Appendix B.

Clark County Environmental Services

Stormwater Capital Program 2013-2018

CLARK COUNTY, WASHINGTON

Prepared by Clark County Environmental Services, Clean Water Program

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Introduction

Clean Water Program

The Clark County Department of Environmental Services administers the Clean Water Program to protect surface water and groundwater resources from polluted storm runoff and to coordinate compliance with state and federal water pollution laws. Primary responsibilities of this stormwater management program include planning and building stormwater control facilities, water quality monitoring of stormwater runoff and streams, public education and outreach, development and enforcement of water quality regulations, coordination with other municipalities and maintenance of the county's stormwater system.

As the county's population continues to increase, Clark County is committed to responsible stormwater management to keep our waterways clean for people, fish, and wildlife. Unfortunately, many past drainage and stormwater management practices and regulations have proven inadequate to prevent stormwater runoff impacts to streams and groundwater, and thousands of developed acres in Clark County currently contribute to problems in streams, lakes and rivers.

The primary means of controlling runoff from areas of new growth and for fixing problems caused by uncontrolled runoff from existing developed areas is by expanding and improving the stormwater management infrastructure.

Stormwater Impacts and Solutions

Impacts of stormwater runoff on surface water are well-documented and widespread. In Clark County, runoff contributes to impaired stream health, diminished fish populations, and degraded habitat conditions. These impacts have been observed in the *2010 Clark County Stream Health Report*, the *2010 Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan*, and the Washington Department of Ecology's statewide list of impaired water bodies.

Stormwater runoff impacts water bodies in two critical ways: water quality and water quantity.

Stormwater runoff from roads, fields, rooftops, parking lots, and yards carries with it a variety of pollutants deposited by everyday activities. Fertilizers, oil, grease, heavy metals, pesticides, chemicals, soil, and animal wastes all can make

their way to water bodies in stormwater runoff. These pollutants degrade stream water quality, posing risks to both human health and stream life.

Hard surfaces and cleared areas increase the amount and speed of runoff flowing into streams. The result often is streams that have too much flow during storms, and too little flow during non-storm periods. Left unchecked, this situation leads to increased erosion during storms, decreased habitat quality, and negative impacts to groundwater recharge, stream life and overall water quality.

Keeping existing stormwater facilities in good repair, updating old facilities, constructing new projects to remove pollutants or slow down runoff, planting trees, preserving intact forested or streamside habitats, and rehabilitating stream channels are ways Clark County can help limit the impacts of stormwater runoff. These activities and projects all are part of the county's Stormwater Capital Program.

Regulatory Requirements Summary

Clark County selects projects for the Stormwater Capital Program based on environmental factors as well as to meet regulatory requirements stemming from federal and state laws. The Clean Water Act's National Pollutant Discharge Elimination Systems (NPDES) municipal stormwater permit program and Washington's state water pollution laws provide regulatory objectives.

NPDES Permit – S5.C.6. Structural Stormwater Controls

The NPDES Permit requires the county to have a program to construct structural stormwater controls to prevent or reduce impacts to waters of the state caused by discharges from the municipal separate storm sewer system, often referred to as the MS4. Projects include flow control facilities, water quality treatment facilities, facilities to trap sediment, retrofits of existing facilities, and property acquisition to provide water quality or flow control benefits. Other recognized means of reducing impacts include riparian habitat acquisition and restoration of forest in upland areas or in riparian buffers.

Chapter 173-218 WAC – Underground Injection Control (UIC) Program

Pursuant to Chapter 90.48 RCW, the state's requirements for stormwater infiltration wells may drive capital improvements if the county finds systems that pose a threat to groundwater quality.

NPDES Permit S5.C.5 – Controlling Runoff from New Development, Redevelopment and Construction Sites

The NPDES Permit requires the county to have a program to prevent and control the impacts of runoff from new development, redevelopment, and construction activities. The program must apply to all development activity, including county projects such as roads and parks. The program must enforce development regulations that provide protection equivalent to the minimum requirements, thresholds, and definitions in Appendix 1 of the NPDES Phase I Municipal Stormwater permit and the design standards in the *Stormwater Management Manual for Western Washington*.

As allowed by the NPDES Phase I Municipal Stormwater Permit, Clark County elected to adopt an alternate and equally protective method of achieving the Permit's flow control requirements for development and redevelopment sites (referred to as development projects). Clark County developed an alternate approach to apply the NPDES Permit's flow control standard that utilizes both development regulations and a capital program to meet the requirement to control duration of erosive flows to historic rates.

Stormwater Capital Program Local Framework

Policies and Goals

County policies for the stormwater capital program include:

- Meet the Phase 1 Municipal Stormwater Permit requirements through stormwater capital planning and capital construction.

County goals for stormwater capital projects include:

- Protect and enhance streams and wetlands in Clark County through planning and constructing modifications to the stormwater infrastructure.
- Minimize the degradation of receiving waters from impacts attributable to stormwater runoff in existing developed areas.
- Maximize public benefits of county-owned land by providing multiple uses, including recreation, and by leveraging funding from multiple sources.
- Provide stormwater facilities for future development and redevelopment.

Guiding principles

In support of county policies and goals, the capital planning process strives to:

- Prioritize projects with the greatest potential to support multiple county programs and goals, including local and regional fish recovery, habitat enhancement, and water cleanup goals.
- Ensure a reliable scientific and engineering basis for projects.

- Establish that each project in the plan is needed, feasible, and cost-effective.
- Focus limited resources on the most pressing concerns and the most cost-beneficial solutions.
- Incorporate environmental benefits into needed infrastructure repair projects.
- Maintain a sufficient list of potential projects to enable replacement of any projects that become infeasible, and to take advantage of funding opportunities.

WHAT IS IN THIS PROGRAM

The remainder of this document includes:

- A description of project types and strategies for implementation
- A description of the process used to develop the capital program
- The Six-Year Program Matrix
- A map and index of projects
- Project detail sheets

Project Types

Stormwater capital projects come in many shapes and sizes, which are grouped into seven basic types for evaluation and prioritization purposes. Projects of all types are then programmed for implementation under three general program categories described in the next section, Program Development.

Capital Repairs

Description

Capital repair projects are stormwater facility repair projects costing more than $25,000. Repairs of this kind are required under the county's municipal stormwater permit; however, due to the often high costs associated with repair work, the permit does not set a time limit for completing these projects. Typical repair activities include replacing pipes and flow control structures, addressing drainage problems, and replacing retaining walls or access roads.

Strategy

Repairing and maintaining existing infrastructure is a county priority. Routine inspection of county stormwater facilities identifies repair needs. Given regulatory requirements and funding constraints, Clark County intends to address as many of the existing list of repair projects as feasible by 2018.

Water Quality Retrofits

Description

A retrofit is like a remodel. Water quality retrofits include a variety of modifications to existing stormwater infrastructure to add or enhance water quality treatment, including installation of cartridge filter systems, conversion of swales to rain gardens or wet ponds, and other improvements to stormwater facilities or conveyance systems where water quality treatment is either inadequate or can be significantly improved.

Strategy

Water quality retrofits typically qualify for the permit-required Structural Stormwater Controls program, so a significant annual investment in these projects is expected. Water quality retrofits are located primarily in areas that have been urbanized for many years, as

these areas were often developed with little or no water quality treatment and contribute disproportionately to water quality degradation. The focus is on areas with no treatment, followed by those with outdated treatment facilities.

Hydrology Improvement Facilities

Description

Hydrology improvement facilities address problems from too much runoff and include new facilities, retrofits focused on providing detention or retention of runoff, and structural low impact development practices aimed at reducing the volume of runoff.

Strategy

Hydrology improvement facilities are needed to meet obligations accrued under permit condition S5.C.5 and the county's Flow Restoration Program.

In addition to S5.C.5 obligations, hydrology improvement facilities may be used to meet Structural Stormwater Control requirements and often address significant stormwater runoff impacts.

Hydrology improvement facilities are focused on urbanizing areas where streams are still in the process of adjusting to development and increased runoff. In these areas, increased flow control can slow ongoing stream degradation and help promote the eventual recovery of aquatic systems.

Growing Green

Description

The Growing Green Program enhances county properties with native vegetation. Intact and rehabilitated forested areas provide stormwater benefits because water evaporates from foliage, soaks into the ground, or is taken up by vegetation. These projects maximize the ecological and stormwater benefits of the properties, supporting numerous local and regional environmental goals.

Strategy

Growing Green projects provide stormwater benefits that often qualify for the Structural Stormwater Controls program, so they may be included in stormwater capital plans; however, these projects represent only a subset of the overall Growing Green program. Projects scheduled for 2013 planting are represented in this plan, along with continuing maintenance for existing projects. Placeholders are included for expected implementation levels in the remaining plan years.

Environmental Services is preparing a Growing Green Management Plan. As part of that plan, the Clean Water Program is evaluating stormwater-related priorities for planting projects on county lands. Projects and priorities from these efforts will be represented in future Stormwater Capital Programs.

Underground Injection Control (UIC) Retrofits

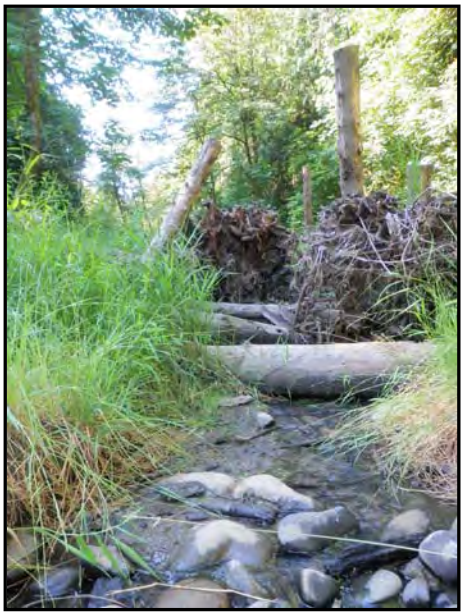
Description

UIC Retrofit projects improve stormwater infiltration systems that are a demonstrated threat to groundwater quality. Improvements typically include the addition of upstream treatment devices or the replacement of failing infiltration wells with stormwater retention facilities.

Strategy

Under requirements in Chapter 90.48 RCW, Clark County has identified and registered 2,200 UICs with the Washington State Department of Ecology and is currently assessing each one's risk of polluting groundwater. The county's obligation to retrofit failing or at-risk facilities begins in 2015. Some UIC retrofit projects may also satisfy municipal stormwater permit requirements for the Structural Stormwater Controls program.

In-stream Habitat Improvement



Description

In-stream Habitat improvement projects typically include channel enhancements or stabilization, floodplain reconnections, or culvert/fish barrier removal.

Strategy

Habitat improvement projects are usually very cost-effective methods to improve stream habitat and function where past impacts have been significant. Their presence is limited in the capital plan because these projects typically do not qualify as Structural Stormwater Controls or for use as hydrology improvements under the permit. In-stream habitat improvement projects often rely on the availability of grant funding, or use remaining budget after regulatory requirements have been met.

Property Acquisition for Stormwater Benefit

Description

Clark County purchases sites with existing high-quality habitat along streams, in wetlands, or in forested upland areas. Preservation of these areas provides significant long-term watershed benefits, including stormwater control. Property purchases are often costly and are dependent on the availability of willing sellers; however, preventing stormwater problems before they occur is among the most cost-beneficial means of managing stormwater impacts.

Strategy

Property acquisitions are prioritized and pursued through the county's Legacy Lands program. Current anticipated acquisitions are subject to future updates of the Conservation Areas Acquisition Plan. When possible, Clark County seeks to leverage stormwater program and Conservation Futures funds together.

Acquisition of intact riparian or forest habitat often qualifies for the Structural Stormwater Controls program. Property acquisition utilizing stormwater funding is usually focused on developing areas where stormwater impacts are currently limited but are expected to increase significantly.

Program Development

At its core, capital planning is the process of identifying and implementing projects that are necessary, feasible, and cost-effective. Planning ensures that stormwater capital projects are aligned with the county's goals and reflect a consistent set of strategies and processes.

The approach to developing the Stormwater Capital Program 2013-2018 included five general steps:

1) Project identification
2) Screening
3) Scoping
4) Prioritization
5) Programming

The final product is a matrix that lists scoped projects and shows Clark County's plan for funding and constructing them over the six years of the capital program.

Project Identification

The capital plan considers projects within the entire unincorporated urban area and rural Clark County, but focuses on urban and urbanizing areas where stormwater impacts are greatest.

Most projects considered for this capital plan were identified through one of three mechanisms: the county's Stormwater Needs Assessment Program (SNAP), stormwater facility inspections, and assessment of drywell systems. Additionally, property acquisitions were identified through the Legacy Lands program under the Conservation Areas Acquisition Plan.

The SNAP is a watershed assessment effort that evaluates the stormwater and surface water systems, identifying problems and opportunities that may be addressed through capital projects. SNAP was conducted county-wide from 2006-2010.

Routine field inspections of stormwater infrastructure identify the majority of repair projects. In addition, stormwater engineers may identify project opportunities while conducting regular business such as responding to drainage complaints, evaluating problems identified by county road operations crews and looking into projects suggested by members of the public.

Drywell inspections identify needed retrofits to underground injection systems that are at risk of polluting groundwater.

County engineers and scientists are developing additional processes to identify capital projects in focused, high-needs areas based on predictive tools and a new generation of field

assessments. Several projects from a prototype application of these processes at the Clark County Fairgrounds are included in this plan. Other focused efforts may include catch basin retrofits in highly urbanized drainages and water quality treatment in major rural roadside ditches.

Candidate projects are entered in the *Capital Planning Database* for further consideration through the planning process. The database tracks stormwater capital projects from inception through construction and close-out.

SCREENING

Project identification generates a large number of candidate projects. Screening is the first step in determining which opportunities should be evaluated more extensively.

