City of Battle Ground

Stormwater Management Plan

2015 – 2035



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Acknowledgements

This plan is an update of the *City of Battle Ground Stormwater Utility Update and Stormwater Management Plan*, October, 2008.

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Section 1 – Overview

Introduction

The City of Battle Ground, as shown in Figure 1, is located in Clark County about 10 miles northeast of Vancouver. The City's population is about 18,680. The City combines a small town feel with peaceful country living and outstanding recreational opportunities.

Since 1990, the City has experienced steady growth, and the population has increased by nearly 500%. In 2004, the City adopted an updated Comprehensive Plan to guide the City's growth and development over the next 20 years, which included a 50-year vision. This vision includes balancing livability, while providing services and adopting regulation that meet the needs of City residents while complying with state and federal laws. The Comprehensive Plan was last updated in 2010.

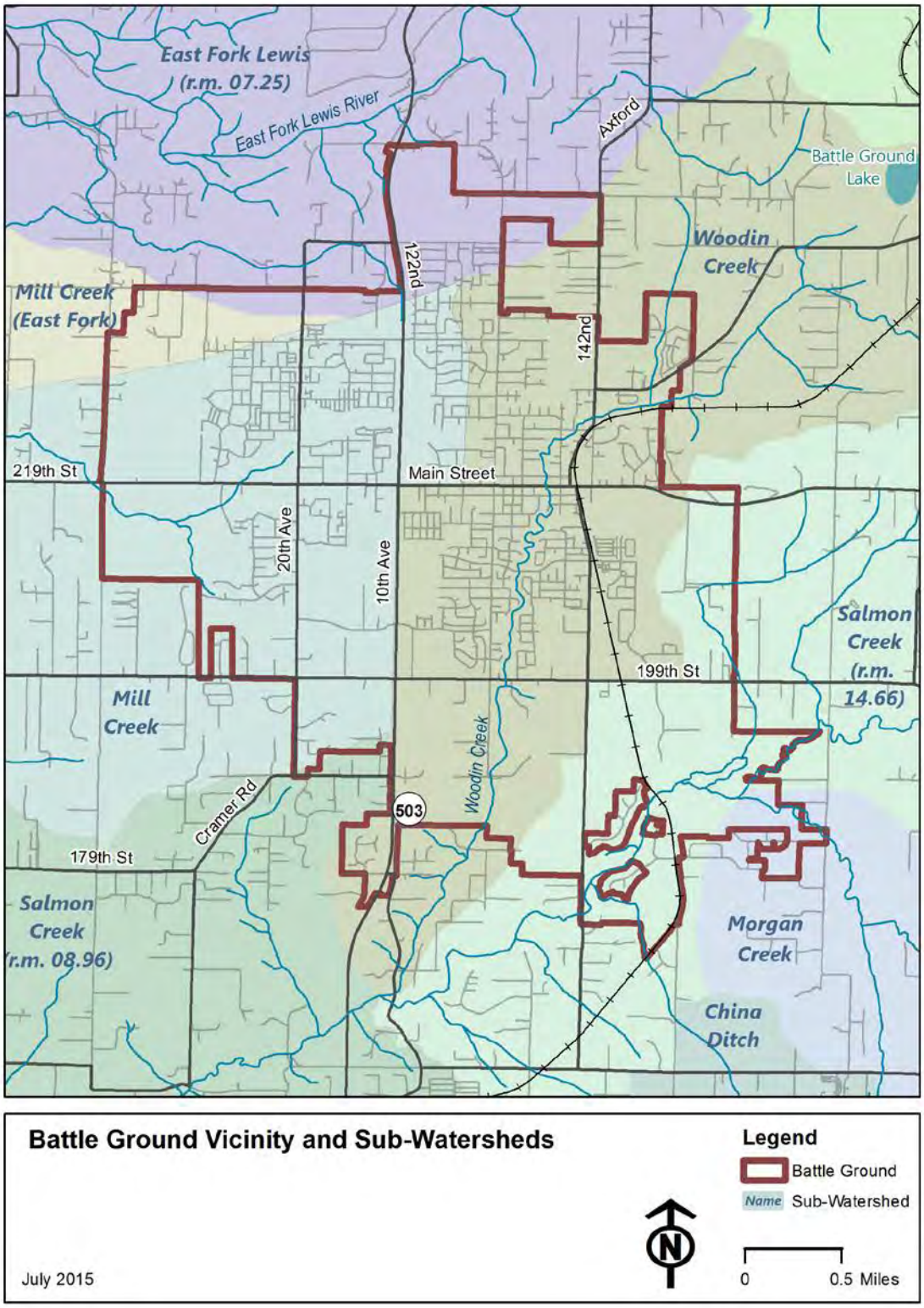
One of the primary goals of the City's Comprehensive Plan is environmental protection. Chapter Six of the Plan lays out the City's environmental goals and objectives, which recognize that a healthy environment is essential to creating a livable community. One of the environmental goals includes enhancing and protecting water quality and the need for a long-term stormwater program.

A required element of the Comprehensive Plan is a capital facilities plan to provide necessary services, such as wastewater, water, storm drainage, and other facilities, to serve the current population and future growth. The *Stormwater Management Plan* is an essential component of the capital facilities plan element, and it will be adopted in the updated Comprehensive Plan.

In 2004, the City developed its first stormwater management plan to document its stormwater program. The plan was updated in 2008 to respond to new regulatory requirements, and the City published the *Stormwater Utility Update and Stormwater Management Plan* in October of that year.

Now, in concert with an update to the City's Comprehensive Plan, due in 2016, and with an update to its municipal stormwater permit, the City is updating this plan in 2015.

Figure 1: City of Battle Ground Vicinity Map



Stormwater Management Plan Purpose

The City will use the *Stormwater Management Plan* to guide future decisions for planning, funding, and implementing the City's stormwater program, including a capital improvement program, through 2035. The plan is designed to help the City meet existing and future stormwater and surface water-related federal and state regulations, as well as local and regional drainage and water quality obligations and community priorities.

The *Stormwater Management Plan* describes how the City intends to comply with the requirements of the United States Clean Water Act, which are embodied in the Washington Department of Ecology's (Ecology) National Pollutant Discharge Elimination System and State Waste Discharge General Permit for Discharges from Small Municipal Separate Storm Sewers in Western Washington.

The *Stormwater Management Plan*, including a capital plan and funding analysis, was previously updated in 2008. In conjunction with the ongoing update to the City's Comprehensive Plan, which is expected to be completed in 2016, the City has elected to update the *Stormwater Management Plan*. The updated plan describes the current baseline program, including funding, staffing, and capital investment; describes known changes to regulating laws, rules, and permits; evaluates the potential for gaps in compliance; updates the stormwater Capital Improvement Program (CIP); and analyzes revenue needs and recommends a funding option.

Background

To manage its stormwater, the City needs to address local facility needs, reduce flooding, enhance water quality, and protect habitat areas, as well as comply with various regulatory requirements.

The City established a permanent stormwater program in 1996, with adoption of ordinance 96-802 § 1. In 2000 the City established its stormwater utility, which funds the stormwater program through rates on impervious cover of properties. The City has codified its stormwater management requirements within the Battle Ground Municipal Code (BGMC). Code provisions prohibit non-stormwater discharges into the City's drainage system and describe how stormwater must be managed on development and construction sites. An important component of the City's stormwater program is maintenance and operation of its storm drainage system.

Existing System

The City's stormwater drainage system consists of a network of pipelines and catch basins, roadside ditches, culverts and residential and commercial water quality and detention facilities. Stormwater from private systems also discharges to the City's storm system.

The City's drainage system discharges the runoff it carries to local streams, primarily Woodin and Mill Creeks, both tributaries of Salmon Creek. Protection of water quality within the receiving waters is the primary intention of federal and state regulations that require the programs and actions of the City's stormwater program. Local concern for flooding and water quality is the primary motivation for the City's Stormwater CIP, which increases capacity of the storm drainage system and provides water quality upgrades.

Regulatory Requirements

The City is subject to a suite of federal and state regulations that shape its stormwater program. Federal regulations include the Clean Water Act, the Endangered Species Act, and the Safe Drinking Water Act. Through agreements with the Washington Department of Ecology (Ecology), each of these Acts is administered in Washington by Ecology using various regulatory mechanisms. State regulations include laws that protect surface waters, drinking water, and endangered fish, and provide guidance on water resource issues.

Of these, the regulation with the greatest impact on the City's stormwater program is the Clean Water Act. The Clean Water Act's National Pollutant Discharge Elimination System (NPDES) municipal stormwater permitting program requires permittees, such as the City of Battle Ground, to control pollutants discharging into and from its municipal drainage system to the maximum extent practicable. In administering the program, Ecology issued a NPDES Western Washington Phase II Municipal Stormwater Permit (NPDES Permit) to the City of Battle Ground, which allows the City to discharge water from its stormwater drainage system to Waters of the State only under certain prescribed conditions. The City's most recent NPDES Permit was issued with an effective date in 2013, and it includes new requirements and increased performance measures.

Regulations are described in greater detail in Section 3 – Regulatory Analysis.

Ordinances and Legal Authorities

Legal authorities for the City's stormwater program operate primarily through BGMC Title 18—*Environmental Protection* and Title 13—*Water and Sewers*.

Stormwater control and drainage is addressed in Chapter 18.250. This section of the code covers development review requirements, ownership and maintenance of facilities, and

authorizes inspection for both public and private facilities. Erosion control is addressed by Chapter 18.255 and includes specific enforcement mechanisms.

Chapter 13.126—*Storm Drainage System* prohibits non-stormwater discharges to the City's drainage system and provides for specific enforcement of these provisions.

The stormwater utility and its operation are established in Chapter 13.125—*Storm Drainage Utility* and Chapter 13.105—*Utility Rates and Billing Procedure.* The City Council sets utility rates.

Chapter 20.102—*Development Code Enforcement Procedures and Penalties* covers enforcement of the City's Development Code.

Organization and Services

The City's stormwater activities are performed primarily by the Public Works Department, with assistance from the Community Development Department and administrative support from the City Manager's Office and the Finance Department.

Figure 2 (in Section 2) shows the organizational structure of the departments involved in stormwater activities, along with an estimate of the current staffing levels. In total, the City directly devotes 3.48 full time equivalents (FTE) to its stormwater program, as well as the efforts of several other staff that are paid through overhead and administrative allocations.

The majority of stormwater program services relate to the operation and maintenance of the City's storm drainage system. Regular operation and maintenance includes street sweeping; inspecting and cleaning catch basins; mowing and removing trash from ditches, swales, and stormwater detention ponds; and removing debris from culverts.

Another significant service is the design, installation, and regulation of new storm drainage infrastructure. New infrastructure is added to the City's drainage system in two primary ways. Private development projects add public stormwater infrastructure in much the same way that they add public roads. Secondly, the City develops its own capital projects to increase system capacity, correct drainage problems, and provide more water quality treatment functions. The Community Development Department oversees site plan review and permitting of development projects, while Public Works Engineering oversees construction and installation of new stormwater facilities on development projects. Public Works also manages the construction of public stormwater projects and upgrades of existing facilities. Public Works maps and maintains the infrastructure once it has been constructed and accepted.

Other activities include education and outreach; detection and elimination of illicit connections and polluted discharges to the system; and participation in Salmon Recovery and Water Resource Inventory Area (WRIA) planning that addresses Endangered Species Act (ESA) requirements for salmon habitat protection and conservation.

The organization and program activities are described in greater detail in Section 2 – Existing Stormwater Program.

Funding

The City's stormwater program is funded through a Stormwater Utility Fund. The City collects revenue through monthly charges on impervious cover of properties and through a one-time System Development Charge (SDC) on newly developed properties. The utility fees, as well as grant funding and investment interest, are used to cover the cost of stormwater program activities, while accrued SDCs and surplus operating funds are available for capital improvement projects.

The City's funding strategy and an analysis of future funding options is included in Section 5 – Financial Analysis.

Clarification of Terms

The City's stormwater program consists of the collective activities and responsibilities of staff in various departments, although primarily in the Public Works Department, to operate the City's stormwater drainage system and comply with applicable regulations relating to stormwater.

This *Stormwater Management Plan 2015-2035* is intended as a long-range planning document and includes the City's Stormwater CIP.

The City is also required to create and document an annual *Stormwater Management Program (SWMP)* and submit it with the City's NPDES Annual Report to the Washington Department of Ecology. Each year, the annual *SWMP* contains a comprehensive plan for NPDES Permit compliance for the upcoming calendar year; it does not include stormwater management activities that fall outside of the regulatory authority of the City's NPDES Permit. Requirements of the City's NPDES Permit are described further in Section 3.

Approach

In November 2014, the City hired Otak, Inc. (Otak), in conjunction with Financial Consulting Solutions Group, Inc. (FCS GROUP), to update its 2008 *Stormwater Utility Update and Stormwater Management Plan*. The intent of the project was three-fold:

- Update the list, priorities, and costs of the Stormwater CIP.
- Review the status of the City's existing stormwater program, compare it with the requirements of the NPDES Permit, document the City's other water resource related commitments and obligations, and estimate the resources needed to meet regulatory requirements.
- Review and recommend updates to the stormwater utility fees and charges as needed to fund the compliance program and capital improvements.

City staff, Otak, and FCS GROUP worked closely in a collaborative process to develop the analyses and recommendations contained in this plan.

Section 2 – Existing Stormwater Program

This section describes the City's existing stormwater program as a baseline for identifying potential regulatory compliance gaps in Section 3.

The major components of the City's program were in place prior to 2007, when the City was first issued a NPDES Permit. Several significant updates were made to comply with the 2007-2012 NPDES Permit, and the City's current stormwater program is largely based on those initial existing components and the changes made beginning in 2008.

Method

City staff described and summarized the City's current stormwater program based on calendar year 2014, with a focus on the NPDES Permit-related elements. Otak gathered additional information through meetings and correspondence with City staff to develop this baseline program description.

Following the organization of the 2008 plan, the City's stormwater program was divided into 14 elements for evaluation, as follows:

NPDES Phase II Municipal Stormwater Permit Elements

- Element 1: Public Education and Outreach
- Element 2: Public Involvement and Participation
- Element 3: Illicit Discharge Detection and Elimination
- Element 4: Controlling Runoff from New Development, Redevelopment, and Construction Sites
- Element 5: Municipal Operations and Maintenance
- Element 6: Program Implementation
- Element 7: Total Maximum Daily Loads (TMDLs)
- Element 8: Monitoring
- Element 9: Reporting

Other Stormwater-Related Regulatory Requirements

- Element 10: Underground Injection Control Rule
- Element 11: WRIA #27/28 Lewis, Salmon-Washougal Watershed Plan
- Element 12: Endangered Species Act (ESA)

Capital and Administrative Needs

- Element 13: Capital Projects
- Element 14: Additional Activities

Program Description by Element

Element 1: Public Education and Outreach

The City's public education and outreach program involves delivering messages about water quality and the effects of stormwater on surface waters to adult and child audiences. The City uses both direct and indirect methods to reach audiences.

City staff helps guide a monthly water quality monitoring program for middle school students. Information is distributed to establishments such as restaurants regarding proper waste disposal and environmental concerns. The City provides brochures, fliers, and bookmarks at City Hall and community events. Information is also posted on the City's website.

Element 2: Public Involvement and Participation

Public involvement and participation refers to creating opportunities for the general public to participate in decision-making regarding the stormwater program. Currently, the City relies on public meetings and hearings before the Planning Commission and City Council as its primary mechanisms for public involvement and participation. The City also posts its NPDES Annual Report and annual *Stormwater Management Program* (*SWMP*) on its website.

Element 3: Illicit Discharge Detection and Elimination

The City maintains a map of its storm drainage system which is updated regularly as new public infrastructure is added. The City approved an Illicit Discharge Ordinance (Ordinance No. 09-10) in 2009 to prohibit entry of non-stormwater discharges into the storm drainage system. The City began its illicit discharge program in 2011.

Element 4: Controlling Runoff from New Development, Redevelopment, and Construction Sites

The City has adopted standards for controlling stormwater runoff from new development, redevelopment and construction sites consistent with requirements in the 2007-2012 NPDES Permit. The City has a well-developed regulatory program that includes plan review, construction inspection, post-construction inspection, and enforcement of erosion control and permanent stormwater control requirements.

Element 5: Municipal Operations and Maintenance

The City conducts a maintenance program for stormwater infrastructure that includes street sweeping, catch basin cleaning, spot checks after minor and major storm events, and facility upkeep and maintenance. Operations crews respond to minor flooding and drainage concerns of property owners. The City has developed a Storm Water Pollution Prevention Plan (SWPPP) for its Operations Center.

The City is currently using Lucity to develop a database system to record, track and report maintenance activities to demonstrate compliance with Permit requirements.

Element 6: Program Implementation

The City meets the requirements of the Permit, including its obligation to develop an annual *SWMP*.

Element 7: Total Maximum Daily Loads (TMDLs)

The City is subject to the Salmon Creek Tributaries TMDL for bacteria, turbidity and temperature. A detailed Implementation Plan describes the TMDL requirements. Compliance with these plans is achieved through implementation of Permit requirements, and is required in the Permit.

Element 8: Monitoring

The City has not conducted any water quality monitoring and is not required to do so under the current Permit. The City contributes funds to the Regional Stormwater Monitoring Program (RSMP) for effectiveness monitoring and source identification diagnostic monitoring.

Element 9: Reporting

The City meets its obligations to develop an NPDES Annual Report each year, which includes a written *SWMP*. The City posts these documents on its website.

Element 10: Underground Injection Control (UIC) Rule

The UIC Rule applies to those municipalities that use injection wells as a means of disposing of surface water. There currently are no public infiltration facilities in Battle Ground that qualify as UIC wells used for stormwater management, and opportunities for new infiltration facilities to be created in the future are limited. In the future, if any publicly owned infiltration facilities are constructed for stormwater management, Ecology approval will need to be obtained prior to use.

Element 11: WRIA #27/28 Lewis, Salmon-Washougal Watershed Plan

The City has been involved in watershed planning associated with the Lewis, Salmon-Washougal Watershed Plan led by the Lower Columbia Fish Recovery Board (LCFRB). City staff has also been involved in salmon recovery planning through participation in development of the Lower Columbia Habitat Status and Trends Monitoring (HSTM) project. The City's involvement in these plans and projects includes attendance at meetings and implementing its stormwater program in compliance with its NPDES Permit.

Element 12: Endangered Species Act (ESA)

The City has included the reduction of stormwater runoff, stormwater runoff treatment, erosion and sediment control, and protection of critical areas from further loss and degradation as goals in the City's Comprehensive Plan. The City also participates in the regional WRIA watershed planning process, which has incorporated ESA compliance involving habitat protection and enhancement, and has partnered with LCFRB.

Element 13: Capital Improvement Projects

The City has an ongoing Stormwater CIP to increase system capacity, correct drainage problems, and provide water quality treatment and structural source control. The City completed three projects from the 2008 plan. The highest priority project from the 2008 plan was to construct a decant facility to properly handle the City's solid wastes from street sweepings and catch basin cleaning.

Element 14: Additional Activities (overhead, professional services, taxes, program administration)

For this element, the 2014 Budget identified office supplies, equipment replacement, equipment rental, program overhead, professional services agreements and administration and support. The City's Drainage Fund pays for a number of program overhead items such as Insurance, Excise Tax, Training and Travel. The City uses annual contracts for outside help as the need arises throughout the year.

Program Staffing

The City's stormwater activities are performed primarily by the Public Works Department, with assistance from the Community Development Department and administrative support from the City Manager's Office and the Finance Department. Figure 2 shows the organizational structure of the departments involved with stormwater activities, along with an estimate of current staffing levels.

In total, the City directly devotes 3.48 FTE to its stormwater program, and indirectly draws on the efforts of several other staff that are paid through overhead and administrative allocations.

Direct Stormwater Program Staffing

The Public Works Director devotes 0.15 FTE to stormwater program supervision.

The Public Works Supervisor is responsible for management of the stormwater operations and maintenance program. He performs planning functions and supervises flood and storm response, stormwater facility maintenance, catch basin cleaning, and street sweeping at 0.37

FTE per year. Four maintenance workers, several seasonal workers, and a clerk devote 1.7 FTE to stormwater facility maintenance and operations activities.

The City Engineer devotes 0.03 FTE to stormwater management activities, including supervision of development review functions, construction inspectors (Engineering Technicians), and NPDES Technician (Engineering Technician). Construction inspectors and the NPDES Technician conduct the majority of the regulatory fieldwork, such as inspecting development sites, drainage complaint response, and NPDES internal coordination at 1.07 FTE. Two Associate Civil Engineers devote 0.1 FTE to development review associated with stormwater.

