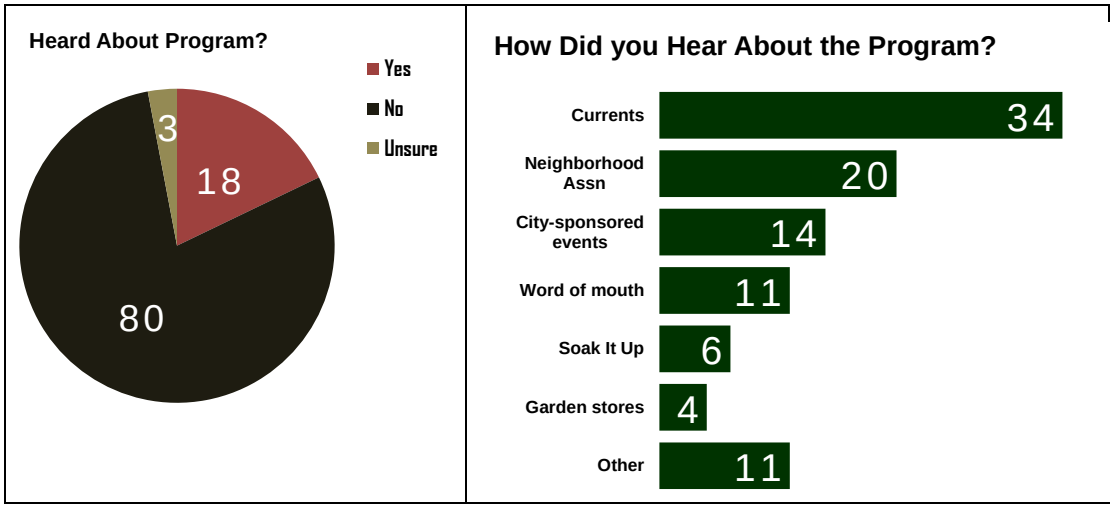
Nearly Half at Least Somewhat Likely to Install Porous Pavement



Q14 Another thing homeowners can do to manage stormwater is to replace driveways, patios, or other paved areas with porous pavement, which allows stormwater to pass through and soak into the ground. If the Soak It Up Program offered rebates for porous pavement replacement of on your property, how likely would you be to replace pavement on your property. Would you be...

- **48% said they were "very likely" (18%) or "somewhat likely" (30%) to replace pavement on their property with porous pavement "if the Soak It Up Program offered rebates" to do so.**
  - Respondents who said that local water pollution is a significant problem
  - Respondents who thought their household had an impact on local water quality were more likely than those who did not to replace their pavement (52% v. 29%).
  - Interestingly, those who said they have "some impact, but not significant" were more likely than those who thought they have a "significant impact" (55% v. 44%).

Nearly 1 in 5 had Heard About the Soak It Up Rebate Program



Q11 Have you heard about a City of Shoreline program called Soak It Up Rebate Program for rain gardens and native vegetation landscaping? How did you heard about the program?

- **18% of respondents said they had heard about the Soak It Up Rebate Program.**
- **Those who had heard about the program named a variety of sources of information about it, topped by**
  - *Currents* newsletter (34%);
  - Their Neighborhood Association (20%); and
  - City-sponsored events (14%).
  - 6% had seen Soak It Up program materials.

QUESTIONNAIRE

with Data

ELWAY RESEARCH, INC.

STORMWATER AWARENESS, ATTITUDES & BEHAVIOR

City of Shoreline 2015

TOPLINE DATA

SAMPLE:	400 Homeowners with a yard in Shoreline
MARGIN OF SAMPLING ERROR:	±4.5% at the 95% level of confidence
DATA COLLECTION:	Telephone survey with live interviewers 23% via cell phone
FIELD DATES:	November 23-30, 2015
GENDER:	MALE...**48%** FEMALE...**52%**

- The questions are presented here as they were asked in the interview
- The figures in bold type are percentages of respondents who gave each answer.
- Percentages may not add to 100% due to rounding.

1. These first questions are about the environment. What do you think is the single most important threat to the environment facing Shoreline today? [OPEN ENDED]

20 Traffic
15 Climate change
15 Land use
11 Other
10 Stormwater runoff
10 Water pollution
8 Air pollution
12 No Opin

2. In your opinion, is pollution in local waterways – like streams rivers, lakes and Puget sound ...

50 A significant problem
30 A problem, but not that significant
16 Over-rated as a problem
4 No Opin

3. To what degree do you believe that actions you and your family take affect the health of local streams, rivers, lakes, and Puget Sound? Would you say your household has...

22 A significant impact on the water quality in local waterways
57 Some, impact but not significant
19 No impact on the water quality in local waterways
3 No Opin

4. When it rains, a lot of water runs off of roofs, driveways, parking lots, and streets. As you understand it, where does that water go?

[OPEN ENDED]

32 Goes down storm drain / or storm sewer
9 Down drain (Not "storm drain")
9 Sewer [NOT storm sewer]
9 Soaks into ground
4 Down the street
1 Catch basin / trough
1 Sits in puddles / ponds

RESPONDENTS WHO DID NOT MENTION PUGET SOUND OR LOCAL WATERS WERE ASKED Q4.1

17 Puget Sound
16 Creeks / streams / rivers / lakes
1 Other
2 DK/NA

4.1 Where does it end up eventually? [OPEN ENDED] % IS TOTAL OF Q4 + FOLLOW UP Q4.1

41 Puget Sound
46 Nearest water / creeks / streams / rivers / lakes
7 Other
6 DK/NA

5. Which of the following views is closest to your opinion about the impact of runoff or stormwater.

67 Stormwater runoff has a significant harmful effect on water quality in local streams, lakes and rivers.

27 Stormwater runoff is part of the natural way of things. Any harm to water quality from stormwater is not enough to worry about.

6 No Opin

6. To the best of your knowledge, is runoff water in Shoreline treated before it goes back into local waters? Or is runoff water not treated?

50 Not Treated
21 Treated
8 Mix / both / some is some is not
21 DK/NA

6.1. **IF TREATED** [n=115]**:** Where does it go for treatment?

DO NOT READ

55 Treatment center
9 Sewer
7 Filter
3 Pond / holding pond
1 Vault (held in)
5 Other
20 DK/NA

7. Are you familiar with the concept of rain gardens?

51 Familiar With it
19 Heard of it, but not Familiar
29 No
2 DK/NA

8. Are you familiar with the concept of native vegetation landscaping?

68 Familiar With it
15 Heard of it, but not Familiar
16 No
1 DK/NA

9. A rain garden is a planted, shallow depression that captures stormwater runoff and allows it to soak into the ground. Native vegetation landscaping means replacing lawn or pavement with native plants and compost amended soils. Both methods filter stormwater before it gets into nearby streams and lakes. Is installing a rain garden something you would:

19 Be likely to do on your property
27 Would consider for your property
15 Want to learn more about
36 Not be interested in
3 DK/NA

10. Is installing native vegetation landscaping something you would:

31 Be likely to do on your property
26 Would consider for your property
14 Want to learn more about
26 Not be interested in
2 DK/NA

11. Have you heard about a City of Shoreline program called Soak It Up Rebate Program for rain gardens and native vegetation landscaping?

18 Yes
80 No
3 Unsure

11.1. IF YES How did you hear about the program?
MULTIPLE ANSWERS ALLOWED

34 Currents Newsletter
20 Neighborhood Association
14 City-sponsored events
11 Word of mouth/ Friends, Neighbors, Relatives
4 Garden stores / nurseries
6 Soak It Up program materials
11 Other

12. The Soak it Up program provides rebates to property owners for installation of rain gardens and native vegetation landscaping. Would getting a rebate from the city make you more likely to install a rain garden or native vegetation landscaping? Or would a rebate not make any difference?

51 YES
46 NO
3 DK

13. Which of the following would be important considerations for you, in deciding whether or not to install a rain garden or native vegetation landscaping .

MULTIPLE ANSWERS ALLOWED

55 The cost
28 The amount of work it takes to maintain
28 How attractive it would be on my property
25 How it helps the environment
21 The time it takes to install
18 The kinds of plants that would be acceptable
7 OTHER
7 DK/NA

14. Another thing homeowners can do to manage stormwater is to replace driveways, patios, or other paved areas with porous pavement, which allows stormwater to pass through and soak into the ground. If the Soak it Up program offered rebates for porous pavement replacement of on your property, how likely would you be to replace pavement on your property? Would you be…

18 Very Likely
30 Somewhat likely
18 Probably Not
32 Not at all Likely
3 DK/NA

15. I have just a few last questions for our statistical analysis. I want to remind you that all your answers are confidential. How old are you?

5 18-35
24 36-50
33 51-64
36 65+

16. Finally, I am going to list five broad categories. Just stop me when I get to the category that best describes your approximate household income – before taxes – for this year.

17 $50,000 or less
18 $50 to $75,000
18 $75 to $100,000
11 $100-$125,000
16 Over $125,000
20 NO ANSWER

DATA TABLES

READING THE CROSSTABULATION TABLES

The crosstabulations found in this report are presented in a "banner table" format. Categories of respondents (e.g. "35-54 years old," or "Female") are listed across the top of each page (the "banner"). The questions asked in the survey are listed down the left margin. The figures in the cells are percentages based on the number of respondents in the category at the head of each

ELWAY RESEARCH, INC.

SHORELINE STORMWATER SURVEY NOV 2015

ENVIRONMENTAL ISSUES	TOTAL		WATER POLLUTION						PERSONAL IMPACT						RUNOFF HARMFUL?					
	(n=)		Significant		Not Signif		Over-rated		None		Insig		Signif		Signif Harm		Not Signif		DK	
TOTAL (n=)	400	100	200	100	121	100	63	100	74	100	228	100	87	100	269	100	107	100	24	100
1.IMPT THREAT TO ENVIRONMENT																				
climate Change	59	15%	37	19%	16	13%	4	6%	5	7%	41	18%	12	14%	47	17%	9	8%	3	13%
Stormwater	41	10%	21	11%	10	8%	8	13%	5	7%	23	10%	12	14%	31	12%	7	7%	3	13%
Water Pollution	38	10%	24	12%	9	7%	3	5%	8	11%	20	9%	8	9%	28	10%	7	7%	3	13%
Air Pollution	32	8%	17	9%	9	7%	6	10%	5	7%	19	8%	7	8%	22	8%	10	9%	0	0%
Traffic	79	20%	30	15%	28	23%	19	30%	20	27%	39	17%	17	20%	44	16%	29	27%	6	25%
Land use	61	15%	32	16%	23	19%	4	6%	2	3%	44	19%	14	16%	48	18%	9	8%	4	17%
Other	43	11%	20	10%	12	10%	9	14%	16	22%	16	7%	10	11%	22	8%	17	16%	4	17%
No Opin	47	12%	19	10%	14	12%	10	16%	13	18%	26	11%	7	8%	27	10%	19	18%	1	4%
2.LOCAL WATERWAYS POLLUTION																				
Significant	200	50%	200	100	0	0%	0	0%	22	30%	114	50%	58	67%	165	61%	25	23%	10	42%
Not Significant	121	30%	0	0%	121	100	0	0%	23	31%	76	33%	19	22%	66	25%	43	40%	12	50%
Over-rated	63	16%	0	0%	0	0%	63	100	25	34%	28	12%	9	10%	28	10%	34	32%	1	4%
No Opin	16	4%	0	0%	0	0%	0	0%	4	5%	10	4%	1	1%	10	4%	5	5%	1	4%
3.PERSONAL IMPACT ON POLLUTION																				
No impact	74	19%	22	11%	23	19%	25	40%	74	100	0	0%	0	0%	32	12%	38	36%	4	17%
Insignificant impact	228	57%	114	57%	76	63%	28	44%	0	0%	228	100	0	0%	162	60%	55	51%	11	46%
Significant impact	87	22%	58	29%	19	16%	9	14%	0	0%	0	0%	87	100	69	26%	11	10%	7	29%
DKNA	11	3%	6	3%	3	2%	1	2%	0	0%	0	0%	0	0%	6	2%	3	3%	2	8%

ENVIRONMENTAL ISSUES	TOTAL		SEX				AGE							
	(n=)		Male		Female		18-35		36-50		51-64		65+	
TOTAL														
(n=)	400	100	192	100	208	100	20	100	95	100	131	100	142	100
1.IMPT THREAT TO ENVIRONMENT														
climate Change	59	15%	24	13%	35	17%	5	25%	15	16%	24	18%	14	10%
Stormwater	41	10%	17	9%	24	12%	2	10%	8	8%	18	14%	12	8%
Water Pollution	38	10%	18	9%	20	10%	1	5%	12	13%	14	11%	8	6%
Air Pollution	32	8%	19	10%	13	6%	2	10%	7	7%	9	7%	14	10%
Traffic	79	20%	38	20%	41	20%	3	15%	17	18%	22	17%	37	26%
Land use	61	15%	27	14%	34	16%	2	10%	18	19%	23	18%	16	11%
Other	43	11%	22	11%	21	10%	2	10%	9	9%	13	10%	19	13%
No Opin	47	12%	27	14%	20	10%	3	15%	9	9%	8	6%	22	15%
2.LOCAL WATERWAYS POLLUTION														
Significant	200	50%	91	47%	109	52%	11	55%	49	52%	72	55%	64	45%
Not Significant	121	30%	56	29%	65	31%	7	35%	31	33%	32	24%	47	33%
Over-rated	63	16%	38	20%	25	12%	1	5%	8	8%	24	18%	28	20%
No Opin	16	4%	7	4%	9	4%	1	5%	7	7%	3	2%	3	2%
3.PERSONAL IMPACT ON POLLUTION														
No impact	74	19%	37	19%	37	18%	1	5%	7	7%	21	16%	41	29%
Insignificant impact	228	57%	114	59%	114	55%	16	80%	68	72%	77	59%	64	45%
Significant impact	87	22%	36	19%	51	25%	3	15%	20	21%	28	21%	33	23%
DKNA	11	3%	5	3%	6	3%	0	0%	0	0%	5	4%	4	3%

ENVIRONMENTAL ISSUES	TOTAL		INCOME									
	(n=)		>50k		50-75k		75-100		100-125		125k+	
TOTAL												
(n=)	400	100	69	100	70	100	73	100	44	100	64	100
1.IMPT THREAT TO ENVIRONMENT												
climate Change	59	15%	5	7%	15	21%	13	18%	8	18%	12	19%
Stormwater	41	10%	8	12%	8	11%	6	8%	3	7%	9	14%
Water Pollution	38	10%	9	13%	6	9%	5	7%	7	16%	1	2%
Air Pollution	32	8%	4	6%	9	13%	8	11%	0	0%	5	8%
Traffic	79	20%	20	29%	11	16%	14	19%	9	20%	13	20%
Land use	61	15%	6	9%	8	11%	14	19%	11	25%	9	14%
Other	43	11%	9	13%	7	10%	8	11%	4	9%	5	8%
No Opin	47	12%	8	12%	6	9%	5	7%	2	5%	10	16%
2.LOCAL WATERWAYS POLLUTION												
Significant	200	50%	35	51%	38	54%	37	51%	22	50%	34	53%
Not Significant	121	30%	17	25%	20	29%	20	27%	15	34%	17	27%
Over-rated	63	16%	14	20%	11	16%	14	19%	6	14%	10	16%
No Opin	16	4%	3	4%	1	1%	2	3%	1	2%	3	5%
3.PERSONAL IMPACT ON POLLUTION												
No impact	74	19%	23	33%	8	11%	13	18%	8	18%	6	9%
Insignificant impact	228	57%	30	43%	44	63%	44	60%	29	66%	44	69%
Significant impact	87	22%	15	22%	16	23%	15	21%	7	16%	12	19%
DKNA	11	3%	1	1%	2	3%	1	1%	0	0%	2	3%