Initial screening eliminates clearly infeasible or unproductive stormwater capital projects early in the planning process by determining at a general level whether the project is both worthwhile and feasible. The first question is answered through an objective scoring of *resource-based* criteria. The second is answered through an objective scoring of *engineering* criteria.

The Resource Benefit criteria assess:

- Support for regional watershed rehabilitation and salmon recovery objectives
- Location of the project in the watershed
- Stream health rating in the project vicinity
- Documented need for the project
- Expected future development impacts

Projects that receive a passing score on the Resource screen move on to the Engineering screen. As appropriate for various project types, engineering criteria assess:

- Potential physical site constraints
- Infiltration and soil suitability
- Potential to achieve measurable benefit
- Feasibility of environmental permitting
- Potential legal constraints

The final step of the screening process is the development of a project basis statement. This statement briefly identifies the problem to be addressed, documenting the purpose and need for a project based on watershed assessments, screening results, and staff knowledge.

Projects passing both portions of the initial screen proceed to the more rigorous scoping stage.

Scoping

Project scoping is perhaps the most critical step in the planning process. Where initial screening takes a general approach, scoping begins to look quantitatively at feasibility and benefit as well as project costs. Scoping is where observed stormwater problems are linked to tangible solutions.

The goal of the scoping process is to ensure that projects have the best possible chance of successful implementation. While significant issues can still arise later in the design phase, scoping is expected to expose most barriers to project implementation and determine with good confidence that the project is both cost-effective and feasible.

Scoping includes the following elements:

- Feasibility and Cost Effectiveness Check (CWP engineering staff)
- Independent Review (PW engineering staff)
- Project justification and discussion (selected CWP/PW managers and staff)

Feasibility and Cost Effectiveness Check

The Feasibility and Cost Effectiveness Check clarifies the need and purpose for each project, describes the problem cause and effect, and proposes a solution. Costs, water quality and flow control benefits, and cost/benefit ratio are calculated. CWP engineers and scientists also apply checklists to establish the rationale for the necessary engineering and environmental permit approvals.

A strong rationale for approval is one key to sending successful projects to design. The checklists help determine whether a project can meet the approved water quality and flow control requirements of the original facility being retrofitted, demonstrate that the proposed project will not cause or worsen any upstream or downstream flooding, and assess the likelihood of difficult environmental permitting approvals or expensive environmental mitigation needs.

This information is presented in a brief pre-design report that includes summary tables designed to meet Municipal Stormwater Permit reporting requirements.

Review

Public Works design engineers are typically responsible for designing the projects listed in the capital plan. To facilitate common understanding and a smooth transition of project development between Environmental Services and Public Works, each pre-design report is reviewed by a Public Works engineer. Public Works comments and suggestions are incorporated directly into the report as part of the final product.

Project Justification

Project justification is an opportunity for a group of experienced stormwater practitioners to examine each project with a critical eye and discuss potential fatal flaws. CWP engineers and scientists act as project proponents, with a team of Public Works and DES staff and managers looking for flaws. Projects that appear problematic or lack consensus support by the examination team are removed from consideration or programmed in the latter years of the plan to allow for more extensive review before passing to Public Works for design.

Prioritization

A robust capital planning program generates more scoped projects than can be implemented in a six-year plan. Prioritization is the process of determining which of the feasible projects of each type best meet program goals and provide the most cost-effective solutions. Within the constraints of regulatory requirements and available funding, the subsequent Programming step strives to implement higher-priority projects.

Each project type requires slightly different prioritization criteria; in all cases, criteria are intended to be simple yet meaningful. The Resource screen provides an initial prioritization step for all project types by forwarding only those projects that appear to provide significant natural resource benefits. Another key consideration goes beyond the parameters of stormwater management: in all cases, priority is given to projects that also meet other related county goals.

Capital Repairs

Repair projects are required, and therefore cannot truly ‘fail’ the Resource screen; however, screening scores along with watershed assessment information and engineering judgment are used to prioritize those projects where continued malfunction poses the most serious problems.

Repair projects are split into four groups in diminishing order of priority:

1) Represents a threat to public safety, or; Passes Resource screen AND has retrofit potential
2) Passes Resource screen and is a repair ONLY
3) Fails Resource screen AND has retrofit potential
4) Fails Resource screen and is a repair ONLY

Water Quality Retrofits

Water quality retrofit projects are prioritized based on the severity of the project need and the results of the cost/benefit analysis.

Hydrology Improvement Facilities

Hydrology improvement facilities are prioritized based on the severity of the project need and the results of the cost/benefit analysis.

Growing Green

Growing Green projects typically have a fairly constant per-acre cost across all projects, so a cost/benefit analysis does not provide significant basis for prioritization. Priority is therefore given to projects that directly benefit streams where the Washington Department of Ecology has established Water Cleanup Plans to address elevated water temperatures. Secondary priority is given to projects in streams that are listed for temperature issues on the statewide list of polluted water bodies, but do not yet have cleanup plans. At both levels, projects that support multiple program goals are given priority. Examples include projects where reforestation can support Parks master plans or improve habitat diversity within identified wildlife corridors.

Underground Injection Control (UIC) Retrofits

UIC retrofits are prioritized based on cost-benefit and the results of the risk analysis the county is required to complete under Chapter 90.48 RCW.

In-Stream Habitat Improvements

In-stream habitat improvements are prioritized based on cost-benefit, applicability to Lower Columbia Fish Recovery Board and other recovery group plans, and the degree to which the project complements other planned stormwater projects within a drainage area.

Property Acquisition for Stormwater Benefit

Selection and prioritization of property acquisitions is described in the Conservation Areas Acquisition Plan (2004). A Conservation Areas Advisory Committee appointed by the Board of County Commissioners produced an acquisition plan divided into three categories: critical habitat, greenways or trail corridors, and farmland. Within these categories, work groups devised methods to identify and prioritize project areas and set acquisition targets. Prioritization for property acquisition in the capital program is based on the outcome of those discussions and is determined by the Legacy Lands program.

Programming

Programming applies regulatory requirements and available funding to the list of scoped and prioritized projects to develop a six-year program matrix that can meet Permit requirements and program goals. Where specific projects have not yet been identified for implementation, placeholder values for projected spending are included in the matrix as ongoing programs.

Six-Year Matrix

Capital projects are placed in the Six-Year Program Matrix based on regulatory requirements, programmatic goals, project prioritization, and available funding.

Most projects have multiple benefits. For example, projects intended to improve hydrology typically deliver water quality and habitat benefits as well. Similarly, many water quality or habitat improvement projects also benefit stream hydrology.

Program Categories

For simplicity, the matrix identifies projects using three general programming categories depending on their primary objective: Water Quality Improvement Projects, Hydrology Improvement Projects and Stream Restoration Projects.

Water Quality Improvement Projects

Water quality projects have the primary objective of directly protecting or improving surface water or ground water quality by removing pollutants from stormwater runoff. Examples include stormwater wetlands, biofiltration swales, filter vaults, bioretention facilities, or catch-basin treatment inserts. The common purpose of these facilities is to remove certain types and amounts of pollutants from the runoff before it is discharged to a stream, dispersed over the ground, discharged into wetlands or injected into groundwater through a drywell.

Capital Repair, Water Quality Retrofit, Property Acquisition and UIC Retrofit projects may be included in this category.

Hydrology Improvement Projects

Hydrology improvement projects have the primary objective of directly protecting or improving stream channels by capturing and slowing down stormwater runoff or allowing it to filter back into the ground. Examples include infiltration facilities, retention and detention ponds, underground storage tanks or vaults and bioretention facilities. Intact forested areas perform the same function as water evaporates from foliage, soaks into the ground, or is taken up by vegetation. The common purpose of these projects is to reduce the volume and rate of stormwater flow from a specific drainage area to reduce flooding, limit flow damage to streams and reduce downstream erosion.

Capital Repair, Hydrology Improvement Facilities, Property Acquisition and Growing Green projects may be included in this category.

Stream Restoration Projects

Stream restoration projects have the primary objective of protecting or improving stream and riparian function and habitat. Examples include rehabilitating stream channels that were historically straightened, adding in-stream woody debris, stabilizing eroding channels, installing channel-spanning log jams to reconnect

floodplain areas, replacing invasive weeds with native vegetation, improving fish passage and aquatic habitat and acquiring intact habitats to minimize the impact of adjacent land-use activities. The common purpose of these projects is to correct long-term degradation caused by land-use activities and in some cases to prevent degradation before it occurs.

In-stream Habitat Improvement, Property Acquisition, and Growing Green projects may be included in this category.

FUNDING

This capital program includes projects totaling approximately $19 million over six years, with about $15 million going toward Clean Water Program funded projects and $4 million toward Conservation Futures funded project. The list slightly exceeds the projected budget over the six-year planning period because over-programming allows projects that become infeasible to be replaced easily. Unexpected grant opportunities or other funding sources also encourage Environmental Services to keep a supply of shovel-ready projects on hand.

Funding for the Stormwater Capital Program comes primarily from three sources: the Clean Water Fund, Conservation Futures Fund, and competitive grant programs, as described below.

Clean Water Fund

The County established the Clean Water Fund in 2000 to implement requirements of its NPDES municipal stormwater permit. Current rates for a standard taxlot are $33.00 per year and bring in approximately $4.9 million annually to support county-wide stormwater management. The Clean Water Program's five areas of effort include:

- Operations and maintenance of the stormwater system
- Stormwater capital planning and projects
- Natural resource assessment and monitoring
- Enforcement and regulations
- Education and outreach

Conservation Futures Fund

Clark County instituted the Conservation Futures Fund in 1985. The primary revenue source for the fund is the conservation futures property tax levy, a county-wide levy that cannot exceed $0.0625 per $1,000 valuation. The levy has generated $2.3 to $2.4 million annually over the last five years. The Legacy Lands Program in the Environmental Services Department manages the fund with the goal of bringing together the people, groups and community support to establish, restore and maintain an interconnected system of parks, natural areas, trails and open spaces within the region. The program coordinates various projects, partners and funding sources to protect and improve lands highly valued for habitat, scenic corridors, low-impact recreation or other qualities that enhance the local environment, including stormwater benefits.

Grant Funding

Grants are highly competitive and available sources are subject to fluctuation from year to year. Where available, grant funds are aggressively pursued.

The most common grant source for stormwater capital projects has been Ecology's Statewide Stormwater Grant Program; in the most recent (2012) round, Clark County was offered approximately $3.4 million in grant funding toward six applications. More commonly, the county receives an annual average of approximately $500,000 from this source.

The most consistent grant sources for the Legacy Lands program have been the suite of grants managed by the State Recreation and Conservation Office, including Washington Wildlife and Recreation Program (WWRP) and Salmon Recovery Funding Board (SRFB). WWRP grant opportunities are available every other year while SRFB grant opportunities are available each year. Between 2006 and 2011, the County successfully competed for approximately $4.2 million through these sources, an annual average of about $700,000.

Six-Year Program Matrix

2013-2018 Storm Water Capital Program
Project Funding Analysis

CLEAN WATER PROGRAM

CRP	Project Name	Category	Phase	Sept 2012 Spent to Date	2013 CWF	2013 Grants/ Loans	2014 CWF	2014 Grants/ Loans	2014 Other	2015 CWF	2015 Grants/ Loans	2016 CWF	2016 Grants/ Loans	2017 CWF	2017 Grants/ Loans	2018 CWF	2018 Grants/ Loans	2013-2018 Expenses	Project Total
401890	**Parkside Manor SWF Retrofit**	Hydrology	PE	179,000	15,000													15,000	194,000
			ROW		10,000													10,000	10,000
			CN	1,000	297,000	891,000												1,188,000	1,189,000
			Total	**180,000**	**1,213,000**		**0**			**0**		**0**		**0**		**0**		**1,213,000**	**1,393,000**
401882	**Harding Farms SWF Retrofit**	Hydrology	PE	165,000			20,000											20,000	185,000
			ROW	16,000														0	16,000
			CN	1,000			959,000											959,000	960,000
			Total	**182,000**	**0**		**979,000**			**0**		**0**		**0**		**0**		**979,000**	**1,161,000**
tbd	**Country Meadow UIC Retrofit**	Water Quality	PE		31,000	19,000												50,000	50,000
			ROW															0	0
			CN		48,000	143,000												191,000	191,000
			Total	**0**	**241,000**		**0**			**0**		**0**		**0**		**0**		**241,000**	**241,000**
28385	**SR-503 CTR Retrofit**	Water Quality	PE		19,000													19,000	19,000
			ROW		101,000													101,000	101,000
			CN		60,000													60,000	60,000
			Total	**0**	**180,000**		**0**			**0**		**0**		**0**		**0**		**180,000**	**180,000**
403264	**Stones Throw SWF Repair**	Water Quality	PE	1,000	85,000													85,000	86,000
			ROW															0	0
			CN		100,000													100,000	100,000
			Total	**1,000**	**185,000**		**0**			**0**		**0**		**0**		**0**		**185,000**	**186,000**
403454	**Cold Creek Court SWF Repair**	Hydrology	PE	5,000	59,000													59,000	64,000
			ROW															0	0
			CN		100,000													100,000	100,000
			Total	**5,000**	**159,000**		**0**			**0**		**0**		**0**		**0**		**159,000**	**164,000**
GG1201	**Salmon Creek Greenway 12 Reforestation**	Stream Restoration	PE															0	0
			ROW															0	0
			CN		134,000		11,000											145,000	145,000
			Total	**0**	**134,000**		**11,000**			**0**		**0**		**0**		**0**		**145,000**	**145,000**
007485	**Heritage Farm Parking Lot LID Project**	Hydrology	PE	27,000	61,000													61,000	88,000
			ROW															0	0
			CN				246,000		246,000									492,000	492,000
			Total	**27,000**	**61,000**		**492,000**			**0**		**0**		**0**		**0**		**553,000**	**580,000**
tbd	**Avalon Meadows SWF Repair**	Water Quality	PE		50,000													50,000	50,000
			ROW															0	0
			CN				169,000											169,000	169,000
			Total	**0**	**50,000**		**169,000**			**0**		**0**		**0**		**0**		**219,000**	**219,000**
tbd	**Tay Terrace UIC Retrofit**	Water Quality	PE		34,000	55,000												89,000	89,000
			ROW															0	0
			CN				206,000	308,000										514,000	514,000
			Total	**0**	**89,000**		**514,000**			**0**		**0**		**0**		**0**		**603,000**	**603,000**
tbd	**Rosemary Ridge UIC Retrofit**	Water Quality	PE		31,000	19,000												0	50,000
			ROW															0	0
			CN				11,000	35,000										46,000	46,000
			Total	**0**	**50,000**		**46,000**			**0**		**0**		**0**		**0**		**96,000**	**96,000**
401972	**Thomas Wetland East**	Hydrology	PE	163,000	38,000													38,000	201,000
			ROW	474,000														0	474,000
			CN	1,000						644,000	900,000							1,544,000	1,545,000
			Total	**638,000**	**38,000**		**0**			**1,544,000**		**0**		**0**		**0**		**1,582,000**	**2,220,000**
tbd	**Aquila UIC Retrofit**	Water Quality	PE				31,000	19,000										50,000	50,000
			ROW															0	0
			CN							42,000	124,000							166,000	166,000
			Total	**0**	**0**		**50,000**			**166,000**		**0**		**0**		**0**		**216,000**	**216,000**