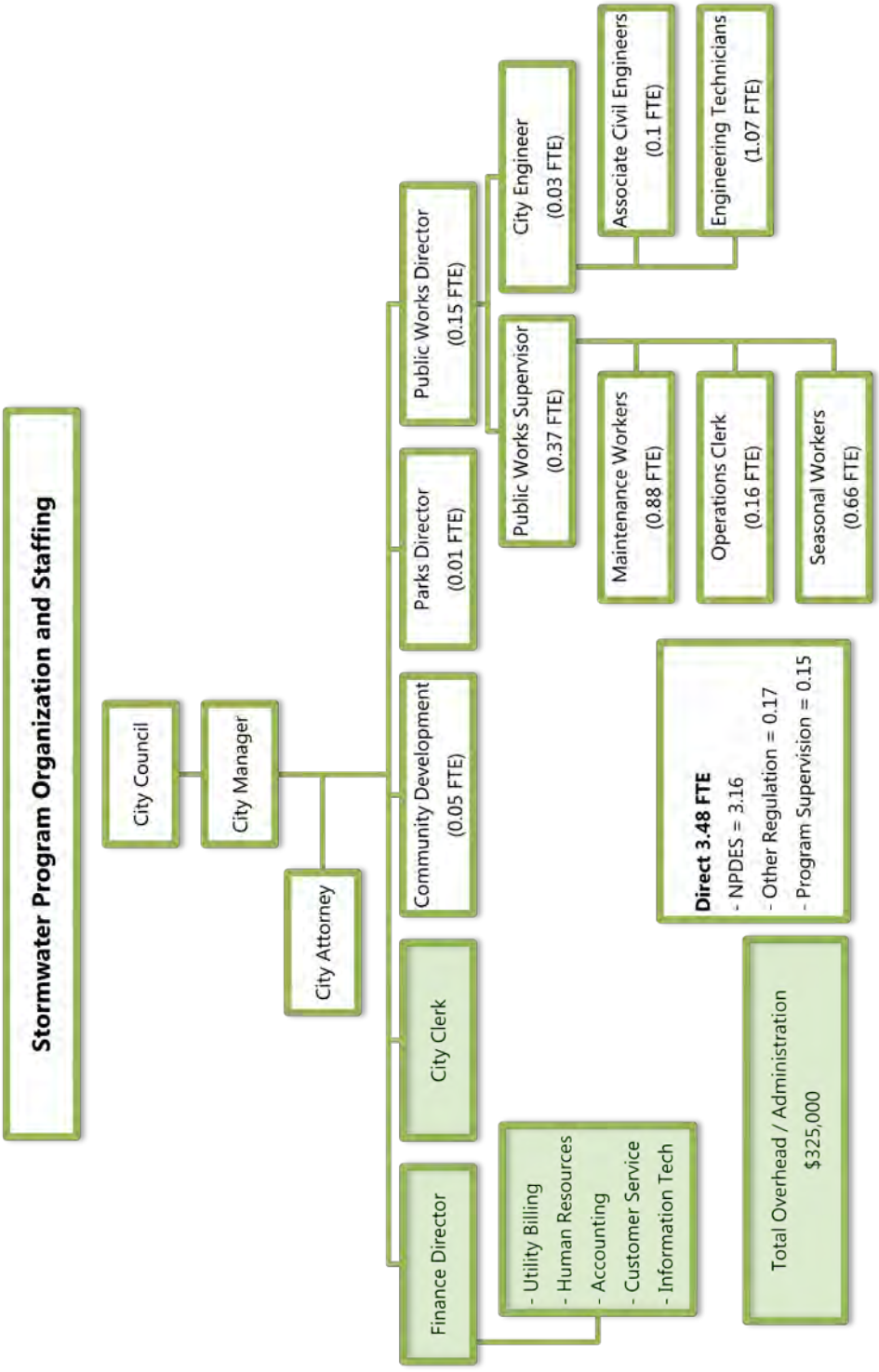
The Community Development Department coordinates development review and handles computerized permit tracking for development review at 0.05 FTE.

The Parks Director coordinates stewardship activities that include a stormwater focus at 0.01 FTE.

Overhead and Administration

Budgeted overhead pays for support from other City departments. The Finance Department provides support functions for utility billing, human resources, accounting, customer service and information services. The City Manager's office provides additional support services. The Police Department is responsible for enforcing stormwater aspects of the city code; however, no costs are charged to the stormwater program.

Figure 2: Stormwater Program Organization and Staffing - Current



Section 3 – Regulatory Analysis

The City is subject to a suite of federal and state regulations that shape its stormwater program. The existing program described in Section 2 was developed to address regulations effective in 2008. Changes to the NPDES Permit since 2008 result in the potential for gaps in compliance should the City continue to implement its current stormwater program with no changes.

This analysis first describes current regulatory requirements and then compares the City's existing program with new requirements to determine potential areas of non-compliance.

Although the planning horizon for this document extends to 2035, the regulatory analysis extends only to about 2019, near the end of the current NPDES Permit term.

Method

The status and requirements of rules, laws, and permits that shape and influence the City's stormwater program were examined, specifically focusing on how requirements may have changed since the 2008 plan.

Then, the description of the City's current program (Section 2) was compared to current requirements to reveal potential gaps in compliance.

Regulatory Requirements

The broad outline of the regulatory framework influencing the City's stormwater program has not changed since 2008. However, changes within individual laws, rules, and permits necessitate a review of requirements.

In the area of surface water management, the City is subject to the requirements of the:

- National Pollutant Discharge Elimination System (NPDES) Western Washington Phase II Municipal Stormwater Permit, issued August 1, 2012 and modified January 16, 2015.
- Salmon Creek Tributaries Bacteria and Turbidity Total Maximum Daily Load (TMDL), March 2005.
- Salmon Creek Temperature Total Maximum Daily Load Water Quality Implementation Report and Implementation Plan, October 2011.
- Underground Injection Control (UIC) Rule.
- Endangered Species Act (ESA).
- Water Resource Inventory Areas (WRIAs) 27-28, Watershed Planning.

Of these, the only significant changes since 2008 were contained within the City's NPDES Permit. Other regulations that are unchanged or largely unchanged are summarized below but are not included in the gap analysis.

NPDES Permit (Stormwater Program Elements 1 – 9)

The City has been permitted under the National Pollutant Discharge Elimination System (NPDES) Western Washington Phase II Municipal Stormwater Permit (Permit) since 2007. The Permit, issued by Washington Department of Ecology (Ecology), is issued under the authority of the United States Water Pollution Control Act, better known as the Clean Water Act.

The Clean Water Act's objective is to restore and maintain the integrity of the nation's surface waters. Toward that end, it gives the United States Environmental Protection Agency (EPA) the authority to regulate discharges into navigable waters and to administer a variety of regulatory mechanisms to protect and restore surface waters. Two mechanisms pertinent to the City are the Total Maximum Daily Load (TMDL) limitations and the National Pollutant Discharge Elimination System (NPDES), described below.

Under section 303(d) of the Act, states and other authorities develop lists of impaired surface waters and develop limits to the amount of a pollutant or pollutants that an impaired water body can receive. The limits are expressed as TMDLs, which apply to operators of point and nonpoint discharges to surface waters. In Washington, Ecology issues detailed implementation plans to guide water quality improvements.

The NPDES program is another way to regulate discharges under the Act. Regulated discharges include those from wastewater treatment plants, industrial facilities, and municipal stormwater drainage systems, among several others. Section 402 of the Act established the NPDES program, which is a system of permits allowing EPA to control discharges by imposing conditions before discharge is permitted. Permits for municipal stormwater drainage systems are included in the NPDES program.

In Washington, EPA has delegated the authority to issue and enforce NPDES permits to Ecology. Ecology also combines requirements from Washington's own Water Pollution Control Act into NPDES permits that it issues. Under this combined federal and state authority, Ecology issues several types of NPDES permits that cover different types of discharges to surface waters. The City of Battle Ground is subject to the NPDES Western Washington Phase II Municipal Stormwater Permit, which is issued to operators of small municipal separate storm sewer systems.

The Permit is a general permit commonly issued for 5-year periods. The City was first covered under the Permit in 2007. Through an extension, the previous Permit requirements lasted through 2013.

In 2012, the current Permit was issued with effective dates of August 2013 to July 2018. The Permit was modified in December 2014, with an effective date of January 2015 and no change to the expiration date.

The 2015 permit modification is the basis for the NPDES regulatory analysis in this plan.

The following sections list new or changed performance measures and requirements compared to the City's previous NPDES Permit issued in 2007. New requirements and milestones are shown in Figure 3.

Element 1: Public Education and Outreach

Permit section S5.C.1.a.ii contains a new goal of affecting behavior change in target audiences through the permittee's outreach program, and section S5.C.1.c. contains a new requirement to measure the understanding and adoption of targeted behavior for the said audiences. The measurements must be used to direct the permittee's outreach resources most effectively.

Element 2: Public Involvement and Participation

There are no substantive changes to the Public Involvement and Participation requirements.

Element 3: Illicit Discharge Detection and Elimination

Permit section S5.C.3.a includes a requirement to map more aspects of the City's storm drainage system, including tributary conveyances of outfalls greater than 24 inches in diameter. In addition, changes to definitions for outfalls, discharge points, and connections could prompt a review of the existing storm sewer mapping terminology to ensure consistency with Permit language. These updates are due by February 2, 2018.

S5.C.3.b. requires minor adjustments to the City's municipal code prohibiting illicit discharges and illicit connections to the City's storm drain system, which is BGMC 13.126, by February 2, 2018.

S5.C.3.c. includes a new performance measure to field screen at least 40% of the City's storm drain system to identify potential sources of illicit discharges and illicit connections by December 31, 2017. The requirement represents a significant increase in effort from the previous permit.

Element 4: Controlling Runoff from New Development, Redevelopment, and Construction Sites

Sections S5.C.4.a and b include a requirement to adopt the Minimum Requirements, thresholds, definitions, requirements, limitations, and criteria of the 2014 *Stormwater Management Manual for Western Washington* (SWMMWW) for stormwater control on new development, redevelopment, and construction sites by December 31, 2016. The effort involved for the City to adopt new standards of direct stormwater control should be modest, although staff training on new standards may require some effort.

S5.C.4.c.iv includes a new inspection performance measure that begins in 2017 to inspect permanent treatment and flow control facilities and catch basins in new residential developments every six months until 90% of the lots are constructed or until the site is fully stabilized beginning in 2017.

S5.C.4.f is a new requirement. The City must review and revise its development codes and standards to incorporate and require Low Impact Development (LID) principles and best management practices. The Permit cites an intensive and months-long process described in *Integrating LID into Local Codes: A Guidebook for Local Governments* (Puget Sound Partnership, 2012) as the guidance for meeting the requirement. The requirement is due by December 31, 2016.

S5.C.4.g is a new requirement for watershed-scale stormwater planning that does not apply to the City of Battle Ground in this term. Future permits may apply this requirement to the City, which, if they closely follow requirements for affected permittees in this term, could represent significant effort and cost.

Element 5: Municipal Operations and Maintenance

Section S5.C.5.a addresses maintenance standards for the City-operated permanent stormwater treatment and control facilities (e.g. bioswales and detention ponds). The section requires the City to adopt maintenance standards for stormwater facilities that are as protective of facility function as those in the 2014 SWMMWW by December 31, 2016. This requirement will be met through the effort to adopt a stormwater code and manual consistent with Ecology's manual in Element 4, above.

Section S5.C.5.d addresses inspection and maintenance of City-operated catch basins and inlets. The performance measure in this section includes a requirement to inspect and clean catch basins at a slightly increased rate compared to the previous permit term (25% per year, compared to 20%) until 2017. Beginning in 2018, the required rate increases to 50% per year.

Element 6: Program Implementation

There are no changes to requirements regarding program implementation.

Element 7: Total Maximum Daily Loads (TMDLs)

Section S7 requires compliance with applicable TMDLs. Impaired waters of Woodin Creek, which is subject to the Salmon Creek Watershed Bacteria and Turbidity TMDL, flow through Battle Ground. Accordingly, the City is subject to the Salmon Creek Tributaries TMDL for bacteria, turbidity and temperature. Compliance with TMDL is achieved through implementation of NPDES Permit requirements.

In 2015, Ecology is proposing an update to its statewide Water Quality Assessment and 303(d) List, which uses monitoring data to rate water quality concerns and to prioritize creation and enforcement of TMDL water cleanup plans. The proposed updates include a change in the method used to map polluted streams and rivers.

Under the new mapping system, the beginning and ending points of listed impaired reaches of Woodin Creek move, and the impaired reaches appear longer. This change is unlikely to cause changes to the Salmon Creek Watershed Bacteria and Turbidity TMDL.

Under the current Permit, compliance with the Salmon Creek Watershed Bacteria and Turbidity TMDL is achieved through compliance with the Permit conditions. Ecology reserves the right to include specific actions for permittee TMDL compliance in Appendix 2 of the Permit. Future permit cycles could include specific TMDL-related actions and performance measures for Battle Ground.

Element 8: Monitoring

Section S8 requires the City to monetarily contribute to the Regional Stormwater Monitoring Program (RSMP) for effectiveness monitoring and source identification diagnostic monitoring. This is a change that has no effect on staffing.

Element 9: Reporting

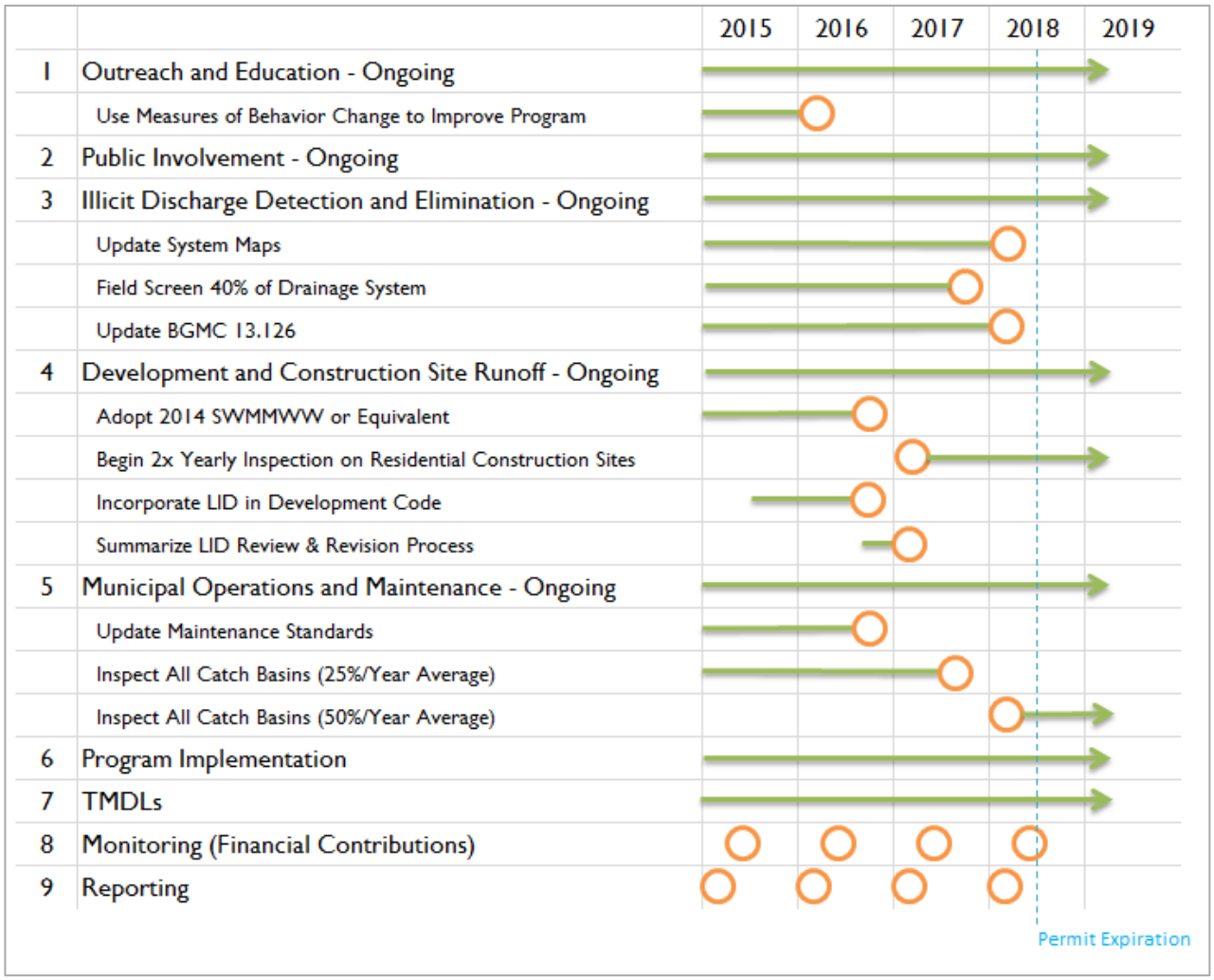
Reporting requirements have not changed.

Other

Additional permit conditions, such as Special Conditions S1 through S4 and General Conditions G1 through G20, also apply to the City of Battle Ground, though they do not result in specific program activities. These additional conditions cover topics such as who is covered by the Phase II Permit, what discharges are authorized under the permit, and legal guidelines for transferring, revoking, and appealing the permit. Penalties for non-compliance are also included.

These permit conditions have not changed.

Figure 3: NPDES New Requirements and Milestones



Other Stormwater-Related Regulatory Requirements (Elements 10 – 12)

Element 10: UIC

With the passage of the Safe Drinking Water Act by Congress in 1974, the EPA created the Underground Injection Control (UIC) Program as one of the key programs for protecting drinking water sources. In 1984, Ecology received authority from EPA to regulate UIC wells and adopted the UIC Rule, Chapter 173-218 WAC.

A UIC well is a human-made hole that is used to put water or other fluids into the ground. In Washington, most of these wells are used to dispose of septic wastes and stormwater

runoff. Even though UIC wells are used for stormwater management, there is no overlap between the UIC Rule and NPDES Permit requirements.

In 2006, Ecology adopted revisions to the UIC Rule. The rule applies to both new and existing UIC wells. As it relates to stormwater management, the rule regulates Class V UIC wells, which must be registered and rule authorized (meet the non-endangerment standard) or receive a state waste discharge permit issued by Ecology to operate. The rule also requires annual updates to Ecology on well status changes and sets specific criteria for well decommissioning and associated notifications.

Exemptions from UIC well status include infiltration ponds, dispersion systems, or infiltration trenches that do not contain perforated pipe. Storm drain components that contain perforated pipes, drain tiles, or other similar mechanisms designed and intended to convey water directly or indirectly to a surface water body are not considered UIC wells, and are not regulated by the UIC Rule.

Because subsurface geology in Battle Ground is generally incompatible with infiltration, the City does not own UIC wells, such as drywells, and does not have a program to comply with the UIC Rule. It is not anticipated that this will change during the timeframe of this plan.

Elements 11-12: Endangered Species Act

In 1998, the United States government listed steelhead and bull trout as threatened in the lower Columbia River. In addition to these listings, Chinook and chum salmon were listed as threatened in 1999. In mid-2005 coho salmon were also listed as threatened. Section 4(f) of the Endangered Species Act (ESA) requires that recovery plans be prepared for listed species. Recovery plans, however, are guidance documents, not regulatory documents. Recovery plans are intended as road maps for species recovery and a tool for decision making throughout the recovery process.

While recovery planning under the ESA is a federal responsibility, Washington State elected to take a proactive approach to salmon recovery. In 1998 and 1999, the state legislature passed the Salmon Recovery Planning Act, the Salmon Recovery Funding Act, and the Watershed Planning Act. The intent behind these acts was to involve local watershed groups in watershed management and habitat protection and restoration. In 1999, Governor Locke adopted the "Statewide Strategy to Recover Salmon: Extinction is Not an Option" and formed the Office of Salmon Recovery.

Concurrently, with the ESA salmon recovery planning, local governments responded to these listings by putting in place policies and practices to protect and restore these fish populations and their habitats. The Watershed Planning Act (RCW 90.82) provides local governments a framework and resources for developing local solutions to watershed issues

on a watershed basis. The Department of Ecology and other state resource agencies frequently use a system of 62 "Water Resource Inventory Areas" (WRIAs) to refer to the state's major watershed basins.

In order to integrate salmon recovery planning into watershed planning, twelve State agencies signed a Memorandum of Understanding for the coordinated implementation of the Watershed Planning Act and the Salmon Recovery Planning Act. The Memorandum clarifies roles and responsibilities, fosters cooperative working relationships between state agencies, local governments and tribal governments, and, where possible, simplifies implementation procedures. WRIA watershed planning is used as a tool to integrate water resource planning issues, including salmon protection and recovery.