STORMWATER	TOTAL		WATER POLLUTION						PERSONAL IMPACT						RUNOFF HARMFUL?					
	(n=)		Significant		Not Signif		Over-rated		None		Insig		Signif		Signif Harm		Not Signif		DK	
TOTAL (n=)	400	100	200	100	121	100	63	100	74	100	228	100	87	100	269	100	107	100	24	100
4.RUNOFF DESTINATION																				
Storm drain	128	32%	66	33%	36	30%	20	32%	21	28%	70	31%	32	37%	90	33%	31	29%	7	29%
Drain	36	9%	17	9%	14	12%	5	8%	11	15%	18	8%	6	7%	22	8%	11	10%	3	13%
Sewer	37	9%	22	11%	7	6%	6	10%	9	12%	22	10%	6	7%	20	7%	14	13%	3	13%
Down street	14	4%	8	4%	4	3%	2	3%	2	3%	8	4%	4	5%	11	4%	3	3%	0	0%
Catch basin	5	1%	2	1%	3	2%	0	0%	2	3%	1	0%	2	2%	3	1%	0	0%	2	8%
Soaks ground	35	9%	12	6%	12	10%	9	14%	11	15%	19	8%	4	5%	20	7%	13	12%	2	8%
Sits in puddles	5	1%	2	1%	2	2%	1	2%	0	0%	4	2%	1	1%	5	2%	0	0%	0	0%
Puget Sound	68	17%	39	20%	20	17%	8	13%	8	11%	41	18%	16	18%	49	18%	17	16%	2	8%
Waterways	63	16%	29	14%	21	17%	10	16%	8	11%	40	18%	15	17%	45	17%	14	13%	4	17%
Other	3	1%	1	1%	1	1%	1	2%	0	0%	3	1%	0	0%	3	1%	0	0%	0	0%
DKNA	6	2%	2	1%	1	1%	1	2%	2	3%	2	1%	1	1%	1	0%	4	4%	1	4%
ENDS UP IN...																				
Sound	162	41%	90	46%	46	39%	21	34%	22	31%	93	42%	40	47%	119	45%	37	36%	6	26%
Stream	179	46%	84	43%	53	45%	36	59%	38	53%	99	44%	39	45%	121	46%	46	45%	12	52%
Other	28	7%	12	6%	11	9%	4	7%	7	10%	15	7%	6	7%	16	6%	12	12%	0	0%
DK	22	6%	11	6%	9	8%	0	0%	5	7%	16	7%	1	1%	9	3%	8	8%	5	22%
5.STORMWATER IMPACT																				
Significant harmful effect	269	67%	165	83%	66	55%	28	44%	32	43%	162	71%	69	79%	269	100	0	0%	0	0%
Natural Not Harmful	107	27%	25	13%	43	36%	34	54%	38	51%	55	24%	11	13%	0	0%	107	100	0	0%
No Opin	24	6%	10	5%	12	10%	1	2%	4	5%	11	5%	7	8%	0	0%	0	0%	24	100
6.RUNOFF TREATMENT																				
Not Treated	201	50%	105	53%	66	55%	26	41%	36	49%	120	53%	43	49%	142	53%	48	45%	11	46%
Treated	83	21%	40	20%	22	18%	18	29%	17	23%	46	20%	18	21%	54	20%	26	24%	3	13%
Mix	32	8%	13	7%	8	7%	9	14%	5	7%	22	10%	4	5%	16	6%	15	14%	1	4%
DKNA	84	21%	42	21%	25	21%	10	16%	16	22%	40	18%	22	25%	57	21%	18	17%	9	38%
61.TREATMENT LOCATION																				
Sewer	10	9%	4	8%	2	7%	2	7%	1	5%	6	9%	3	14%	7	10%	3	7%	0	0%
Vault	1	1%	0	0%	0	0%	1	4%	1	5%	0	0%	0	0%	0	0%	1	2%	0	0%
Pond	4	3%	2	4%	0	0%	2	7%	1	5%	1	1%	2	9%	2	3%	1	2%	1	25%
Filter	8	7%	3	6%	3	10%	2	7%	3	14%	4	6%	1	5%	2	3%	5	12%	1	25%
Treatment center	63	55%	30	57%	18	60%	12	44%	8	36%	43	63%	10	45%	43	61%	19	46%	1	25%
Other	6	5%	1	2%	3	10%	2	7%	2	9%	3	4%	1	5%	4	6%	2	5%	0	0%
DKNA	23	20%	13	25%	4	13%	6	22%	6	27%	11	16%	5	23%	12	17%	10	24%	1	25%

STORMWATER	TOTAL	SEX		AGE			
	(n=)	Male	Female	18-35	36-50	51-64	65+
TOTAL							
(n=)	400 100	192 100	208 100	20 100	95 100	131 100	142 100
4.RUNOFF DESTINATION							
Storm drain	128 32%	55 29%	73 35%	6 30%	31 33%	42 32%	45 32%
Drain	36 9%	18 9%	18 9%	1 5%	7 7%	12 9%	14 10%
Sewer	37 9%	20 10%	17 8%	0 0%	11 12%	11 8%	15 11%
Down street	14 4%	7 4%	7 3%	1 5%	4 4%	4 3%	4 3%
Catch basin	5 1%	4 2%	1 0%	0 0%	0 0%	3 2%	2 1%
Soaks ground	35 9%	18 9%	17 8%	1 5%	5 5%	9 7%	19 13%
Sits in puddles	5 1%	3 2%	2 1%	0 0%	0 0%	2 2%	3 2%
Puget Sound	68 17%	38 20%	30 14%	5 25%	17 18%	22 17%	23 16%
Waterways	63 16%	27 14%	36 17%	6 30%	18 19%	24 18%	15 11%
Other	3 1%	1 1%	2 1%	0 0%	2 2%	1 1%	0 0%
DKNA	6 2%	1 1%	5 2%	0 0%	0 0%	1 1%	2 1%
ENDS UP IN...							
Sound	162 41%	82 43%	80 40%	9 45%	39 42%	54 42%	57 41%
Stream	179 46%	84 44%	95 47%	6 30%	46 49%	65 50%	56 40%
Other	28 7%	15 8%	13 6%	4 20%	3 3%	4 3%	17 12%
DK	22 6%	9 5%	13 6%	1 5%	5 5%	6 5%	10 7%
5.STORMWATER IMPACT							
Significant harmful effect	269 67%	122 64%	147 71%	16 80%	70 74%	93 71%	84 59%
Natural Not Harmful	107 27%	57 30%	50 24%	3 15%	24 25%	28 21%	50 35%
No Opin	24 6%	13 7%	11 5%	1 5%	1 1%	10 8%	8 6%
6.RUNOFF TREATMENT							
Not Treated	201 50%	106 55%	95 46%	11 55%	48 51%	74 56%	60 42%
Treated	83 21%	41 21%	42 20%	2 10%	16 17%	24 18%	40 28%
Mix	32 8%	14 7%	18 9%	3 15%	8 8%	9 7%	11 8%
DKNA	84 21%	31 16%	53 25%	4 20%	23 24%	24 18%	31 22%
61.TREATMENT LOCATION							
Sewer	10 9%	4 7%	6 10%	1 20%	2 8%	4 12%	3 6%
Vault	1 1%	0 0%	1 2%	0 0%	0 0%	0 0%	1 2%
Pond	4 3%	2 4%	2 3%	0 0%	0 0%	1 3%	3 6%
Filter	8 7%	4 7%	4 7%	1 20%	1 4%	2 6%	4 8%
Treatment center	63 55%	30 55%	33 55%	2 40%	16 67%	19 58%	26 51%
Other	6 5%	6 11%	0 0%	0 0%	3 13%	0 0%	3 6%
DKNA	23 20%	9 16%	14 23%	1 20%	2 8%	7 21%	11 22%

STORMWATER	TOTAL		INCOME									
	(n=)		>50k		50-75k		75-100		100-125		125k+	
TOTAL												
(n=)	400	100	69	100	70	100	73	100	44	100	64	100
4.RUNOFF DESTINATION												
Storm drain	128	32%	26	38%	20	29%	26	36%	18	41%	17	27%
Drain	36	9%	4	6%	5	7%	6	8%	7	16%	6	9%
Sewer	37	9%	3	4%	5	7%	9	12%	1	2%	10	16%
Down street	14	4%	3	4%	2	3%	4	5%	1	2%	3	5%
Catch basin	5	1%	1	1%	1	1%	1	1%	1	2%	1	2%
Soaks ground	35	9%	9	13%	6	9%	4	5%	4	9%	4	6%
Sits in puddles	5	1%	2	3%	1	1%	1	1%	0	0%	0	0%
Puget Sound	68	17%	11	16%	17	24%	9	12%	5	11%	9	14%
Waterways	63	16%	10	14%	12	17%	9	12%	7	16%	14	22%
Other	3	1%	0	0%	0	0%	3	4%	0	0%	0	0%
DKNA	6	2%	0	0%	1	1%	1	1%	0	0%	0	0%
ENDS UP IN...												
Sound	162	41%	26	38%	30	43%	24	35%	19	43%	30	47%
Stream	179	46%	37	54%	26	38%	35	51%	18	41%	30	47%
Other	28	7%	3	4%	6	9%	7	10%	4	9%	2	3%
DK	22	6%	3	4%	7	10%	3	4%	3	7%	2	3%
5.STORMWATER IMPACT												
Significant harmful effect	269	67%	45	65%	49	70%	55	75%	26	59%	44	69%
Natural Not Harmful	107	27%	21	30%	16	23%	14	19%	16	36%	17	27%
No Opin	24	6%	3	4%	5	7%	4	5%	2	5%	3	5%
6.RUNOFF TREATMENT												
Not Treated	201	50%	32	46%	39	56%	38	52%	27	61%	30	47%
Treated	83	21%	18	26%	14	20%	17	23%	7	16%	10	16%
Mix	32	8%	6	9%	3	4%	4	5%	2	5%	10	16%
DKNA	84	21%	13	19%	14	20%	14	19%	8	18%	14	22%
61.TREATMENT LOCATION												
Sewer	10	9%	1	4%	2	12%	2	10%	1	11%	3	15%
Vault	1	1%	0	0%	0	0%	0	0%	0	0%	0	0%
Pond	4	3%	0	0%	0	0%	2	10%	0	0%	1	5%
Filter	8	7%	5	21%	1	6%	1	5%	0	0%	1	5%
Treatment center	63	55%	12	50%	10	59%	11	52%	5	56%	12	60%
Other	6	5%	0	0%	3	18%	0	0%	1	11%	1	5%
DKNA	23	20%	6	25%	1	6%	5	24%	2	22%	2	10%

RAIN GARDEN NATURAL VEG	TOTAL		WATER POLLUTION						PERSONAL IMPACT						RUNOFF HARMFUL?					
	(n=)		Significant		Not Signif		Over-rated		None		Insig		Signif		Signif Harm		Not Signif		DK	
TOTAL (n=)	400	100	200	100	121	100	63	100	74	100	228	100	87	100	269	100	107	100	24	100
7.RAINGARDEN FAMILIARITY																				
Not Heard	115	29%	53	27%	39	32%	16	25%	30	41%	58	25%	22	25%	75	28%	34	32%	6	25%
Heard	75	19%	27	14%	24	20%	22	35%	11	15%	40	18%	22	25%	47	17%	24	22%	4	17%
Familiar	204	51%	116	58%	57	47%	25	40%	31	42%	129	57%	41	47%	145	54%	47	44%	12	50%
DKNA	6	2%	4	2%	1	1%	0	0%	2	3%	1	0%	2	2%	2	1%	2	2%	2	8%
8.NATIVE VEGETATION FAMILIARITY																				
Not Heard	65	16%	23	12%	19	16%	17	27%	16	22%	28	12%	19	22%	36	13%	25	23%	4	17%
Heard	61	15%	29	14%	23	19%	8	13%	9	12%	35	15%	15	17%	40	15%	15	14%	6	25%
Familiar	270	68%	146	73%	78	64%	38	60%	48	65%	165	72%	51	59%	191	71%	66	62%	13	54%
DKNA	4	1%	2	1%	1	1%	0	0%	1	1%	0	0%	2	2%	2	1%	1	1%	1	4%
9.INSTALL RAINGARDEN																				
Likely	75	19%	49	25%	17	14%	8	13%	8	11%	46	20%	19	22%	58	22%	14	13%	3	13%
Consider	108	27%	60	30%	36	30%	9	14%	10	14%	73	32%	23	26%	84	31%	15	14%	9	38%
Learn more	61	15%	38	19%	14	12%	8	13%	8	11%	32	14%	21	24%	45	17%	14	13%	2	8%
No interested	145	36%	45	23%	53	44%	38	60%	46	62%	70	31%	23	26%	76	28%	60	56%	9	38%
DKNA	11	3%	8	4%	1	1%	0	0%	2	3%	7	3%	1	1%	6	2%	4	4%	1	4%
10.INSTALL NATIVE VEGETATION																				
Likely	125	31%	68	34%	40	33%	13	21%	19	26%	78	34%	25	29%	91	34%	27	25%	7	29%
Consider	104	26%	59	30%	29	24%	13	21%	13	18%	60	26%	30	34%	77	29%	20	19%	7	29%
Learn more	58	14%	30	15%	16	13%	9	14%	6	8%	37	16%	14	16%	40	15%	15	14%	3	13%
No interested	104	26%	38	19%	34	28%	28	44%	36	49%	48	21%	16	18%	56	21%	43	40%	5	21%
DKNA	9	2%	5	3%	2	2%	0	0%	0	0%	5	2%	2	2%	5	2%	2	2%	2	8%
14.POROUS PAVEMENT																				
Very Likely	70	18%	47	24%	11	9%	10	16%	8	11%	41	18%	20	23%	52	19%	14	13%	4	17%
Somewhat	119	30%	63	32%	36	30%	14	22%	13	18%	84	37%	18	21%	89	33%	25	23%	5	21%
Prob Not	71	18%	33	17%	29	24%	8	13%	13	18%	37	16%	19	22%	46	17%	21	20%	4	17%
Not at All	128	32%	50	25%	42	35%	31	49%	40	54%	59	26%	26	30%	72	27%	46	43%	10	42%
DKNA	12	3%	7	4%	3	2%	0	0%	0	0%	7	3%	4	5%	10	4%	1	1%	1	4%