2013-2018 Storm Water Capital Program
Project Funding Analysis

CLEAN WATER PROGRAM

CRP	Project Name	Category	Phase	Sept 2012 Spent to Date	2013 CWF	2013 Grants/ Loans	2014 CWF	2014 Grants/ Loans	2014 Other	2015 CWF	2015 Grants/ Loans	2016 CWF	2016 Grants/ Loans	2017 CWF	2017 Grants/ Loans	2018 CWF	2018 Grants/ Loans	2013-2018 Expenses	Project Total
tbd	**Lakeshore Elementary School SWF**	Water Quality	PE							80,000								80,000	80,000
			ROW															0	0
			CN									367,000						367,000	367,000
			Total	**0**	**0**		**0**			**80,000**		**367,000**		**0**		**0**		**447,000**	**447,000**
tbd	**Anderson UIC Retrofit**	Water Quality	PE				31,000	19,000										50,000	50,000
			ROW															0	0
			CN							30,000	90,000							120,000	120,000
			Total	**0**	**0**		**50,000**			**120,000**		**0**		**0**		**0**		**170,000**	**170,000**
tbd	**NE 99th St @ Cougar Creek WQ Retrofit**	Water Quality	PE							50,000								50,000	50,000
			ROW															0	0
			CN									280,000						280,000	280,000
			Total	**0**	**0**		**0**			**50,000**		**280,000**		**0**		**0**		**330,000**	**330,000**
tbd	**Andy's Acres (A) SWF Repair**	Water Quality	PE							50,000								50,000	50,000
			ROW															0	0
			CN									77,000						77,000	77,000
			Total	**0**	**0**		**0**			**50,000**		**77,000**		**0**		**0**		**127,000**	**127,000**
tbd	**Columbia River High School SWF Retrofit**	Hydrology	PE				21,000	63,000										84,000	84,000
			ROW															0	0
			CN							59,000	178,000							237,000	237,000
			Total	**0**	**0**		**84,000**			**237,000**		**0**		**0**		**0**		**321,000**	**321,000**
401902	**NE 99th St & 25th Ave SWF**	Water Quality	PE	20,000								75,000						75,000	95,000
			ROW	1,000														0	1,000
			CN	1,000										730,000				730,000	731,000
			Total	**22,000**	**0**		**0**			**0**		**75,000**		**730,000**		**0**		**805,000**	**827,000**
tbd	**Winchester Hills I Tract A SWF Repair/Retrofit**	Water Quality	PE									25,000						25,000	25,000
			ROW															0	0
			CN											47,000				47,000	47,000
			Total	**0**	**0**		**0**			**0**		**25,000**		**47,000**		**0**		**72,000**	**72,000**
tbd	**Whipple Creek Trib 6.44 Habitat Improvement**	Stream Restoration	PE															0	129,080
			ROW															0	0
			CN															0	708,920
			Total	**0**	**0**		**0**			**0**		**0**		**0**		**0**		**0**	**838,000**
tbd	**Highway 99 @Tenny Creek WQ Retrofit**	Water Quality	PE									50,000						50,000	50,000
			ROW															0	0
			CN											100,000				100,000	100,000
			Total	**0**	**0**		**0**			**0**		**50,000**		**100,000**		**0**		**150,000**	**150,000**
tbd	**NE 119th St @ Cougar Creek WQ Retrofit**	Water Quality	PE									50,000						50,000	50,000
			ROW															0	0
			CN											100,000				100,000	100,000
			Total	**0**	**0**		**0**			**0**		**50,000**		**100,000**		**0**		**150,000**	**150,000**
tbd	**Clark County Amphitheater Wetland Retrofit**	Hydrology	PE									95,000						95,000	95,000
			ROW															0	0
			CN											283,000				283,000	283,000
			Total	**0**	**0**		**0**			**0**		**95,000**		**283,000**		**0**		**378,000**	**378,000**
402357	**Clark County Amphitheater SWF #4 Retrofit**	Hydrology	PE									450,000						450,000	450,000
			ROW															0	0
			CN													1,350,000		1,350,000	1,350,000
			Total	**0**	**0**		**0**			**0**		**450,000**		**0**		**1,350,000**		**1,800,000**	**1,800,000**
tbd	**Highway 99 & NE 102nd St SWF**	Hydrology	PE									60,000						60,000	60,000
			ROW											285,000				285,000	285,000
			CN													367,000		367,000	367,000
			Total	**0**	**0**		**0**			**0**		**60,000**		**285,000**		**367,000**		**712,000**	**712,000**

2013-2018 Storm Water Capital Program
Project Funding Analysis

CLEAN WATER PROGRAM

CRP	Project Name	Category	Phase	Sept 2012 Spent to Date	2013 CWF	2013 Grants/ Loans	2014 CWF	2014 Grants/ Loans	2014 Other	2015 CWF	2015 Grants/ Loans	2016 CWF	2016 Grants/ Loans	2017 CWF	2017 Grants/ Loans	2018 CWF	2018 Grants/ Loans	2013-2018 Expenses	Project Total
tbd	NE 229th St & NE 221st Ave SWF	Hydrology	PE															0	60,000
			ROW															0	494,000
			CN															0	335,000
			Total	**0**	**0**		**0**			**0**		**0**		**0**		**0**		**0**	**889,000**
tbd	Harvest Meadows SWF Repair/Retrofit	Water Quality	PE															0	60,000
			ROW															0	0
			CN															0	100,000
			Total	**0**	**0**		**0**			**0**		**0**		**0**		**0**		**0**	**160,000**
tbd	Regency Park Phase I SWF Repair/Retrofit	Water Quality	PE															0	60,000
			ROW															0	0
			CN															0	100,000
			Total	**0**	**0**		**0**			**0**		**0**		**0**		**0**		**0**	**160,000**

ONGOING PROGRAMS

					2013 CWF	2013 Grants/ Loans	2014 CWF	2014 Grants/ Loans	2014 Other	2015 CWF	2015 Grants/ Loans	2016 CWF	2016 Grants/ Loans	2017 CWF	2017 Grants/ Loans	2018 CWF	2018 Grants/ Loans		
	Catch Basin Treatment Retrofits	Water Quality	PE				50,000			50,000		50,000		50,000		50,000		250,000	250,000
			ROW															0	0
			CN							200,000		200,000		200,000		200,000		800,000	800,000
			Total	**0**	**0**		**50,000**			**250,000**		**250,000**		**250,000**		**250,000**		**1,050,000**	**1,050,000**
	UIC Water Quality Retrofit Program	Water Quality	PE				50,000			50,000		50,000		50,000		50,000		250,000	250,000
			ROW															0	0
			CN							200,000		200,000		200,000		200,000		800,000	800,000
			Total	**0**	**0**		**50,000**			**250,000**		**250,000**		**250,000**		**250,000**		**1,050,000**	**1,050,000**
	Growing Green	Hydrology	PE															0	0
			ROW															0	0
			CN				100,000			125,000		165,000		235,000		235,000		860,000	860,000
			Total	**0**	**0**		**100,000**			**125,000**		**165,000**		**235,000**		**235,000**		**860,000**	**860,000**
	2010 - 2012 Reforestation Maintenance (7 projects)	Hydrology	PE															0	0
			ROW															0	0
			CN		67,000		52,000			40,000		25,000						184,000	184,000
			Total	**0**	**67,000**		**52,000**			**40,000**		**25,000**		**0**		**0**		**184,000**	**184,000**

SUMMARY TABLE		2013 CWF	2013 Grants/ Loans	2014 CWF	2014 Grants/ Loans	2014 Other	2015 CWF	2015 Grants/ Loans	2016 CWF	2016 Grants/ Loans	2017 CWF	2017 Grants/ Loans	2018 CWF	2018 Grants/ Loans	
Revenue Source															
Annual Totals By Funding		1,340,000	1,127,000	1,957,000	444,000	246,000	1,620,000	1,292,000	2,219,000	0	2,280,000	0	2,452,000	0	6 Year SW CIP Total
Annual Totals By Phase	PE	516,000		304,000			280,000		905,000		100,000		100,000		$14,977,000
	ROW	111,000		0			0		0		285,000		0		
	CN	1,840,000		2,343,000			2,632,000		1,314,000		1,895,000		2,352,000		
Annual Totals		2,467,000		2,647,000			2,912,000		2,219,000		2,280,000		2,452,000		

2013-2018 Storm Water Capital Program
Project Funding Analysis

CONSERVATION FUTURES

CRP	Project Name	Category	Phase	Sept 2012 Spent to Date	2013 Con Futures	2013 Grants/ Loans	2014 Con Futures	2014 Grants/ Loans	2015 Con Futures	2015 Grants/ Loans	2016 Con Futures	2016 Grants/ Loans	2017 Con Futures	2017 Grants/ Loans	2018 Con Futures	2018 Grants/ Loans	2013-2018 Expenses	Project Total
tbd	East Fork Lewis River Grant Reforestation	Stream Restoration	PE														0	0
			ROW														0	0
			CN	44,000	15,000	8,000	18,000		10,000		8,000						59,000	103,000
			Total	**44,000**	**23,000**		**18,000**		**10,000**		**8,000**		**0**		**0**		**59,000**	**103,000**
GG1204	Zimmerly DIF Grant Reforestation	Stream Restoration	PE														0	0
			ROW														0	0
			CN			36,000		36,000	26,000		16,000		16,000		16,000		146,000	146,000
			Total	**0**	**36,000**		**36,000**		**26,000**		**16,000**		**16,000**		**16,000**		**146,000**	**146,000**
tbd	Gee Creek Tributary Acquisition	Hydrology	PE														0	0
			ROW		374,000												374,000	374,000
			CN														0	0
			Total	**0**	**374,000**		**0**		**0**		**0**		**0**		**0**		**374,000**	**374,000**
tbd	Lwr Washougal Schmid Acquisition	Hydrology	PE														0	0
			ROW		500,000												500,000	500,000
			CN														0	0
			Total	**0**	**500,000**		**0**		**0**		**0**		**0**		**0**		**500,000**	**500,000**
tbd	Flume Creek Acquisition	Hydrology	PE														0	0
			ROW				906,000	1,306,000									2,212,000	2,212,000
			CN														0	0
			Total	**0**	**0**		**2,212,000**		**0**		**0**		**0**		**0**		**2,212,000**	**2,212,000**
tbd	Groenveld Acquisition	Hydrology	PE														0	0
			ROW				200,000										200,000	200,000
			CN														0	0
			Total	**0**	**0**		**200,000**		**0**		**0**		**0**		**0**		**200,000**	**200,000**

ONGOING PROGRAMS

					2013 Con Futures	2013 Grants/ Loans	2014 Con Futures	2014 Grants/ Loans	2015 Con Futures	2015 Grants/ Loans	2016 Con Futures	2016 Grants/ Loans	2017 Con Futures	2017 Grants/ Loans	2018 Con Futures	2018 Grants/ Loans		
	2010 - 2012 Reforestation Maintenance (6 projects)	Hydrology	PE														0	0
			ROW														0	0
			CN		101,000		72,000		50,000		35,000						258,000	258,000
			Total	**0**	**101,000**		**72,000**		**50,000**		**35,000**		**0**		**0**		**258,000**	**258,000**

SUMMARY TABLE		2013 Con Futures	2013 Grants/ Loans	2014 Con Futures	2014 Grants/ Loans	2015 Con Futures	2015 Grants/ Loans	2016 Con Futures	2016 Grants/ Loans	2017 Con Futures	2017 Grants/ Loans	2018 Con Futures	2018 Grants/ Loans	
Revenue Source														**6 Year SW CIP Total**
Annual Totals By Funding		975,000	0	1,178,000	1,306,000	50,000	0	35,000	0	0	0	0	0	**$3,544,000**
Annual Totals By Phase	**PE**	0		0		0		0		0		0		
	ROW	874,000		2,412,000		0		0		0		0		
	CN	101,000		72,000		50,000		35,000		0		0		
Annual Totals		975,000		2,484,000		50,000		35,000		0		0		