The City of Battle Ground is included in WRIA 27/28. The Lower Columbia Fish Recovery Board (LCFRB) is the "Lead Agency" for the *Salmon-Washougal and Lewis Watershed Plan* and also coordinated the development of the *Lower Columbia Salmon Recovery and Fish and Wildlife Subbasin Plan* in accordance with listings under ESA. Many stakeholders are involved in the planning associated with this WRIA process at local, regional, state, and federal levels.

On December 15, 2004 organizations including the Governor's Salmon Recovery Office, the National Oceanic and Atmospheric Administration (NOAA) Fisheries, and the US Fish and Wildlife Service accepted the *Lower Columbia Salmon Recovery and Fish and Wildlife Plan*. The Plan was updated in 2010 and NOAA incorporated it into the *Lower Columbia Salmon & Steelhead Recovery Plan* in 2013. The plan is one part of the regional effort to ultimately restore threatened anadromous fish species and rebuild other focal fish and wildlife species in the lower Columbia River region. By providing a common basis for reaching salmon recovery goals, the various agencies involved can share responsibilities without overlapping efforts.

In 2012, LCFRB and other partners began funding an integrated habitat status and trends monitoring (HSTM) strategy for the lower Columbia evolutionary significant unit (ESU) for endangered and threatened salmon, which includes watersheds in both Washington and Oregon. The integrated monitoring design and results will enable a more meaningful assessment of the region's water quality and habitat conditions and may inform future NPDES municipal stormwater permits in Washington. The project continues with implementation planning beginning in 2015.

The watershed and salmon recovery plans recognize that salmon recovery is a long-term process that is viewed as a dynamic and evolving initiative. As such, the plans lay out frameworks for monitoring and adaptive management strategies to guide recovery efforts through 2030.

The City does not anticipate there will be projects or activities in these plans for City implementation.

Gap Analysis

The City's existing program as described in program documents and by City staff (see Section 2) was compared with current regulatory requirements influencing the City's stormwater program to determine potential current and future gaps in compliance.

The analysis revealed several program strengths and did not uncover existing compliance gaps. The City's strengths include:

- A well-developed construction pollution prevention program that includes weekly site monitoring by specialists in commercial and residential construction (an Engineering Technician and Building Inspector, respectively).
- A catch basin inspection program that is meeting current performance measures.
- Outreach to students through monthly participation in a middle school water quality monitoring program.

With NPDES Permit deadlines for meeting new requirements and updated performance measures approaching in 2015, 2016, and 2017, as well as rolling deadlines for stormwater facility maintenance that are based on results of facility inspections, the analysis shows that the City will need to focus resources as follows:

- Substantially more resources on facility maintenance.
- Additional resources on prevention of pollution in the drainage system through illicit discharge detection and elimination.
- Regulating construction and post-construction stormwater controls in development.

A summary analysis of each Permit element is given below. A detailed Gap Analysis is included as Appendix A.

Element 1: Public Education and Outreach

No gaps in compliance were found. However, several brochures the City distributes are outdated and should be updated for continued circulation.

In 2015, the City will need to develop and implement a targeted outreach program that reaches a targeted audience, and use tools to measure adoption of targeted behaviors. In 2016, the City will need to summarize how it has effectively directed resources to its outreach program in response to lessons learned.

Element 2: Public Involvement and Participation

No gaps in compliance were found.

The City could elect to create more opportunities for citizen involvement in the stormwater program budget if City Council will consider an increase in utility rates and connection fees in 2015 or 2016.

Element 3: Illicit Discharge Detection and Elimination

The City is carrying out all required elements of IDDE. The performance of some elements may be insufficient to maintain permit compliance without increased effort, and new requirements and performance measures will require increased effort.

Increase in Effort for Existing Requirements

The City needs to fill some geographic gaps in its drainage system map. The City's existing IDDE program needs to be documented, and preferably would include standard operating procedures for field assessment, spill response, characterization, source tracing, and source termination. The City may also need to train additional municipal staff to recognize, report, and respond to potential illicit discharges and connections.

New Requirements

The City will need to meet several new requirements and performance measures in the Permit term.

The City must map tributary basins to outfalls greater than 24 inches diameter.

An update to BGMC 13.126 to incorporate modifications to allowable and conditionally allowable discharges is required.

The City must plan and implement a field screening program to screen 40% of the drainage system for illicit connections and discharges by the end of 2017. It is assumed that training requirements and record-keeping efforts will increase as field screening activities increase.

Element 4: Controlling Runoff from New Development, Redevelopment, and Construction Sites

No gaps in compliance were found.

The City will need to respond to two one-time efforts: 1) stormwater standards and thresholds must be revised to reflect the current SWMMWW, and 2) development codes must be reviewed and revised to incorporate LID principles. As a result of the required regulatory changes, it is anticipated that maintaining compliance with private development

review performance measures will demand an ongoing increase in effort to regulate and enforce stormwater standards on private development projects.

The City also needs to ensure that maintenance of private permanent treatment and flow control facilities is enforced within Permit timelines, and it appears that more effort will be needed to maintain compliance.

Element 5: Municipal Operations and Maintenance

The City is carrying out all required elements of municipal operations and maintenance. The performance of four elements may be insufficient to maintain permit compliance without increased effort. One new requirement will require a one-time effort.

Increase in Effort for Existing Requirements

The City completed the first full inspection of its entire inventory of permanent stormwater treatment and flow control facilities in 2014. The results of these inspections revealed numerous facilities in need of significant repairs, such as removal of sediment and undesirable trees; re-grading; replanting; and repair of structures such as inlets, outlets, control structures, and level spreaders. The City will need to increase its facility maintenance program to accurately characterize its maintenance needs and to address deficiencies within Permit timelines. The pertinent timelines are within one year for typical maintenance and within two years for maintenance that requires capital construction of less than $25,000. At the same time the City must continue to perform typical facility upkeep such as mowing and trash removal at its facilities.

The catch basin inspection and cleaning program must increase from 20% of the system per year to 25% per year immediately and to 50% of the system per year beginning in 2018.

The City may need to ensure that more Public Works field staff receives training on the importance of protecting water quality, operations and maintenance standards, and procedures and best management practices for avoiding introducing pollutants to stormwater during the normal course of their work.

The City needs to begin a routine pollution prevention inspection of its Operations Center and review and update of the center's Stormwater Pollution Prevention Plan.

Finally, as each inspection and maintenance requirement necessitates detailed record-keeping to meet Permit requirements, the City needs to improve record-keeping for all elements of the municipal operations and maintenance program. This process has already been started with an effort to install the Lucity maintenance and asset management system. The increase in effort associated with this system is scheduled to continue at least through 2018.

New Requirement

The new Permit requirement is to update maintenance standards. A one-time effort will be necessary to adopt these.

Element 6: Program Implementation

There are no gaps in program implementation.

Element 7: Total Maximum Daily Loads (TMDLs)

Since compliance with the NPDES Permit constitutes compliance with the Salmon Creek Tributaries TMDL for bacteria, turbidity and temperature, there are no specific regulatory gaps in the City's response to the TMDL. However, if the City fell out of compliance with its Permit, the City's TMDL compliance could also be in jeopardy.

Element 8: Monitoring

There are no gaps in the City's response to its monitoring requirements.

Element 9: Reporting

There are no gaps in the City's response to its reporting requirements.

Element 10: Underground Injection Control Rule

There are no gaps in the City's response to this rule.

Element 11: WRIA #27/28 Lewis, Salmon-Washougal Watershed Plan

There are no gaps in this activity.

Element 12: Endangered Species Act (ESA)

There are no gaps in this activity.

Element 13: Capital Improvement Projects

The Stormwater CIP contributes to meeting the City's obligations under the Growth Management Act to plan for capital facilities to serve growth. No specific regulatory gaps are identified. Some facility maintenance obligations described in Element 5 may be met through the CIP, and some capital projects may help the City meet its voluntary commitments in Elements 11 and 12. Finally, stormwater capital projects are essential to meeting community priorities for drainage capacity, reduced flooding, and water quality protection.

Element 14: Additional Activities (overhead, professional services, taxes, program administration)

These activities assist with administration of the stormwater program and do not have a direct role in regulatory compliance.

Gap Summary

The Gap Analysis shows several pending Permit requirements, milestones, and performance measures to which the City must allocate resources. These include:

- Measuring behavior changes of a target audience resulting from an outreach program.
- Mapping tributary conveyances to outfalls from the storm drainage system and updating maps.
- Establishing a field screening program to search for and respond to potential illicit discharges and illicit connections to the storm drainage system, and screening 40% of the system.
- Developing a one-time plan to review and revise development codes to incorporate LID principles.
- Adopting the 2014 SWMMWW.
- Planning for increased site plan review and construction-site inspection obligation when thresholds for stormwater control on development sites are lowered in 2017.
- Ensuring maintenance enforcement for private stormwater facilities meets Permit timelines.
- Addressing non-routine maintenance and repairs of permanent treatment and flow control facilities within Permit timelines when a maintenance standard is exceeded.
- Increasing frequency of catch basin inspection and maintenance.
- Improving recordkeeping across several permit elements.

The Gap Analysis shows a need for an additional 1.74 FTE to comply with Permit requirements and performance measures. Recommended changes to staffing are summarized in Table 1.

Table 1: Estimated Staffing Needs

	Current FTE	Future FTE	Class-ification	Justification / Notes
Education and Outreach	.08	.14		No change to staffing recommended.
Public Involvement	.02	.02		No change to staffing recommended.

IDDE	.13	.26	Engineering Technician	Implement a comprehensive field screening program, proactively address illicit discharges and connections, increase staff training, and improve record-keeping
Controlling Runoff from Development	.47	.58	Civil Engineer, Engineering Technician, Building Inspector	Update stormwater code, leading to expected increase in stormwater site plan reviews (private development review) and construction inspections. Address a backlog of enforcement for private facility maintenance
Municipal Operations and Maintenance	2.26	3.34	Maintenance Worker, Engineering Technician	Address a list of non-routine and capital facility maintenance tasks within Permit timelines. Increase catch basin inspection frequency. Improve the ongoing training program for municipal staff whose job functions may impact stormwater quality. Also see Capital Stormwater Program, below.
Program Implementation	.11	.08		No change to staffing recommended.
Monitoring & Assessment	.03	.02		No change to staffing recommended.
NPDES Reporting	.05	.05		No change to staffing recommended.
Total NPDES	**3.16**	**4.5**		
Capital Planning & Design	.17	.57	Civil Engineer	Address design, project management, construction management, and grant management for proposed Capital Improvement Program. Address design and support needs for facility capital maintenance projects.
Overall Stormwater Program Oversight	.15	.15		No change to staffing recommended.
Program Total	3.48	5.22		

A detailed Gap Analysis is included as Appendix A.

Conclusions

The City of Battle Ground's stormwater program is responding to all known regulatory requirements, and no new applicable regulations have been established since the 2008 *Stormwater Utility Update and Stormwater Management Plan*. However, specific requirements within the NPDES Permit have changed.

The Gap Analysis shows that the City's primary need to respond to the increased requirements of the current Permit is operational. The City is currently employing 3.48 FTE to operate all aspects of its stormwater program. The Gap Analysis shows a need for an average of 5.22 FTE from 2015 to 2018 to maintain ongoing compliance activities, improve operational performance in key areas to maintain compliance, and meet new requirements and performance measures with deadlines in 2015, 2016, and 2017, as well as ongoing increased level of effort associated with new requirements and performance measures.

Future Planning

A third NPDES Permit for Battle Ground and other western Washington Phase II permittees is expected with an effective date in 2018. Requirements in the current Permit that are not applicable to Battle Ground could become applicable in the next cycle. In addition, Washington's Phase I NPDES permittees are subject to two requirements that have not yet been applied to Phase II permittees; this could change in future permit cycles. A list of conceivable future NPDES permit requirements or compliance actions includes:

- Watershed-scale stormwater planning, with potential requirements to update land use policies.
- Specific requirements and performance measures for compliance with the Salmon Creek Watershed Bacteria and Turbidity TMDL.
- Specific requirements and performance measures for operational or capital programs resulting from HSTM results.
- Source control (required in the Phase I permit).
- Capital retrofit of developed areas for water quality (required in the Phase I permit).

The City could plan to track pending requirements and respond accordingly as draft Permits are released for comment, presumably in 2017.

Section 4 – Capital Needs Assessment

Introduction

The City's Stormwater Capital Improvement Program (CIP) has been updated for 2015. The previous update occurred in 2008.

The Stormwater CIP focuses primarily on drainage improvements, and also includes structural source controls and a water quality treatment project.

The City worked closely with Otak and FCSG in a collaborative process to develop the 2015 – 2035 Stormwater CIP. City engineering staff identified and selected projects and provided draft cost estimates. Otak then reviewed draft cost estimates, and FCSG proposed an implementation schedule based on funding availability. Methodologies for these activities are described below.

Table 2 shows the proposed 2015 – 2035 Stormwater CIP Summary, with 16 projects at a cost of $10.3 million.

Table 2: 2015-2035 Stormwater CIP Summary

ID	Status	Project	Design	Construction	Total
CS-B	Retained	Railroad Ditch Stormwater Facility	$106,000	$1,401,594	$1,507,594
CS-D	Retained	SE Eaton Blvd Ditch Elimination*	$-	$348,008	$348,008
CS-E	Retained	View Meadows Storm	$282,889	$1,131,555	$1,414,444
G-2	Retained	West Terminus of SW 10th Street Storm	$308,229	$1,232,915	$1,541,143
TR-2	Retained	SR 503 Crossing Storm	$68,455	$273,818	$342,273
CS-1	Retained	Jewel Creek Bypass Drainage*	$-	$169,738	$169,738
SW-1	Reinstated	Parkway Estates Storm	$130,526	$522,105	$652,631
DA-140	New	Edgebrook Subdivision Storm	$169,007	$676,028	$845,034
DA-141	New	Nowak Addition Drainage	$206,884	$827,537	$1,034,421
DA-144	New	Pipe Project	$14,077	$56,308	$70,385
DA-145	New	Battle Ground West Subdivision Drainage	$203,179	$812,715	$1,015,894
15-01	New	Chelatchie Rails with Trails (Storm)	$66,000	$633,823	$699,823
15-02	New	Railroad Ditch Maintenance & Regrading	$15,997	$63,989	$79,986
15-03	New	Decant Facility Upgrade	$7,379	$9,839	$17,218
15-04	New	Ops Wash Bay	$25,975	$103,901	$129,877
15-05	New	Wood Recycling Facility (Storm)	$95,585	$382,340	$477,925
*Design for these projects has been completed.			**$ 1,700,182**	**$ 8,646,214**	**$ 10,346,396**

Project Selection

City engineering staff identified potential capital projects primarily by reviewing the 2008 CIP. Six projects have been retained from the 2008 CIP, and one project from the 2004 CIP has been reinstated.

New projects are those that address drainage or municipal source control needs observed by Public Works crews and engineering staff over the past several years. Engineering staff have developed new projects to the conceptual level.

Table 3 compares the 2008 CIP to the 2015-2035 CIP.

Cost Estimate Methodology

In 2014 and 2015, the City developed draft detailed estimates for each project. Design concepts for many projects retained from the 2008 CIP were updated, so cost estimates for retained projects were regenerated.

The City's engineer estimated unit costs using the Washington State Department of Transportation (WSDOT) Unit Bid Analysis searchable database. Unit costs not available from WSDOT were estimated based on bid tabs from similar projects. Contingencies of 15% to 50% were applied to construction costs depending on how well the project was defined.

Otak reviewed the City's draft cost estimates. Otak's reviews were based on costs for similar public projects in southwest Washington and the engineer's professional judgment.

Detailed cost estimates are included in Appendix B.

Capital Projects Prioritization and Summary

The City anticipates implementing stormwater capital projects as funding allows, including revenue from grants. FCS Group and Otak developed a proposed implementations schedule through 2035 based on the City's priorities expressed in meetings and correspondence, on obligated projects, and on anticipated available funding. In some cases, more costly projects were scheduled later to ensure funding availability.

Stormwater aspects of transportation projects were scheduled based on their ranking in the Six Year Transportation Improvement Program from 2015 to 2020.

For the purposes of this plan, the City proposes one or two years of design for each project and proposes construction for the year following completion of design.

The proposed design and construction schedule is in Table 4 below. Figure 4 shows a map of the proposed projects.

2008 CIP Status Update

The City completed three projects from the 2008 Stormwater CIP.

The City constructed a decant facility to properly handle solid wastes from street sweeping and catch basin cleaning. Project CS-A was constructed to address flooding on East Main Street near Fairgrounds Avenue. Project WQ-1 provided riparian improvements along Mill and Woodin Creeks.

The status of projects from the 2008 CIP is given in Table 3.

Table 3: 2008 CIP Status

ID	Name	Status
N/A	Decant Facility	Complete
CS-A	East Main Street Flooding	Complete
WQ-1	Mill and Woodin Creek Restorations	Complete
CS-C	NW 29th Ave Pond Retrofit	On Hold
CS-B	Railroad Ditch Stormwater Facility	Retained
CS-D	SE Eaton Blvd Ditch Elimination	Retained
CS-E	View Meadows Storm	Retained
G-2	West Terminus of SW 10th Street Storm	Retained
TR-2	SR 503 Crossing Storm	Retained
CS-1	Jewel Creek Bypass Drainage	Retained
SW-1	Parkway Estates Storm (includes SW-2, CS-2)	Reinstated from 2004

Earlier CIPs, including the 2008 CIP and projects that have been developed between 2008 and the development of this plan, used a project identification numbering system that relied on abbreviations for facility type and location. The numbering system has been replaced. New projects are identified serially by year (e.g. 15-01 for the first project developed in 2015).

For reference, the previous ID numbering system included the abbreviations given in Table 4.