RAIN GARDEN NATURAL VEG	TOTAL		SEX				AGE							
	(n=)		Male		Female		18-35		36-50		51-64		65+	
TOTAL														
(n=)	400	100	192	100	208	100	20	100	95	100	131	100	142	100
7.RAINGARDEN FAMILIARITY														
Not Heard	115	29%	53	28%	62	30%	11	55%	22	23%	34	26%	42	30%
Heard	75	19%	39	20%	36	17%	3	15%	19	20%	24	18%	28	20%
Familiar	204	51%	95	49%	109	52%	6	30%	54	57%	70	53%	70	49%
DKNA	6	2%	5	3%	1	0%	0	0%	0	0%	3	2%	2	1%
8.NATIVE VEGETATION FAMILIARITY														
Not Heard	65	16%	33	17%	32	15%	5	25%	6	6%	18	14%	31	22%
Heard	61	15%	34	18%	27	13%	4	20%	12	13%	20	15%	22	15%
Familiar	270	68%	121	63%	149	72%	11	55%	77	81%	93	71%	86	61%
DKNA	4	1%	4	2%	0	0%	0	0%	0	0%	0	0%	3	2%
9.INSTALL RAINGARDEN														
Likely	75	19%	36	19%	39	19%	1	5%	19	20%	31	24%	23	16%
Consider	108	27%	47	24%	61	29%	10	50%	32	34%	42	32%	21	15%
Learn more	61	15%	27	14%	34	16%	2	10%	14	15%	20	15%	22	15%
No interested	145	36%	75	39%	70	34%	6	30%	27	28%	36	27%	72	51%
DKNA	11	3%	7	4%	4	2%	1	5%	3	3%	2	2%	4	3%
10.INSTALL NATIVE VEGETATION														
Likely	125	31%	52	27%	73	35%	2	10%	28	29%	53	40%	39	27%
Consider	104	26%	49	26%	55	26%	9	45%	32	34%	37	28%	25	18%
Learn more	58	14%	30	16%	28	13%	4	20%	13	14%	19	15%	19	13%
No interested	104	26%	58	30%	46	22%	5	25%	18	19%	21	16%	56	39%
DKNA	9	2%	3	2%	6	3%	0	0%	4	4%	1	1%	3	2%
14.POROUS PAVEMENT														
Very Likely	70	18%	37	19%	33	16%	3	15%	15	16%	36	27%	16	11%
Somewhat	119	30%	60	31%	59	28%	6	30%	40	42%	36	27%	33	23%
Prob Not	71	18%	28	15%	43	21%	7	35%	13	14%	24	18%	25	18%
Not at All	128	32%	61	32%	67	32%	4	20%	26	27%	31	24%	62	44%
DKNA	12	3%	6	3%	6	3%	0	0%	1	1%	4	3%	6	4%

RAIN GARDEN NATURAL VEG	TOTAL		INCOME									
	(n=)		>50k		50-75k		75-100		100-125		125k+	
TOTAL												
(n=)	400	100	69	100	70	100	73	100	44	100	64	100
7.RAINGARDEN FAMILIARITY												
Not Heard	115	29%	21	30%	22	31%	18	25%	8	18%	16	25%
Heard	75	19%	14	20%	11	16%	12	16%	8	18%	13	20%
Familiar	204	51%	33	48%	37	53%	41	56%	27	61%	34	53%
DKNA	6	2%	1	1%	0	0%	2	3%	1	2%	1	2%
8.NATIVE VEGETATION FAMILIARITY												
Not Heard	65	16%	15	22%	13	19%	10	14%	3	7%	7	11%
Heard	61	15%	10	14%	10	14%	10	14%	7	16%	13	20%
Familiar	270	68%	44	64%	47	67%	52	71%	33	75%	44	69%
DKNA	4	1%	0	0%	0	0%	1	1%	1	2%	0	0%
9.INSTALL RAINGARDEN												
Likely	75	19%	9	13%	16	23%	16	22%	9	20%	16	25%
Consider	108	27%	11	16%	22	31%	25	34%	14	32%	20	31%
Learn more	61	15%	11	16%	11	16%	9	12%	7	16%	8	13%
No interested	145	36%	36	52%	19	27%	23	32%	13	30%	20	31%
DKNA	11	3%	2	3%	2	3%	0	0%	1	2%	0	0%
10.INSTALL NATIVE VEGETATION												
Likely	125	31%	17	25%	24	34%	19	26%	21	48%	22	34%
Consider	104	26%	16	23%	20	29%	26	36%	11	25%	16	25%
Learn more	58	14%	10	14%	8	11%	13	18%	5	11%	9	14%
No interested	104	26%	26	38%	16	23%	15	21%	6	14%	17	27%
DKNA	9	2%	0	0%	2	3%	0	0%	1	2%	0	0%
14.POROUS PAVEMENT												
Very Likely	70	18%	12	17%	14	20%	15	21%	9	20%	13	20%
Somewhat	119	30%	19	28%	27	39%	22	30%	14	32%	19	30%
Prob Not	71	18%	12	17%	8	11%	14	19%	10	23%	12	19%
Not at All	128	32%	26	38%	19	27%	22	30%	9	20%	20	31%
DKNA	12	3%	0	0%	2	3%	0	0%	2	5%	0	0%

INFO SOURCES	TOTAL		WATER POLLUTION			PERSONAL IMPACT			RUNOFF HARMFUL?		
	(n=)		Significant	Not Signif	Over-rated	None	Insig	Signif	Signif Harm	Not Signif	DK
TOTAL											
(n=)	400	100	200 100	121 100	63 100	74 100	228 100	87 100	269 100	107 100	24 100
11.HEARD OF SOAK IT UP											
Yes	71	18%	36 18%	21 17%	10 16%	11 15%	42 18%	17 20%	51 19%	16 15%	4 17%
No	318	80%	156 78%	98 81%	53 84%	62 84%	180 79%	68 78%	211 78%	89 83%	18 75%
Unsure	11	3%	8 4%	2 2%		1 1%	6 3%	2 2%	7 3%	2 2%	2 8%
11. INFO SOURCES											
Currents	24	34%	10 28%	8 38%	4 40%	3 27%	15 36%	6 35%	19 37%	5 31%	
Nabe Assn	14	20%	8 22%	5 24%	1 10%	5 45%	6 14%	3 18%	8 16%	4 25%	2 50%
City Events	10	14%	8 22%	1 5%		1 9%	7 17%	1 6%	9 18%	1 6%	
Word of Mouth	8	11%	5 14%	1 5%	2 20%	1 9%	3 7%	4 24%	5 10%	2 13%	1 25%
Nurseries	3	4%	2 6%	1 5%			1 2%	2 12%	3 6%		
Soak It Up	4	6%	1 3%	3 14%			3 7%	1 6%	3 6%	1 6%	
Other	8	11%	3 8%	1 5%	3 30%	2 18%	5 12%	1 6%	5 10%	3 19%	
DKNA	3	4%	1 3%	2 10%			3 7%		2 4%		1 25%

INFO SOURCES	TOTAL		SEX			AGE						
	(n=)		Male		Female		18-35		36-50		51-64		65+	
TOTAL														
(n=)	400	100	192	100	208	100	20	100	95	100	131	100	142	100
11.HEARD OF SOAK IT UP														
Yes	71	18%	33	17%	38	18%	5	25%	22	23%	18	14%	24	17%
No	318	80%	155	81%	163	78%	15	75%	69	73%	109	83%	116	82%
Unsure	11	3%	4	2%	7	3%			4	4%	4	3%	2	1%
11. INFO SOURCES														
Currents	24	34%	12	36%	12	32%	2	40%	8	36%	6	33%	8	33%
Nabe Assn	14	20%	6	18%	8	21%	1	20%	2	9%	5	28%	5	21%
City Events	10	14%	2	6%	8	21%			2	9%	5	28%	3	13%
Word of Mouth	8	11%	3	9%	5	13%			3	14%	1	6%	4	17%
Nurseries	3	4%	2	6%	1	3%	1	20%	1	5%	1	6%		
Soak It Up	4	6%			4	11%			2	9%			2	8%
Other	8	11%	6	18%	2	5%	1	20%	3	14%	1	6%	3	13%
DKNA	3	4%	3	9%					1	5%			1	4%

INFO SOURCES	TOTAL		INCOME									
	(n=)		>50k		50-75k		75-100		100-125		125k+	
TOTAL												
(n=)	400	100	69	100	70	100	73	100	44	100	64	100
11.HEARD OF SOAK IT UP												
Yes	71	18%	12	17%	14	20%	15	21%	10	23%	9	14%
No	318	80%	55	80%	53	76%	57	78%	33	75%	54	84%
Unsure	11	3%	2	3%	3	4%	1	1%	1	2%	1	2%
11. INFO SOURCES												
Currents	24	34%	4	33%	2	14%	7	47%	6	60%	2	22%
Nabe Assn	14	20%	4	33%	3	21%	3	20%	1	10%	2	22%
City Events	10	14%	3	25%	4	29%	3	20%				
Word of Mouth	8	11%			2	14%	1	7%	1	10%	1	11%
Nurseries	3	4%	1	8%							1	11%
Soak It Up	4	6%	1	8%			1	7%				
Other	8	11%	1	8%	3	21%			2	20%	2	22%
DKNA	3	4%			1	7%					1	11%

INFO SOURCES	TOTAL		WATER POLLUTION				PERSONAL IMPACT						RUNOFF HARMFUL?					
	(n=)		Significant		Not Signif		Over-rated		None		Insig		Signif		Signif Harm		Not Signif		DK	
TOTAL																		
(n=)	400	100	200	100	121	100	63	100	74	100	228	100	87	100	269	100	107	100	24	100
12.REBATE MAKE DIFF																				
Yes	204	51%	115	57%	60	50%	21	33%	28	38%	117	51%	56	64%	154	57%	40	37%	10	42%
No	183	46%	78	39%	59	49%	41	65%	46	62%	102	45%	28	32%	106	39%	65	61%	12	50%
Unsure	13	3%	7	4%	2	2%	1	2%			9	4%	3	3%	9	3%	2	2%	2	8%
13.CONSIDERATIONS																				
Cost	220	55%	122	61%	58	48%	30	48%	26	35%	136	60%	51	59%	157	58%	52	49%	11	46%
Time	84	21%	44	22%	24	20%	15	24%	8	11%	62	27%	10	11%	61	23%	19	18%	4	17%
Work	113	28%	62	31%	36	30%	12	19%	17	23%	69	30%	21	24%	80	30%	28	26%	5	21%
Appearance	111	28%	57	28%	32	26%	18	29%	14	19%	80	35%	15	17%	74	28%	33	31%	4	17%
Environment	98	25%	59	30%	28	23%	10	16%	11	15%	62	27%	21	24%	76	28%	17	16%	5	21%
Plants	72	18%	34	17%	26	21%	11	17%	9	12%	53	23%	8	9%	48	18%	23	21%	1	4%
Other	26	7%	9	5%	9	7%	7	11%	10	14%	7	3%	8	9%	18	7%	7	7%	1	4%
DKNA	29	7%	13	7%	9	7%	5	8%	9	12%	13	6%	6	7%	18	7%	9	8%	2	8%

INFO SOURCES	TOTAL		SEX			AGE							
	(n=)		Male		Female		18-35		36-50		51-64		65+	
TOTAL														
(n=)	400	100	192	100	208	100	20	100	95	100	131	100	142	100
12.REBATE MAKE DIFF														
Yes	204	51%	90	47%	114	55%	10	50%	63	66%	74	56%	52	37%
No	183	46%	96	50%	87	42%	9	45%	29	31%	52	40%	87	61%
Unsure	13	3%	6	3%	7	3%	1	5%	3	3%	5	4%	3	2%
13.CONSIDERATIONS														
Cost	220	55%	104	54%	116	56%	12	60%	59	62%	81	62%	61	43%
Time	84	21%	37	19%	47	23%	7	35%	28	29%	26	20%	22	15%
Work	113	28%	53	28%	60	29%	3	15%	28	29%	40	31%	41	29%
Appearance	111	28%	54	28%	57	27%	6	30%	25	26%	40	31%	38	27%
Environment	98	25%	46	24%	52	25%	3	15%	21	22%	36	27%	37	26%
Plants	72	18%	34	18%	38	18%	3	15%	10	11%	28	21%	31	22%
Other	26	7%	13	7%	13	6%			3	3%	9	7%	13	9%
DKNA	29	7%	15	8%	14	7%			3	3%	4	3%	21	15%

INFO SOURCES	TOTAL		INCOME									
	(n=)		>50k		50-75k		75-100		100-125		125k+	
TOTAL												
(n=)	400	100	69	100	70	100	73	100	44	100	64	100
12.REBATE MAKE DIFF												
Yes	204	51%	27	39%	40	57%	37	51%	29	66%	38	59%
No	183	46%	41	59%	28	40%	32	44%	15	34%	25	39%
Unsure	13	3%	1	1%	2	3%	4	5%			1	2%
13.CONSIDERATIONS												
Cost	220	55%	33	48%	40	57%	46	63%	27	61%	37	58%
Time	84	21%	8	12%	20	29%	19	26%	11	25%	17	27%
Work	113	28%	23	33%	17	24%	19	26%	14	32%	20	31%
Appearance	111	28%	13	19%	19	27%	19	26%	15	34%	26	41%
Environment	98	25%	14	20%	17	24%	20	27%	11	25%	20	31%
Plants	72	18%	13	19%	14	20%	14	19%	4	9%	11	17%
Other	26	7%	3	4%	5	7%	3	4%	4	9%	3	5%
DKNA	29	7%	10	14%	4	6%	5	7%	1	2%	1	2%

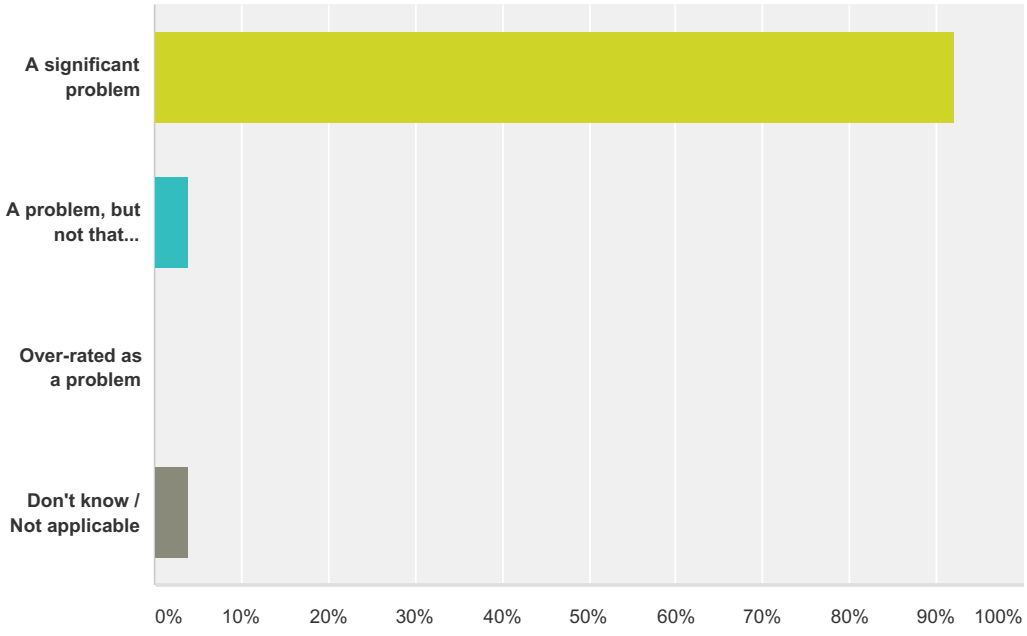
Q1 What do you think is the single most important threat to the environment facing Shoreline today?