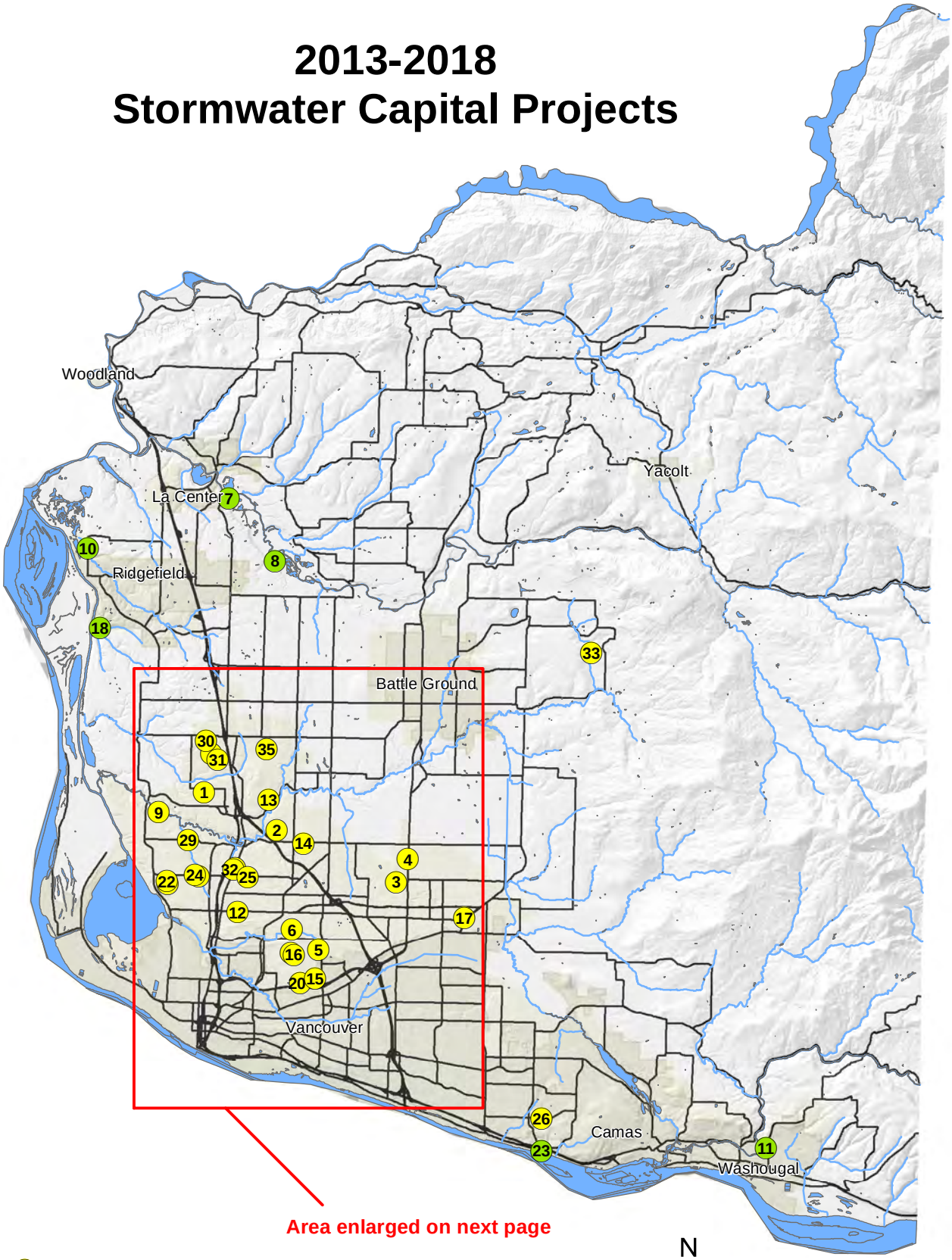
Project Index and Map

2013-2018 Stormwater Capital Program
Project Index

Map ID	WO	Project	Subwatershed
1	401890	Parkside Manor SWF Retrofit	Whipple Creek (Upper)
2	401882	Harding Farms SWF Retrofit	Salmon Creek (r.m. 03.83)
3	tbd	Country Meadows UIC Retrofit	Curtin Creek
4	28385	SR-503 CTR Retrofit	Curtin Creek
5	403264	Stones Throw Subdivision SWF Repair	Lower Burnt Bridge Creek
6	403454	Cold Creek Court SWF Repair	Lower Burnt Bridge Creek
7	tbd	East Fork Lewis River Grant Reforestation	East Fork Lewis (r.m. 03.19)
8	GG1204	Zimmerly DIF Grant Reforestation Project	East Fork Lewis (r.m. 03.19)
9	GG1201	Salmon Creek Greenway 12 Reforestation	Salmon Creek (r.m. 03.83)
10	tbd	Gee Creek Tributary Acquisition	Gee Creek (Lower)
11	tbd	Lower Washougal Schmid Acquisition	Washougal (Lower)
12	007485	Heritage Farm Parking Lot LID Project	Cougar Creek
13	tbd	Avalon Meadows SWF Repair	Salmon Creek (r.m. 03.83)
14	tbd	Tay Terrace SWF Retrofit	Salmon Creek (r.m. 03.83)
15	tbd	Rosemary Ridge UIC Retrofit	Lower Burnt Bridge Creek
16	401972	Thomas Wetland East	Lower Burnt Bridge Creek
17	tbd	Aquila UIC Retrofit	Upper Burnt Bridge Creek
18	tbd	Flume Creek Acquisition	Flume Creek
19	tbd	Lakeshore Elementary School SWF	Lakeshore
20	tbd	Anderson UIC Retrofit	Lower Burnt Bridge Creek
21	tbd	NE 99th St @ Cougar Creek WQ Retrofit	Cougar Creek
22	tbd	Andys Acres (A) SWF Repair	Lakeshore
23	tbd	Groenveld Acquisition	Columbia Slope
24	tbd	Columbia River High School SWF Retrofit	Cougar Creek
25	401902	NE 99th St & 25th Ave SWF	Salmon Creek (r.m. 03.83)
26	tbd	Winchester Hills I Tract A SWF Repair/Retrofit	Columbia Slope
27	tbd	Whipple Creek Trib 6.44 Habitat Improvement	Whipple Creek (Upper)
28	tbd	Highway 99 @ Tenny Creek WQ Retrofit	Salmon Creek (r.m. 03.83)
29	tbd	NE 119th St @ Cougar Creek WQ Retrofit	Cougar Creek
30	tbd	Clark County Amphitheater Wetland Habitat Improvement	Whipple Creek (Upper)
31	402357	Clark County Amphitheater SWF#4 Retrofit	Whipple Creek (Upper)
32	tbd	Highway 99 & NE 102nd St SWF	Salmon Creek (r.m. 03.83)
33	tbd	NE 229th St & NE 221st Ave SWF	Rock Creek
34	tbd	Harvest Meadows SWF Repair/Retrofit	Lower Burnt Bridge Creek
35	tbd	Regency Park Phase 1 SWF Repair/Retrofit	Mill Creek

Conservation Futures projects

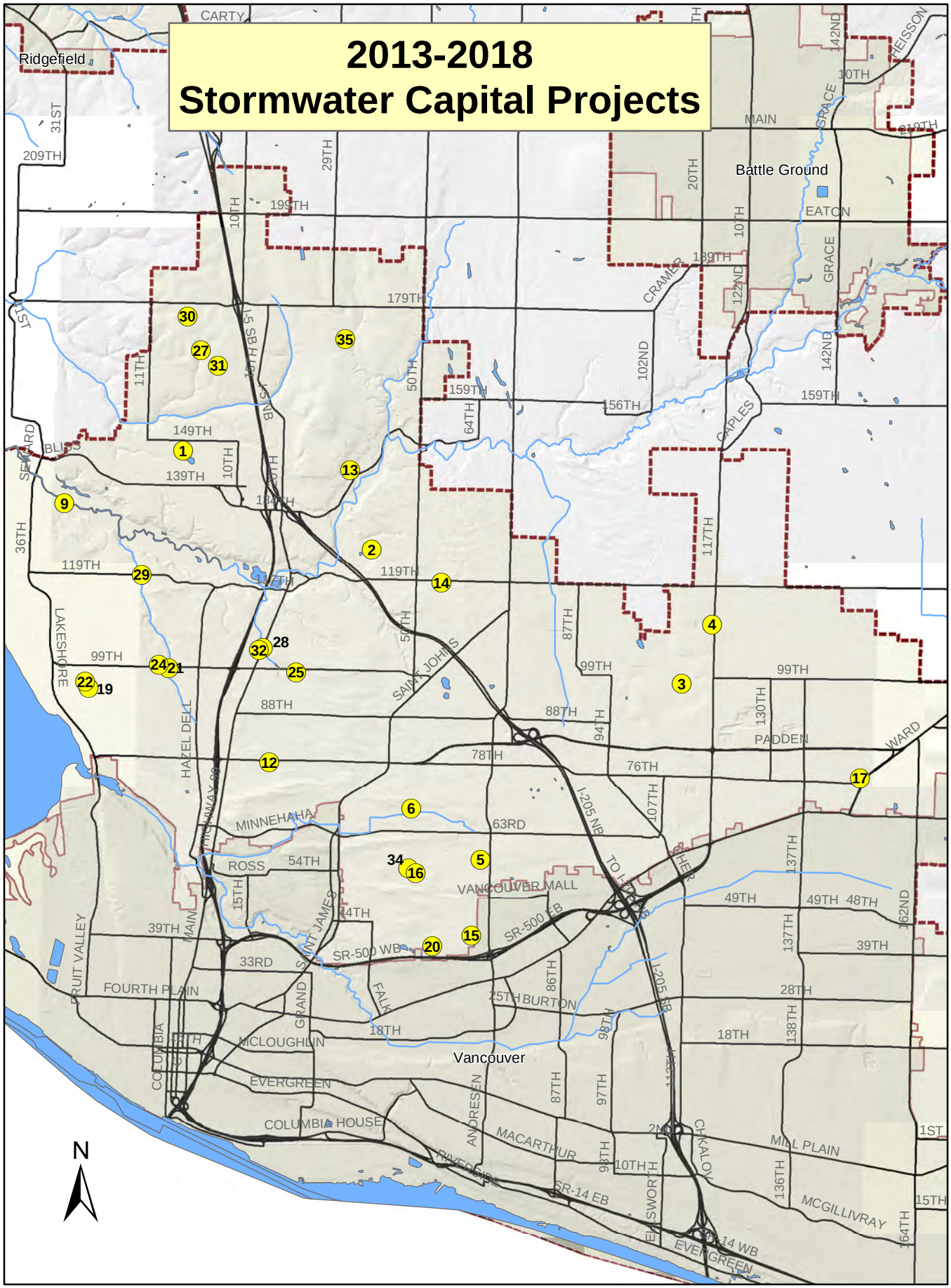
2013-2018
Stormwater Capital Projects



Clean Water Fund

Conservation Futures

2013-2018
Stormwater Capital Projects



Project Detail Sheets

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Parkside Manor SWF Retofit

Vicinity Map

Site Photo

Project Summary

Site ID: OS-93

Subwatershed: Whipple Creek (Upper)

Work Order Number: 401890

Location: NW 4th Ct. south of NW 149th St

Project Manager: Scott Fakler

Description: This project combines three undersized stormwater facilities discharging insufficiently treated stormwater to an intact headwater wetland of Whipple Creek. The project will replace three biofiltration swale/detention pond facilities with a biofiltration swale/bioretention cell and stormwater wetland. Existing detention capacity will be approximately doubled (from 2.2 to 4.5 acre-feet) and enhanced stormwater treatment will be provided for 26 acres of residential development

Basis: Whipple Creek is a rapidly developing, significantly impacted watershed that received 'poor' scores for water quality, biological health, and stream flow impacts in the 2010 Clark County Stream Health Report. Watershed assessments and regional planning documents place a high priority on protection and restoration of threatened or degraded wetlands in Whipple Creek, and recommend reducing the amount of stormwater discharged to tributary streams. The project is expected to help protect an existing high quality wetland, improve water quality, and stabilize channel conditions.

Schedule and Estimated Cost

Project Status:	Design
Planned Construction Year:	2013
Engineering/Permitting:	$194,000
Property Acquisition:	$10,000
Construction:	$1,189,000
ESTIMATED TOTAL:	**$1,393,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Harding Farms SWF Retrofit

Vicinity Map

Site Photo

Project Summary

Site ID: OS-79

Subwatershed: Salmon Creek (r.m. 03.83)

Work Order Number: 401882

Location: Vicinity of NE 126th Street & NE 40th Ave

Project Manager: Troy Pierce

Description: This project will construct a new biofiltration swale and stormwater wetland to capture and treat runoff from approximately 75 acres of fully developed residential area. The treated and controlled runoff will then drain back into the existing storm sewer outfall in the south west corner of the property, which discharges directly to Salmon Creek approximately 1/4 mile west of the new facility. The project will repair the existing outfall and construct a new maintenance access. An existing biofiltration swale on the west side will remain unchanged but the project will increase storage capacity in the existing detention pond.

Basis: Stormwater runoff from a large drainage area in the Pleasant Valley drainage basin is currently discharged to a wetland with no flow control or water quality treatment. Evidence of high stormwater discharge is present at the existing outfall to Salmon Creek. Salmon Creek in this vicinity is subject to multiple TMDLs and is a moderate regional priority for salmon recovery. The 2010 Stream Health Report and regional analyses recommend increased treatment and infiltration of stormwater runoff in this watershed.