Table 4: Project ID Numbering Key

Abbreviation	Meaning
CS	Conveyance System Improvements
DA	Ditch Area
G	Gardner Ditch
NM	North Mill Creek
SW	Small Works
TR	Trash Rack
WQ	Water Quality

Table 5: Proposed Stormwater CIP Design and Construction Schedule

ID	Status	Project	Design	Construction	Total	Design Year	Construction Year	Notes
CS-B	Retained	Railroad Ditch Stormwater Facility	$106,000	$1,401,594	$1,507,594	2019	2020-2021	Partial design completed
CS-D	Retained	SE Eaton Blvd Ditch Elimination	$-	$348,008	$348,008		2018	Design is complete.
CS-E	Retained	View Meadows Storm	$282,889	$1,131,555	$1,414,444	2027-2028	2029	
G-2	Retained	West Terminus of SW 10th Street Storm	$308,229	$1,232,915	$1,541,143	2025-2026	2027	
TR-2	Retained	SR 503 Crossing Storm	$68,455	$273,818	$342,273	2024	2025	
CS-1	Retained	Jewel Creek Bypass Drainage	$-	$169,738	$169,738		2015	Design is complete.
SW-1	Reinstated	Parkway Estates Storm	$130,526	$522,105	$652,631	2022-2023	2024	Includes former SW-2 and CS-2; Removed in 2008 - reinstated
DA-140	New	Edgebrook Subdivision Storm	$169,007	$676,028	$845,034	2031-2032	2033	
DA-141	New	Nowak Addition Drainage	$206,884	$827,537	$1,034,421	2033-2034	2036	
DA-144	New	Pipe Project	$14,077	$56,308	$70,385	2018	2019	
DA-145	New	Battle Ground West Subdivision Drainage	$203,179	$812,715	$1,015,894	2029-2030	2031	
15-01	New	Chelatchie Rails with Trails (Storm)	$66,000	$633,823	$699,823	2015	2016	
15-02	New	Railroad Ditch Maintenance & Regrading	$15,997	$63,989	$79,986	2016	2017	
15-03	New	Decant Facility Upgrade	$7,379	$9,839	$17,218	2016	2017	
15-04	New	Ops Wash Bay	$25,975	$103,901	$129,877	2017	2018	
15-05	New	Wood Recycling Facility (Storm)	$95,585	$382,340	$477,925	2018	2019	
			$ 1,700,182	**$ 8,646,214**	**$ 10,346,396**			

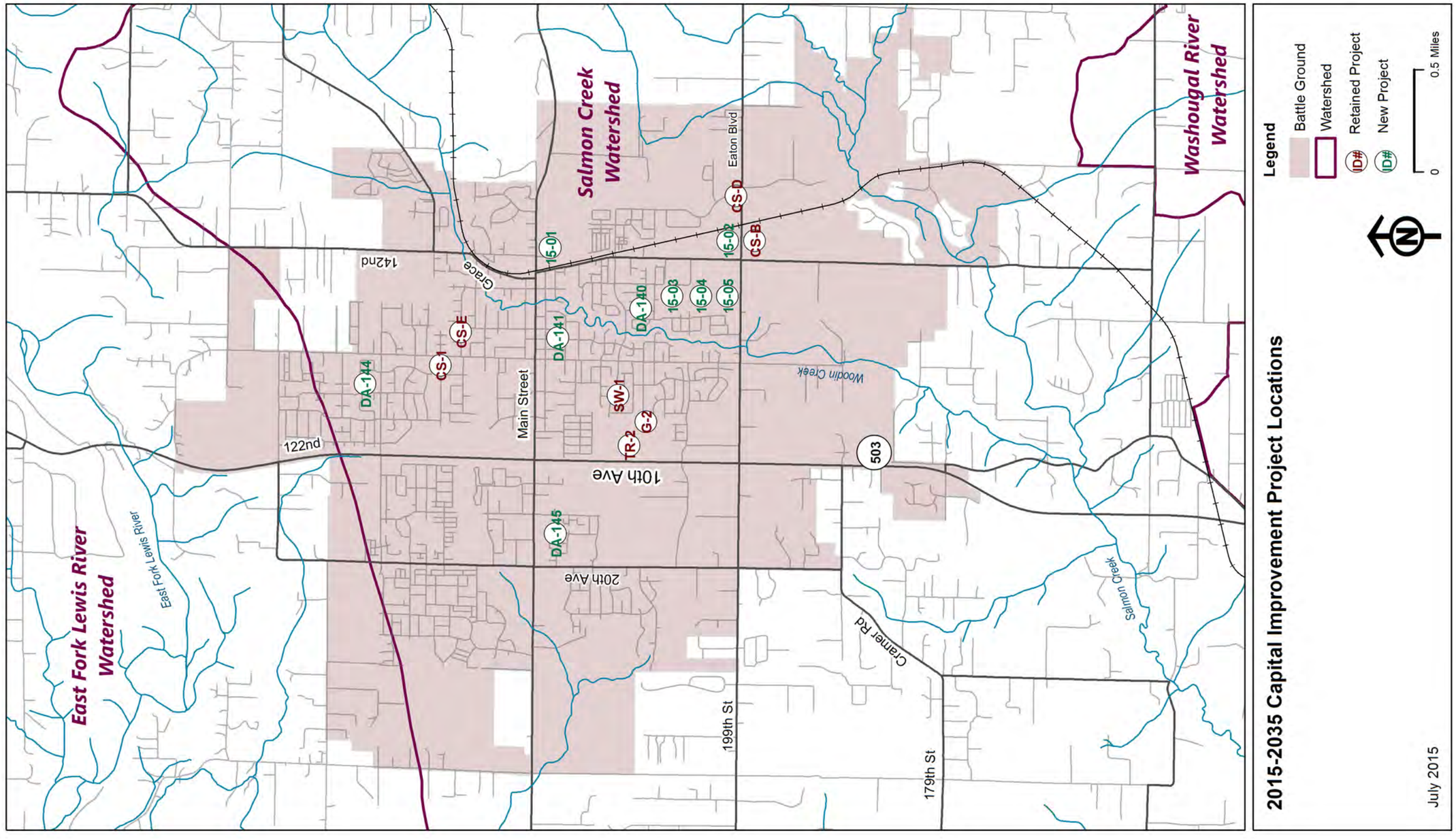


Figure 4: Stormwater CIP Map

Project Descriptions and Estimates

The following section describes each project evaluated for the 2015-2035 CIP. A map showing CIP locations is included as Figure 4, above.

Project ID: CS-B
Name: Railroad Ditch Stormwater Facility

Status: Retained, Updated.
Design Status: Survey complete.

Location: The intersection of SE Grace Avenue and SE Eaton Blvd., and the railroad crossing at SE Eaton Blvd. east of Grace Avenue

Problem: Flooding occurs on the northwest corner of Grace Avenue and SE Eaton Blvd. and along the ditch on the north side of SE Eaton Blvd. between Grace Avenue and the railroad tracks. Future development in this area will increase flows through this system.

Description: This project is to provide more capacity in the downstream system which drains this area, and is tributary to Salmon Creek. This project consists of the following improvements:

- Upsize the western culvert crossing under SE Eaton Blvd. along the Chelatchie Railroad.
- Upsize the culvert crossing the Chelatchie Railroad south of SE Eaton Blvd. where the drainageway outfalls to the Salmon Creek tributary.
- Construct a flow control manhole where the existing ditch turns east, and construct a piped system with surface inlets along the railroad south to Salmon Creek.

In addition, vegetation and debris should be routinely removed from the ditches in this system to help maintain and improve flow capacity. The reducer on the north side of SE Eaton at the railroad tracks can then be removed.

Updated Cost Estimate: $1,507,594







Project ID: CS-D
Name: SE Eaton Blvd. Ditch Elimination

Status: Retained.
Design Status: 100% Design.

Location: North side of SE Eaton Blvd. near Commerce Avenue

Problem: There is limited capacity in the ditches along the north side of SE Eaton Blvd.

Description: The section of ditch along the north side of SE Eaton Blvd. from Commerce Avenue to the city limits should be piped to improve conveyance. The City currently plans to install the pipe and a parallel ditch to NE 157th Avenue. Project design is at 100% but construction has been put on hold until 2018.

Updated Cost Estimate: $348,008






Project ID: CS-E
Name: View Meadows Subdivision Drainage Improvements

Status: Retained.

Location: Along the north side of NE 7th St. from NE 1st Ct. to NE 3rd Ave.

Problem: Multiple grass-lined ditches drain the streets and homes on the north side of NE 7th Street. These ditches drain to culverts that are tied to catch basins. The catch basins drain to a piped storm system.

The ditches require frequent maintenance to control vegetation and remove leaves. The City Maintenance crews clear leaves and vegetation from the ditches, catch basins, and culverts during most storm events so flows do not flood homes. This area is relatively flat and the ditches are small. The City has made some improvements to the ditches; however, some of the culverts may be undersized.

Recommendations: A more in-depth evaluation and alternatives analysis of conveyance in this area will assist in developing a solution to localized flooding and reducing the demand on maintenance resources. The following cost estimate applies to a study that will gather topographic information and allow a modeling of this system to identify conveyance constraints. The purpose of the study is to determine conveyance capacities and identify conveyance improvements that could include upgrades to existing culverts, piping of the ditch system, or a combination of these measures.

Update: The project has been updated to include construction of a stormwater system in the street with laterals to ditches or to include in full street improvements. Include piping ditch in backyards on south side of NE 7th Street.

Updated Cost Estimate: $1,414,444











Project ID: G-2
Name: West Terminus of SW 10th Street Storm

Status: Retained.
Note: This project is related to Project TR-2 and should be considered part of that design.

Location: West terminus of SW 10th Street near the pump station in the Gardner Ditch area.

Problem: The 2004 SWMP recommends constructing a regional detention/water quality facility in this area to mitigate for runoff from existing development and the increase in runoff from future development in the 250 acres tributary to this area.

In addition, the ditch is very deep with very steep side slopes, and some sections along the toe of the ditch have slumped into the channel. Gardner Ditch is located very close to and can be easily accessed by the residential neighborhood to the east and maintenance staff are concerned that the ditch may pose a safety concern.

Description: The 2004 SWMP recommends a regional detention/water quality facility to reduce flows in Gardner Ditch and Woodin Creek. There is City property available and potential for a future park. City maintenance staff also recommend installing a pipe and filling in the ditches or the portions of the ditches within the proposed park area. This project could be included as part of the parks master plan for this area.

Update: The project recommendation has been updated to include piping flow in ditch and possibly adding a pond or upgrading Gardner Pond. The estimate assumes a one acre pond and one acre of wetland mitigation.

Updated Cost Estimate: $1,541,143









Project ID: TR-2
Name: SR 503 Crossing Storm

Status: Retained.

Location: SR-503 in WSDOT right-of-way across the open space near Gardner Ditch west of the pump station

Problem: Excessive field flow occurring south of the future SW Rasmussen Blvd. and west of SW 4th Avenue.

Description: The 2004 SWMP describes flows from the upstream basin of Gardner Ditch being routed west through a 30-inch culvert under SR-503 that contributes to excessive field flow on the west side of SR-503. The 2004 SWMP recommends retrofitting the upstream end of the 30-inch culvert under SR-503 to allow overflows from this upstream drainage area through the culvert for conveyance toward Mill Creek. This would direct flows south of SR-502 and east of SR-503 toward Gardner Ditch instead of through the 30-inch culvert toward Mill Creek.

Update: The project recommendation has been updated to include installing a flow control manhole near SR 503 and installing 1,000 feet of 18" storm conveyance pipe (estimated size) to the east, to outlet to Gardner Ditch. Approximately 30 feet of 30" storm pipe will also be installed to connect to the existing 30" culvert under SR-503.

Updated Cost Estimate: $342,273









Project ID: CS-1
Name: Jewel Creek Bypass Drainage Improvements

Status: Retained.
Design Status: 100% Design.

Location: Jewel Creek at the culvert inlet at the retirement home west of N. Parkway and north of Battle Ground High School.

Recommendations: Extend existing 3'x6' concrete box culvert from stub at North Parkway Avenue curb to Jewel Creek, approximately 200' feet to the west.

Updated Cost Estimate: $169,738





Project ID: SW-1
Name: Parkway Estates Drainage Improvements

Status: Reinstated.
Note: Combined with reinstated former projects SW-2 and CS-2 from the 2004 SWMP.

Locations: Throughout the Parkway Estates subdivision

Description: The subdivision needs review for several drainage problems.

At SW 3rd Avenue south of SW 6th Street, approximately 234' of 12" or 30" pipe back up. Field-verify pipe size.

Stormwater has been reported to back up or stand in the cul-de-sac of SW 2nd Circle at the west end of SW 6th Street. The recommended improvement is to identify the low point along the gutter line in the cul-de-sac, install a catch basin at this point, and install a lateral to the nearest manhole or catch basin. Existing storm pipes are 12" Aluminum SP.

The storm system along SW 6th Street, in a residential area on the west side of S. Parkway Avenue, appears to be undersized for existing conditions. Standing water has been observed. This system should be inspected to determine whether any obstructions are causing the system to surcharge or be inundated. Construction of a new 24-inch pipeline is assumed to be needed along SW 6th Street west of S. Parkway Avenue.

Standing water has been noted by residents at the north catch basin SW 1st Avenue and SW 6th Street.

Updated Cost Estimate: $652,631

















Project ID: SW-2
Name: Parkway Estates Cul-de-Sac

Status: Reinstated from 2004 CIP. Combined with SW-1. See SW-1.

Project ID: CS-2
Name: Parkway Estates SW 6th Street

Status: Reinstated from 2004 CIP. Combined with SW-1. See SW-1.

Project ID: DA-140
Name: Edgebrook Subdivision Drainage Improvements

Status: New.

Location: SE 10th Street to SE 11th Street and S. Parkway Avenue to SE 2nd Avenue.

Problem: The area has flat, shallow ditches and intermittent culverts to drain the area. There are no curbs or gutters in the area. Maintenance crews regularly clear vegetation and debris from the culverts. Many area inlets collect debris and clog.

Recommendation: The area needs a backbone storm system, and may need a pump system. Consider LID.

Cost Estimate: **$845,034** (Does not include pump station option)













Project ID: DA-141
Name: Nowak Addition Drainage Improvements

Status: New.

Location: SE 1st Avenue and SE 2nd Avenue and SE 1st Street to almost SE 5th Circle.

Problem: The area has flat, shallow ditches and intermittent culverts to drain the area. There are no curbs or gutters in the area. Maintenance crews regularly clear vegetation and debris from the culverts. Many area inlets collect debris and clog.

Recommendation: The area needs a backbone storm system, and may need a pump system. Consider LID.

Cost Estimate: $1,034,421 (Does not include pump station option)













Project ID: DA-144
Name: Pipe Project

Status: New.

Location: NW 19th Street at NW 3rd Court

Problem: Drainage channel through private backyards in a public easement collects sediment and vegetation and does not flow well.

Recommendation: Project would extend the existing culvert approximately 160 feet across two private lots and fill the existing drainage ditch.

Cost Estimate: $70,385



Project ID: DA-145
Name: Battle Ground West Subdivision Drainage Improvements

Status: New.

Location: From SW 17th Avenue to SW 20th Avenue and from SW 1st Street to SW 3rd Street

Problem: The area has flat, shallow ditches and intermittent culverts to drain the area. There are no curbs or gutters in the area. Maintenance crews regularly clear vegetation and debris from the culverts. Many area inlets collect debris and clog.

Description: Replace all ditches with a piped system. Add catch basins and inlets where necessary. Consider adding curb and gutter throughout. Alternatives include a backbone storm system with pump system or LID.

Cost Estimate: **$1,015,894** (Does not include pump station option)






Project ID: 15-01
Name: Chelatchie Rails with Trails

Status: New.

Location: East side of SE Grace Avenue from East Main Street south to Rasmussen Blvd.

Description: Project converts existing ditch on the east side of the railroad tracks to a 48" storm pipe conveyance system from Main Street to SE 5th Street with a walking trail from Main Street to SE Rasmussen Blvd.

Cost Estimate: $699,823





Project ID: 15-02
Name: Railroad Ditch Maintenance and Re-grading (Maintenance)

Status: New.

Location: The intersection of SE Grace Avenue and SE Eaton Blvd., and the railroad crossing at SE Eaton Blvd. east of Grace Avenue and along railroad, north to Rasmussen.

Problem: Flooding occurs on the northwest corner of Grace Avenue and SE Eaton Blvd. and along the ditch on the north side of SE Eaton Blvd. between Grace Avenue and the railroad tracks. Future development in this area will increase flows through this system. Flooding also occurs along the railroad ditch during heavy storms.

Recommendations: The project is to provide ditch improvements along both sides of the railroad from approximately 1,000 feet south of SE Eaton Blvd. (where the ditches combine and turn east) north to Rasmussen Blvd. Ditch improvements include vegetation removal, and re-grading.

- Clean ditches from SE 5th Street to SE Eaton Blvd (West side)
- Clean ditches south of SE Eaton (East side)
- Clean ditches from SE Rasmussen Blvd to SE Eaton Blvd (West side)
- Clean ditches from SE Grace Avenue to railroad tracks (North side)

In addition, vegetation and debris should be routinely removed from the ditches in this system to help maintain and improve flow capacity.

Design Status: HDJ has collected all survey information from SE Eaton Blvd to Salmon Creek and along north side of SE Eaton Blvd. from approximately SE Grace Avenue to the railroad tracks.

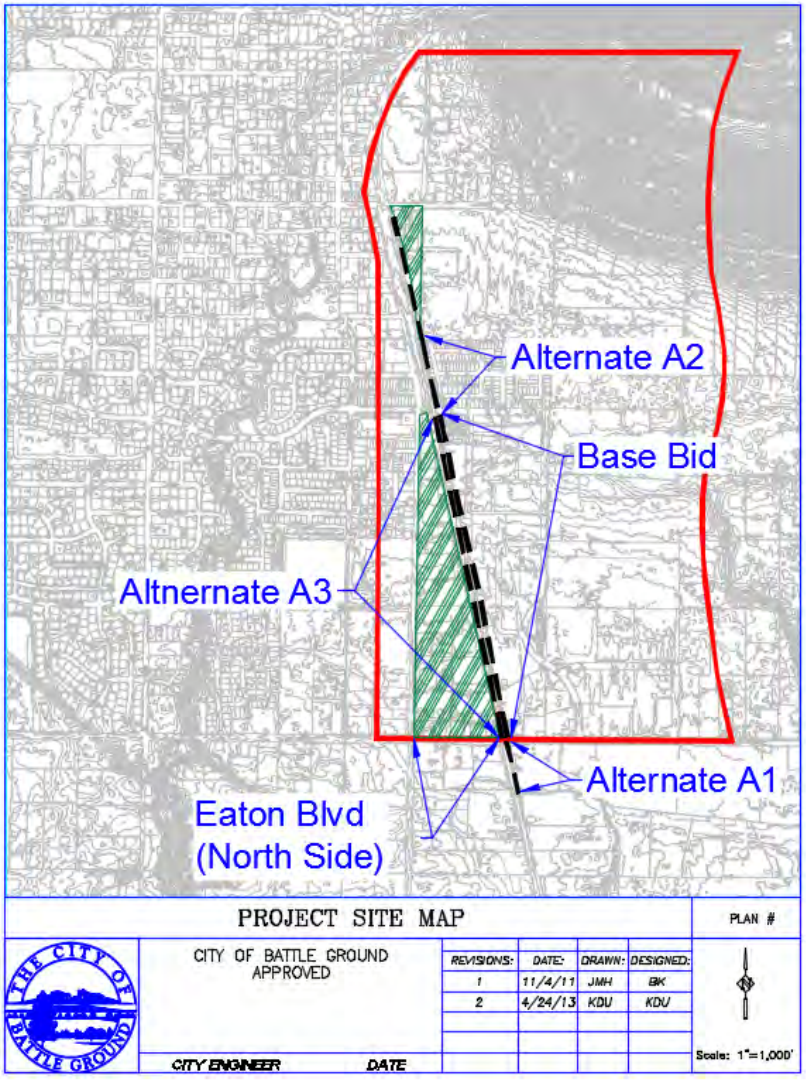
Cost Estimate: $79,986










Alternate A2
Base Bid
Altnernate A3
Alternate A1
Eaton Blvd
(North Side)
PROJECT SITE MAP
PLAN #
CITY OF BATTLE GROUND
APPROVED
REVISIONS:
DATE:
DRAWN:
DESIGNED:
1
11/4/11
JMH
BK
2
4/24/13
KDU
KDU
CITY ENGINEER
DATE
Scale: 1"=1,000'

Project ID: 15-03
Name: Decant Facility Upgrade

Status: New.

Location: Operations Center.

Problem: Sanitary, street sweeping, and storm vactor material are currently disposed of in separate bays of the same decant facility. Liquids drain to a combined system with a sump, then to the sanitary system. The sump collects solids from both the sanitary decant and the storm decant.

Recommendation: The upgrade would add a manhole with a sump to collect only solids from the stormwater decant, allowing those solids to be disposed separately at a lower rate. Approximately 20 linear feet of stormwater pipe and a manhole with a sump will be installed to collect decant liquids from the stormwater solids and route the liquids to the sanitary system and collect any solids in the manhole sump.

Cost Estimate: $17,218





Project ID: 15-04
Name: Ops Wash Bay (Maintenance)

Status: New.

Location: Operations Center.

Problem: Current wash station is not covered and does not drain to the sanitary sewer.

Recommendation: Project would construct a covered area for truck washing with a concrete floor draining to an oil/water separator and plumbed to the sanitary sewer.

Cost Estimate: $129,877



Project ID: 15-05
Name: Wood Recycling Facility (Maintenance)

Status: New.

Location: Operations Center – 1308 SE Grace Avenue.

Problem: The City has to haul leaves and wood debris off-site to dispose.

Cost Estimate: $477,925 (Storm)



Completed / On Hold Project Descriptions

Project: Decant Facility

Status: Completed. Removed from CIP.

The project constructed a new decant facility at the City's Operations Center to properly manage and dispose of street sweeping and stormwater system solid wastes.

Project ID: CS-A
Name: East Main Street Flooding

Status: Completed. Removed from CIP.

The project corrected flooding and high flows in the ditches along the north side of East Main Street.

Project ID: WQ-1
Name: Mill and Woodin Creek Restoration

Status: Completed. Removed from CIP.

This project provided riparian improvements along Mill and Woodin Creeks.

Project ID: CS-C
Name: NW 29th Avenue Pond Retrofit

Status: On hold

Location: SR-502 between 26th and 27th Street

Problem: Water has been observed surcharging out of roadway catch basins that drain to the stormwater pond facility at this location north of SR-502. Surcharged water flows down SR-502 and is intercepted by catch basins downstream of the surcharging catch basins. City maintenance staff had currently modified the flow control structure to provide more capacity at the outlet of the pond to help lower the water surface elevation during high flows.

2014 Update: Plans for a by-pass pipe have been developed and approved, however this will likely not be constructed. Modifications to the high flow riser, inlet pipe and control manhole high flow window were made to match the design elevations and this will likely correct the surcharging problem.





Section 5 – Financial Analysis

The City needs to estimate future expenses and revenues to analyze whether existing revenues are adequate to fund its stormwater program, including operational and capital commitments.