Answered: 25 Skipped: 0

#	Responses	Date
1	toxic chemicals in some plant foods, and disguarded pesticides	12/16/2015 1:20 PM
2	Climate Change	12/11/2015 9:38 PM
3	Massive rezones that allow removal of trees and an exponential increase in hard scape	12/11/2015 6:01 PM
4	Global Warming	12/11/2015 1:38 PM
5	When the city approves new development with insufficient mitigations for water runoff.	12/11/2015 12:55 PM
6	Over development	12/11/2015 12:02 PM
7	loss of natural environment	12/11/2015 11:48 AM
8	Overuse of fertilizers and pesticides	12/11/2015 10:59 AM
9	Automobile-related pollution; exhaust and street runoff.	12/9/2015 12:55 PM
10	our toxic food system	12/9/2015 10:53 AM
11	overly aggressive plans to upzone Shoreline single family neighborhoods	12/7/2015 10:08 AM
12	water availability and costs	12/6/2015 7:16 AM
13	pollution; over development	12/6/2015 6:44 AM
14	Climate change	12/5/2015 12:14 AM
15	cars	12/4/2015 9:52 PM
16	Greenhouse gas emissions	12/4/2015 8:26 PM
17	Development	12/4/2015 6:19 PM
18	Potential loss of forest habitat (particularly with regard to the rezoned areas)	12/4/2015 3:50 PM
19	Fossil fuels	12/4/2015 3:27 PM
20	Water conservation	12/4/2015 3:03 PM
21	water pollution	12/4/2015 12:54 PM
22	carbon emmisions	12/4/2015 11:53 AM
23	Number of current and future residents	12/4/2015 11:29 AM
24	Loss of tree canopy	12/4/2015 11:16 AM
25	Traffic	12/4/2015 10:59 AM

Q2 In your opinion, is pollution in local waterways – like streams, rivers, lakes and Puget sound …

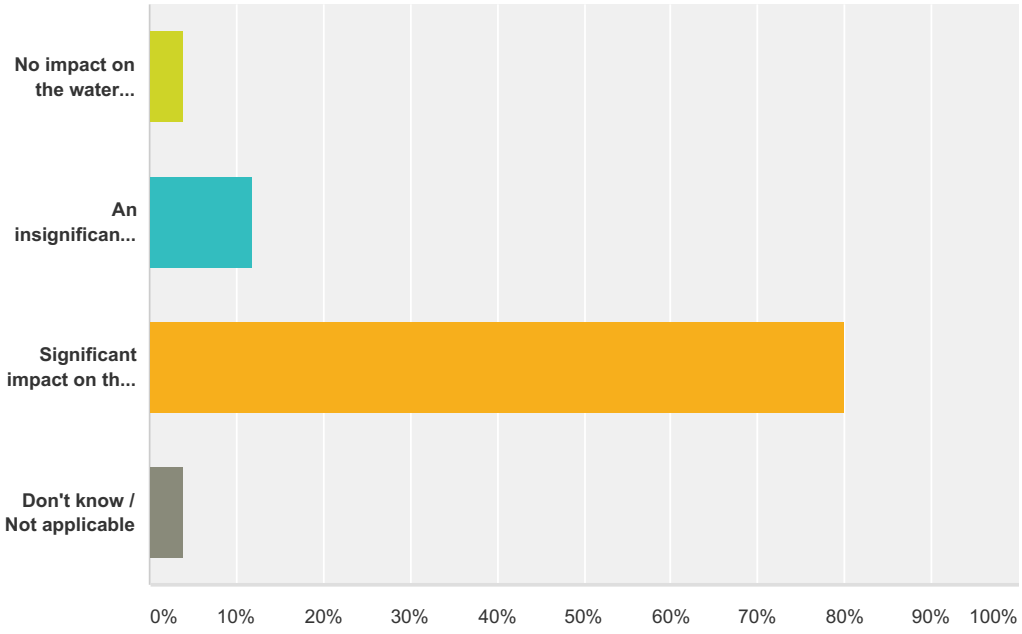
Answered: 25 Skipped: 0



Answer Choices	Responses	
A significant problem	**92.00%**	23
A problem, but not that significant	**4.00%**	1
Over-rated as a problem	**0.00%**	0
Don't know / Not applicable	**4.00%**	1
Total		**25**

Q3 To what degree do you believe that actions you and your family take affect the health of local streams, rivers, lakes, and Puget Sound? Would you say your household has…

Answered: 25 Skipped: 0



Answer Choices	Responses	
No impact on the water quality in local waterways	4.00%	1
An insignificant impact	12.00%	3
Significant impact on the water quality in local waterways	80.00%	20
Don't know / Not applicable	4.00%	1
Total		**25**

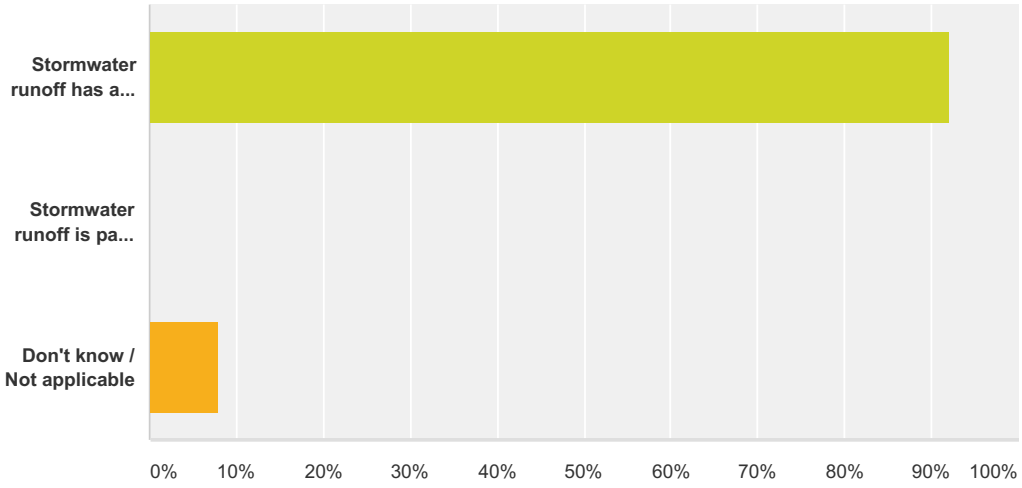
Q4 When it rains, a lot of water runs off of roofs, driveways, parking lots, and streets. As you understand it, where does that water go?

Answered: 25 Skipped: 0

#	Responses	Date
1	to plants and garden beds via catch drums	12/16/2015 1:20 PM
2	Through the sewers and into our local waterways--streams, rivers, lakes, the Sound	12/11/2015 9:38 PM
3	Into streams and Puget sound	12/11/2015 6:01 PM
4	The Puget Sounds, eventually.	12/11/2015 1:38 PM
5	Ultimately the water goes to Puget Sound.	12/11/2015 12:55 PM
6	Yes	12/11/2015 12:02 PM
7	sewer system then to Puget Sound	12/11/2015 11:48 AM
8	to the nearest body of water	12/11/2015 10:59 AM
9	Some into the ground, but most to storm drains which lead to steams, lakes and the Sound.	12/9/2015 12:55 PM
10	puget sound	12/9/2015 10:53 AM
11	via storm drains to the Sound	12/7/2015 10:08 AM
12	water tables in ground and storm drains take alot that go into P sound and L. wash.?	12/6/2015 7:16 AM
13	into the Sound	12/6/2015 6:44 AM
14	Storm drains and then streams	12/5/2015 12:14 AM
15	Into the Puget Sound	12/4/2015 9:52 PM
16	Streams and Puget Sound	12/4/2015 8:26 PM
17	I believe it all leads to the sewer and then the sound (if over capacity)	12/4/2015 6:19 PM
18	Most of it is piped directly to streams	12/4/2015 3:50 PM
19	Storm drains, then into the Sound. Probably some smaller bodies in between	12/4/2015 3:27 PM
20	In to the storm drains then into nearby lakes and stream. Untreated runoff.	12/4/2015 3:03 PM
21	Into streams and waterways.	12/4/2015 12:54 PM
22	Into our waterways	12/4/2015 11:53 AM
23	our waterways, which ultimately lead to the ocean	12/4/2015 11:29 AM
24	First, into the streams, then straight into Puget Sound	12/4/2015 11:16 AM
25	To the Sound or Lake Washington depending on watershed	12/4/2015 10:59 AM

Q5 Which of the following views is closest to your opinion about the impact of runoff or stormwater.

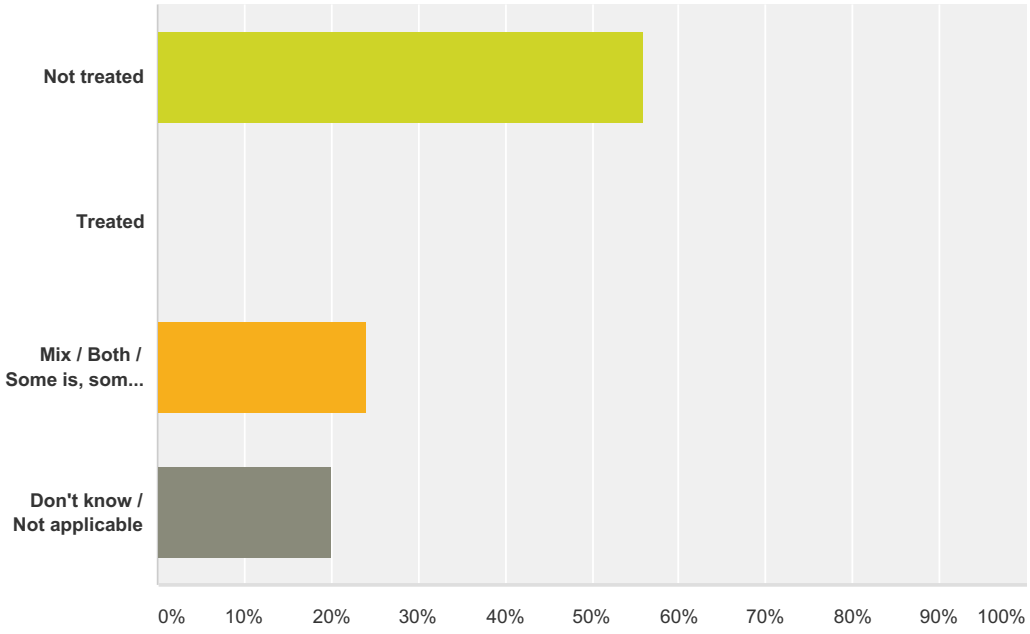
Answered: 25 Skipped: 0



Answer Choices	Responses	
Stormwater runoff has a significant harmful effect on water quality in local streams, lakes, and rivers.	**92.00%**	23
Stormwater runoff is part of the natural way of things. Any harm to water quality from stormwater is not enough to worry about.	**0.00%**	0
Don't know / Not applicable	**8.00%**	2
Total		**25**

Q6 To the best of your knowledge, is runoff water in Shoreline treated before it goes back into local waters? Or is runoff water not treated?

Answered: 25 Skipped: 0



Answer Choices	Responses	
Not treated	**56.00%**	14
Treated	**0.00%**	0
Mix / Both / Some is, some is not	**24.00%**	6
Don't know / Not applicable	**20.00%**	5
Total		**25**

Q7 If TREATED, where does it go for treatment?

Answered: 11 Skipped: 14

#	Responses	Date
1	unknown	12/16/2015 1:21 PM
2	Unsure	12/11/2015 1:38 PM
3	treatment plant	12/11/2015 12:55 PM
4	Don't know	12/11/2015 12:03 PM
5	don't know	12/11/2015 11:48 AM
6	Unknown	12/4/2015 9:52 PM
7	Puget Sound	12/4/2015 8:27 PM
8	Stormwater detention ponds	12/4/2015 3:51 PM
9	I don't know.	12/4/2015 3:27 PM
10	water treatment center (don't know name)	12/4/2015 11:29 AM
11	Westpoint or Brightwater	12/4/2015 10:59 AM

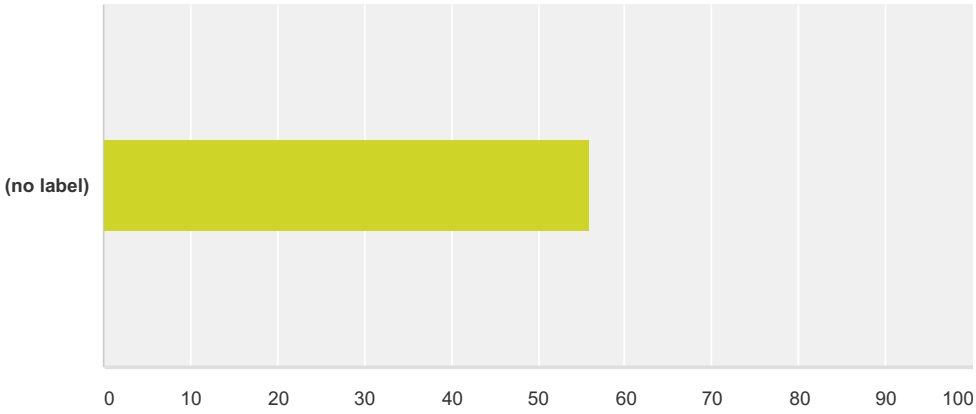
Q8 How did you hear about the City of Shoreline's Soak It Up LID Rebate Program for rain gardens and native vegetation landscaping?

Answered: 25 Skipped: 0

#	Responses	Date
1	event	12/16/2015 1:23 PM
2	Shoreline newsletter, and a neighbor	12/11/2015 9:40 PM
3	At city council meeting	12/11/2015 6:03 PM
4	Neighbors	12/11/2015 1:39 PM
5	a City of Shoreline newsletter that was mailed to my house	12/11/2015 12:58 PM
6	City of shoreline	12/11/2015 12:05 PM
7	1-2 years ago Shoreline had an event at city hall and one of the displays had information about it	12/11/2015 11:51 AM
8	shoreline newsletter	12/11/2015 11:01 AM
9	Earth Day at Central Market.	12/9/2015 12:57 PM
10	Diggin' Shoreline	12/9/2015 10:56 AM
11	from a friend	12/7/2015 10:10 AM
12	earth day 2014	12/6/2015 7:20 AM
13	Shoreline city website	12/6/2015 6:45 AM
14	City employee	12/5/2015 12:16 AM
15	UW Class	12/4/2015 9:53 PM
16	I am a former employee	12/4/2015 8:28 PM
17	Inquiry after knowing about the seattle program	12/4/2015 6:21 PM
18	Web search	12/4/2015 3:52 PM
19	Word of mouth, I think	12/4/2015 3:28 PM
20	Through city of shoreline residential newsletter	12/4/2015 3:04 PM
21	From a friend and a publication sent by Shoreline.	12/4/2015 1:01 PM
22	friend	12/4/2015 11:55 AM
23	originally by researching rain gardens after reading seattle times article about jessie bloom	12/4/2015 11:31 AM
24	Not sure, but perhaps a flyer from the city	12/4/2015 11:21 AM
25	Flyer or City Website	12/4/2015 11:02 AM

Q9 How likely is it that you would recommend the Soak It Up Program to a friend or colleague?