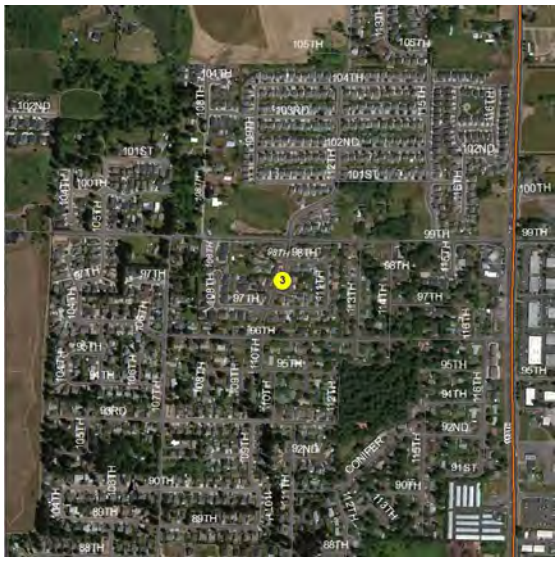
Schedule and Estimated Cost

Project Status:	Design
Planned Construction Year:	2014
Engineering/Permitting:	$185,000
Property Acquisition:	$16,000
Construction:	$960,000
ESTIMATED TOTAL:	**$1,161,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Country Meadows UIC Retrofit

Vicinity Map



Site Photo

Project Summary

Site ID: CP-156

Subwatershed: Curtin Creek

Work Order Number: TBD

Location: Vicinity of NE 110th Avenue & NE 97th Street

Project Manager: TBD

Description: This project will retrofit existing catchbasins and install up to 13 storm filter cartridges to provide water quality treatment before discharging to drywells, providing treatment for runoff from approximately 10 acres of residential development.

Basis: Water routed to drywells directly recharges the Pleistocene gravel aquifer that is the water source for 50 to 60 percent of the residents in urban Clark County. Country Meadows subdivision is situated in a high groundwater area. Due to the lack of sufficient groundwater separation and pre-treatment, untreated stormwater discharge is adversely impacting groundwater quality. The project improves water quality in 303(d) listed water bodies, while supporting groundwater protection requirements under RCW 90.48 and Chapter 173-200 WAC.

Schedule and Estimated Cost

Project Status:	Planning
Planned Construction Year:	2013
Engineering/Permitting:	$50,000
Property Acquisition:	$0
Construction:	$191,000
ESTIMATED TOTAL:	**$241,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

SR-503 CTR Retrofit

Vicinity Map

Site Photo

Project Summary

Site ID: CP-169

Subwatershed: Curtin Creek

Work Order Number: 28385

Location: NE 117th Ave (SR-503, MP 2.37), South of NE 112th Dr

Project Manager: Matt Griswold

Description: This project will construct a new stormwater facility to manage stormwater runoff that will be generated as a result a road improvement project along SR-503 (construction of a new right turn lane). The project will help reduce runoff volume that is currently discharged to an existing undersized infiltration system.

Basis: The SR-503 CTR project will create additional impervious area by adding a right turn auxiliary lane that includes a concrete pedestrian island. Runoff from SR 503 is now being managed through infiltration within the existing WSDOT ROW. The existing infiltration system is undersized and is failing. Construction of a new stormwater facility is warranted here to manage the current and future runoff, particularly since effective infiltration of stormwater is critical to maintaining groundwater resources that sustain summer streamflow in Curtin Creek.

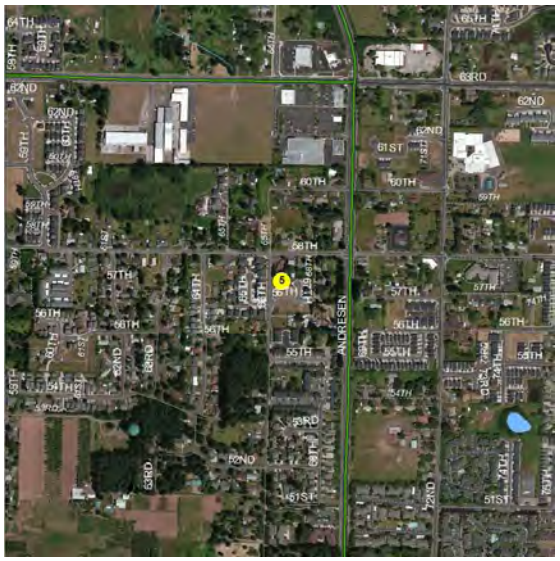
Schedule and Estimated Cost

Project Status:	Design
Planned Construction Year:	2013
Engineering/Permitting:	$19,000
Property Acquisition:	$101,000
Construction:	$60,000
ESTIMATED TOTAL:	**$180,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Stones Throw Subdivision SWF Repair

Vicinity Map



Site Photo

Project Summary

Site ID: CP-133

Subwatershed: Lower Burnt Bridge Creek

Work Order Number: 403264

Location: East of NE 66th Avenue & South of NE 58th Street; Parcel No. 160846054

Project Manager: Scot Brantley

Description: Reconstruct an existing bio-swale by excavating/re-grading the facility to eliminate standing water and ensure flow of runoff to the existing detention pond. Install an underdrain. Eliminate the existing swale segment at a right angle, located on the eastside of the pond. Reconstruct the failing retaining wall on the north side of the facility.

Basis: The existing bio-swale is non-functional due to poor grading. A retaining wall along the north side of the bio-swale is failing due to poor construction and seepage from the swale. There is a threat of flooding and property damage to the adjacent property.

Schedule and Estimated Cost

Project Status:	Design
Planned Construction Year:	2013
Engineering/Permitting:	$86,000
Property Acquisition:	$0
Construction:	$100,000
ESTIMATED TOTAL:	**$186,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Cold Creek Court SWF Repair

Vicinity Map

Site Photo

Project Summary

Site ID: CP-141

Subwatershed: Lower Burnt Bridge Creek

Work Order Number: 403454

Location: NE 50th Avenue, North of NE 68th Street

Project Manager: Scot Brantley

Description: Install a new infiltration trench to retain a portion of runoff from the subdivision to minimize impact at the existing undersized stormwater facility. Install a pair of storm filter catch basins to capture and treat runoff prior to sending it to the infiltration trench. Alternatively, route the overflow from the existing system by installing new perforated pipe along 68th avenue to an existing flow control manhole located to the east.

Basis: The problem is street flooding at the intersection of NE 50th Avenue and NE 68th Street. No homes are reported flooded, however street flooding occurs repeatedly and can be considered chronic flooding. The facility constructed to treat and dispose stormwater from Cold Creek Court subdivision has failed to function as intended. The existing filter vault with four cartridges provides insufficient treatment. Flow from the treatment vault is routed to a drywell and a short infiltration trench. The drywell routinely fills up completely and backs up water into the street.

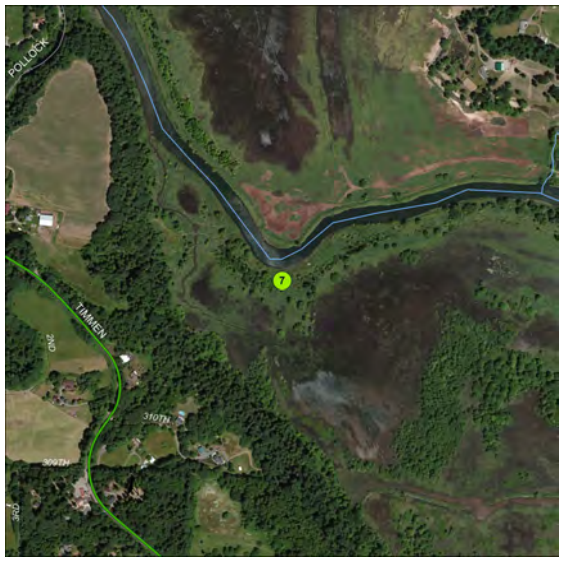
Schedule and Estimated Cost

Project Status:	Design
Planned Construction Year:	2013
Engineering/Permitting:	$64,000
Property Acquisition:	$0
Construction:	$100,000
ESTIMATED TOTAL:	**$164,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

East Fork Lewis River Grant Reforestation

Vicinity Map



Site Photo

Project Summary

Site ID: CP-161

Subwatershed: East Fork Lewis (r.m. 03.19)

Work Order Number: GG2012-04

Location: Vicinity of NW Pollock Rd and NW Timmen Rd (Parcel No. 211474000)

Project Manager: Travis Goddard

Description: Plant native trees and shrubs on approximately 10 acres of county-owned land along the East Fork Lewis River.

Basis: This project re-establishes native vegetation along the East Fork Lewis River Greenway, adjacent to the LaCenter Bottoms wildlife area. The East Fork is subject to a temperature TMDL, with the highest temperatures typically recorded in the lower watershed in the vicinity of the project area. The project improves long-term shade conditions in an East Fork tributary and the floodplain area within this reach. The East Fork is a regional priority for salmon recovery; improving wetlands and riparian forest in the lower watershed is recogized as a priority management technique.

Schedule and Estimated Cost

Project Status:	Design
Planned Construction Year:	2013
Engineering/Permitting:	$0
Property Acquisition:	$0
Construction:	$103,000
ESTIMATED TOTAL:	**$103,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Zimmerly DIF Grant Reforestation Project

Vicinity Map

Site Photo

Project Summary

Site ID: OS-41

Subwatershed: East Fork Lewis (r.m. 03.19)

Work Order Number: GG1204

Location: NE Bjur Rd, north of NE 269th St (Parcel No. 212103000)

Project Manager: Travis Goddard

Description: Plant native trees and shrubs on approximately 15 acres of county owned land.

Basis: This project re-establishes native vegetation along the East Fork Lewis River Greenway. The East Fork is subject to a temperature TMDL, and the project location along a tributary stream is expected to improve long-term shade conditions. The East Fork is a regional priority for salmon recovery; improving wetlands and riparian forest in the lower watershed is recogized as a priority management technique.

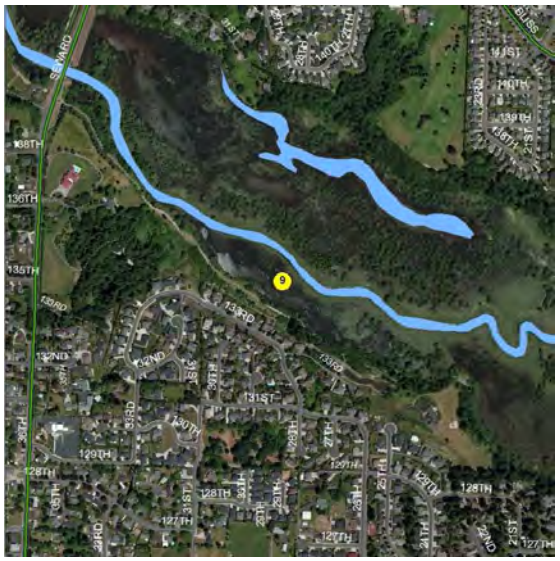
Schedule and Estimated Cost

Project Status:	Design
Planned Construction Year:	2013
Engineering/Permitting:	$0
Property Acquisition:	$0
Construction:	$146,000
ESTIMATED TOTAL:	**$146,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Salmon Creek Greenway 12 Reforestation

Vicinity Map



Site Photo

Project Summary

Site ID: OS-243

Subwatershed: Salmon Creek (r.m. 03.83)

Work Order Number: GG1201

Location: In the vicinity of NW 133rd St & NW 28th Ave (Parcel No. 187564000)

Project Manager: Travis Goddard

Description: Plant native trees and shrubs on county owned land along lower Salmon Creek.

Basis: Salmon Creek is a moderate priority for regional salmon recovery and also subject to the Salmon Creek temperature TMDL. The project improves shading and riparian habitat along the Salmon Creek Greenway in support of both efforts.

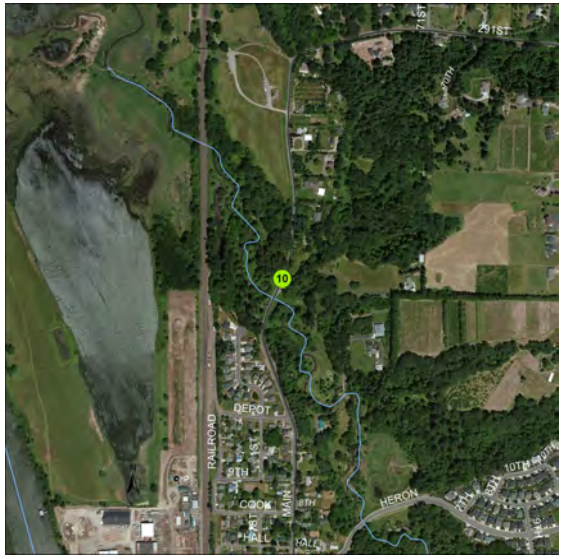
Schedule and Estimated Cost

Project Status:	Design
Planned Construction Year:	2013
Engineering/Permitting:	$0
Property Acquisition:	$0
Construction:	$145,000
ESTIMATED TOTAL:	**$145,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Gee Creek Tributary Acquisition

Vicinity Map



Site Photo

NO IMAGE AVAILABLE

Project Summary

Site ID: CP-171

Subwatershed: Gee Creek (Lower)

Work Order Number: TBD

Location: N Main Avenue @ Gee Creek (Parcel No. 218238000)

Project Manager: Pat Lee

Description: Acquire riparian corridor with mature trees adjacent to Ridgecrest Park (20 acres)

Basis: This project acquires approximately 20 acres along the Gee Creek Greenway between Abrams Park and the Ridgefield National Wildlife Refuge. The project protects important riparian habitat and facilitates construction of an off-road trail connecting downtown Ridgfield and the Refuge as called for in the City of Ridgefield Parks and Recreation Comprehensive Plan.