FCS GROUP performed a financial analysis through 2024. The analysis assumes staffing levels as supported by the Regulatory Analysis (Section 3) and capital programming as discussed in the Capital Needs Assessment (Section 4).

The financial analysis is based on and updates the analysis in the 2008 *Stormwater Utility Update and Stormwater Management Plan*.

The full financial analysis is given in Appendix C.

Funding Sources

Funding for the City's stormwater program comes from two primary sources, the stormwater utility fees charged on residential and business properties, and the systems development charges (SDC) charged for all new development. The stormwater utility rate for a single-family residence is set at $92.40 per year ($7.70 per month). For commercial customers, the rate is determined based on the relative equivalent residential units (ERUs) of impervious area, currently set at 3,000 square feet, times the base rate of $7.70 per ERU per month. The SDC is set at the rate of $370.00 per ERU.

The City is also eligible for grant funding from the Department of Ecology or other sources on an occasional basis. Future grant funding is not assumed and is not included in the financial analysis.

Rate History

In 2000 the City established its stormwater utility and set rates based on impervious surface coverage on residential and business properties. Rates were set at $4.80 per month per ERU.

The 2008 *Stormwater Utility Update and Stormwater Management Plan* offered several options for rate increases to fund required stormwater program activities and the proposed capital plan. While each option was unique, each recommended a graduated increase in rates from 2008 to 2015. Different recommendations all resulted in regulatory compliance, except for Option 2c; the differences were in degree of capital implementation.

The City adopted a rate increase after 2008, and the current rate per ERU stands at $7.70 per month. This rate does not correspond to any of the recommended rates from the 2008 plan, but it falls between the proposed rates recommended in the 2008 plan's Options 2b and 2c,

which proposed, respectively, achieving regulatory compliance and funding no capital improvements (2b) and maintaining the existing stormwater program, slightly short of meeting regulatory requirements, and funding no capital improvements (2c).

In the interim, the City has managed to maintain regulatory compliance and complete three projects from its 2008 Stormwater CIP.

Established City policy requires City staff to review utility rates annually and submit recommendations to City Council, which may act to amend rates based on inflation, change in costs, or other lawful considerations (BGMC 13.105.010).

Policy Review

The City's fiscal policies relating to its stormwater program are briefly summarized in support of the analysis. One policy recommendation from the 2008 *Stormwater Utility Update and Stormwater Management Plan* is also revisited.

Operating Fund

Operating reserves provide a minimum unrestricted fund balance needed to accommodate the short-term cycles of revenues and expenses. These reserves are intended to address both anticipated and unanticipated changes in revenues and expenses by providing a "cushion" to cover cash balance fluctuations. Anticipated changes may include billing and receipt cycles, payroll cycles, and other payables; examples of unanticipated changes include the loss of a large customer or, as recently witnessed, sudden changes to the economy.

The City charges monthly stormwater rates on an ERU basis ($7.70 per ERU), in which one ERU is equal to one single-family residency (or 3,000 square feet of impervious surface area, depending on the customer type). Because the basis of charging changes very little from year to year, the stormwater utility generates relatively constant and predictable total rate revenue.

FCSG recommends that the City begin each year with at least one and a half months (45 days) of cash operating expenses. This analysis assumes a target minimum balance equal to 45 days of operating expenses for the City's stormwater utility, which equates to roughly $98,500 based on the operating expense projections included in the City's 2015 Budget. For purposes of this analysis, it is assumed that any funds in excess of the minimum operating balance may be used to fund capital projects.

System Development Charge (SDC) Fund

The SDC Fund is a separate fund intended to house and distribute annual SDC revenues for capital projects which increase the capacity of the stormwater system.

This analysis assumes a target minimum balance equal to 1% of plant assets, which equates to roughly $82,000 in 2015 based on the plant assets noted in the 2014 financial statements.

2008 Policy Review

The 2008 plan recommended that the City establish a policy regarding system replacement funding. The purpose of system replacement funding is to provide for the replacement of aging system facilities to sustain system condition for ongoing operations. A common approach of municipal utilities is to incorporate a replacement funding (or equity accumulation) mechanism based on annual depreciation expense as a reasonable level of reinvestment in the system.

The City has not implemented a system replacement strategy; therefore, the recommendation from the 2008 plan is still pertinent. The current financial analysis assumes no system replacement funding.

Revenue Requirements Analysis

The revenue requirements analysis is the core of the financial analysis. It forecasts the amount of annual rate revenue needed to meet the financial obligations of providing stormwater services. The analysis incorporates operating revenues, operations and maintenance expenses (O&M), rate funded capital needs, and any other identified revenues or expenses related to utility operations, and then determines the sufficiency of current rate levels.

Key Assumptions

The following assumptions were used in the analysis:

- O&M expense projections are based on the 2015 and 2016 proposed budgets. Beginning in 2016, the City is expected to employ two additional full time employees (FTEs) in response to the NPDES Permit as supported by the Gap Analysis.
- Revenue projections are based on the assumption of 9,575 existing ERUs (beginning of 2015). Consistent with the City's recent account growth over the last five years, customer account growth is assumed to remain constant at 1.41% per year for the duration of the study period.
- General cost inflation is assumed to escalate according to the average historical Consumer Price Index (5-year average, 20 City CPI) at 1.99% per year.
- Labor cost inflation is assumed to escalate at 4.00% per year, per City staff input.
- Benefit cost inflation is assumed to escalate at 6.00% per year, per City staff input.

- Capital construction cost inflation (for applicable capital projects) is assumed to escalate according to the average historical Engineering News Record Construction Cost Index (5-year average, 20 City ENR-CCI) at 2.73% per year.
- 2016 is the first year eligible for stormwater rate increases.

Key Financial Findings

Operation

Operating expenses are funded by utility rate revenue. Utility rate revenue is estimated to be $872,120 in 2015 and $913,855 in 2016. Any excess operating revenue is rolled into a capital reserve at the end of each year.

The revenue requirements analysis shows that the City needs $798,655 in 2015 and $953,665 in 2016. Operating expenses rise to $1,214,439 in 2024.

Under the current utility rate structure, the City will begin to fall below revenues needed to cover operating expenses in 2016. The deficit for operating expenses in 2016 would be $39,810.

Capital Improvement Program

Capital funding consists of excess operating funds at the end of each year and SDC funds. It could also include grant revenue.

Capital expenses fluctuate over the planning horizon, based on the cost of scheduled projects. In 2016, capital expenses are $693,600 using inflated dollars. The lowest annual capital expense is $80,968 in 2022 and the highest is $1,184,847 in 2021.

The utility is projected to have $1,224,237 in available capital funding at the beginning of 2016. With its capital reserve, the City could fund the proposed Stormwater CIP through 2017.

Rate Increase

The analysis shows that a series of annual rate increases from 2016 to 2020 produces sufficient revenue to cover operating expenses, including increased staffing to meet regulatory requirements, and the proposed Stormwater CIP. No further rate increases are forecasted. Table 6 shows calculated rate increases.

Table 6: Calculated Rate Increases for Revenue Requirements

	2015	2016	2017	2018	2019	2020
% Increase	0%	13%	13%	11.5%	11.5%	11.5%
Sample Residential Monthly Bill	$7.70	$8.70	$9.83	$10.96	$12.22	$13.63

A summary of the financial analysis is shown in Table 7. The full financial analysis is presented in Appendix C.

Table 7: Financial Analysis Summary

Revenue Requirement	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Revenues @ Existing Rates										
Rate Revenues Under Existing Rates	$ 868,920	$ 913,000	$ 925,893	$ 938,969	$ 952,229	$ 965,676	$ 979,313	$ 993,143	$ 1,007,168	$ 1,021,391
Non-Rate Revenues	3,200	855	1,021	1,053	1,087	1,105	1,141	1,179	1,218	1,258
Total Revenues	**$ 872,120**	**$ 913,855**	**$ 926,915**	**$ 940,022**	**$ 953,315**	**$ 966,781**	**$ 980,455**	**$ 994,322**	**$ 1,008,386**	**$ 1,022,650**
Expenses										
Cash Operating Expenses	$ 798,655	$ 953,665	$ 983,665	$ 1,014,802	$ 1,032,125	$ 1,065,883	$ 1,100,937	$ 1,137,340	$ 1,175,154	$ 1,214,439
Existing Debt Service	-	-	-	-	-	-	-	-	-	-
New Debt Service	-	-	-	-	-	-	-	-	-	-
Rate Funded System Reinvestment	-	-	-	-	-	-	-	-	-	-
Total Expenses	**$ 798,655**	**$ 953,665**	**$ 983,665**	**$ 1,014,802**	**$ 1,032,125**	**$ 1,065,883**	**$ 1,100,937**	**$ 1,137,340**	**$ 1,175,154**	**$ 1,214,439**
Net Surplus (Deficiency)	**$ 73,465**	**$ (39,810)**	**$ (56,751)**	**$ (74,780)**	**$ (78,809)**	**$ (99,102)**	**$ (120,482)**	**$ (143,019)**	**$ (166,768)**	**$ (191,789)**
Additions to Meet Coverage	-	-	-	-	-	-	-	-	-	-
Total Surplus (Deficiency)	**$ 73,465**	**$ (39,810)**	**$ (56,751)**	**$ (74,780)**	**$ (78,809)**	**$ (99,102)**	**$ (120,482)**	**$ (143,019)**	**$ (166,768)**	**$ (191,789)**
Annual Rate Increase	**0.00%**	**13.00%**	**13.00%**	**11.50%**	**11.50%**	**11.50%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**
Cumulative Rate Increase	**0.00%**	**13.00%**	**27.69%**	**42.37%**	**58.75%**	**77.00%**	**77.00%**	**77.00%**	**77.00%**	**77.00%**
Rate Revenues After Rate Increase	$ 868,920	$ 1,031,690	$ 1,182,273	$ 1,336,851	$ 1,511,638	$ 1,709,279	$ 1,733,417	$ 1,757,896	$ 1,782,721	$ 1,807,897
Additional Taxes from Rate Increase	$ -	$ 1,780	$ 3,846	$ 5,968	$ 8,391	$ 11,154	$ 11,312	$ 11,471	$ 11,633	$ 11,798
Net Cash Flow After Rate Increase	**73,465**	**77,100**	**195,784**	**317,134**	**472,209**	**633,347**	**622,310**	**610,263**	**597,152**	**582,919**
Sample Residential Monthly Bill [a]	$ **7.70**	$ **8.70**	$ **9.83**	$ **10.96**	$ **12.22**	$ **13.63**	$ **13.63**	$ **13.63**	$ **13.63**	$ **13.63**
Monthly Average Increase ($)	$ -	$ 1.00	$ 1.13	$ 1.13	$ 1.26	$ 1.41	$ -	$ -	$ -	$ -

[a] per ERU

Fund Balance	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
OPERATING FUND										
Beginning Balance	$ 848,000	$ 131,286	$ 156,767	$ 161,698	$ 166,817	$ 169,664	$ 175,214	$ 180,976	$ 186,960	$ 193,176
Ending Balance	$ 131,286	$ 156,767	$ 161,698	$ 166,817	$ 169,664	$ 175,214	$ 180,976	$ 186,960	$ 193,176	$ 199,634
Minimum Target Balance	$ 98,464	$ 117,575	$ 121,274	$ 125,113	$ 127,248	$ 131,410	$ 135,732	$ 140,220	$ 144,882	$ 149,725
CAPITAL FUNDING (SDC Fund + Excess Operating Funds)										
Beginning Balance	$ 637,071	$ 1,224,237	$ 653,405	$ 794,302	$ 424,051	$ 452,585	$ 649,690	$ 148,665	$ 738,474	$ 1,319,157
Ending Balance	$ 1,224,237	$ 653,405	$ 794,302	$ 424,051	$ 452,585	$ 649,690	$ 148,665	$ 738,474	$ 1,319,157	$ 1,201,760
Minimum Target Balance	$ 81,728	$ 88,664	$ 89,746	$ 97,181	$ 102,201	$ 107,144	$ 118,992	$ 119,802	$ 120,633	$ 128,366

Section 6 – Summary

The analyses developed in this plan demonstrate that the City is currently meeting its stormwater management obligations and has not raised utility rates for several years. Looking ahead, the City needs to meet new requirements and performance measures under current regulations and increase its regulated operations and maintenance activities. In addition, the City would like to implement a robust capital program focused on correcting drainage issues and providing additional capacity.

The following sections summarize the findings for the stormwater program, the Stormwater CIP, and utility finance.

Program Recommendations

Maintain compliance with all applicable regulations, and increase staffing and effort to comply with the NPDES Permit. The regulatory Gap Analysis shows a need for an additional 1.74 FTE to comply with Permit requirements and performance measures. Recommended changes to staffing are summarized in Table 8.

Table 8: Estimated Staffing Needs

	Current FTE	Future FTE	Classification
Education and Outreach	.08	.14	
Public Involvement	.02	.02	
IDDE	.13	.26	Engineering Technician
Controlling Runoff from Development	.47	.58	Civil Engineer, Engineering Technician, Building Inspector
Municipal Operations and Maintenance	2.26	3.34	Maintenance Worker, Engineering Technician
Program Implementation	.11	.08	
Monitoring & Assessment	.03	.02	
NPDES Reporting	.05	.05	
Total NPDES	**3.16**	**4.5**	

Capital Planning & Design	.17	.57	Civil Engineer
Overall Stormwater Program Oversight	.15	.15	
Program Total	**3.48**	**5.22**	

Capital Plan Recommendations

Implement the Stormwater CIP of $10.3 million between 2015 and 2035 to address drainage issues, system capacity, and improve structural source control at City properties. Seek grant funding whenever possible to offset the costs of design and construction.

Table 9: Stormwater CIP Summary

ID	Project	Cost
CS-B	Railroad Ditch Stormwater Facility	$1,507,594
CS-D	SE Eaton Blvd Ditch Elimination*	$348,008
CS-E	View Meadows Storm	$1,414,444
G-2	West Terminus of SW 10th Street Storm	$1,541,143
TR-2	SR 503 Crossing Storm	$342,273
CS-1	Jewel Creek Bypass Drainage*	$169,738
SW-1	Parkway Estates Storm	$652,631
DA-140	Edgebrook Subdivision Storm	$845,034
DA-141	Nowak Addition Drainage	$1,034,421
DA-144	Pipe Project	$70,385
DA-145	Battle Ground West Subdivision Drainage	$1,015,894
15-01	Chelatchie Rails with Trails (Storm)	$699,823
15-02	Railroad Ditch Maintenance & Regrading	$79,986
15-03	Decant Facility Upgrade	$17,218
15-04	Ops Wash Bay	$129,877
15-05	Wood Recycling Facility (Storm)	$477,925
		$ 10,346,396

Financial Recommendations

Continue to make excess operating expenses available to fund the Stormwater CIP at the end of each year.

To fund operating and capital programs, including the needed increase in staffing and the recommended Stormwater CIP, increase stormwater utility rates by 13% in both 2016 and 2017 and by 11.5% each year in 2018 through 2020. This would raise the rate per ERU from $7.70 to $13.63 in 2020.

References

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Appendix A—Gap Analysis

City of Battle Ground

2013 - 2018 Phase II NPDES Municipal Stormwater Permit

Gap Analysis

20-Jul-15

Legend

Abbreviation	Title and Name
CDC (JJ)	Community Development Clerk - Judy Jones
ET (KU)	Engineering Technician II - Kelly Uhacz
ET(RA)	Engineering Technician II - Rick Adams
ET (JH)	Engineering Technician II - Joan Hall
BI (LL)	Building Inspector - Larry LaDuke
AE (RJ)	Associate Civil Engineer - Ryan Jeynes
AE (ME)	Associate Civil Engineer - Marit Ernst
PWS (MV)	Public Works Supervisor - Mike Venne
CE (MH)	City Engineer - Mark Herceg
PD (DH)	Parks Director - Debbi Hanson
PWD (SS)	Public Works Director - Scott Sawyer

2013-2018 Phase II NPDES Municipal Stormwater Permit - Gap Analysis

NPDES Requirements					Current Program Description				
Permit Section			Requirements Summarized	Permit Due Date	Current Compliance Activities	Information Source	Responsi-bility (Legend on last page)	Level of Effort (Hours, Average Annual)	Cont'd to Right ▶
Permit Element #S5.C.1, Public Education and Outreach									
The SWMP shall include an education and outreach program designed to reduce or eliminate behaviors and practices that cause or contribute to adverse stormwater impacts and encourage the public to participate in stewardship activities. The education program may be developed and implemented locally or regionally.									
S5.C.1.a	**Educate Target Audiences**	Provide an education and outreach program for the area served by the MS4. The program shall be designed to educate target audiences about the stormwater problem and provide specific actions they can follow to minimize the problem. i. To build general awareness, select from the following target audiences and subject areas: (a) General public (including school children), and businesses (including home-based and mobile) - General impacts of stormwater on surface waters - Impacts from impervious surfaces - Impacts of illicit discharges and how to report them - Low impact development principles and BMPs - Opportunities to become involved in stewardship activities (b) Engineers, contractors, developers and land use planners - Technical standards for stormwater site and erosion control plans - LID principles and BMPs - Stormwater treatment and flow control BMPs/facilities	Build general awareness of the stormwater problem among the general public, businesses, engineers, contractors, developers, and land use planners.	**Ongoing**	The City's Engineering Technician (KU) accompanies Battle Ground students to a local stream for water quality monitoring each month. The City participates in Stormwater Partners, a regional collaboration of permittees that offers information on preventing stormwater impacts through source controls, facility maintenance, and low impact development (LID). City officials occasionally present general stormwater and surface water information to school classes. Various pertinent handouts are available at City Hall. The City's municipal code requires all new subdivisions to stencil new storm drains.	Staff Knowledge	AE (RJ, ME) ET (KU) CE (MH) PWD (SS)	100	▶
		ii. To effect behavior change, select from the following target audiences and BMPs: (a) General public (including school children), businesses (including home-based and mobile) - Use and storage of automotive chemicals, hazardous cleaning supplies, carwash soaps and other hazardous materials - Equipment maintenance - Prevention of illicit discharges (b) Residents, landscapers and property managers/owners - Yard care techniques protective of water quality - Use and storage of pesticides and fertilizers and other household chemicals - Carpet cleaning and auto repair and maintenance - Vehicle, equipment and home/building maintenance - Pet waste management and disposal - LID principles and LID BMPs - Stormwater facility maintenance - Dumpster and trash compactor maintenance	Effect changes in specific behavior in a specific target audience.	**2/2/2016; See S5.C.1.c**	No current program.	Staff Knowledge	ET (KU)	0	▶
S5.C.1.b	**Create Stewardship Opportunities**	Create stewardship opportunities and/or partner with existing organizations to encourage residents to participate in activities such as stream teams, storm drain marking, volunteer monitoring, riparian plantings, and education activities.	Create stewardship opportunities to encourage residents to participate in activities such as stream teams, storm drain marking, volunteer monitoring, riparian plantings, and education activities.	**Ongoing**	The Parks Department hosts an annual parks cleanup day. The City works with Clark Public Utilities on a restoration at Woodin Creek, with on-the-ground work to be done with work crews or volunteers.	Staff Knowledge	ET (KU) PD (DH)	60	▶
S5.C.1.c	**Measure Adoption of Behaviors**	Measure the understanding and adoption of the targeted behaviors (see S5.C.1.a.ii) for at least one target audience in at least one subject area. No later than February 2, 2016, use the resulting measurements to direct education and outreach resources most effectively, as well as to evaluate changes in adoption of the targeted behaviors. May meet individually or as a member of a regional group.	Measure the understanding and adoption of targeted behavior(s), (see S5.C.1.a, above) and direct changes to outreach and education resources based on results.	**2/2/2016 - Direct changes to outreach program**	No current program.	Staff Knowledge	ET (KU)	0	▶
							Hours	**160**	▶
							FTE	**0.08**	▶
Permit Element #S5.C.2, Public Involvement and Participation									
Permittees shall provide ongoing opportunities for public involvement and participation through advisory councils, public hearings, watershed committees, participation in developing rate-structures or other similar activities. Each Permittee shall comply with applicable state and local public notice requirements when developing elements of the SWMP.									
S5.C.2.a	**Input to SWMP**	Create opportunities for public to participate in the decision making processes involved in the development, implementation and update of the Stormwater Management Program (SWMP).	Create opportunities for the public to participate in the decision making processes involved in the development, implementation and update of the Stormwater Management Program (SWMP).	**Ongoing**	Public involvement in the City's SWMP consists of opportunities to provide input at City Council meetings. In the previous permit term, the City hosted open houses during development of its stormwater and erosion control ordinance.	Staff Knowledge	ET (KU)	40	▶
S5.C.2.b	**Availability of Stormwater Program Documents**	Post the SWMP, the Annual Report, and all other required permit submittals on the Permittee's website no later than May 31 each year. All other submittals shall be available to the public upon request.	Post the SWMP, the Annual Report, and all other required permit submittals on the Permittee's website and make documents available to the public upon request.	**5/31 Each Year; Ongoing**	The City posts the current SWMP and NPDES Annual Report to its website.	Website	ET (KU) CDC (JJ)	4	▶
							Hours	**44**	▶
							FTE	**0.02**	▶