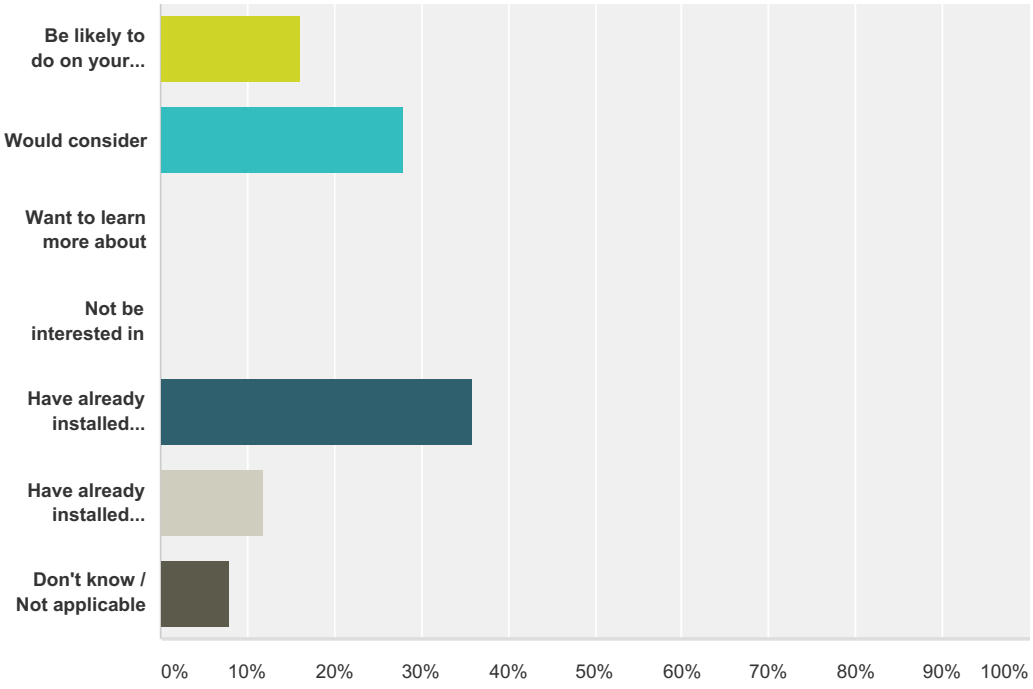
Answered: 25 Skipped: 0



	Not at all likely - 0	1	2	3	4	5	6	7	8	9	Extremely likely - 10	Total	Weighted Average
(no label)	**0.00%** 0	**0.00%** 0	**0.00%** 0	**0.00%** 0	**0.00%** 0	**12.00%** 3	**0.00%** 0	**12.00%** 3	**8.00%** 2	**0.00%** 0	**68.00%** 17	25	56.00

Q10 A rain garden is a planted, shallow depression that captures stormwater runoff and allows it to soak into the ground. Native vegetation landscaping means replacing lawn or pavement with native plants and compost amended soils. Both methods filter stormwater before it gets into nearby streams and lakes. Is installing a rain garden something you would:

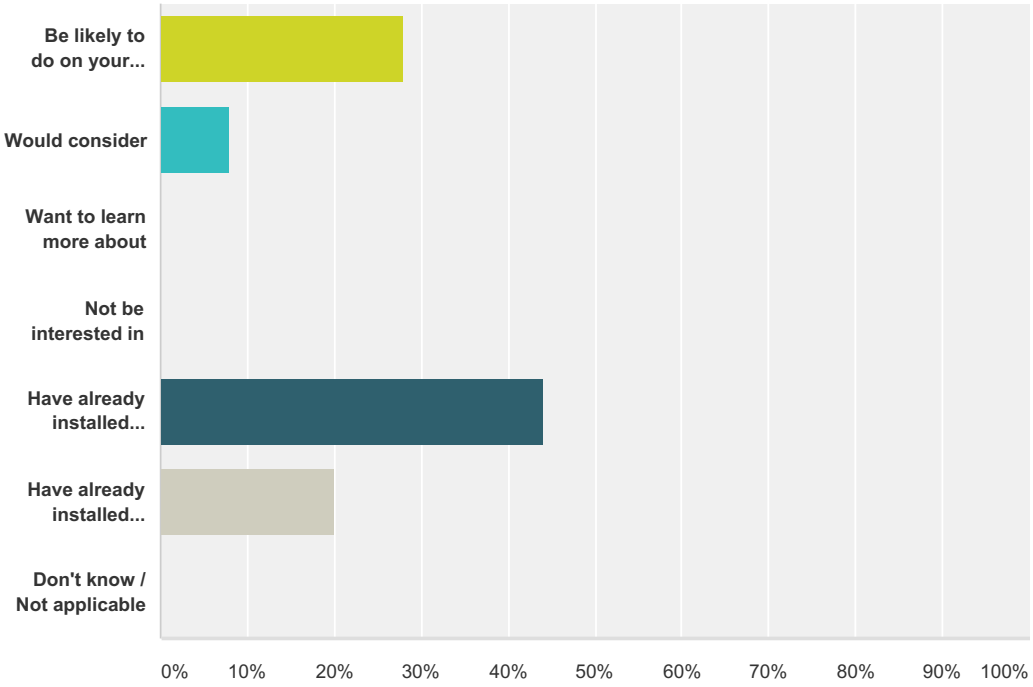
Answered: 25 Skipped: 0



Answer Choices	Responses	
Be likely to do on your property	16.00%	4
Would consider	28.00%	7
Want to learn more about	0.00%	0
Not be interested in	0.00%	0
Have already installed through the Soak It Up Program	36.00%	9
Have already installed without the assistance of a rebate	12.00%	3
Don't know / Not applicable	8.00%	2
Total		25

Q11 Is installing native vegetation landscaping something you would:

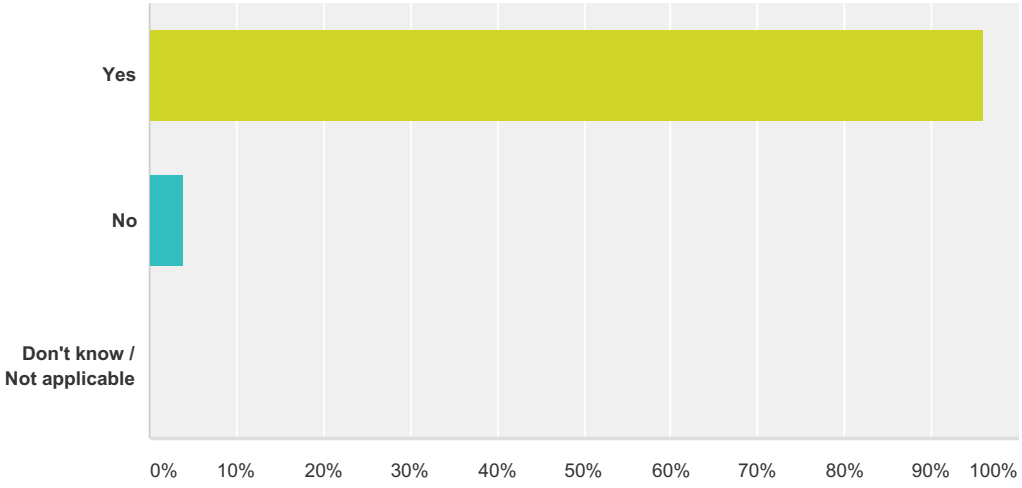
Answered: 25 Skipped: 0



Answer Choices	Responses	
Be likely to do on your property	**28.00%**	7
Would consider	**8.00%**	2
Want to learn more about	**0.00%**	0
Not be interested in	**0.00%**	0
Have already installed through the Soak It Up Program	**44.00%**	11
Have already installed without the assistance of a rebate	**20.00%**	5
Don't know / Not applicable	**0.00%**	0
Total		**25**

Q12 The Soak It Up Program provides rebates to property owners for installation of rain gardens and native vegetation landscaping. Would getting a rebate from the City make you more likely to install a rain garden or native vegetation landscaping?

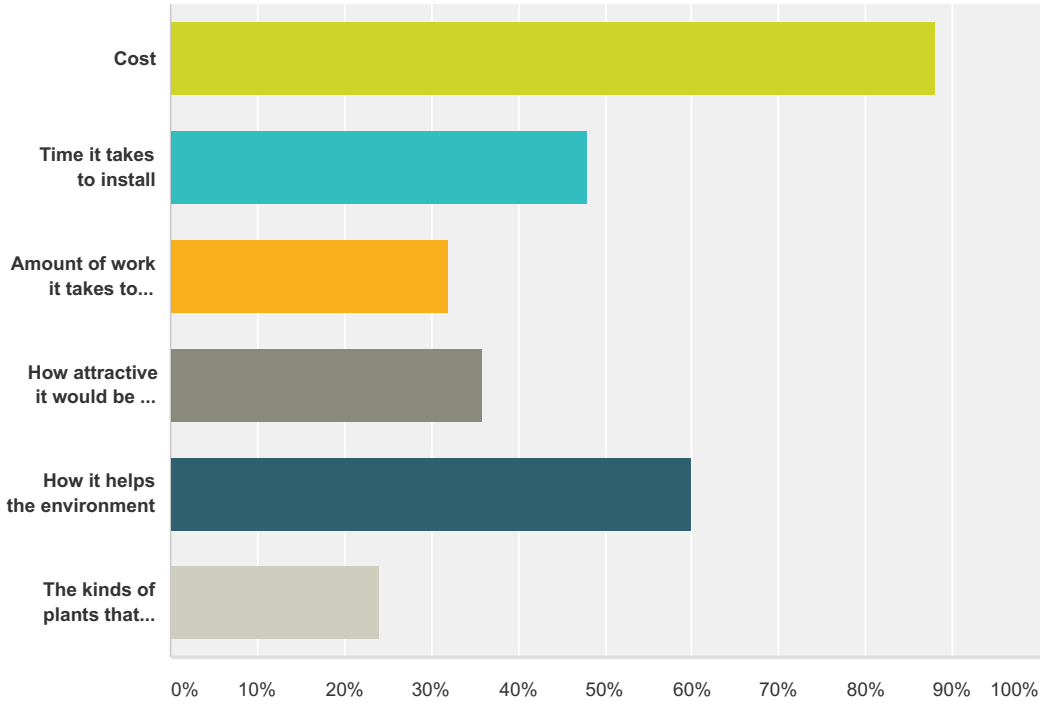
Answered: 25 Skipped: 0



Answer Choices	Responses	
Yes	**96.00%**	24
No	**4.00%**	1
Don't know / Not applicable	**0.00%**	0
Total		**25**

Q13 Which of the following would be important considerations for you, in deciding whether or not to install a rain garden or native vegetation landscaping. Check all that apply.

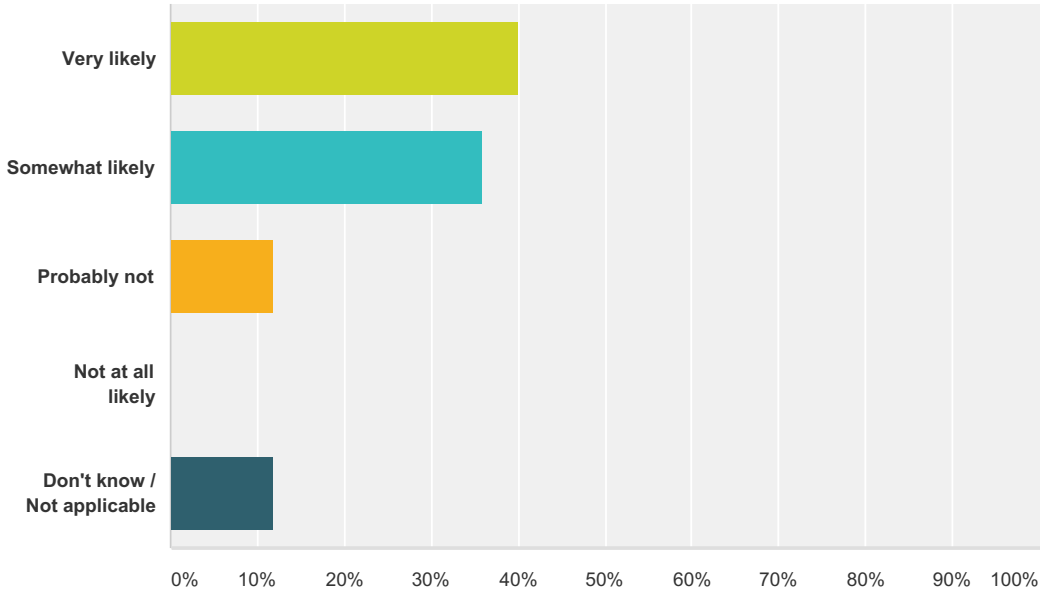
Answered: 25 Skipped: 0



Answer Choices	Responses	
Cost	88.00%	22
Time it takes to install	48.00%	12
Amount of work it takes to maintain	32.00%	8
How attractive it would be on my property	36.00%	9
How it helps the environment	60.00%	15
The kinds of plants that would be acceptable	24.00%	6
Total Respondents: 25		

Q14 Another thing homeowners can do to manage stormwater is to replace driveways, patios, or other paved areas with porous pavement, which allows stormwater to pass through and soak into the ground. If the Soak It Up Program offered rebates for porous pavement replacement on your property, how likely would you be to replace pavement on your property? Would you be…

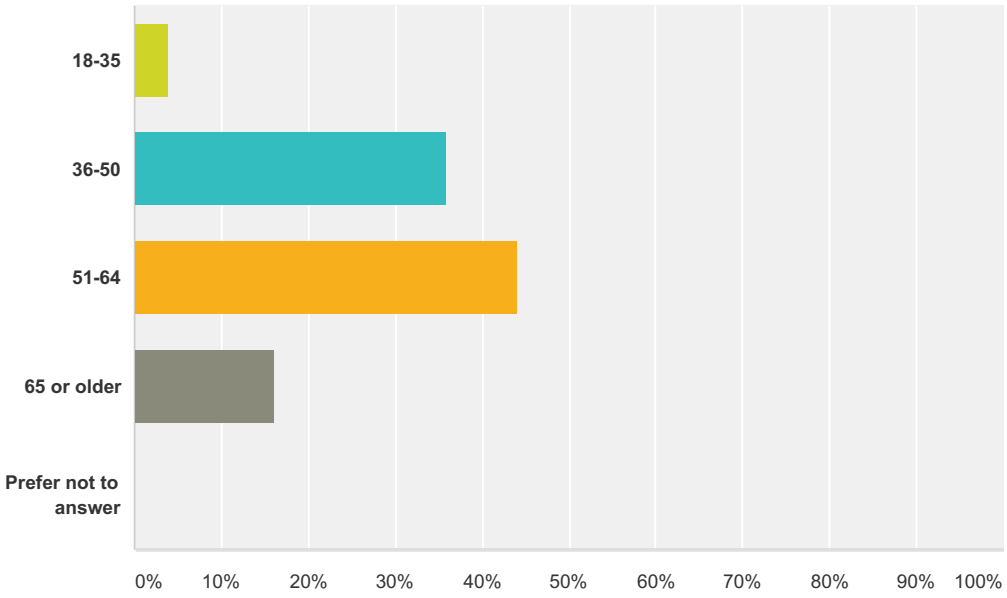
Answered: 25 Skipped: 0



Answer Choices	Responses	
Very likely	40.00%	10
Somewhat likely	36.00%	9
Probably not	12.00%	3
Not at all likely	0.00%	0
Don't know / Not applicable	12.00%	3
Total		25

Q15 What is your age?