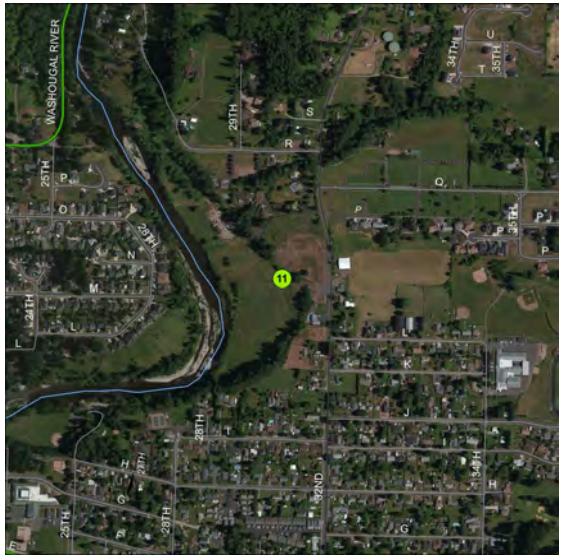
Schedule and Estimated Cost

Project Status:	Planning
Planned Construction Year:	2013
Engineering/Permitting:	$0
Property Acquisition:	$374,000
Construction:	$0
ESTIMATED TOTAL:	**$374,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Lower Washougal Schmid Acquisition

Vicinity Map



Site Photo

Project Summary

Site ID: CP-173

Subwatershed: Washougal (Lower)

Work Order Number: TBD

Location: Near 32nd Avenue & L Street (Parcel No. 131880000)

Project Manager: Pat Lee

Description: Acquire 20.65 acres of land, most of it in the floodplain of the Washougal River, just inside the Washougal city limits off 32nd Avenue.

Basis: This property represents an extremely rare opportunity to conserve 20 acres of habitat and potential park land along the Washougal River. This property contains the largest undeveloped section of river frontage on the lower Washougal River. This section of the Washougal is ranked as tier one for protection and restoration of salmon species by the Lower Columbia Fish Recovery Board. The floodplain portion of the property also supports many terrestrial and avian species, while the upland section of the property along 32nd Street is highly desirable from a public parks perspective and is directly in line with the City of Washougal's Comprehensive Parks Plan.

Schedule and Estimated Cost

Project Status:	Planning
Planned Construction Year:	2013
Engineering/Permitting:	$0
Property Acquisition:	$500,000
Construction:	$0
ESTIMATED TOTAL:	**$500,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Heritage Farm Parking Lot LID Project

Vicinity Map

Site Photo

Project Summary

Site ID: CP-94 **Subwatershed:** Cougar Creek

Work Order Number: 007485 **Location:** NE 78th Street, East of NE 19th Court

Project Manager: Laura Pederson

Description: The master plan developed for Heritage Farm includes a new parking lot on approximately 0.7 acres of vacant land along 78th Street, west of the administration building. This project will incorporate LID techniques to manage on-site stormwater runoff.

Basis: Cougar Creek is heavily urbanized and highly impacted by increased stormwater flows. The project is located at the headwaters where increased infiltration and retention of stormwater is most beneficial. All of the parking lot stormwater will be managed on-site, significantly reducing stormwater runoff to Cougar Creek. The project is an opportunity to showcase and promote sustainable stormwater management practices.

Schedule and Estimated Cost

Project Status:	Design
Planned Construction Year:	2014
Engineering/Permitting:	$88,000
Property Acquisition:	$0
Construction:	$492,000
ESTIMATED TOTAL:	**$580,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Avalon Meadows SWF Repair

Vicinity Map

Site Photo

Project Summary

Site ID: CP-65

Subwatershed: Salmon Creek (r.m. 03.83)

Work Order Number: TBD

Location: NE 143rd St & NE 35th Ave; Parcel No. 118255928

Project Manager: TBD

Description: This project will remove the existing biofiltration swale and construct a bioretention facility to provide water quality treatment.

Basis: Avalon Meadows is a poorly performing facility serving a 7.5 acre residential subdivision in the lower Salmon Creek watershed. Salmon Creek has degraded water quality, is subject to multiple TMDLs, and is a regional priority for salmon recovery. The facility is very near the mainstem of Salmon Creek and discharges urban runoff with no other viable location for treatment.

Schedule and Estimated Cost

Project Status:	Planning
Planned Construction Year:	2014
Engineering/Permitting:	$50,000
Property Acquisition:	$0
Construction:	$169,000
ESTIMATED TOTAL:	**$219,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Tay Terrace Subdivision UIC Retrofit

Vicinity Map

Site Photo

Project Summary

Site ID: OS-74

Subwatershed: Salmon Creek (r.m. 03.83)

Work Order Number: TBD

Location: NE 119th St & NE 56th Ave

Project Manager: Troy Pierce

Description: This project will construct up to 8 curb extensions upstream of the existing catchbasins along NE 56th Avenue, located between NE 116th Street and NE 119th Street, to provide water quality treatment before stormwater runoff is discharged to the existing infiltration system (three drywells and infiltration pipes). The project will replace the existing drywells with new wells to improve infiltration capacity and provide adequate separation between these structures and the groundwater table. Alternatively, the project may replace the existing drywell/infiltration pipe system with a conveyance pipe within NE 56 Avenue right-of-way and construct a new stormwater facility (bioretention/pond) inside a county owned parcel located south of NE 119th Street and west of NE 56th Avenue.

Basis: This project addresses three high-risk drywells located in an area with vulnerable groundwater resources. Pollutants of particular concern include total and suspended solids, nutrients, metals, and hydrocarbons. The project is located in the lower main stem Salmon Creek watershed, an area with multiple TMDLs. The 2010 Clark County Stream Health Report highlights increased infiltration and retention of stormwater runoff throughout the Salmon Creek watershed as one of the most effective means to protect stream channels and maintain base flow in this salmon-bearing system.

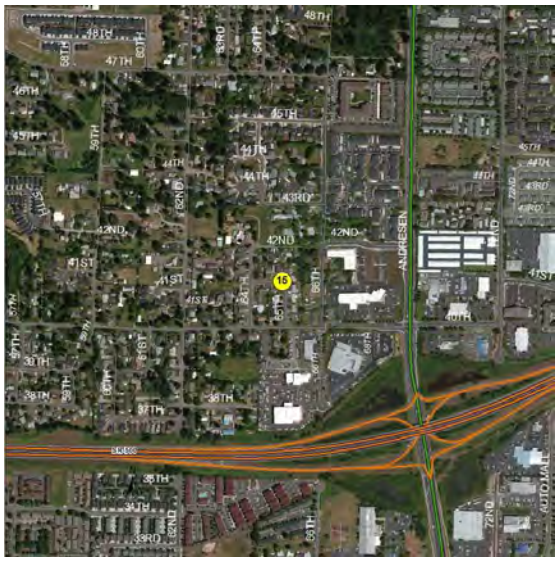
Schedule and Estimated Cost

Project Status:	Planning
Planned Construction Year:	2014
Engineering/Permitting:	$89,000
Property Acquisition:	$0
Construction:	$514,000
ESTIMATED TOTAL:	**$603,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Rosemary Ridge UIC Retrofit

Vicinity Map



Site Photo

Project Summary

Site ID: CP-155

Subwatershed: Lower Burnt Bridge Creek

Work Order Number: TBD

Location: Vicinity of NE 65th Avenue & NE 41st Street

Project Manager: TBD

Description: Install 6 curb extension rain gardens upstream of existing drywells within the subdivision to provide pre-treatment to the runoff prior to discharging to groundwater.

Basis: Water routed to drywells directly recharges the Pleistocene gravel aquifer that is the water source for 50 to 60 percent of the residents in urban Clark County. Rosemary Ridge subdivision is situated in a high groundwater area and is also within a designated well-head protection zone. Due to the lack of sufficient groundwater separation and pre-treatment, untreated stormwater discharge is adversely impacting the groundwater quality. The project improves water quality in 303(d) listed water bodies, while supporting groundwater protection requirements under RCW 90.48 and Chapter 173-200 WAC.

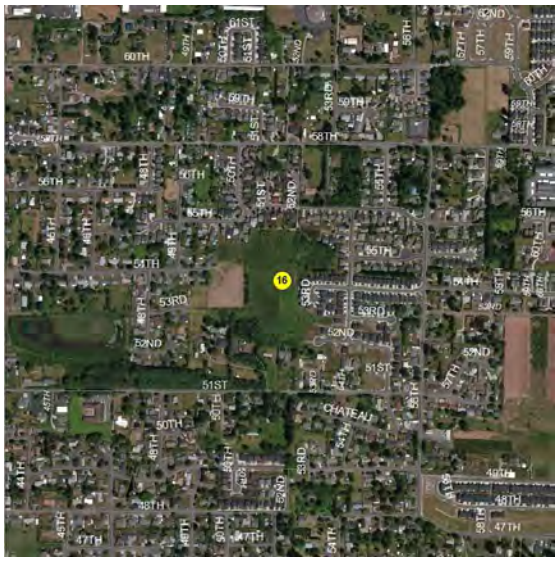
Schedule and Estimated Cost

Project Status:	Planning
Planned Construction Year:	2014
Engineering/Permitting:	$50,000
Property Acquisition:	$0
Construction:	$46,000
ESTIMATED TOTAL:	**$96,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Thomas Wetland East

Vicinity Map



Site Photo

Project Summary

Site ID: CP-2

Subwatershed: Lower Burnt Bridge Creek

Work Order Number: 401972

Location: NE 55th Street and NE 53rd Avenue

Project Manager: Scott Fakler

Description: The new stormwater facility will serve approximately 125 acres of a fully developed residential area. The project will excavate and lower the existing ditched wetland to construct a stormwater wetland pond within the south portion of the county property. The lowered ground surface will provide improved hydrology for wetland plants. The additional storage developed will reduce peak flows/volumes that would eventually discharge to Burnt Bridge Creek. The project will also provide recreational opportunities such as walking paths that will connect neighborhoods and nearby parks.

Basis: Burnt Bridge Creek is a heavily developed, significantly impacted watershed that received a 'poor' score for water quality in the 2010 Clark County Stream Health Report. The report highlights the need for protection of remaining headwater and stream corridor wetlands, and suggests increasing infiltration and retention of stormwater runoff whenever possible. The project is a regional watershed improvement to rehabilitate a ditched wetland, restoring the natural hydrology and providing water quality treatment for an area with limited stormwater detention and treatment. The project also addresses general recommendations of the 1995 Burnt Bridge Creek Watershed Plan to replace wetlands and open water areas.

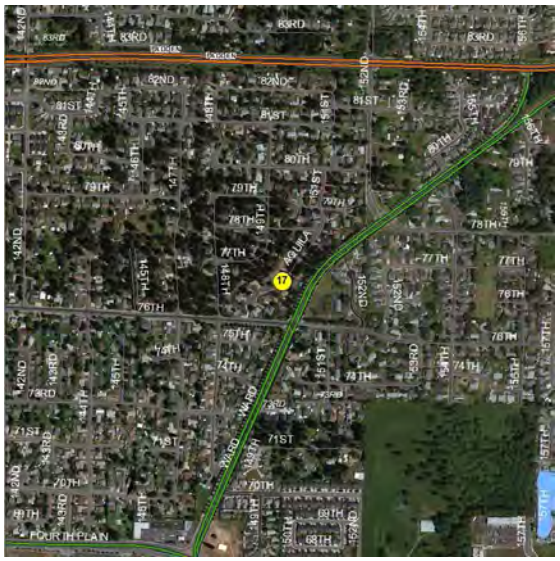
Schedule and Estimated Cost

Project Status:	Design
Planned Construction Year:	2015
Engineering/Permitting:	$201,000
Property Acquisition:	$474,000
Construction:	$1,545,000
ESTIMATED TOTAL:	**$2,220,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Aquila UIC Retrofit

Vicinity Map



Site Photo

Project Summary

Site ID: CP-157

Subwatershed: Upper Burnt Bridge Creek

Work Order Number: TBD

Location: Vicinity of NE 76th Street & NE 152nd Avenue

Project Manager: TBD

Description: Install 12 curb extension rain gardens and 5 Contech storm filter catch basins upstream of the existing drywells within the project site to provide water quality treatment to the runoff prior to discharging to the drywells.

Basis: Water routed to drywells directly recharges the Pleistocene gravel aquifer that is the water source for 50 to 60 percent of the residents in urban Clark County. Aquila subdivision is situated in a high groundwater area and is also within a designated well-head protection zone. Due to the lack of sufficient groundwater separation and pre-treatment, untreated stormwater discharge is adversely impacting groundwater quality. The project improves water quality in 303(d) listed water bodies, while supporting groundwater protection requirements under RCW 90.48 and Chapter 173-200 WAC.

Schedule and Estimated Cost

Project Status:	Planning
Planned Construction Year:	2015
Engineering/Permitting:	$50,000
Property Acquisition:	$0
Construction:	$166,000
ESTIMATED TOTAL:	**$216,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Flume Creek Acquisition

Vicinity Map

Site Photo

Project Summary

Site ID: CP-170

Subwatershed: Flume Creek

Work Order Number: TBD

Location: NW 234th Street, west of NW 51st Ave (Parcel No. 220031000)

Project Manager: Pat Lee

Description: Acquire 165 acres of riparian and mature forest habitat in the lower Flume Creek watershed.

Basis: The property is extensively covered by Priority Habitat and Species polygons for both riparian and non-riparian priority habitat. Non-riparian priority habitat values include "Biodiversity Area and Corridor"; waterfowl concentrations; and Oregon White Oak. PHS mapping also identifies use by Sandhill Cranes. Flume Creek is presumed to support ESA-listed coho and steelhead. The project site is located on the Lake River Water Trail. The Flume Creek drainage includes additional vacant parcels which might allow for futures phases of land conservation to support both habitat and farm land preservation.