2013-2018 Phase II NPDES Municipal Stormwater Permit - Gap Analysis

	2015-2018 Program (New Program)						Assumptions
Cont'd from Left ◄	"Gap" Between Existing Program and Planned and Required Activities in 2013-2018 Permit	2015 LOE (Hours)	2016 LOE (Hours)	2017 LOE (Hours)	2018 LOE (Hours)		Assumptions
◄	The City's current activities meet this requirement.	100	100	100	100		Assumes 80 hours for volunteer monitoring support and minimal effort for remaining tasks.
◄	The City needs to develop and implement a program plan in 2015 that incudes selection of a target audience, selection of a best management practice (BMP) or BMPs, creation of outreach materials, and delivery of the message. The City is considering including a mailing with utility billings or partnering with other local agencies to develop and deliver this outreach program.	300	0	0	0		Assumes program will be designed, delivered, and measured using City staff in 2015. Assumes work effort for measurement is accounted for in S5.C.1.c, below.
◄	The City's current activities meet this requirement.	60	60	60	60		As the Woodin Creek restoration site is completed, the City may wish to select a similar project to continue offering stewardship opportunities. Assumes a constant level of effort for these. Assumes 20 hours annually for the Parks Supervisor.
◄	The City is developing a plan to meet this requirement (see S5.C.1.a(ii)) for the outreach component of this requirement. The City will need to create a pre-test questionnaire and follow-up questionnaire, or plan for some other method of measuring understanding and adoption of targeted behaviors. The City will need to evaluate the results of the measurement effort and by February 2016 direct changes to outreach and education resources based on results.	80	40	0	0		Assumes 80 hours in 2015 to create pre-test questionnaire and information sheet with follow-up questionnaire. Assumes 40 hours in early 2016 for directing changes to the outreach program.
◄		**540**	**200**	**160**	**160**	***265***	***Average Annual Hours***
◄		**0.28**	**0.11**	**0.08**	**0.08**	***0.14***	***Average FTE***
◄	The City's current activities meet this requirement.	40	40	40	40		Assumes baseline effort will continue. The City may elect to provide additional public input opportunities, which could increase level of effort.
◄	The City's current activities meet this requirement.	4	4	4	4		
◄		**44**	**44**	**44**	**44**	***44***	***Average Annual Hours***
◄		**0.02**	**0.02**	**0.02**	**0.02**	***0.02***	***Average FTE***

2013-2018 Phase II NPDES Municipal Stormwater Permit - Gap Analysis

NPDES Requirements					Current Program Description				
Permit Section			Requirements Summarized	Permit Due Date	Current Compliance Activities	Information Source	Responsi-bility (Legend on last page)	Level of Effort (Hours, Average Annual)	Cont'd to Right ▶
Permit Element #S5.C.3, Illicit Discharge Detection and Elimination									
The SWMP shall include an ongoing program designed to prevent, detect, characterize, trace and eliminate illicit connections and illicit discharges into the MS4.									
S5.C.3.a	**Storm Sewer System Map**	Mapping of the MS4 shall continue on an ongoing basis. MS4 maps shall be periodically updated. At a minimum, maps shall include the following information: [Note: a long list of items is listed. Requirements are summarized to the right. Please refer to the permit for verbatim requirements.]	Ongoing mapping of the MS4, including outfalls, receiving waters, City-owned stormwater treatment and flow control facilities, and tributary conveyances to outfalls that are 24-inch or larger.	**Ongoing; Meet requirements by 2/2/2018**	The City updates maps from as-builts as new infrastructure is added in coordination with Operations.	Staff Knowledge	ET (JH, KU)	80	▶
S5.C.3.b	**Illicit Discharge Ordinance**	Each Permittee shall implement an ordinance or other regulatory mechanism to effectively prohibit non-stormwater, illicit discharges into the Permittee's MS4 to the maximum extent allowable under state and federal law. i. Allowable Discharges: The regulatory mechanism does not need to prohibit the following categories of non-stormwater discharges (see permit for list): ii. Conditionally Allowable Discharges: The regulatory mechanism may allow the following categories of non-stormwater discharges only if the stated conditions are met: [Note: a long list of items is listed. Requirements are summarized to the right. Please refer to the permit for verbatim requirements.]	Implement an ordinance to prohibit non-stormwater, illicit discharges and connections to the MS4. Update the allowable, conditionally allowable, and prohibited discharges according to new permit requirements.	**Ongoing - current program; 2/2/2018 - Update ordinance**	The City developed Ordinance No. 09-10 to address prohibited illicit discharges.	Staff Knowledge Ordinance No. 09-10; BGMC 13.126 - Storm Drainage System	ET (KU)	0	▶
S5.C.3.c	**Detection and Elimination Program (IDDE)**	Each Permittee shall implement an ongoing program designed to detect and identify non-stormwater discharges and illicit connections into the Permittee's MS4. The program shall include the following components: [Note: a long list of items is listed. Requirements are summarized to the right. Please refer to the permit for verbatim requirements.]	Implement an ongoing program designed to detect and identify non-stormwater discharges and illicit connections into the MS4, including investigation through a field screening methodology, training field staff, operating a hotline for public reporting, and informing the public, businesses, and the general public of hazards associated with illicit discharges.	**12/31/2017 - field screen 40% of MS4 and, on average, 12% each year thereafter; Ongoing - Hotline, field staff training, inform public**	As Operations crews become aware of incidents, usually during maintenance activities, they report them to the appropriate sources. Public complaints come to the main switchboard at City Hall or directly to Public Works. These numbers are listed on the City website. The City distributes brochures at City Hall on various residential best management practices, including automobile maintenance, car washing, and pool and spa maintenance, to inform the public of hazards associated with illicit discharges.	Staff Knowledge Website	ET (KU) Operations crews	40	▶
S5.C.3.d	**Address Illicit Discharges**	Implement an ongoing program designed to address illicit discharges, including spills and illicit connections, into the Permittee's MS4. The program shall include: i. Procedures for characterizing the nature of, and potential public or environmental threat posed by, any illicit discharges found by or reported to the Permittee. Procedures shall address the evaluation of whether the discharge must be immediately contained and steps to be taken for containment of the discharge. ii. Procedures for tracing the source of an illicit discharge; including visual inspections, and when necessary, opening manholes, using mobile cameras, collecting and analyzing water samples, and/or other detailed inspection procedures. iii. Procedures for eliminating the discharge; including notification of appropriate authorities; notification of the property owner; technical assistance; follow-up inspections; and use of the compliance strategy developed pursuant to S5.C.3.b.v, including escalating enforcement and legal actions if the discharge is not eliminated. iv. Compliance with the provisions in (i), (ii), and (iii), above, shall be achieved by meeting the following timelines: • Immediately respond to all illicit discharges, including spills, which are determined to constitute a threat to human health, welfare, or the environment, consistent with General Condition G3. • Investigate (or refer to the appropriate agency with the authority to act) within 7 days, on average, any complaints, reports or monitoring information that indicates a potential illicit discharge. • Initiate an investigation within 21 days of any report or discovery of a suspected illicit connection to determine the source of the connection, the nature and volume of discharge through the connection, and the party responsible for the connection. • Upon confirmation of an illicit connection, use the compliance strategy in a documented effort to eliminate the illicit connection within 6 months. All known illicit connections to the MS4 shall be eliminated.	Addresses illicit discharges and illicit connections by characterizing discharges, tracing illicit discharges and illicit connections, and eliminating discharges and connections.	**Ongoing**	The City relies on the Street and Storm Divisions of Public Works, the Fire Department, and Ecology for assistance with spill response. During normal working hours, stormwater division crew members respond to complaints received through the City Hall or Public Works switchboard. After hours, an on-call employee is available for emergency dispatch for spill or illicit discharge situations. Calls are tracked through the Citizen Action Request system.	Staff Knowledge Website	ET (KU, RA) PWS (MV)	100	▶
S5.C.3.e	**Staff Training**	Train staff who are responsible for identification, investigation, termination, cleanup, and reporting of illicit discharges, including spills, and illicit connections, to conduct these activities. Follow- up training shall be provided as needed to address changes in procedures, techniques, requirements or staffing. Permittees shall document and maintain records of the training provided and the staff trained.	Train staff who are responsible for identification, investigation, termination, cleanup, and reporting of illicit discharges, including spills, and illicit connections, to conduct these activities.	**Ongoing**	The City's Engineering Technician (KU) attended Illicit Discharge and Detection training in 2013.	Staff Knowledge	ET (KU, RA)	0	▶
S5.C.3.f	**Recordkeeping**	Track and maintain records of the activities conducted to meet the requirements of this section.	Track and maintain records of the activities conducted to meet the requirements of this section.	**Ongoing**	Maintain files for each Illicit Discharge	Staff Knowledge Illicit Discharge Binder	ET (KU)	24	▶
							Hours	**244**	▶
							FTE	**0.13**	▶

2013-2018 Phase II NPDES Municipal Stormwater Permit - Gap Analysis

	2015-2018 Program (New Program)						Assumptions
Cont'd from Left ◄	"Gap" Between Existing Program and Planned and Required Activities in 2013-2018 Permit	2015 LOE (Hours)	2016 LOE (Hours)	2017 LOE (Hours)	2018 LOE (Hours)		Assumptions
◄	The City needs to fill a few gaps identified in the existing mapping data and also needs to map outfalls to Mill Creek, Jewel Creek, the Railroad Ditch and the WSDOT ditch. The City needs to map basins to outfalls that are 24-inch or larger.	200	120	80	80		Assume increased level of effort in 2015 to map outfalls and fill minor gaps. Assume additional level of effort in 2015 and 2016 to map outfall basins as required and smaller outfalls, if time allows.
◄	The City needs to update BGMC 13.126 to incorporate modifications to allowable and conditionally allowable discharges in the 2013-2018 permit.	0	0	80	40		Assumes minor modifications to existing ordinance and minimal associated public outreach.
◄	The City needs to implement a field screening program to screen the MS4 for potential illicit connections/illicit discharges (IC/ID). The City needs to develop a comprehensive IDDE Program Standard Operating Procedure document. The program should include procedures, field assessment activities, spill response, source tracing and source termination. The City needs to provide training to Public Works Operations crews from the Water, Sewer, Facilities/Fleet, Streets, Parks, and Drainage divisions, as well as other municipal field staff such as Police, Code Enforcement, and Building Division, to identify and report suspected illicit discharges and illicit connections. Note: this training requirement is distinct from more thorough training required for City staff who must be trained to conduct field inspections and to respond to spills and IC/ID. The City needs to update brochures on residential best management practices distributed at City Hall and on its website to ensure that these are written in accordance with the 2014 SWMMWW.	160	120	160	80		Assumes program planning and documentation (Standard Operating Procedures) is conducted in 2015 (80 hours), along with resuming field screening. Assumes field screening methodology selected is outfall inspection. Assumes 80 hours per year for outfall inspection beginning in 2015, including time to mail notifications of access. Assumes City field staff will attend either an online training or a short group training conducted by the Engineering Technician or qualified consultant in 2016. Assumes 20 staff with a 2-hour time commitment, plus preparatory time for the Engineering Technician (40 hours). Assumes 80 hours to update various brochures in 2017 will occur in tandem with update of City code 13.126 (see S5.C.3.b).
◄	The City will need to proactively address illicit discharges and illicit connections that may be discovered when field reconnaissance resumes in 2015 following Standard Operating Procedures established under S5.C.3.c.	160	160	160	160		Assume similar level of effort in future years to respond to Illicit discharge notifications from police, DOE, public works or discovery during other activities. Assumes additional effort to respond to more suspected discharges and connections as a result of outfall screening or other field investigation method.
◄	The City needs to ensure that Public Works Stormwater division crews and other staff responsible spill response are trained to respond, clean-up, and report spills. The City may need to train one additional staff member in IC/ID field investigation and follow-up if a two-person crew (recommended) performs the field screening.	60	0	0	0		Assumes training for spill response is covered in S5.C.5.g (Operations 7 maintenance) and appropriate employees will attend. Assumes of other Engineering Technician will receive training in identifying, tracing and eliminating IC/ID.
◄		40	40	40	40		Assume increase in effort to maintain records of field investigations, related increase in identified incidents requiring responses, and tracking of field staff training beginning in 2015.
◄		**620**	**440**	**520**	**400**	***495***	***Average Annual Hours***
◄		**0.33**	**0.23**	**0.27**	**0.21**	***0.26***	***Average FTE***

2013-2018 Phase II NPDES Municipal Stormwater Permit - Gap Analysis

NPDES Requirements					Current Program Description				
Permit Section			Requirements Summarized	Permit Due Date	Current Compliance Activities	Information Source	Responsi-bility (Legend on last page)	Level of Effort (Hours, Average Annual)	Cont'd to Right ▶
Permit Element #S5.C.4, Controlling Runoff from New Development, Redevelopment, and Construction Sites									
Each Permittee shall implement and enforce a program to reduce pollutants in stormwater runoff to a regulated small MS4 from new development, redevelopment and construction site activities. The program shall apply to private and public development, including roads.									
S5.C.4.a	**Stormwater Runoff Control Ordinance**	Implement an ordinance or other enforceable mechanism that addresses runoff from new development, redevelopment, and construction site projects. The ordinance or other enforceable mechanism to implement (i) through (iii), below, shall be adopted and effective no later than 12/31/2016. The local program adopted to meet the requirements of S5.C.5.a(i) through (iii), below shall apply to all applications submitted on or after January 1, 2017 and shall apply to projects approved prior to January 1, 2017, which have not started construction by January 1, 2022. The ordinance or other enforceable mechanism shall include, at a minimum: [Note: a long list of items is listed. Requirements are summarized to the right. Please refer to the permit for verbatim requirements.]	Continue to enforce the current stormwater runoff control ordinance. Update the ordinance and other associated enforceable documents to new standards, including Minimum Requirements, thresholds, and definitions in Appendix 1 of the 2012 Stormwater Management Manual for Western Washington (SWMMWW). Include requirements, limitation, and criteria for site planning, BMP selection, BMP design, BMP infeasibility criteria, LID competing needs criteria, and BMP limitations.	**Ongoing; 12/31/2016 for new requirements**	The City adopted the 2005 SWMMWW for new and redevelopment projects over 1 acre and enforces site plan review and temporary erosion and sediment control on smaller sites.	Staff Knowledge City Code	CE (MH) ET (KU)	24	▶
S5.C.4.b	**Site Plan Review and Permitting**	The program shall include a permitting process with site plan review, inspection and enforcement capability to meet the standards listed in (i) through (iv) below, for both private and public projects, using qualified personnel (as defined in Definitions and Acronyms). At a minimum, this program shall be applied to all sites that meet the minimum thresholds adopted pursuant to S5.C.4.a.i, above. [Note: a long list of items is listed. Requirements are summarized to the right. Please refer to the permit for verbatim requirements.] i. Review of all stormwater site plans for proposed development activities. ii. Inspect, prior to clearing and construction, all permitted development sites that have a high potential for sediment transport as determined through plan review based on definitions and requirements in Appendix 7 Determining Construction Site Sediment Damage Potential. As an alternative to evaluating each site according to Appendix 7, Permittees may choose to inspect all construction sites that meet the minimum thresholds adopted pursuant to S5.C.4.a.i, above. iii. Inspect all permitted development sites during construction to verify proper installation and maintenance of required erosion and sediment controls. Enforce as necessary based on the inspection. iv. Inspect all permitted development sites upon completion of construction and prior to final approval or occupancy to ensure proper installation of permanent stormwater facilities. Verify that a maintenance plan is completed and responsibility for maintenance is assigned for stormwater treatment and flow control BMPs/facilities. Enforce as necessary based on the inspection. v. Compliance with the inspection requirements in (ii), (iii) and (iv) above, shall be determined by the presence and records of an established inspection program designed to inspect all sites. Compliance during this permit term shall be determined by achieving at least 80% of scheduled inspections. vi. An enforcement strategy shall be implemented to respond to issues of non-compliance.	Conduct site plan review, inspection, and enforcement of applications for public and private projects meeting the thresholds adopted pursuant to S5.C.4.a, above. Include the following components in the review and inspection program: site plan review, pre-construction inspection of sites with high potential for erosion, inspection of all development sites during construction to confirm proper installation and maintenance of erosion and sediment controls, post-construction inspection of permanent stormwater facilities, and an enforcement strategy for issues of non-compliance.	**Ongoing; 1/1/2017 implementation of updated code and new manual**	The City enforces codes 18.250 - Stormwater Control and Drainage, 18.255 - Erosion Control, and 18.257 - Clearing and Grading to address runoff from new development, redevelopment, and land clearing operations. The City conducts site plan review and construction inspection to ensure compliance with the BGMC. All site plans are reviewed through the Community Development Department for compliance with city code, including erosion control and post-construction runoff. Responsibilities include: - Associate Engineers (RJ, ME) review plans and applications and run pre-construction conferences. - Engineering Technician (KU) conducts weekly inspection of most sites (4 hours/week) and attends pre-construction conferences. - Building Inspector (LL) monitors erosion control of residential building. - Engineering Technician (RA) monitors erosion control of commercial development.	Staff Knowledge Municipal Code	CE (MH) AE (RJ, ME) ET (KU) ET (RA) BI (LL)	600	▶
S5.C.4.c	**Long Term Operation and Maintenance**	The program shall include provisions to verify adequate long-term operation and maintenance (O&M) of stormwater treatment and flow control BMPs/facilities that are permitted and constructed pursuant to (b) above. These provisions shall be in place no later than December 31, 2016. The provisions shall include: [Note: a long list of items is listed. Requirements are summarized to the right. Please refer to the permit for verbatim requirements.]	Enact provisions to ensure adequate long-term operation and maintenance of facilities permitted and constructed pursuant to the requirements in S5.C.4.a and b, above. Include a requirement to identify the responsible party, provide authority for inspection, establish maintenance standards, inspect facilities, and enforce compliance with standards.	**12/31/2016**	The City published the *Stormwater Facility Maintenance Manual* (BG02.01) in May 2014 with maintenance standards equivalent to the 2012 SWMMWW. In addition, the City has begun the process of developing a LID facility maintenance manual. Operations crews conduct annual inspections, and the Engineering Technician (KU) mails compliance letters and coordinates with owners for facility maintenance. The City maintains records of inspections of private treatment and flow control BMPs/facilities in hard copy in a binder and as digital scans. Facility maintenance is not tracked.	Staff Knowledge Municipal Code 18.250	ET (KU) PWS (MV)	200	▶
S5.C.4.d	**Provide NOI Forms**	Make available as applicable copies of the "Notice of Intent for Construction Activity" and copies of the "Notice of Intent for Industrial Activity" to representatives of proposed new development and redevelopment. Permittees shall continue to enforce local ordinances controlling runoff from sites that are also covered by stormwater permits issued by Ecology.	Make available as applicable copies of the "Notice of Intent for Construction Activity" and copies of the "Notice of Intent for Industrial Activity" to representatives of proposed new development and redevelopment.	**Ongoing**	Copies are available at City Hall and are distributed at Pre-Application Conferences.	Staff Knowledge	ET (KU)	4	▶
S5.C.4.e	**Staff Training**	Each Permittee shall ensure that all staff whose primary job duties are implementing the program to control stormwater runoff from new development, redevelopment, and construction sites, including permitting, plan review, construction site inspections, and enforcement, are trained to conduct these activities. Follow-up training shall be provided as needed to address changes in procedures, techniques or staffing. Permittees shall document and maintain records of the training provided and the staff trained.	Ensure that all staff whose primary job duties are implementing the program to control stormwater runoff from new development, redevelopment, and construction sites, including permitting, plan review, construction site inspections, and enforcement, are trained to conduct these activities.	**Ongoing; Implied deadline: 12/31/2016 for new training**	The City's Building Inspector (LL) is CESCL certified, and the Engineering Technician (KU) will obtain certification in 2015.	Staff Knowledge	ET (KU)	16	▶
Permit Element continued on next page…									▼