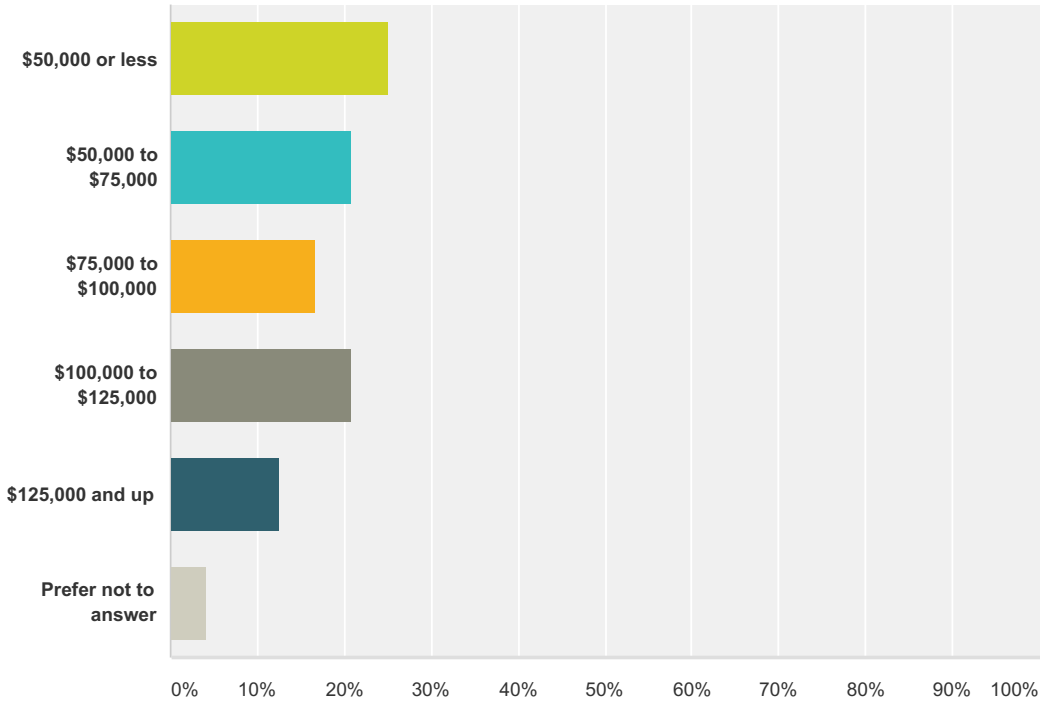
Answered: 25 Skipped: 0



Answer Choices	Responses	
18-35	**4.00%**	1
36-50	**36.00%**	9
51-64	**44.00%**	11
65 or older	**16.00%**	4
Prefer not to answer	**0.00%**	0
Total		**25**

Q16 How much total combined money did all members of your HOUSEHOLD earn last year, before taxes?

Answered: 24 Skipped: 1



Answer Choices	Responses	
$50,000 or less	25.00%	6
$50,000 to $75,000	20.83%	5
$75,000 to $100,000	16.67%	4
$100,000 to $125,000	20.83%	5
$125,000 and up	12.50%	3
Prefer not to answer	4.17%	1
Total		24

Q17 Please provide us with any additional feedback or comments.

Answered: 16 Skipped: 9

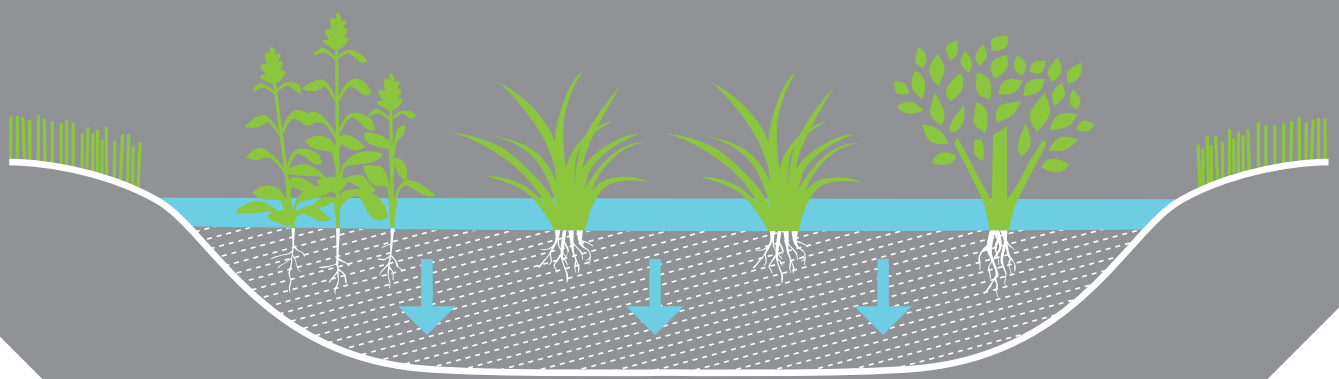
#	Responses	Date
1	I applied for the Soak It Up program, but didn't qualify. because I had already put weed block cloth down without loosening the soil below. (Loosening the soil disturbs soil microbes.) Little by little I have been removing the grass/weeds and replacing them with the ground cloth, with wood chips on top. When the grass under the ground cloth has decayed, I cut holes in it and plant. Unfortunately that method does not qualify for a rebate. :(I already have the weed block on most of my yard, and I don't want to undo all that work in order to qualify for the rebate.	12/11/2015 9:46 PM
2	I will not be doing a rain garden unless the city is required to redo the 185th st rezone. No point in doing so when the property will be bulldozed for an apartment building	12/11/2015 6:06 PM
3	Really looking forward to partaking in the Soak-It-Up program this year if our budget can handle it. I think this is a GREAT program for Shoreline and probably the best city-based program from Shoreline that I've learned of since moving here 2 years ago.	12/11/2015 1:40 PM
4	It would help to have someone that could give a estimate range of what it would cost to do a certain area. Not knowing stops me.	12/11/2015 11:53 AM
5	Providing tours of existing rain gardens in Shoreline would help educate residents of their benefits.	12/11/2015 11:02 AM
6	I like the program, wish more money was available, as in seattle. also, rain catchment and permeable paving systems should be encouraged same way.	12/9/2015 10:57 AM
7	Considered the conservation/native plant city program but decided against it: too limiting in plant choices, too many hoops to jump through, too much money I would need to spend upfront in order to get rebate.	12/7/2015 10:15 AM
8	I love my rain garden, and appreciate the rebate I received. I would not have been able to afford the garden without it!	12/6/2015 6:46 AM
9	Soak It Up is a great program. I like Seattle's program where they do it for you which may help those that are intimidated or not physically able to do the work.	12/4/2015 9:54 PM
10	We utilized the conservation lanscaping rebate on our last house in Shoreline. We found it advantageous all around and Tina was great in fascilitating things.	12/4/2015 6:22 PM
11	We received funding from the Soak it Up program for a rain garden and conservation landscaping. Tina was great to work with.	12/4/2015 3:53 PM
12	I love the soak it up program!	12/4/2015 3:05 PM
13	Really commend you for encouraging citizens to remove their lawns and plant native plants. The idea of porous driveways is very interesting.	12/4/2015 11:56 AM
14	I have told several neighbors about the program. thank you to tina, who has personally helped me work through several details/steps of the program.	12/4/2015 11:32 AM
15	Air and water quality will continue to degrade, if we don't put a halt to over-development. Loss of trees and soil surfaces will deter the absorption of water, and affect the air that all of creation need to sustain life.	12/4/2015 11:30 AM
16	I hope you continue forward thinking programs like Soak It Up and are to be commended with coming up with it in the first place!	12/4/2015 11:04 AM

CITY OF SHORELINE

Rain Garden

The plants and soils in rain gardens are specifically designed to catch, absorb, and filter rainwater runoff. This rain garden was made possible with support from the City of Shoreline Soak It Up Rebate Program.

For more information about rain gardens and available incentives, visit **shorelinewa.gov/SoakItUp**



Soak It Up
Rebate Program

CITY OF SHORELINE

Manage your rain water at home

Maintenance Guide
Rain Garden & Native Vegetation Landscaping

Thank you for maintaining your installation to protect our waterways.

The Soak It Up Program, funded by the Surface Water Utility, offers rebates for native vegetation landscaping and rain gardens on private property. Learn more at shorelinewa.gov/soakitup.

Rain Garden & Native Vegetation Landscaping

Weed:

Weeds can choke young plants and spread quickly. Pull weeds by hand or with a long-handled weed puller. Weed as necessary year-round, especially in late winter, spring, and early fall when the soil is still moist. **Pull the entire weed—roots and all—**so that it doesn't immediately grow back. **Never use herbicides/pesticides** in your garden.

Weed: Remove entire weed, including roots.

Mulch:

Mulch (such as compost, leaves and wood chips) prevents weeds, conserves water and protects roots. **Check and maintain a mulch layer to a depth of 3 inches** from the soil, *as necessary*. The best mulch is arborist wood chips that may be available for free by contacting a tree company. Look for any areas of exposed soil and cover them with mulch when needed. Be careful to avoid piling mulch up against plant stems.

Mulch: Put mulch, such as woodchips, on the soil's surface.

Water:

Young plants need water to grow strong roots. **Watering is important during the first two to three summers** after your project has been installed. In general, water when the weather is dry and warm, from May through September. Watering before 8 am is best to reduce evaporation.

Be sure to water deeply, moistening the top 6-12 inches of soil. After watering, wait an hour, then dig down to see if the water has gone deep enough.

You can use a watering wand or save time by laying out a soaker hose next to your plants and covering it with mulch. Learn more about how to water new plants and how to use a soaker hose at **www.seattle.gov/util/environmentconservation/mylawngarden/smart_watering**.

Age of Garden	Watering Frequency
1st year	Every 3-4 days
2nd year	Once every 2 weeks
3rd year	Once a month or more frequently depending on whether the leaves are showing stress (excessive wilting, browning)

Water: Water deeply.

Plant:

If you need to remove dead or dying plants, **replace them in the fall.** This will give the plants time to grow more roots *before the dry season.* More extensive roots help plants fight off disease, dry summers, and cold winters.

Plant: Fall is the best time to replace plants.

Clean:

Trash and debris can block inlets and outlets of rain gardens. **Clean any sediment, debris, or trash from inside your rain garden regularly.** Check the flow when rains start in fall and again in winter.

Weeds to Remove

View a complete guide of common weeds at **kingcounty.gov/weeds**

Himalayan Blackberry
Vine with thorns and black summer fruit.

Dandelion
Long, deep roots.

Bindweed (Morning glory)
White flowers in spring to summer.

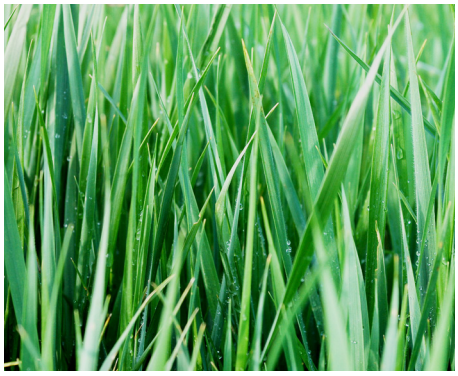
Buttercup
Shiny yellow flowers. Spreads aggressively in moist areas.

English Ivy
Vine with fast growth.

Common Vetch
Lots of seeds in pods after flowering.

Herb Robert (Stinky Bob)
Smelly weed with long, extensive roots.

Bittercress / Shotweed
Seeds pop off at slightest touch.



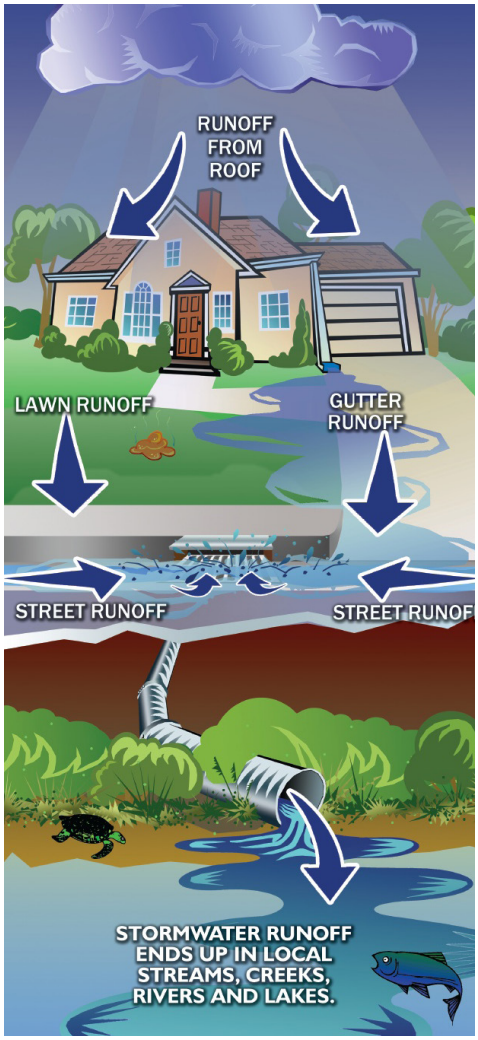
Grass
Grass from surrounding lawn can spread into your garden and become the worst weed.

Gutters

Please keep your gutters clean year round.

Leaves, dirt, and so much more land on your roof all year long. If you have a composite roof, the grit on the shingles may slowly come off, making its way into your gutters. Eventually, all this debris collects in your gutters until rain washes it down your downspouts.

Please clean your gutters at least once a year to keep the rainwater flowing.



Courtesy of NCDENR

Questions?

- Need help identifying if a plant in your garden is a weed?
- Not sure where to find arborists' wood chips for fresh mulch?
- Wondering how often or how long to water your new rain garden?

Contact the Garden Hotline at:
206-633-0224 or **help@gardenhotline.org**
Multi-lingual service is provided.

the Garden Hotline
Your Garden. Our Expertise.

Maintain your installation

The City of Shoreline is counting on your ***Soak It Up*** project to control polluted stormwater. Your rain garden and/or native vegetation landscaping was made possible with public funds. And, in return, your continued maintenance will help protect our lakes, streams and Puget Sound.

Let us know if you sell your property

Remember to contact the City of Shoreline at (206) 801-2455 or **PW@shorelinewa.gov** if you intend to sell your home. Your ***Soak It UP*** project must be listed in your Seller's Disclosure Form to let the next owner know about your rain garden and/or native vegetation landscaping.

For more information, please visit: shorelinewa.gov/soakitup

Thanks to the City of Seattle, Seattle Public Utilities and King County for developing this guide and giving us permission to revise.

Attachment B. Ordinance No. 768

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ORDINANCE NO. 768

AN ORDINANCE OF THE CITY OF SHORELINE, WASHINGTON AMENDING CERTAIN SECTIONS OF THE SHORELINE MUNICIPAL CODE CHAPTER 13.10 SURFACE WATER UTILITY AND CHAPTER 13.12 FLOODPLAIN MANAGEMENT SO AS TO BE CONSISTENT WITH THE WESTERN WASHINGTON PHASE II NPDES PERMIT.