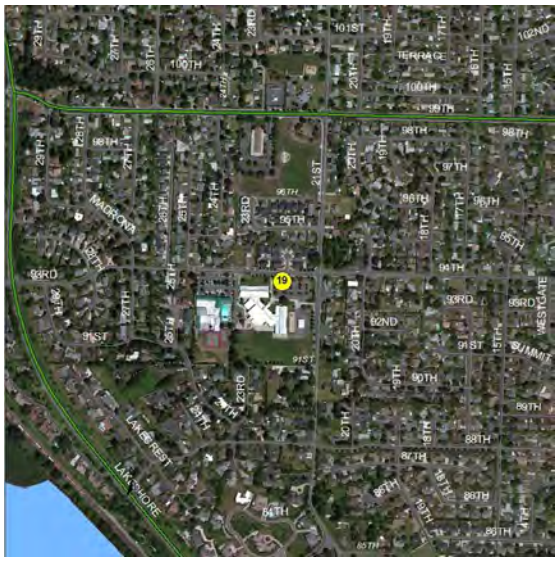
Schedule and Estimated Cost

Project Status:	Planning
Planned Construction Year:	2014
Engineering/Permitting:	$0
Property Acquisition:	$2,212,000
Construction:	$0
ESTIMATED TOTAL:	**$2,212,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Lakeshore Elementary School SWF

Vicinity Map



Site Photo

Project Summary

Site ID: CP-104

Subwatershed: Lakeshore

Work Order Number: TBD

Location: NW 94th Street & NW 21st Ave

Project Manager: TBD

Description: This project will construct parking lot swales and bioretention facilities inside the Lakeshore Elementary School property to provide water quality treatment. The project also intends to reduce runoff volumes that currently leave the school site to help minimize localized flooding at the west end of NE 94th Street.

Basis: The Lakeshore subwatershed drains directly to Vancouver Lake, a regionally significant water body with multiple 303(d) listings. The lake is the subject of significant research and management efforts through the Vancouver Lake Watershed Partnership. Runoff from rooftops and high-traffic parking areas at Lakeshore Elementary receives very limited water quality treatment prior to discharging to Vancouver Lake. Although flow control is not required in this area, the downstream drainage system is near capacity; reduction of runoff from the project site serves to decrease pressure on the downstream system.

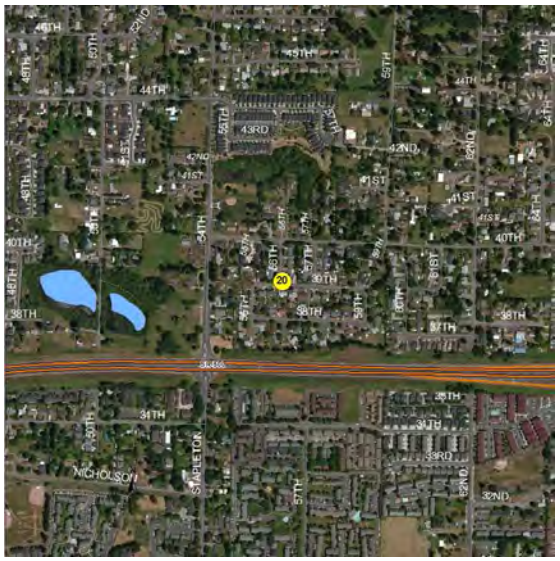
Schedule and Estimated Cost

Project Status:	Planning
Planned Construction Year:	2016
Engineering/Permitting:	$80,000
Property Acquisition:	$0
Construction:	$367,000
ESTIMATED TOTAL:	**$447,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Anderson UIC Retrofit

Vicinity Map



Site Photo

Project Summary

Site ID: CP-154

Subwatershed: Lower Burnt Bridge Creek

Work Order Number: TBD

Location: Vicinity of NE 56th Avenue & NE 39th Street

Project Manager: TBD

Description: Install 12 curb extension rain gardens upstream of the existing drywells within the subdivision to treat the runoff prior to discharging to the drywells.

Basis: Water routed to drywells directly recharges the Pleistocene gravel aquifer that is the water source for 50 to 60 percent of the residents in urban Clark County. Anderson subdivision is situated in a high groundwater area and is also within a designated well-head protection zone. Due to the lack of sufficient groundwater separation and pre-treatment, untreated stormwater discharge is adversely impacting groundwater quality. The project improves water quality in 303(d) listed water bodies, while supporting groundwater protection requirements under RCW 90.48 and Chapter 173-200 WAC.

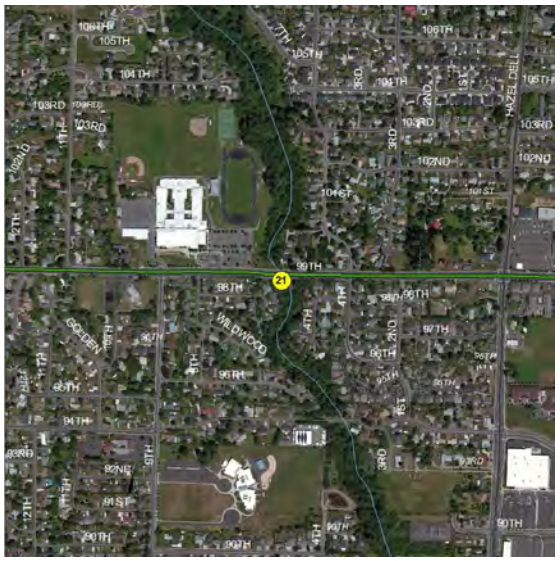
Schedule and Estimated Cost

Project Status:	Planning
Planned Construction Year:	2015
Engineering/Permitting:	$50,000
Property Acquisition:	$0
Construction:	$120,000
ESTIMATED TOTAL:	**$170,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

NE 99th St @ Cougar Creek WQ Retrofit

Vicinity Map



Site Photo

Project Summary

Site ID: CP-15

Subwatershed: Cougar Creek

Work Order Number: TBD

Location: Cougar Creek at 99th Street

Project Manager: TBD

Description: This project will retrofit existing catchbasins along both sides of NE 99th Street by installing storm filter cartridges to provide water quality treatment before the runoff is discharged to Cougar Creek.

Basis: Cougar Creek has well-documented water quality degradation, and as a tributary to Salmon Creek is subject to multiple TMDLs. Cougar Creek lags behind observed water quality improvements in the larger Salmon Creek watershed. The project treats stormwater from nearly 3/4 mile of high-traffic area on NE 99th Street that is currently discharged directly to Cougar Creek with no water quality treatment.

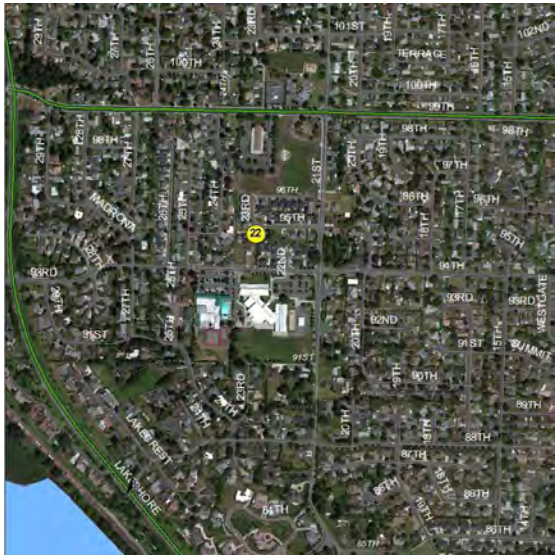
Schedule and Estimated Cost

Project Status:	Planning
Planned Construction Year:	2016
Engineering/Permitting:	$50,000
Property Acquisition:	$0
Construction:	$280,000
ESTIMATED TOTAL:	**$330,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Andys Acres (A) SWF Repair

Vicinity Map



Site Photo

Project Summary

Site ID: CP-151

Subwatershed: Lakeshore

Work Order Number: TBD

Location: NW 95th Street & NW 23rd Avenue

Project Manager: TBD

Description: This project will replace two existing catchbasins with catchbasins containing 4 filter cartridges to provide water quality treatment. Alternatively, existing manholes may be modified to include filter cartridges.

Basis: Much of the Lakeshore subwatershed was developed with minimal water quality treatment, leaving a significant need for water quality retrofitting. This project area drains directly to Vancouver Lake with no water quality treatment; Vancouver Lake is 303(d) listed for multiple water quality issues, and is the subject of extensive current research and planning for improved management.

Schedule and Estimated Cost

Project Status:	Planning
Planned Construction Year:	2016
Engineering/Permitting:	$50,000
Property Acquisition:	$0
Construction:	$77,000
ESTIMATED TOTAL:	**$127,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Groenveld Acquisition

Vicinity Map

Site Photo

Project Summary

Site ID: CP-172

Subwatershed: Columbia Slope

Work Order Number: TBD

Location: SE Evergreen HWY near 192nd Ave (Parcel No. 125654000)

Project Manager: Pat Lee

Description: Acquire a 16-acre property in the Columbia Slope Acquisition Corridor on the river side of SR-14 near the 192nd Avenue interchange.

Basis: The Conservation Areas Acquisition Plan identifies the Columbia South Slope as a target area, with a goal of acquiring 15-25 acres. The site fulfills the greenway plan elements due to the inclusion of Columbia River waterfront and associated uplands. This is a joint acquisition with Vancouver-Clark Parks and assists in meeting park acreage standards in a highly developed area where potential acquisitions are limited (Parks District 4).

Schedule and Estimated Cost

Project Status:	Planning
Planned Construction Year:	2014
Engineering/Permitting:	$0
Property Acquisition:	$200,000
Construction:	$0
ESTIMATED TOTAL:	**$200,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Columbia River High School SWF Retrofit

Vicinity Map

Site Photo

Project Summary

Site ID: CP-134

Subwatershed: Cougar Creek

Work Order Number: TBD

Location: NW 99th Street and NW 9th Ave

Project Manager: TBD

Description: Currently, there are two large parking lots located on the eastside and westside of the school building. This project will construct LID structures such as parking lot swales and rain gardens to provide water quality treatment before stormwater runoff is discharged to Cougar Creek.

Basis: Cougar Creek is a significantly impacted tributary to Salmon Creek, and lags behind documented water quality improvements in the larger watershed. The creek is subject to multiple TMDLs. This project reduces fecal coliform, turbidity and nutrient inputs to Cougar Creek in support of these TMDLs, reduces toxin loading to a salmon-bearing stream system, and limits documented erosion in a susceptible stream channel.

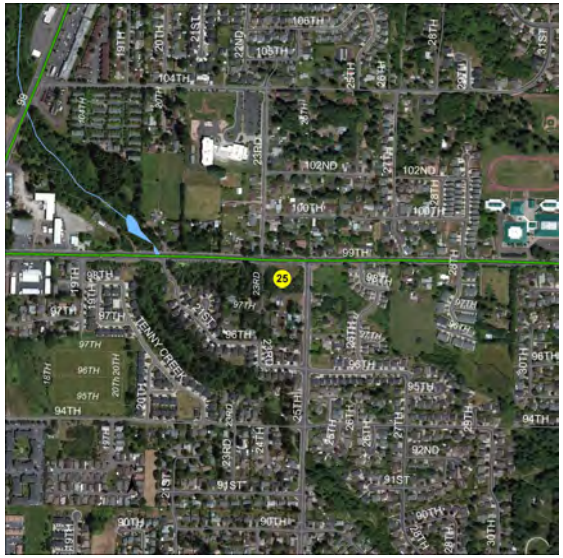
Schedule and Estimated Cost

Project Status:	Planning
Planned Construction Year:	2015
Engineering/Permitting:	$84,000
Property Acquisition:	$0
Construction:	$237,000
ESTIMATED TOTAL:	**$321,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

NE 99th St & 25th Ave SWF

Vicinity Map



Site Photo

Project Summary

Site ID: OS-72

Subwatershed: Salmon Creek (r.m. 03.83)

Work Order Number: 401902

Location: NE 99th St & NE 25th Ave

Project Manager: Don Andrews

Description: This project will replace a failed biofiltration swale with a bioretention facility or a stormwater wetland to provide enhanced water quality treatment and increased detention storage. The facility will treat runoff generated by approximately 5 acres of NE 99th Street. This will result in removing sediment that would otherwise be discharged to Swan Pond and Tenny Creek.

Basis: Tenny Creek has documented water quality problems and drains to lower Salmon Creek, a salmon-bearing stream subject to multiple active TMDLs. Water quality treatment is lacking in many areas, highlighting the importance of maximizing treatment in existing underperforming facilities where feasible.

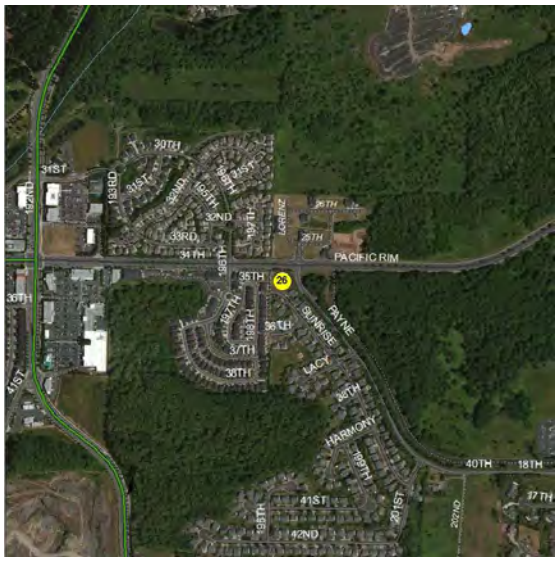
Schedule and Estimated Cost

Project Status:	Planning
Planned Construction Year:	2017
Engineering/Permitting:	$95,000
Property Acquisition:	$1,000
Construction:	$731,000
ESTIMATED TOTAL:	**$827,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Winchester Hills I Tract A SWF Repair/Retrofit

Vicinity Map



Site Photo

Project Summary

Site ID: CP-142

Subwatershed: Columbia Slope

Work Order Number: TBD

Location: SE 34th Street & Payne Rd

Project Manager: TBD

Description: Reconstruct the bio-swale with a minimum of 4 feet bottom width and 2:1 side slopes. Place a liner underneath the facility to keep groundwater out. Construct a sedimentation trap and install hand placed riprap at the end of bio swale. Flush out the existing 24-inch detention pipe, clean the bottom of North pond to its original grade, and remove sediment/debris from existing flow control structure.