2013-2018 Phase II NPDES Municipal Stormwater Permit - Gap Analysis

	2015-2018 Program (New Program)						Assumptions
Cont'd from Left ◄	"Gap" Between Existing Program and Planned and Required Activities in 2013-2018 Permit	2015 LOE (Hours)	2016 LOE (Hours)	2017 LOE (Hours)	2018 LOE (Hours)		Assumptions
◄	The City needs to update its stormwater code and adopt the 2014 SWMMWW or an equivalent manual by December 31, 2016. The adopted manual may need some local customizations, depending on City preference.	80	160	0	0		Assumes some preparatory work in 2015 and code update and new manual adoption in 2016. Assumes minimal customization of selected manual, minimal public outreach and involvement, and minimal involvement of City Council.
◄	Site plan review and construction inspections may increase after the 2014 SWMMWW or equivalent becomes effective in 2017. New required BMPs will require additional training for review and inspection staff; some post-construction inspections may be conducted by different staff. Some single-family residential building permits may trigger Minimum Requirements under the 2014 SWMMWW, which would lead to a need for Building Department staff to receive training in stormwater review. The City needs to add a program to conduct pre-construction inspections of sites with high potential for erosion as determined by criteria contained in Appendix 7 of the Western Washington Phase II Municipal Stormwater Permit.	600	600	750	750		<u>Existing Program</u> Assume approximately 180 annually for Associate Engineers (Plan Review) Assume approximately 4/hours per week for Engineering Technician (KU) (Erosion Control Rounds) Assume approximately 2/hours per week for Engineering Technician (RA) (Commercial Site Inspections) Assume approximately 2/hours per week for Building Inspector (LL) (Residential Site Inspections) <u>New Program</u> Assumes constant level of effort through 2016, then increased effort to account for 1) a learning curve in reviewing and inspecting new BMPs, 2) review, potentially, of a greater number of applications that trigger Minimum Requirements as a result of decreased thresholds, and 3) implementation of a pre-construction inspection program for sites with high erosion potential. The increased effort may decrease after a year or two when staff become more comfortable with new site plan review and inspection procedures.
◄	The City needs to work toward bringing private facilities into compliance with maintenance standards by addressing a backlog of enforcement and continuing to coordinate with private facility owners. The City needs to ensure that the *Stormwater Facility Maintenance Manual* provides equivalent protection to the 2014 SWMMWW and needs to complete the LID facility maintenance manual. These activities are addressed in S5.C.5.a., below. The City needs to inspect bonded sites during construction every 6 months beginning in 2017. The City needs to document maintenance of private facilities.	240	240	280	280		<u>Existing Program</u> 120 hours for inspections, 40 hours for compliance letters. 40 hours for coordination with owners to maintain facilities. <u>New Program</u> Assume future years will require more time to coordinate with private owners and document maintenance activities beginning in 2015. Assume inspection of all bonded facilities every 6 months until 90% of lots are built out beginning in 2017.
◄	The City's current activities meet this requirement.	4	4	4	4		
◄	The City will need to provide additional training for staff in development review and enforcement consistent with the Phase II requirements in late 2016 and early 2017.	24	72	72	72		Assume a baseline of 2 days of training per year each for the Engineering Technician (KU) and the Building Inspector (LL) (24 hours/year) to obtain and maintain CESCL certification. Assumes that Operations and Engineering staff (RJ, ME) and ET (RA) will require additional training in 2016 and 2017 for site plan review and inspection. Estimated training is one 2-day training for each person.
▼	**Permit Element continued on next page…**						

2013-2018 Phase II NPDES Municipal Stormwater Permit - Gap Analysis

NPDES Requirements					Current Program Description				
Permit Section			Requirements Summarized	Permit Due Date	Current Compliance Activities	Information Source	Responsi-bility (Legend on last page)	Level of Effort (Hours, Average Annual)	Cont'd to Right ▶
Continued - Permit Element #S5.C.4, Controlling Runoff from New Development, Redevelopment, and Construction Sites									▲
S5.C.4.f	**Low Impact Development Requirements**	Low impact development code-related requirements. i. No later than 12/31/2016, review, revise and make effective their local development-related codes, rules, standards, or other enforceable documents to incorporate and require LID principles and LID BMPs. The intent of the revisions shall be to make LID the preferred and commonly-used approach to site development. The revisions shall be designed to minimize impervious surfaces, native vegetation loss, and stormwater runoff in all types of development situations. Permittees shall conduct a similar review and revision process, and consider the range of issues, outlined in the following document: Integrating LID into Local Codes: A Guidebook for Local Governments (Puget Sound Partnership, 2012). ii. Submit a summary of the results of the review and revision process in (i) above with the annual report due no later than March 31, 2017. This summary shall include, at a minimum, a list of the participants (job title, brief job description, and department represented), the codes, rules, standards, and other enforceable documents reviewed, and the revisions made to those documents which incorporate and require LID principles and LID BMPs. The summary shall include existing requirements for LID principles and LID BMPs in development- related codes. The summary shall be organized as follows: (a) Measures to minimize impervious surfaces; (b) Measures to minimize loss of native vegetation; and (c) Other measures to minimize stormwater runoff.	Incorporate requirements to use Low Impact Development principles in development and redevelopment projects following guidance in *Integrating LID into Local Codes: a Guidebook for Local Governments* (Puget Sound Partnership, 2012). Summarize the results of the revision process.	**12/31/2016 - Code and manual update 3/31/2017 - Submit summary**	During the previous permit term, the City completed a LID barriers analysis and adopted street standards that include LID practices such as reduced pavement areas. The City has created preliminary LID BMP standard details.	Staff Knowledge 2013 SWMP	ET (KU)	40	▶
S5.C.4.g	**Watershed-scale Stormwater Planning**	Each Permittee that has all or part of its coverage area under this Permit in a watershed selected by a Phase I county for watershed-scale stormwater planning under condition S5.C.4.c of the Phase I Municipal Stormwater General Permit shall participate with the watershed-scale stormwater planning process led by the Phase I county...	Participate in watershed-scale stormwater planning within a watershed selected by a Phase I county.	**N/A**	City of Battle Ground is not subject to this requirement.			0	▶
							Hours	**884**	▶
							FTE	**0.47**	▶

2013-2018 Phase II NPDES Municipal Stormwater Permit - Gap Analysis

	2015-2018 Program (New Program)						Assumptions
Cont'd from Left ◀	"Gap" Between Existing Program and Planned and Required Activities in 2013-2018 Permit	2015 LOE (Hours)	2016 LOE (Hours)	2017 LOE (Hours)	2018 LOE (Hours)		Assumptions
▲							
◀	The City needs to review and revise its development codes using a process similar to, and considering the range of issues described in, *Integrating LID into Local Codes: A Guidebook for Local Governments* . The review process must include staff from various stakeholder departments and divisions, including Building Division, Planning Division, Engineering, and Operations. The City may also need to involve Clark County Fire and Rescue and community stakeholders. It appears that the City may have made substantial progress on meeting these requirements in the previous permit term; the City will need to analyze the status of LID implementation in its development codes and determine the level of effort required to complete this task in a manner that meets permit requirements. The City will need to summarize the process in the annual report due in 2017.	40	80	40	0		Assume that the current LID implementation status is largely compliant with permit requirements and minimal effort is needed to comply and summarize the process.
◀	N/A	0	0	0	0		N/A
◀		**988**	**1156**	**1146**	**1106**	***1099***	***Average Annual Hours***
◀		**0.52**	**0.61**	**0.60**	**0.58**	***0.58***	***Average FTE***

2013-2018 Phase II NPDES Municipal Stormwater Permit - Gap Analysis

NPDES Requirements					Current Program Description				
Permit Section			Requirements Summarized	Permit Due Date	Current Compliance Activities	Information Source	Responsi-bility (Legend on last page)	Level of Effort (Hours, Average Annual)	Cont'd to Right ▶
Permit Element #S5.C.5, Municipal Operations and Maintenance									
Each Permittee shall implement an operations and maintenance (O&M) program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations.									
S5.C.5.a	**Establish Maintenance Standards**	Each Permittee shall implement maintenance standards that are as protective, or more protective, of facility function than those specified in Chapter 4 of Volume V of the 2012 Stormwater Management Manual for Western Washington. For facilities which do not have maintenance standards, the Permittee shall develop a maintenance standard. No later than December 31, 2016, Permittees shall update their maintenance standards as necessary to meet the requirements of this section. i. The purpose of the maintenance standard is to determine if maintenance is required. The maintenance standard is not a measure of the facility's required condition at all times between inspections. Exceeding the maintenance standard between inspections and/or maintenance is not a permit violation. ii. Unless there are circumstances beyond the Permittee's control, when an inspection identifies an exceedance of the maintenance standard, maintenance shall be performed: • Within 1 year for typical maintenance of facilities, except catch basins. • Within 6 months for catch basins. • Within 2 years for maintenance that requires capital construction of less than $25,000. Circumstances beyond the Permittee's control include denial or delay of access by property owners, denial or delay of necessary permit approvals, and unexpected reallocations of maintenance staff to perform emergency work. For each exceedance of the required timeframe, the Permittee shall document the circumstances and how they were beyond their control.	Establish maintenance standards in accordance with the SWMMWW for the City's stormwater treatment and flow control facilities. Follow guidelines for completing maintenance within timeframes specified in the permit if inspection finds that a maintenance standard is exceeded.	**Ongoing; 12/31/2016 - for new standards**	The City produced the a *Stormwater Facility Maintenance Manual* (BG02.01) in May 2014 containing maintenance standards equivalent to the 2012 SWMMWW and has begun preparing a LID facility maintenance manual.	Staff Knowledge Website	ET (KU) PWS (MV)	40	▶
S5.C.5.b	**Annual Inspections of Water Quality and Flow Control Facilities**	Annual inspection of all municipally owned or operated permanent stormwater treatment and flow control BMPs/facilities, and taking appropriate maintenance actions in accordance with the adopted maintenance standards. Permittees may reduce the inspection frequency based on maintenance records of double the length of time of the proposed inspection frequency. In the absence of maintenance records, the Permittee may substitute written statements to document a specific less frequent inspection schedule. Written statements shall be based on actual inspection and maintenance experience and shall be certified in accordance with G19 Certification and Signature.	Annually inspect all City-operated stormwater treatment and flow control facilities.	**Ongoing**	The City's Engineering Technician conducts annual inspections of all public facilities with the first full inspection occurring in 2014.	Staff Knowledge	ET (KU)	160	▶
		Resultant cleaning and maintenance, as indicated from inspections performed in compliance with S5.C.5.b, above.	Resultant cleaning and maintenance, as indicated from inspections performed in compliance with S5.C.5.b, above.	**Ongoing**	The City Operations division performs non-routine maintenance and major corrections identified in inspections, above, as time allows.	Staff Knowledge	Operations	40	▶
S5.C.5.c	**Spot Checks after Storm Events**	Spot checks of potentially damaged permanent stormwater treatment and flow control BMPs/facilities after major storm events (24 hour storm event with a 10 year or greater recurrence interval). If spot checks indicate widespread damage/maintenance needs, inspect all stormwater treatment and flow control BMPs/facilities that may be affected. Conduct repairs or take appropriate maintenance action in accordance with maintenance standards established above, based on the results of the inspections.	Spot checks of potentially damaged permanent stormwater treatment and flow control BMPs/facilities after major storm events. If spot checks indicate widespread damage/maintenance needs, inspect all stormwater treatment and flow control BMPs/facilities that may be affected. Conduct repairs or take appropriate maintenance action.	**Ongoing**	The City's Engineering Technician (KU) conducts occasional spot checks of known problem areas after heavy rains. Examples include NW 29th Pond, Railroad Ditches, SE Eaton Blvd., and SW 24th Ave Pond. Operations conducts regular brief site checks at stormwater facilities and conveyances. The City's program appears to exceed permit requirements.	Staff Knowledge	Operations ET (KU)	340	▶
S5.C.5.d	**Catch Basin Inspection**	Inspect all catch basins and inlets owned or operated by the Permittee at least once no later than August 1, 2017 and every two years thereafter. Clean catch basins if the inspection indicates cleaning is needed to comply with maintenance standards established in the 2012 Stormwater Management Manual for Western Washington. Decant water shall be disposed of in accordance with Appendix 6 Street Waste Disposal. The following alternatives to the standard approach of inspecting all catch basins once no later than August 1, 2017 and every two years thereafter may be applied to all or portions of the system: i. The catch basin inspection schedule of every two years may be changed as appropriate to meet the maintenance standards based on maintenance records of double the length of time of the proposed inspection frequency. In the absence of maintenance records for catch basins, the Permittee may substitute written statements to document a specific, less frequent inspection schedule. Written statements shall be based on actual inspection and maintenance experiences and shall be certified in accordance with G19 Certification and Signature. ii. Inspections at least once by August 1, 2017 and every two years thereafter may be conducted on a "circuit basis" whereby 25% of catch basins and inlets within each circuit are inspected to identify maintenance needs. Include an inspection of the catch basin immediately upstream of any system outfall, if applicable. Clean all catch basins within a given circuit for which the inspection indicates cleaning is needed to comply with maintenance standards established under S5.C.5.a, above. iii. The Permittee may clean all pipes, ditches, catch basins, and inlets within a circuit once during the permit term. Circuits selected for this alternative must drain to a single point.	Inspect all catch basins and inlets owned or operated by the City at least once no later than August 1, 2017 and every two years thereafter. Clean catch basins if the inspection indicates cleaning is needed to comply with maintenance standards established in the SWMMWW.	**August 1, 2017 then Every Two Years**	The City's Operations crews currently inspect and clean approximately 20% of catch basins annually.	Staff Knowledge	Operations	160	▶
S5.C.5.e	**Inspection Compliance**	Compliance with the inspection requirements in b, c, and d above shall be determined by the presence of an established inspection program designed to inspect all sites and achieving at least 95% of inspections.	Compliance with the inspection requirements in b, c, and d above shall be determined by the presence of an established inspection program designed to inspect all sites and achieving at least 95% of inspections.	**3/31/2015 - Document established inspection program in Annual Report; 6/30/2018 - Achieve 95% of inspections**	The City's program is designed to comply with inspection requirements.	Staff Knowledge	ET (KU) Operations	0	▶
Permit Element continued on next page...									▼

2013-2018 Phase II NPDES Municipal Stormwater Permit - Gap Analysis

	2015-2018 Program (New Program)						Assumptions
Cont'd from Left ◄	"Gap" Between Existing Program and Planned and Required Activities in 2013-2018 Permit	2015 LOE (Hours)	2016 LOE (Hours)	2017 LOE (Hours)	2018 LOE (Hours)		Assumptions
◄	The City needs to ensure that its *Stormwater Facility Maintenance Manual* provides equivalent protection to the 2014 SWMMWW and needs to complete the LID facility maintenance manual.	80	0	0	0		Assumes *Stormwater Facility Maintenance Manual* is substantially equivalent to the 2014 SWMMWW and will need few modifications. Assumes the LID facility maintenance manual will be published in 2015 and will comply with the 2014 SWMMWW.
◄	The City needs to develop a new inspection form to document inspections.	160	160	160	160		Assumes 120 hours/year to conduct inspections of 79 facilities. Assumes 40 hours/year to compile a list, document needed (non-routine) maintenance, and coordinate with Operations.
◄	The City needs to address needed non-routine maintenance and repairs within timelines required by the permit section S5.C.5.a.	160	160	160	160		Assumes increased effort to bring facilities into compliance.
◄	The City's current activities meet or exceed this requirement.	340	340	340	340		Assumes 20 hours/year for the Engineering Technician. Assumes 320 hours/year for Operation Rounds.
◄	The City would like to develop a Standard Operation Procedure for catch basin inspection and cleaning.	200	160	160	200		Assumes that 20% of catch basins is approximately 300 structures. Assume most CB's will be relatively clean when "Every 2 year" schedule begins in 2018, but 50% will need to be inspected and/or cleaned beginning in 2018. Assumes development of SOP document for Catch Basin Inspection and Cleaning in 2015 (40 hours).
◄	The Engineering Technician could develop a tracking mechanism to ensure that the City will meet this performance measure.	40	20	20	20		Assumes the Engineering Technician develops a tracking mechanism in 2015 and continues tracking is subsequent years.
▼	**Permit Element continued on next page...**						

2013-2018 Phase II NPDES Municipal Stormwater Permit - Gap Analysis

NPDES Requirements					Current Program Description				
Permit Section			Requirements Summarized	Permit Due Date	Current Compliance Activities	Information Source	Responsi-bility (Legend on last page)	Level of Effort (Hours, Average Annual)	Cont'd to Right ▶
Continued - Permit Element #S5.C.5, Municipal Operations and Maintenance									▲
S5.C.5.f	**Municipal Maintenance to Reduce Stormwater Impacts**	Implement practices, policies and procedures to reduce stormwater impacts associated with runoff from all lands owned or maintained by the Permittee, and road maintenance activities under the functional control of the Permittee. Lands owned or maintained by the Permittee include, but are not limited to, streets, parking lots, roads, highways, buildings, parks, open space, road right-of-ways, maintenance yards, and stormwater treatment and flow control BMPs/facilities. The following activities shall be addressed: • Pipe cleaning • Cleaning of culverts that convey stormwater in ditch systems • Ditch maintenance • Street cleaning • Road repair and resurfacing, including pavement grinding • Snow and ice control • Utility installation • Pavement striping maintenance • Maintaining roadside areas, including vegetation management • Dust control • Application of fertilizers, pesticides, and herbicides according to the instructions for their use, including reducing nutrients and pesticides using alternatives that minimize environmental impacts • Sediment and erosion control • Landscape maintenance and vegetation disposal • Trash and pet waste management • Building exterior cleaning and maintenance	Implement practices, policies and procedures to reduce stormwater impacts associated with runoff from all lands owned or maintained by the City, and road maintenance activities. Such lands include, but are not limited to, streets, parking lots, roads, highways, buildings, parks, open space, road rights-of-way, maintenance yards, and stormwater treatment and flow control BMPs/facilities.	**Ongoing**	The City implements an Operations and Maintenance program designed to reduce impacts to stormwater from municipal operations, including: - Routinely mowing and removing trash from swales, ponds, and other grassed water quality and flow control facilities (3 or 4 times per year). - Constructing a decant facility at its Operations Department in 2010; using this facility to decant street sweepings. - Sweeping each quadrant of the City in a regular street sweeping program. - Removing snow and ice when necessary and has its snow removal routes posted to its website. - Cleaning pipes and culverts as necessary when there is a problem. - Regularly mowing ditches throughout the City and removing sediment as necessary. - Responding to public drainage complaints	Staff Knowledge Website	Operations ET (KU) for drainage complaint coordination	3063	▶
S5.C.5.g	**Staff Training**	Implement an ongoing training program for employees of the Permittee whose primary construction, operations or maintenance job functions may impact stormwater quality. The training program shall address the importance of protecting water quality, operation and maintenance standards, inspection procedures, selecting appropriate BMPs, ways to perform their job activities to prevent or minimize impacts to water quality, and procedures for reporting water quality concerns. Follow-up training shall be provided as needed to address changes in procedures, techniques, requirements, or staffing. Permittees shall document and maintain records of training provided and the staff trained.	Implement an ongoing training program for employees whose primary construction, operations or maintenance job functions may impact stormwater quality. The training program shall address the importance of protecting water quality, operation and maintenance standards, inspection procedures, selecting appropriate BMPs, ways to perform their job activities to prevent or minimize impacts to water quality, and procedures for reporting water quality concerns.	**Ongoing**	No formal training program has been implemented.	Staff Knowledge	ET (KU)	0	▶
S5.C.5.h	**SWPPP for Maintenance Yards**	Implement a Stormwater Pollution Prevention Plan (SWPPP) for all heavy equipment maintenance or storage yards, and material storage facilities owned or operated by the Permittee in areas subject to this Permit that are not required to have coverage under the General NPDES Permit for Stormwater Discharges Associated with Industrial Activities or another NPDES permit that authorizes stormwater discharges associated with the activity. A schedule for implementation of structural BMPs shall be included in the SWPPP. Generic SWPPPs that can be applied at multiple sites may be used to comply with this requirement. The SWPPP shall include periodic visual observation of discharges from the facility to evaluate the effectiveness of the BMP.	Implement a Stormwater Pollution Prevention Plan (SWPPP) for all heavy equipment maintenance or storage yards, and material storage facilities operated by the City. The SWPPP shall include periodic visual observation of discharges from the facility to evaluate the effectiveness of the BMP.	**Ongoing**	The City created a SWPPP in 2010 for the Operations Center.	Staff Knowledge 2010 City of Battle Ground Operations Center Stormwater Pollution Prevention Plan (SWPPP)	ET (KU)	0	▶
S5.C.5.i	**Record Keeping**	Maintain records of inspection and/or repair activities.	Maintain records of inspection and repair activities.	**Ongoing**	The City keeps records of annual inspections as hard copies in binders and as digital scans.	Staff Knowledge	ET (KU) PWS (MV)	500	▶
							Hours	**4303**	▶
							FTE	**2.26**	▶