WHEREAS, the City of Shoreline is a non-charter optional municipal code city as provided in Title 35A RCW, incorporated under the laws of the state of Washington; and

WHEREAS, the United States Environmental Protection Agency (EPA), under authority granted to it in the Clean Water Act's National Pollution Discharge Elimination System (NPDES) program, has adopted regulations for municipal stormwater systems; and

WHEREAS, in January 2007, as authorized by the EPA, the Washington State Department of Ecology (Ecology) issued a Phase II municipal stormwater permit (Phase II Permit) for Western Washington and Ecology has modified and reissued that Phase II Permit since then; and

WHEREAS, Ecology's last update and reissuance of the Phase II Permit occurred in August 2012; the current Phase II Permit is effective until 2018; and

WHEREAS, the City of Shoreline is subject to Ecology's Phase II Permit and must update its stormwater-related regulations to maintain consistency with the requirements of the current Phase II Permit; and

WHEREAS, the current Phase II Permit requires the City to review, revise, and make effective codes, rules, and other enforceable standards so as to incorporate and require Low Impact Development (LID) principles and LID Best Management Practices; and

WHEREAS, the City Staff, in consultation with Brown and Caldwell, determined the necessary amendments to ensure consistency with the current Phase II Permit; and

WHEREAS, on November 21, 2016, the City Council held a study session on the proposed code amendments; and

WHEREAS, the City Council has considered all relevant information in the public record and all public comments, written and oral; and

THEREFORE, THE CITY COUNCIL OF THE CITY OF SHORELINE, WASINGTON DO ORDAIN AS FOLLOWS:

Section 1. Amendment. Shoreline Municipal Code (SMC) Chapter 13.10 Surface Water Utility is amended as set forth in Exhibit A to this Ordinance.

Section 2. Amendment. Shoreline Municipal Code (SMC) Chapter 13.12 Floodplain Management is amended as set forth in Exhibit B to this Ordinance.

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Section 3. Corrections by City Clerk or Code Reviser. Upon approval of the City Attorney, the City Clerk and/or the Code Reviser are authorized to make necessary corrections to this ordinance, including the corrections of scrivener or clerical errors; references to other local, state, or federal laws, codes, rules, or regulations; or ordinance numbering and section/subsection numbering and references.

Section 4. Severability. Should any section, subsection, paragraph, sentence, clause, or phrase of this ordinance or its application to any person or situation be declared unconstitutional or invalid for any reason, such decision shall not affect the validity of the remaining portions of this ordinance or its application to any person or situation.

Section 5. Publication and Effective Date. A summary of this Ordinance consisting of the title shall be published in the official newspaper. This Ordinance shall take effect five days after publication.

PASSED BY THE CITY COUNCIL ON 12th DAY OF DECEMBER, 2016.

Mayor Christopher Roberts

ATTEST:

Jessica Simulcik Smith
City Clerk

APPROVED AS TO FORM:

Margaret King
City Attorney

Date of Publication: December 15, 2016
Effective Date: December 20, 2016

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Chapter 13.10
SURFACE WATER UTILITY

Sections:

13.10.100 Purpose. SHARE

A surface water utility is necessary to provide for and promote the public health, safety, and welfare by:

A. Establishing a program to comprehensively manage surface water with the intent of reducing flooding, erosion and sedimentation, preventing habitat loss, and enhancing groundwater recharge.

B. Protecting and enhancing the water quality of water courses, water bodies, groundwater, and wetlands in a manner pursuant to and consistent with the Federal Clean Water Act, Department of Ecology's Western Washington Phase II Municipal Stormwater Permit related to the National Pollutant Discharge Elimination System (NPDES), and Chapter 90.48 RCW, Water Pollution Control.

C. Providing design, construction, and maintenance criteria for permanent and temporary surface water drainage facilities for development and redevelopment activities.

D. This chapter is adopted to protect the public and not for the benefit of any particular individual or class. [Ord. 531 § 2 (Exh. 2), 2009

13.10.105 Definitions. SHARE

The following terms are defined for the purpose of implementing the provisions of this chapter:

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~~A.~~ "Best management practices" means schedules of activities, restrictions, maintenance procedures, and structural and/or managerial practices that, when used singly or in combination, prevent or reduce the release of pollutants and other adverse impacts to waters of the state.

~~B.~~ "City" means the Ceity of Shoreline.

~~C.~~ "Chlorinated" means water that contains more than 10 milligrams per liter chlorine.

~~D. "Comprehensive plan" means the City's comprehensive plan adopted pursuant to Chapter 36.70A RCW and such plan as amended, and as described in SMC Title 20the City's current generalized coordinated long-range land use policy statement adopted pursuant to the Growth Management Act, chapter 36.70A RCW that provides a basis for future development within the City...the plan and amendments as described in Chapter SMC.~~

~~E.~~ "Critical areas" means critical areas as defined in SMC 20.20.014 and regulated pursuant to SMC Chapter 20.80 Critical Areas.

~~F.~~ "Dangerous waste" means those solid wastes designated in WAC 173-303-070 through 173-303-100 as dangerous or extremely hazardous or mixed waste, as further defined under WAC 173-303-040.

~~G.~~ "Development" means land disturbing activities, including class IV general forest practices that are conversions from timber land to other uses; structural development, including construction or installation of a building or other structure; creation of ~~impervious~~ hard surfaces; and subdivision and binding site plans, as defined and applied in Chapter 58.17 RCW. Projects meeting the definition of "redevelopment" shall not be considered new development.

~~H.~~ "Declaration of covenant" means a legal document between the Ceity and persons holding title to the property requiring the title holder to perform required maintenance and repairs on drainage facilities necessary to meet the Ceity's specified standards within a reasonable time limit.

~~I.~~ "Director" means the public works director or designee~~, except that when referring to enforcement of permitting and review processes defined in Chapter 20.30 SMC, "director" shall mean the director of Planning and development services or designee.~~

~~J.~~ "Discharge" means to throw, drain, release, dump, spill, empty, emit, or pour forth any matter or to cause or allow matter to flow, run or seep from land or be thrown, drained, released, dumped, spilled, emptied, emitted or poured into water.

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~~K.~~ "Drainage" means collection, conveyance, containment, and/or discharge of surface water and stormwater runoff.

~~L.~~ "Drainage facility" means a constructed or engineered feature that collects, conveys, stores, ~~or~~ treats, or infiltrates stormwater runoff. "Drainage facility" includes, but is not limited to, a constructed or engineered stream, pipeline, channel, ditch, gutter, lake, wetland, closed depression, flow control or water quality treatment facility, infiltration facility, constructed low impact development facility(LID), erosion and sediment control facility and other structure and appurtenance that provides for drainage.

"Emergency" means any natural or human-caused event or set of circumstances that disrupts or threatens to disrupt or endanger the operation, structural integrity or safety of the drainage system; or endangers the health and safety of the public or environment; or otherwise requires immediate action by the utility.

~~M.~~ "Emerging technologies" means treatment technologies that have not been evaluated with Department of Ecology-approved protocols, but for which preliminary data indicate that they may provide a necessary function(s) in a stormwater treatment system.

~~N.~~ "Hard surface" means an area which either prevents or retards the entry of water into the soil mantle as under natural ~~an~~conditions, an impervious surface, a permeable pavement, or a vegetated roof.

~~NO.~~ "Illicit connection" means any manmade conveyance that is connected to a municipal separate storm sewer without a permit, or that is not intended for collecting and conveying stormwater discharges or the non-stormwater discharges ~~allowed~~not prohibited pursuant to ~~by~~ SMC 13.10.320, excluding roof drains and other similar type connections. Examples of illicit connections include sanitary sewer connections, floor drains, channels, pipelines, conduits, inlets, or outlets that are connected directly to the municipal separate storm sewer system.

~~OP.~~ "Illicit discharge" means any discharge to a municipal separate storm sewer that is not composed entirely of stormwater or of the non-stormwater discharges ~~allowed by~~ not prohibited pursuant to SMC 13.10.320.

~~Q.~~ "Impervious surface" means a non-vegetated surface area that either prevents or retards the entry of water into the soil mantle as under natural conditions prior to ~~development. A non-vegetated surface area which~~development and ~~causes~~ water to run off the surface in greater quantities or at an increased rate of flow from the flow present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, roof tops, walkways, patios, driveways, parking lots or storage areas,

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concrete or asphalt paving, gravel roads, packed earthen materials, and oiled, macadam or other surfaces which similarly impede the natural infiltration of stormwater.

~~P~~R. "Land disturbing activity" means any activity that results in movement of earth, or a change in the existing soil cover (both vegetative and non-vegetative) and/or the existing soil topography. "Land disturbing activities" include, but are not limited to, clearing, grading, filling, and excavation. Compaction that is associated with stabilization of structures and road construction shall also be considered a land disturbing activity. Vegetation maintenance practices are not considered land disturbing activity. Stormwater facility maintenance is not considered land disturbing activity if conducted according to established standards and procedures.

~~Q~~S. "Low impact development(LID)" means a stormwater and land use management strategy that strives to mimic pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation and transpiration by emphasizing conservation, use of on-site natural features, site planning, and distributed stormwater management practices that are integrated into a project design.

~~T.~~ "Low impact development best management practices(LID BMP)" means distributed stormwater management practices, integrated into a project design, that emphasize pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation and transpiration. LID BMPs include, but are not limited to, ~~bioretention,rain~~bioretention, rain gardens, permeable pavements, roof downspout controls, dispersion, soil quality and depth, minimal excavation foundations, vegetated roofs, and water re-use.

~~U.~~ "Low impact development (LID) principles" means land use management strategies that emphasize conservation, use of on-site natural features, and site planning to minimize impervious surfaces, native vegetation loss, and stormwater runoff. ~~means stormwater management and land development strategy applied at the parcel and subdivision scale that emphasizes conservation and use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely mimic predevelopment hydrologic functions.~~

~~R~~V. "Municipal separate ~~stormwater~~storm sewer~~water~~ system (MS4)" means a conveyance, or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

1. Owned or operated by the state, city, county, or special purpose district having jurisdiction over disposal of wastes, stormwater, or other wastes, or a designated and approved management agency under Section 208 of the CWA that discharges to waters of the United States;

2. Designed or used for collecting or conveying stormwater;

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3. Which is not a combined sewer; and

4. Which is not part of a publicly owned treatment works (POTW) as defined at 40 CFR 122.2.

~~SW.~~ "Natural systems" means channels, swales, and other non-manmade conveyance systems as defined by the first documented topographic contours existing for the subject property, either from maps or photographs, or such other means as appropriate. In the case of outwash soils with relatively flat terrain, no natural location of surface discharge may exist.

~~TX.~~ "Operation and maintenance plan" means a set of instructions and schedules to keep drainage facilities working to meet the design performance criteria.

~~UY.~~ "Record drawings" means a submittal documenting as-built conditions of a permitted development or redevelopment project.

~~VZ.~~ "Redevelopment" means, on a site that is already substantially developed (i.e., has 35 percent or more of existing ~~impervious~~ hard surface coverage), the creation or addition of ~~impervious~~ hard surfaces; the expansion of a building footprint or addition or replacement of a structure; structural development including construction, installation or expansion of a building or other structure; replacement of ~~impervious~~ hard surface that is not part of a routine maintenance activity; and land disturbing activities.

~~WAA.~~ "Runoff" means water that travels across the land surface and discharges to water bodies either directly or through a collection and conveyance system.

~~XAB.~~ "Stormwater Manual" means the Stormwater Management Manual for Western Washington, published by the Washington State Department of Ecology. The version in effect is the most recent version that has been approved for City use by ~~the d~~the Director.

~~X~~YAC. "Surface water" or "stormwater" means water originating from rainfall and other precipitation that is found on ground surfaces and in drainage facilities, creeks, rivers, streams, springs, seeps, ponds, lakes, wetlands, as well as shallow ground water.

~~YZAD.~~ "Waters of the state" includes lakes, rivers, ponds, streams, inland waters, underground water, salt waters, estuaries, tidal flats, beaches, and lands adjoining the seacoast of the state, sewers, and all other surface waters and watercourses within the jurisdiction of the state of Washington. [Ord. 531 § 2 (Exh. 2), 2009]

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13.10.110 Utility created. SHARE

A. There is hereby created and established the surface water utility of the ~~city~~ City of Shoreline under which the provisions of this chapter shall be carried out.

B. The ~~director~~ Director is authorized to administer, implement, and enforce the provisions of this chapter. The ~~director~~ Director may establish inspection programs to ensure compliance with the requirements of this chapter and the Western Washington Phase II Municipal Stormwater Permit (Phase II Permit). [Ord. 531 § 2 (Exh. 2), 2009]

13.10.120 Revenue and expenditures. SHARE

A. Fees, discounts and rebates associated with surface water management are set forth in the surface water management fee schedule in Chapter 3.01 SMC. All fees collected pursuant to this chapter shall be credited and deposited in the surface water utility enterprise fund pursuant to SMC 3.35.080.

B. Fees deposited in the surface water enterprise fund shall be expended for:

1. Administering, operating, maintaining, or improving the surface water system, including all or any part of the cost of planning, designing, acquiring, constructing, repairing, replacing, improving, regulating, educating the public, or operating drainage and stormwater facilities owned by the C~~c~~ity;

2. Paying or securing the payment of all or any portion of any debt issued for ~~such purpose~~the purposes set forth in SMC 13.10.120(B)(1) and the related reserve and coverage requirements;

3. Providing a rebate for previous developed properties for the construction of approved Low impact development best management practices including rain gardens, native vegetation ~~or conservation~~ landscaping, ~~or~~ pervious asphalt pavement or porous concrete. ~~of at least 400 square feet secured by a property covenant for repayment of the rebate if the improvement is discontinued within 10 years of payment.~~

C. Fees shall not be transferred to any other funds of the ~~city~~ City except to pay for expenses attributable to the surface water system. [Ord. 659 § 1, 2013; Ord. 531 § 2 (Exh. 2), 2009]

13.10.200 Adoption of Stormwater Management Manual. SHARE

A. The ~~city~~ City adopts by reference the ~~most recent version of the~~ Stormwater Management Manual for Western Washington published by Washington State Department of Ecology, henceforth referred to as "Stormwater Manual." ~~,~~ The ~~-~~ effective version shall be the most recent version ~~as~~that has been approved for City use by the dDirector. ~~henceforth referred to as "Stormwater Manual."~~ All new development, redevelopment, and other activities which have the potential to impact surface water and

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stormwater shall comply with the standards set forth in the current effective _version of the following unless specifically exempted by the Stormwater Manual:

1. Stormwater Manual;

2. Western Washington Phase II Municipal Stormwater Permit, issued by the Washington Department of Ecology; and

3. City of Shoreline Eengineering Ddevelopment Mmanualguide.

B. Low Impact Development. Low impact development techniques shall be employed wherever feasible, reasonable and appropriate before conventional on-site detention and infiltration methods are considered consistent with the requirements of the Stormwater Manual. When low impact development techniques are employed, the design, and construction, and ongoing maintenance shall be consistent with the Stormwater Manual and the most recent version of Low Impact Development, Technical Guidance for Puget Sound (Puget Sound Action Team and Washington State University, Pierce County Extension), or consistent with techniques approved by the public works director.Director

Low impact development principles shall also be employed wherever feasible in planning, site layout, and implementation of development and redevelopment projects. Low impact development principles include management strategies that emphasize conservation, use of on-site natural features, and site planning to minimize impervious surfaces, native vegetation loss, and stormwater runoff.