Basis: The existing bio swale is wet most of the time due to groundwater exfiltration and does not support healthy grass growth. The swale is much narrower than intended in the original design. These conditions result in ineffective water quality treatment for 5 acres of developed area.

Schedule and Estimated Cost

Project Status:	Planning
Planned Construction Year:	2017
Engineering/Permitting:	$25,000
Property Acquisition:	$0
Construction:	$47,000
ESTIMATED TOTAL:	**$72,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Whipple Creek Trib 6.44 Habitat Improvement

Vicinity Map

Site Photo

Project Summary

Site ID: CP-166

Subwatershed: Whipple Creek (Upper)

Work Order Number: TBD

Location: Tributary channel North of NE 164th Street (Parcel No. 182144000)

Project Manager: TBD

Description: Install in-stream structures to reduce erosion by re-directing stream flow. Amend the soil, using erosion control and biostabilization methods to stabilize exposed soil. Remove invasive species and replant the riparian buffers with native vegetation.

Basis: This project is in a riparian habitat corridor located on a headwater stream in the Whipple Creek watershed. The project is part of a package of stormwater improvements in and around the Clark County Fairgrounds aimed at reducing erosive flows in Whipple Creek and rehabilitating past channel damage. The project improves stability in a steep and historically eroded channel. Site reconnaissance and a stream assessment completed by Clark County engineering staff showed significant need for a channel stabilization project in this tributary.

Schedule and Estimated Cost

Project Status:	Planning
Planned Construction Year:	TBD
Engineering/Permitting:	$129,080
Property Acquisition:	$0
Construction:	$708,920
ESTIMATED TOTAL:	**$838,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Highway 99 @ Tenny Creek WQ Retrofit

Vicinity Map

Site Photo

Project Summary

Site ID: CP-22

Subwatershed: Salmon Creek (r.m. 03.83)

Work Order Number: TBD

Location: Highway 99 at Tenny Creek

Project Manager: TBD

Description: This project will replace existing catchbasins along Highway 99 with Catchbasin StormFilters to treat stormwater runoff prior to discharging to Tenny Creek. As an alternative design, consider using UrbanGreen BioFilter. The UrbanGreen BioFilter may also include one or more StormFilter cartridges which provide reliable pollutant removal for the portion of the design storm that exceeds the capacity of the biofilter bay.

Basis: Highway 99 in the vicinity of Tenny Creek has no existing stormwater treatment infrastructure and discharges untreated stormwater from a high traffic corridor directly to the stream. Tenny Creek flows into Salmon Creek less than a mile downstream from Highway 99, flushing roadway pollutants into a salmon-bearing stream identified as a moderate regional recovery priority. Salmon Creek is also subject to multiple TMDLs; the increased water quality treatment from this project directly supports TMDL goals in the watershed.

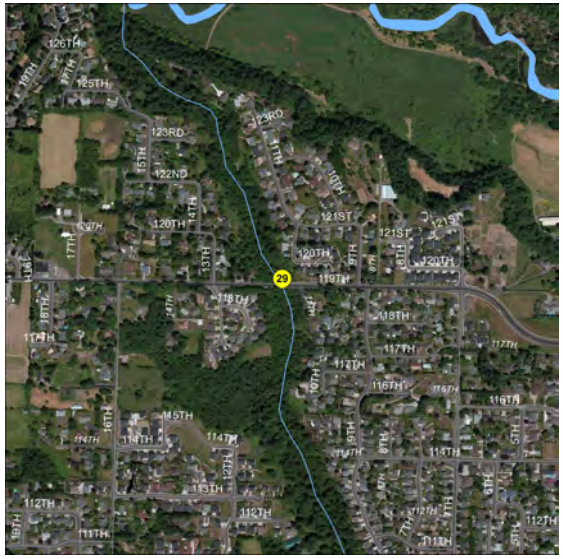
Schedule and Estimated Cost

Project Status:	Planning
Planned Construction Year:	2017
Engineering/Permitting:	$50,000
Property Acquisition:	$0
Construction:	$100,000
ESTIMATED TOTAL:	**$150,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

NE 119th St @ Cougar Creek WQ Retrofit

Vicinity Map



Site Photo

Project Summary

Site ID: CP-17

Subwatershed: Cougar Creek

Work Order Number: TBD

Location: NE 119th Street at Cougar Creek

Project Manager: TBD

Description: Replace existing catchbasins along NE 119th Street with Catchbasin StormFilters to treat stormwater runoff prior to discharging to Cougar Creek. As an alternative design, consider using UrbanGreen BioFilter. The UrbanGreen BioFilter may also include one or more StormFilter cartridges which provide reliable pollutant removal for the portion of the design storm that exceeds the capacity of the biofilter bay.

Basis: Cougar Creek has well-documented water quality degradation, and as a tributary to Salmon Creek is subject to multiple TMDLs. The project treats stormwater from NE 119th Street and a residential subdivision that is currently discharged directly to Cougar Creek with no water quality treatment.

Schedule and Estimated Cost

Project Status:	Planning
Planned Construction Year:	2017
Engineering/Permitting:	$50,000
Property Acquisition:	$0
Construction:	$100,000
ESTIMATED TOTAL:	**$150,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Clark County Amphitheater Wetland Habitat Improvement

Vicinity Map

Site Photo

Project Summary

Site ID: CP-165

Subwatershed: Whipple Creek (Upper)

Work Order Number: TBD

Location: Near northwest corner of parcel no. 182214000

Project Manager: TBD

Description: Rehabilitate Wetland Area#1 with a series of rain gardens and reforestation.

Basis: This project rehabilitates a degraded wetland at the headwaters of Whipple Creek. The project is part of a package of stormwater improvements in and around the Clark County Fairgrounds aimed at reducing erosive flows in Whipple Creek and rehabilitating past channel damage. The project improves wetland function and infiltration in a heavily developed headwater area.

Schedule and Estimated Cost

Project Status:	Planning
Planned Construction Year:	2017
Engineering/Permitting:	$95,000
Property Acquisition:	$0
Construction:	$283,000
ESTIMATED TOTAL:	**$378,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Clark County Amphitheater SWF#4 Retrofit

Vicinity Map

Site Photo

Project Summary

Site ID: CP-24

Subwatershed: Whipple Creek (Upper)

Work Order Number: 402357

Location: NE 164th St, west of NE 6th Ave (Parcel No. 182148000)

Project Manager: TBD

Description: Replace the existing facility with a large wetpond to provide water quality treatment and greater detention storage for stormwater runoff from approximately 49 acres of mostly impervious drainage area. Install a modern flow control structure to more efficiently regulate outflows and help reduce erosion along the receiving tributary channel of Whipple Creek.

Basis: The project is part of a package of stormwater improvements in and around the Clark County Fairgrounds aimed at reducing erosive flows in Whipple Creek and rehabilitating past channel damage. The facility is located at the head of a Whipple Creek tributary. Basin assessments indicate the tributary is susceptible to erosion and large existing headcuts are present a short distance downstream of the project site. Hydraulic modeling suggests a high likelihood of increased erosion in this catchment as build-out occurs. Whipple Creek downstream of the project site has poor water quality, including high turbidity, as well as documented erosion problems.

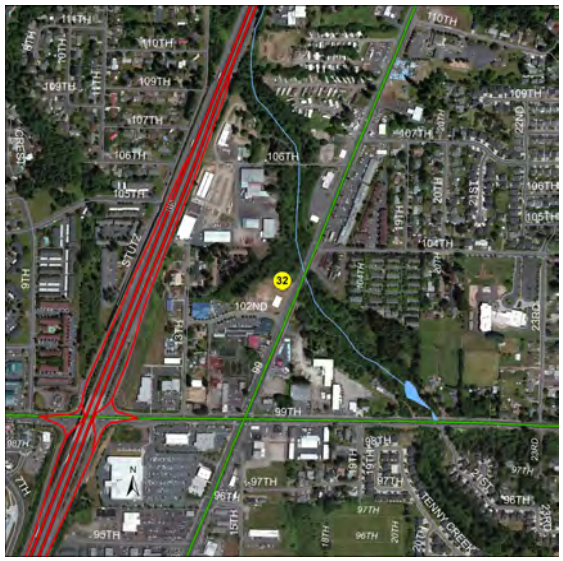
Schedule and Estimated Cost

Project Status:	Design
Planned Construction Year:	2018
Engineering/Permitting:	$450,000
Property Acquisition:	
Construction:	$1,350,000
ESTIMATED TOTAL:	**$1,800,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Highway 99 & NE 102nd St SWF

Vicinity Map



Site Photo

Project Summary

Site ID: CP-79

Subwatershed: Salmon Creek (r.m. 03.83)

Work Order Number: TBD

Location: Highway 99 at NE 102nd Street; Parcel No. 117988000 & 117986015

Project Manager: TBD

Description: Purchase two privately owned parcels and build a new stormwater wetland/detention facility.

Basis: The large commercial drainage basin to be served by this facility currently has no stormwater management, discharging large amounts of untreated and undetained stormwater to lower Tenny Creek just upstream of the confluence with Salmon Creek. Salmon Creek is subject to multiple TMDLs and is a medium priority for regional salmon recovery. The increased stormwater detention and water quality treatment from this project directly support both of these watershed goals.

Schedule and Estimated Cost

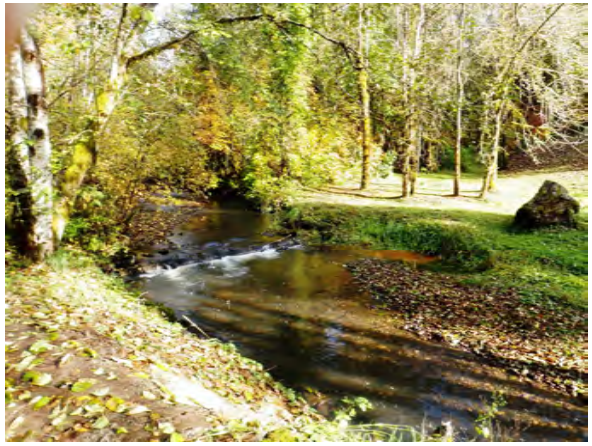
Project Status:	Screened
Planned Construction Year:	2018
Engineering/Permitting:	$60,000
Property Acquisition:	$285,000
Construction:	$367,000
ESTIMATED TOTAL:	**$712,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

NE 229th St & NE 221st Ave SWF

Vicinity Map

Site Photo



Project Summary

Site ID: CP-83

Subwatershed: Rock Creek

Work Order Number: TBD

Location: NE 229th St and NE 221st Ave; Parcel No. 236611016

Project Manager: TBD

Description: Purchase a private property and excavate flood plain bench and/or construct an off-line detention facility. The project may include wetland enhancement/reforestation.

Basis: The Rock Creek (Salmon Creek) subwatershed is a medium priority for regional salmon recovery and has been characterized by Ecology as an area where hydrologic processes should be protected. The drainage basin for this project has undergone significant clearing to accommodate rural residential development in the headwaters of Rock Creek. Drainage is primarily through roadside ditches; there is no water quality treatment or flow control. The project protects and improves headwater wetlands and riparian habitat while improving stormwater treatment and helping maintain summer stream flows through increased groundwater recharge.

Schedule and Estimated Cost

Project Status:	Screened
Planned Construction Year:	TBD
Engineering/Permitting:	$60,000
Property Acquisition:	$494,000
Construction:	$335,000
ESTIMATED TOTAL:	**$889,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Harvest Meadows SWF Repair/Retrofit

Vicinity Map

Site Photo

Project Summary

Site ID: CP-152

Subwatershed: Lower Burnt Bridge Creek

Work Order Number: TBD

Location: NE 55th Street, East of NE 49th Avenue

Project Manager: TBD

Description: Construct a two cell wet pond or a stormwater wetland facility by replacing the existing detention pond to improve water quality and the hydrologic benefit of the facility.

Basis: Burnt Bridge Creek is a heavily developed, significantly impacted watershed that received a 'poor' score for water quality in the 2010 Clark County Stream Health Report and has well-documented erosion and stream channel degradation. Suggested stream health strategies for Burnt Bridge Creek include increasing infiltration and retention of stormwater runoff to replace lost watershed storage.
The existing stormwater detention facility is located on a fairly large stormwater tract with no water quality component and a sub-standard flow control structure. Conversion to a two cell wet pond or a stormwater wetland will improve both water quality and flow control.

Schedule and Estimated Cost

Project Status:	Screened
Planned Construction Year:	TBD
Engineering/Permitting:	$60,000
Property Acquisition:	$0
Construction:	$100,000
ESTIMATED TOTAL:	**$160,000**

STORMWATER CAPITAL IMPROVEMENT PROGRAM

Regency Park Phase 1 SWF Repair/Retrofit

Vicinity Map

Site Photo

Project Summary

Site ID: CP-148

Subwatershed: Mill Creek

Work Order Number: TBD

Location: NE 32nd Ave, South of NE 173rd Street

Project Manager: TBD

Description: Replace the existing biofiltration swale with a wet swale or wetland swale to provide water quality treatment.

Basis: The existing bioswale is wet year-round due to the presence of base flow (springs) and subsequently provides limited water quality treatment.

Schedule and Estimated Cost

Project Status:	Screened
Planned Construction Year:	TBD
Engineering/Permitting:	$60,000
Property Acquisition:	$0
Construction:	$100,000
ESTIMATED TOTAL:	**$160,000**