C. Emerging Technologies.

1. The use of emerging technologies is encouraged. Examples of emerging technologies include media filters, catch basin inserts, and engineered erosion control products, and low impact development techniques.

2. The Washington State Department of Ecology's Technology Assessment Protocol (TAPE) or Chemical Technology Assessment Protocol (CTAPE) should be consulted by project proponents to determine which emerging technologies may be appropriate for use on their project site.

3. The public works Ddirector has the authority to review and approve the use of emerging technologies.

D. Deviations to the standards may be requested pursuant to SMC 20.30.290. [Ord. 531 § 2 (Exh. 2), 2009]

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13.10.225 Minimum requirements. SHARE

The requirements of this chapter are minimum requirements. They do not replace, repeal or supersede more stringent requirements, rules, regulations, covenants, standards, or restrictions. Where this chapter imposes requirements which are more protective of human health or the environment than those set forth elsewhere, the provisions of this chapter shall prevail. [Ord. 531 § 2 (Exh. 2), 2009]

13.10.230 Special drainage areas. SHARE

A. ~~The public works director~~The Director may designate "special drainage areas" where it has determined that the existing flooding, drainage, and/or erosion conditions present a threat of harm to the welfare or safety of the surrounding community.

B. Activities in special drainage areas shall meet additional drainage requirements that are outlined in the engineering development ~~guide~~manual. [Ord. 531 § 2 (Exh. 2), 2009]

13.10.235 Construction Inspections. SHARE

A. All development and redevelopment that could impact surface water ~~may be~~is subject to inspection to assure consistency with the provisions of this chapter.

B. Work for which a permit is required shall be subject to inspection by the D~~d~~irector and such work shall remain accessible and exposed for inspection until approved. The C~~c~~ity shall not be liable for expenses for the removal or replacement of any material required to allow inspection.

C. The standards of this code shall be enforced regardless of an inspection and approval of work.

D. Reports of approved inspection agencies may be accepted.

E. The permit holder shall notify the C~~c~~ity when work is ready for inspection. The planning and development services D~~d~~irector, upon notification, shall make the requested inspections and either approve that the portion of the work inspected or notify the permit holder of any portions of work that fail to comply with this code. Any portions that do not comply shall be corrected and shall not be covered until authorized by the D~~d~~irector. [Ord. 531 § 2 (Exh. 2), 2009]

13.10.240 Record drawings and certifications. SHARE

A. Before final approval of an engineered surface water drainage facility, the owner shall provide a record drawing that delineates the as-built conditions. The ~~planning and development services D~~director~~,~~ shall review and approve record drawings prior to final approval of the facility. Record drawings shall be prepared in accordance with the engineering development manual~~guide~~ and shall be stamped by a civil engineer.

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B. The record drawings shall include a certification that all facilities function in accordance with the plans, specifications, hydraulic computations, and design volumes shown on the approved plans or as approved by the Ddirector. [Ord. 531 § 2 (Exh. 2), 2009]

13.10.245 Operation and maintenance. SHARE

A. Pursuant to the Stormwater Manual, the owner shall prepare an operation and maintenance plan for the constructed surface water drainage facilities. This plan is subject to review and approval by the ~~planning and development services director~~Director.

B. When required, the ~~planning and~~ Director~~development services director~~ sshall prepare a declaration of covenant for signature by the owner. A covenant is required for all permanent stormwater facilities installed pursuant to the Stormwater Manual.

C. The ~~owner~~ owner, at their own expense, shall record the approved operation and maintenance plan and the associated declaration of covenant with King County recorder's office and provide a copy of the recorded document to the ~~planning and development services~~public works Ddirector.

D. The dedication of surface water facilities located within the public right-of-way shall comply with SMC 20.70.~~060 and 20.70.070~~140. [Ord. 531 § 2 (Exh. 2), 2009]

13.10.320 Prohibited discharges. SHARE

A. Any discharge into a municipal separate ~~stormwater~~storm sewer~~water~~ system (MS4) or waters of the state that is not composed entirely of stormwater, either directly or via an illicit connection, ~~that is not composed entirely of stormwater~~ is considered an illicit discharge and is prohibited; provided, that the following discharges are not prohibited:

1. Discharges made pursuant to the Phase II Permit or other current permit issued or approved by the Department of Ecology.

2. Discharges resulting from activities undertaken to avoid or lessen an imminent threat to public health or safety. Such public health or safety activities should minimize prohibited discharges to the maximum extent practicable. The Ccity shall be notified of the occurrence within 24 hours.

3. Discharges not considered a significant source of contamination, as determined by the ~~public works director~~Director, including:

a. Spring water;

b. Diverted stream flows;

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c. Uncontaminated water from crawl space pumps, foundation drains, or footing drains;

d. Lawn watering or other activities using collected rainwater;

e. Pumped groundwater flows that are uncontaminated;

f. Materials placed as part of an approved restoration project;

g. Natural uncontaminated surface water or groundwater;

h. Flows from riparian habitats and wetlands;

i. Uncontaminated groundwater that seeps into or otherwise enters surface and groundwaters;

j. Air conditioning condensation.

4. Discharges where no additional pollutants are being discharged from the site above the background conditions of the water entering the site; provided, that any prohibited discharges through illicit connections, dumping, spills, improper maintenance of surface water facilities, or other discharges that allow pollutants to enter surface water or ground water in violation of state water quality standards is considered a violation.

B. Prohibited discharges include, but are not limited to, the following:

1. Domestic or sanitary sewage;

2. Trash or debris;

3. Construction materials;

4. Steam cleaning wastes;

5. Pressure washing wastes;

6. Heated water;

7. Animal carcasses;

8. Domestic animal wastes;

9. Food wastes;

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10. Yard wastes;

11. Silt, sediment, or gravel;

12. Petroleum products, including but not limited to oil, gasoline, grease, fuel oil, and heating oil;

13. Soaps, detergents, or ammonia;

14. Chlorinated spa or swimming pool water;

15. Antifreeze and other automotive products;

16. Metals in excess of naturally occurring amounts, in either particulate or dissolved form;

17. Degreasers and/or solvents;

18. Commercial and household cleaning products;

19. Drain cleaners;

20. Chemicals not normally found in uncontaminated water;

21. Flammable or explosive materials;

22. Acids, alkalis, or bases;

23. Painting products;

24. Pesticides, herbicides, or fertilizers;

25. Dyes, with the following exception: Dye testing is allowable but requires verbal notification to the City at least one business day prior to the date of the test; and

26. Any chemical or dangerous waste not listed above. [Ord. 531 § 2 (Exh. 2), 2009]

C. Conditionally allowable discharges, provided that the identified conditions are met:

1. Discharges from potable water sources, including but not limited to water line flushing, hyperchlorinated water line flushing, fire hydrant system flushing, and pipeline hydrostatic test water. Planned discharges shall be dechlorinated to a total residual chlorine concentration of 0.1 ppm or less, pH-adjusted, if necessary, and

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volumetrically and velocity controlled to prevent re-suspension of sediments in the MS4.

2. Discharges from lawn watering and other irrigation runoff. These discharges shall be minimized by property owners.

3. Dechlorinated swimming pool, spa and hot tub discharges. The discharges shall be dechlorinated to a total residual chlorine concentration of 0.1 ppm or less, pH-adjusted and reoxygenized if necessary, volumetrically and velocity controlled to prevent re-suspension of sediments in the MS4. Discharges shall be thermally controlled to prevent an increase in temperature of the receiving water. Swimming pool cleaning wastewater and filter backwash shall not be discharged to the MS4.

4. Street and sidewalk wash water, water used to control dust, and routine external building washdown that does not use detergents. The ~~the~~ amount of street and sidewalk wash, building wash, and dust control water used shall be minimized.

5. Other non-stormwater discharges. The discharges shall be in compliance with the requirements of a pollution prevention plan reviewed by the City, which addresses control of such discharges.

13.10.330 General requirements. SHARE

A. Requirement to Implement Best Management Practices.

1. Best management practices as specified in ~~Volume II (Construction Stormwater Pollution Prevention), Volume IV (Source Control BMPs) and Volume V (Runoff Treatment BMPs) of~~ the Stormwater Manual shall be applied to any activity that might result in a prohibited discharge. Activities that ~~might~~ may result in prohibited discharges include, but are not limited to, the following:

a. Land disturbing activity;

b. Potable water line flushing;

c. Lawn watering with potable water;

d. Dust control with nonpotable water;

e. Vehicle and boat washing;

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f. Pavement and building washing;

g. Swimming pool and hot tub maintenance;

h. Auto repair and maintenance;

i. Building repair maintenance;

j. Landscape maintenance;

k. Dangerous waste handling;

l. Solid and food waste handling; and

m. Pesticide application.

2. The owner or operator of a residential, commercial or industrial establishment shall provide, at their own expense, reasonable protection from accidental discharge of prohibited materials or other wastes into the stormwater drainage system or waters of the state through the use of structural and nonstructural BMPs as defined in the Stormwater Manual. The ~~director~~ Director may require any person responsible for a property or premises which is, or may be, the source of an illicit discharge to implement, at their own expense, additional structural and nonstructural BMPs to prevent the further discharge of pollutants to the stormwater drainage system.

B. Watercourse Protection. Any person owning property through which surface water or waters of the state passes shall keep and maintain that part of the watercourse within the property free of any activities or items that would pollute or contaminate the flow of water through the watercourse.

C. Notification of Spills. Notwithstanding other requirements of law, as soon as any person responsible for a facility or operation has information of any known or suspected illegal discharge into the surface water, stormwater drainage system or water of the state, said person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release. In the event of a release of hazardous materials, said person shall immediately notify emergency response agencies of the occurrence via emergency dispatch services. In the event of a release of nonhazardous materials, said person shall notify the Ceity no later than the next business day. If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator shall also retain an on-site written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years after the date of the spill. [Ord. 531 § 2 (Exh. 2), 2009]

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D. Declaration of Emergency. The Director shall make determination of emergency as defined in this chapter and authorize representatives of the utility or enforcement offcers to take necessary abatement action during an emergency situation, to conduct inspections, take remedial action, or to carry out other duties imposed or required by this code subject to the provisions of this Chapter

13.10.340 Inspections and investigations and illicit discharges. SHARE

A. The ~~director~~ Director is authorized to establish inspection programs. Inspection programs may include: routine inspections; random inspections; inspections based upon complaints or other notice of possible violations; inspection of drainage basins or areas identified as higher than typical sources of sediment or other pollutant or pollutants; inspections of businesses or industries of a type associated with higher than usual discharges of pollutant or pollutants; and joint inspections with other agencies inspecting under environmental or safety laws. Inspections may include, but are not limited to: reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in drainage control facilities; screening for or tracking illicit discharges or illicit connections; and evaluating the condition of drainage control facilities and other BMPs, including those located on private property.

B. Property owners shall allow access, with reasonable notice from the City, to all parts of the premises for the purpose of inspection, sampling, examination, abatement, and copying of records that must be kept under the conditions of an NPDES permit to discharge stormwater, and the performance of any additional duties as defined by state and federal law. In an event of emergency, reasonable notice is not required.

C. The ~~director~~ Director shall have the right to set up necessary equipment to conduct monitoring or sampling of discharge from stormwater facilities.

D. The ~~director~~ Director has the right to require the property owner to install stormwater facility monitoring equipment as necessary. Sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition at the property owner's expense. All devices used to measure stormwater flow and water quality shall be calibrated to ensure their accuracy.

E. Any temporary or permanent obstruction to the facility to be inspected and/or sampled shall be promptly removed by the property owner at the written or oral request of the ~~director~~Director. Such obstructions shall not be replaced. The costs of ~~clearing~~ removing obstructions shall be born by the property owner. [Ord. 531 § 2 (Exh. 2), 2009]

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13.10.400 Violations. SHARE

Any activity or action caused or permitted to exist in violation of this chapter is a threat to public health, safety, and welfare, and is declared and deemed a public nuisance. Such violations are subject to enforcement under SMC 20.30.720 through 20.30.790. [Ord. 531 § 2 (Exh. 2), 2009]

A. Imminent Nuisance and Summary Abatement. If a violation exists, the City may summarily and without prior notice abate the condition. Notice of such abatement, including the reason for the abatement, shall be given to the person responsible for the property and the violation as soon as reasonably possible after the abatement. The Director shall make the determination of a condition, substance, act or other occurrence constituting an imminent nuisance requiring summary abatement. Costs, both direct and indirect, of the abatement may be assessed as provided under SMC 20.30.720 through 20.30.790.

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Chapter 13.12

FLOODPLAIN MANAGEMENT

Sections:

13.12.400 General development standards.

A. Subdivisions. This section applies to all subdivision proposals, short subdivisions, short plats, planned developments, and new manufactured housing parks, as well as expansions to manufactured housing parks.

1. All proposals shall be consistent with the need to minimize flood damage.

2. The proposed subdivision should have one or more new lots in the regulatory floodplain set aside for open space use through deed restriction, easement, subdivision covenant, or donation to a public agency.

3. In the regulatory floodplain outside the protected area, zoning must maintain a low density of floodplain development. The density of the development in the portion of the development outside the regulatory floodplain may be increased to compensate for land in the regulatory floodplain preserved as open space in accordance with SMC 20.70.150(A).

4. If a parcel has a buildable site outside the regulatory floodplain, the parcel shall not be subdivided to create a new lot, tract, or parcel that does not have a buildable site outside the regulatory floodplain. This provision does not apply to lots set aside from development and preserved as open space.

5. All proposals shall have utilities and facilities, such as sewer, gas, electrical, and water systems, located and constructed to minimize or eliminate flood damage.

6. All proposals shall ensure that all subdivisions have at least one access road connected to land outside the regulatory floodplain with the surface of the road at or above the FPE wherever possible.

7. All proposals shall have adequate drainage provided to avoid exposure to water damage and to reduce exposure to flood damage.

8. The final recorded subdivision plat shall include a notice that part of the property is in the SFHA, riparian habitat zone, and/or channel migration area, as appropriate.

B. Site Design.

1. Structures and other development shall be located to avoid flood damage.

a. If a lot has a buildable site out of the regulatory floodplain, whenever possible all new structures shall be located in that area.

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b. If a lot does not have a buildable site out of the regulatory floodplain, all new structures, pavement, and other development must be sited in the location that has the least impact on habitat by locating the structures as far from the water body as possible, or by placing the structures on the highest land on the lot.

c. All new structures shall be set back at least 15 feet from the protected area.

2. All new development shall be designed and located in accordance with the applicable provisions of SMC Chapters 13.10 and to minimize the impact on flood flows, flood storage, water quality, and habitat.

a. Stormwater and drainage features shall incorporate low impact development techniques, if technically feasible, that mimic predevelopment hydrologic conditions, such as stormwater infiltration, rain gardens, grass swales, filter strips, disconnected impervious areas, permeable pavement, and vegetative roof systems.

b. If the proposed project will create new impervious surfaces so that more than 10 percent of the portion of the lot in the regulatory floodplain is covered by impervious surface, the applicant shall demonstrate that there will be no net increase in the rate and volume of the stormwater surface runoff that leaves the site or that the adverse impact is mitigated, as provided by SMC 13.12.600(F) and (G).