2013-2018 Phase II NPDES Municipal Stormwater Permit - Gap Analysis

	2015-2018 Program (New Program)						Assumptions
Cont'd from Left ◀	"Gap" Between Existing Program and Planned and Required Activities in 2013-2018 Permit	2015 LOE (Hours)	2016 LOE (Hours)	2017 LOE (Hours)	2018 LOE (Hours)		Assumptions
▲							
◄	The City plans to add one FTE to its Operations program in order to provide a higher level of service and to allow greater flexibility in scheduling non-routine facility maintenance and repairs. The City could choose to formalize its pesticide, herbicide, and nutrient use practices, which are currently unwritten. The City could choose to develop a pet waste management program for its parks.	4700	4700	4700	4700		<u>Current Program</u> Assumes 1.15 FTE Operations staff dedicated to municipal O&M for stormwater. <u>New Program</u> Assumes one additional FTE Operations crew member beginning in 2015. Assumes the FTE may also contribute to meeting other Operations & Maintenance permit requirements, particularly facility non-routine maintenance required in S5.C.5.b, although level of effort is accounted for only in this requirement. Assumes 200 hours/year for Engineering Technician to coordinate responses to public drainage complaints.
◄	The City needs to develop and implement an ongoing training program for Public Works crew members who participate in construction and operation and maintenance job functions that may impact stormwater quality. The training program should include information about the importance of protecting water quality, operation and maintenance standards, inspection procedures, selection of appropriate BMPs for source control and erosion and sediment control, and ways to perform job activities to prevent impacts to water quality. The City needs to maintain records of this training.	60	64	12	12		Assumes preparatory time in 2015 and delivery of, or attendance at, a 4-hour training program for 10 municipal field staff in 2016. This training could conceivably be combined with staff training for illicit discharge/connection detection (S5.C.3.c(iii)), although this is not assumed here. Assumes individual training of new Public Works field crew members as needed when new staff are hired; training to be conducted by the Engineering Technician (KU). Assumes 4 hours of record-keeping per year.
◄	The City needs to update the SWPPP in 2015, develop a periodic visual observation schedule, perform periodic visual observations, and update the SWPPP as necessary.	40	20	20	20		Assume 40 hours to update in 2015, then 20 hours per year for visual observations and any needed updates.
◄	The City needs to begin maintaining records of maintenance and repair activities in addition to inspections. The City plans to begin using the Lucity maintenance and asset management system to track maintenance activities.	800	800	600	600		Assumes inspection records will continue to be kept manually (300 hours/year). Assumes 500 hours/year in 2015 and 2016 for setting up the Lucity system and then 300 hours/year in future years to maintain the system.
◄		**6580**	**6424**	**6172**	**6212**	***6347***	***Average Annual Hours***
◄		**3.46**	**3.38**	**3.25**	**3.27**	***3.34***	***Average FTE***

2013-2018 Phase II NPDES Municipal Stormwater Permit - Gap Analysis

NPDES Requirements					Current Program Description				
Permit Section			Requirements Summarized	Permit Due Date	Current Compliance Activities	Information Source	Responsi-bility (Legend on last page)	Level of Effort (Hours, Average Annual)	Cont'd to Right ▶
Permit Elements #S5.A and #S5.B, Program Implementation, and Other Administration									
S5.A.1	**SWMP Implementation**	Develop and implement a SWMP that covers the geographic area subject to the permit. Included with items above.	Develop and implement a SWMP that covers the geographic area subject to the permit. Included with items above.	**Ongoing**	Updated in January 2014.	2013 SWMP	ET (KU)	20	►
S5.A.2	**SWMP Plan**	Prepare written documentation of the SWMP and maintain annual updates. Write the plan to inform the public of the planned SWMP activities for the upcoming calendar year. Include a description of planned activities of the program components in S5.C, planned actions to meet applicable TMDL requirements (NPDES Permit Condition S7), and planned actions to meet NPDES Permit Condition S8, Monitoring.	Prepare written documentation of the SWMP and maintain annual updates.	**5/31/2014 then by 3/31 each year**	Updated in January 2014.	2013 SWMP	ET (KU)	120	►
S5.A.3	**Program Tracking**	The SWMP shall include an ongoing program for gathering, tracking, maintaining, and using information to evaluate SWMP development, implementation and permit compliance and to set priorities. a. Each Permittee shall track the cost or estimated cost of development and implementation of each component of the SWMP. This information shall be provided to Ecology upon request. b. Each Permittee shall track the number of inspections, official enforcement actions and types of public education activities as required by the respective program component. This information shall be included in the annual report.	The SWMP shall include an ongoing program for gathering, tracking, maintaining, and using information to evaluate SWMP development, implementation and permit compliance and to set priorities.	**Ongoing - for cost tracking 3/31/2015 and annually with Annual Report - for inspection/enforcement/education tracking**	The City tracks Inspections, enforcement actions, and public education activities. Costs have not been tracked.	Staff Knowledge Inspections Binder	ET (KU)	8	►
S5.A.5	**Coordination Among Permittees**	Coordination among entities covered under municipal stormwater NPDES permits may be necessary to comply with certain conditions of the SWMP. The SWMP should include, when needed, coordination mechanisms among entities covered under a municipal stormwater NPDES permit to encourage coordinated stormwater-related policies, programs and projects within adjoining or shared areas, including: i. Coordination mechanisms clarifying roles and responsibilities for the control of pollutants between physically interconnected MS4s covered by a municipal stormwater permit. ii. Coordinating stormwater management activities for shared water bodies among Permittees to avoid conflicting plans, policies and regulations. b. The SWMP shall include coordination mechanisms among departments within each jurisdiction to eliminate barriers to compliance with the terms of this permit. Permittees shall include a written description of internal coordination mechanisms in the Annual Report due no later than March 31, 2015.	Coordination among entities covered under municipal stormwater NPDES permits may be necessary to comply with certain conditions of the SWMP. The SWMP should include, when needed, coordination mechanisms among entities covered under a municipal stormwater NPDES permit to encourage coordinated stormwater-related policies, programs and projects within adjoining or shared areas.	**3/31/2015 - for description of intrajurisdictional coordination mechanisms Ongoing - for other components**	The City's Engineering Technician (KU) attend quarterly meetings with local stormwater permittees. The Engineering Technician (KU) coordinates with Operations for facility maintenance and catch basin inspection and cleaning and coordinates with the Building Inspector for erosion control inspections.	Staff Knowledge	ET (KU)	40	►
S5.B	**MEP and AKART**	Design the SWMP to reduce discharge of pollutants from the MS4 to the Maximum Extent Practicable (MEP), meet State AKART requirements, and protect water quality.	Design the SWMP to reduce discharge of pollutants from the MS4 to the Maximum Extent Practicable (MEP), meet State AKART requirements, and protect water quality.	**Ongoing**	The City's SWMP is designed to meet this requirement through implementation of program elements.	Staff Knowledge	ET (KU) PWS (MV)	20	►
G18	**Duty to Reapply**	Reapply for coverage under the next permit.	Reapply for coverage under the next permit.	**2/2/2018**	None	Staff Knowledge		0	►
							Hours	**208**	►
							FTE	**0.11**	►
Permit Element #8, Monitoring and Assessment									
All permittees shall provide, in each annual report, a description of any stormwater monitoring or stormwater-related studies conducting by or on behalf of the permittee during the reporting period, except those conducted as part of the RSMP.									
S8.A	**Reporting**	All permittees shall provide, in each annual report, a description of any stormwater monitoring or stormwater-related studies conducting by or on behalf of the permittee during the reporting period, except those conducted as part of the RSMP.	Describe any stormwater monitoring or stormwater-related studies conducting by or on behalf of the permittee during the reporting period, except those conducted as part of the RSMP.	**3/31/2015 and each year thereafter**	None	None	ET (KU)	0	
S8.B	**Status and Trends**	Either participate in the RSMP or conduct status and trends monitoring in accordance with S8.B.2.	Either participate in the RSMP or conduct status and trends monitoring in accordance with S8.B.2.	**N/A**	This requirement does not apply to Battle Ground; however the Engineering Technician participates in the regional Habitat Status and Trends workshops with the Lower Columbia Fish Recovery Board.	Staff Knowledge	ET (KU)	30	►
S8.C	**SWMP Effectiveness Study**	Either participate in the RSMP for effectiveness or conduct effectiveness study in accordance with S8.C.2	Either participate in the RSMP for effectiveness or conduct effectiveness study in accordance with S8.C.2	**8/15/2014 and each year thereafter - for Option #1 payment into RSMP Various - for Option #2**	RSMP Participant. The Engineering Technician (KU) attends the RSMP Pooled Resources Oversight committee meetings in Tacoma.	Staff Knowledge	ET (KU)	30	►
S8.D	**Source ID and Diagnostic Monitoring**	Participate in the RSMP SIDIR	Participate in the RSMP SIDIR	**Payment due 8/15/2014 and each year thereafter**	RSMP Participant	Staff Knowledge	ET (KU)	2	►
							Hours	**62**	►
							FTE	**0.03**	►

2013-2018 Phase II NPDES Municipal Stormwater Permit - Gap Analysis

	2015-2018 Program (New Program)						Assumptions
Cont'd from Left ◄	"Gap" Between Existing Program and Planned and Required Activities in 2013-2018 Permit	2015 LOE (Hours)	2016 LOE (Hours)	2017 LOE (Hours)	2018 LOE (Hours)		Assumptions
◄	The City's current activities meet this requirement.	20	20	20	20		Assumes consistent level of effort during permit term.
◄	The City's current activities meet this requirement.	40	20	20	20		SWMP was updated to new permit requirements in 2014. SWMP will be submitted with Annual Report electronically in 2015, therefore, additional time was allocated for 2015. The time is reduced for future years to update and submit.
◄	The City needs to implement a system for tracking costs to comply with each permit component.	100	20	20	20		Assumes 80 hours for developing a cost-tracking mechanism in 2015 and 20 hours to perform cost-tracking annually beginning in 2015. Other program tacking is accounted for in individual permit elements, above.
◄	The City would like to partner with other local permittees on an education effectiveness study. The City needs to document internal coordination mechanisms in its annual report due in March 2015.	48	40	40	40		Assumes increased effort in 2015 and then a return to baseline.
◄	The City's program appears to meet MEP and AKART requirements.	20	20	20	20		Assumes consistent level of effort during permit term.
◄	None	0	0	0	8		
◄		**228**	**120**	**120**	**128**	***149***	***Average Annual Hours***
◄		**0.12**	**0.06**	**0.06**	**0.07**	***0.08***	***Average FTE***
◄	None	0	0	0	0		Assumes no monitoring, therefore no reporting.
◄	The City's current activities in this area exceed permit requirements.	20	20	20	20		Assumes continued participation in the Habitat Status and Trends workshops with the Lower Columbia Fish Recovery Board.
◄	The City's current activities in this area meet or exceed permit requirements.	20	20	20	20		Assumes continued participation in the RSMP Pooled Resources Oversight committee with meetings in Tacoma.
◄	The City's current activities in this area meet permit requirements.	2	2	2	2		
◄		**42**	**42**	**42**	**42**	***42***	***Average Annual Hours***
◄		**0.02**	**0.02**	**0.02**	**0.02**	***0.02***	***Average FTE***

2013-2018 Phase II NPDES Municipal Stormwater Permit - Gap Analysis

NPDES Requirements					Current Program Description				
Permit Section			Requirements Summarized	Permit Due Date	Current Compliance Activities	Information Source	Responsi-bility (Legend on last page)	Level of Effort (Hours, Average Annual)	Cont'd to Right ▶
Permit Elements #S9.A and #S9.B, Reporting									
S9.A & D	**Annual Reports**	Submit annual report electronically at http://www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html Each annual report shall include: - Copy of the current SWMP; - The annual report form found at the URL above, including implementation status of Elements 1 through 5 and questions/instructions in Appendix 3; - Other attachments required in S5.C; - Notice of reliance on another governmental entity to satisfy any obligation of permit, if applicable; - Certification of the submittal - Change in geographic coverage area of permit due to annexation or other boundary changes	Submit annual report electronically at http://www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html	**Annually 3/31 beginning 2015**	Annual reports have been prepared every year.	2013 Stormwater Annual Report	ET (KU)	80	▶
S9.B-C	**Maintain Open Public Records**	Maintain records of SWMP and permit activities for five years; make records available to the public upon request.	Maintain records of SWMP and permit activities for five years; make records available to the public upon request.	**Ongoing**	Records have been maintained, but no records have been requested.	Staff Knowledge	ET (KU)	20	▶
							Hours	**100**	▶
							FTE	**0.05**	▶

Program Summary

Current Annual Hours	**6005**	▶
Current FTE	**3.16**	▶

2013-2018 Phase II NPDES Municipal Stormwater Permit - Gap Analysis

	2015-2018 Program (New Program)						Assumptions
Cont'd from Left ◄	"Gap" Between Existing Program and Planned and Required Activities in 2013-2018 Permit	2015 LOE (Hours)	2016 LOE (Hours)	2017 LOE (Hours)	2018 LOE (Hours)		Assumptions
◄	The City needs to submit the 2014 Annual Report online for the first time in March 2015 and needs to continue submitting reports annually.	100	80	80	80		Assumes an additional 20 hours in 2015 because report will be submitted online for first time.
◄	The City's current activities in this area meet permit requirements.	20	20	20	20		Assumes low level of activity for public records requests.
◄		**120**	**100**	**100**	**100**	***105***	***Average Annual Hours***
◄		**0.06**	**0.05**	**0.05**	**0.05**	***0.06***	***Average FTE***
	Program Summary						
◄	**New Program Annual Hours**	**9,162**	**8,526**	**8,304**	**8,192**	***8,546***	***Average Annual Hours***
◄	**New Program FTE**	**4.82**	**4.49**	**4.37**	**4.31**	***4.50***	***Average FTE***

Appendix B—Detailed Cost Estimates

CS-B - RAILROAD DITCH STORMWATER FACILITY

Division 1 - General Requirements					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
1-1	Surveying	1	LS	$5,000.00	$5,000.00
1-2	SPCC Plan	1	LS	$1,000.00	$1,000.00
1-3	Type B Progress Schedule	1	LS	$500.00	$500.00
1-4	Mobilization	1	LS	$76,000.00	$76,000.00
1-5	Project Temporary Traffic Control	1	LS	$5,000.00	$5,000.00
			Division 1 Total		$87,500.00

Division 2 - Earthwork					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
2-1	Clearing and Grubbing	1	LS	$17,500.00	$17,500.00
2-2	Removal of Structures and Obstructions	1	LS	$1,500.00	$1,500.00
			Division 2 Total		$19,000.00

Division 4 - Bases					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
4-1	Crushed Surfacing Base Course	6	CY	$40.00	$240.00
			Division 4 Total		$240.00

Division 5 - Surface Treatments and Pavements					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
5-1	Access Road Rock	30	TN	$100.00	$3,000.00
			Division 5 Total		$3,000.00

Division 7 - Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
7-1	Flow Control Structure	1	EA	$10,000.00	$10,000.00
7-2	Jack and Bore 60" Culvert under railway	40	LF	$1,500.00	$60,000.00
7-3	Corrugated Polyethylene Storm Sewer Pipe 42 inch Diameter	2,870	LF	$175.00	$502,250.00
7-4	Trash Screen	2	EA	$1,000.00	$2,000.00
7-5	Trench Safety	2,870	LF	$1.00	$2,870.00
7-6	Manhole 72 In. Diam. Type Storm	8	EA	$6,500.00	$52,000.00
7-7	Testing Storm Sewer Pipe	2,870	LF	$2.00	$5,740.00
			Division 7 Total		$634,860.00

Division 8 - Miscellaneous Construction					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
8-1	ESC Lead	60	Day	$50.00	$3,000.00
8-2	Silt Fence	4,000	LF	$4.00	$16,000.00
8-3	Outlet Protection	1	EA	$1,020.00	$1,020.00
8-4	Construction Entrance	1	EA	$1,500.00	$1,500.00
8-5	Hydro Seeding	3.5	AC	$3,500.00	$12,250.00
8-6	Railroad Inspector	480	HR	$85.00	$40,800.00
			Division 8 Total		$74,570.00

Division 9 - Materials					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
9-1	Construction Geotextile for Stabilization	39	SY	5.00	$195.00
9-2	Hand Placed Riprap	10	CY	100.00	$1,000.00
			Division 9 Total		$1,195.00

Construction Subtotal	**$820,365.00**
Sales Tax (8.4%)	**$68,910.66**
Contingency - 25%	**$222,318.92**
Construction Total	**$1,111,594.58**

Division X - Other					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
X-1	Wetland Delineation/Permitting	1	LS	$25,000.00	$25,000.00
X-2	Wetland Mitigation	1	AC	$225,000.00	$225,000.00
X-3	Archaeological Investigation	1	LS	$15,000	$15,000.00
X-4	Biological Assessment	1	LS	$25,000.00	$25,000.00
			Division X Total		**$290,000.00**

Construction + Mitigation Total	**$1,401,594.58**

Design	**$106,000.00**

Project Total	**$1,507,594.58**

CS-D - EATON BLVD. DITCH CONSTRUCTION

Division 1 - General Requirements

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
1-1	Mobilization	1	LS	$31,640.00	$31,640.00
1-2	Minor Change	1	CALC	$2,500.00	$2,500.00
1-3	Roadway Surveying	1	LS	$6,000.00	$6,000.00
1-4	SPCC Plan	1	LS	$1,000.00	$1,000.00
1-5	Project Temporary Traffic Contnrol	1	LS	$23,000.00	$23,000.00
			Division 1 Total		$64,140.00

Division 2 - Earthwork

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
2-1	Clearing and Grubbing	1	LS	$1,000.00	$1,000.00
2-2	Removal of Structure and Obstruction	1	LS	$2,000.00	$2,000.00
2-3	Common Borrow Incl. Haul	1,250	CY	$20.00	$25,000.00
			Division 2 Total		$28,000.00

Division 4 - Bases

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
4-1	Crushed Surfacing Base Course	120	CY	$48.00	$5,760.00
			Division 4 Total		$5,760.00

Division 5 - Surface Treatments and Pavements

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
5-1	HMA for Approach Cl. 1/2" PG 64-22	75	SY	$30.00	$2,250.00
5-2	Sawcut Asphalt Pavement	1,370	LF	$3.00	$4,110.00
			Division 5 Total		$6,360.00

Division 7 - Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits					
Item Number	**Item**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
7-1	Trash Screen (Salvage and Reuse)	1	EA	$500.00	$500.00
7-2	Corrugated Polyethylene Storm Sewer Pipe 12 In. Diam.	59	LF	$70.00	$4,130.00
7-3	Corrugated Polyethylene Storm Sewer Pipe 18 In. Diam.	25	LF	$90.00	$2,250.00
7-4	Corrugated Polyethylene Storm Sewer Pipe 36 In. Diam.	1,312	LF	$140.00	$183,680.00
7-5	Testing Storm Sewer Pipe	1,396	LF	$3.00	$4,188.00
7-6	Manhole 60 Inc. Diam. (with Top Slab)	4	EA	$5,000.00	$20,000.00
7-7	Ditch Inlet (Type 1L)	5	EA	$1,300.00	$6,500.00
7-8	24 In. Dome Inlet	3	EA	$1,000.00	$3,000.00
7-9	Trench Safety System	1	LS	$1,000.00	$1,000.00
7-10	Removal and Replacement of Unsuitable Material	100	CY	$75.00	$7,500.00
7-11	Water Service Splice	5	EA	$500.00	$2,500.00
			Division 7 Total		$235,248.00

Division 8 - Miscellaneous Construction					
Item Number	**Item**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
8-1	Erosion Control	1	LS	$2,000.00	$2,000.00
8-2	Outlet Protection	1	EA	$1,000.00	$1,000.00
8-3	High Visibility Fence	500	LF	$3.00	$1,500.00
8-4	Seeding, Fertilizing, and Mulching	1	AC	$4,000.00	$4,000.00
			Division 8 Total		$8,500.00

Construction Subtotal	**$348,008.00**

Project Total	**$348,008.00**

CS-E - VIEW MEADOWS STORM

Includes $100,000 for treatment and detention if roadway is converted to full section and completely re-built.
Includes catch basins.
Includes mainline and laterals.
Includes cul de sacs.
Does not include road construction.
Includes 50% contincency for co**nstruction at conceptual level.**
Includes 25% for design.
Assume some street closures. Traffic control - 2 flaggers, 8 hours/day, 90 days.

Division 1 - General Requirements

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
1-1	Surveying	1	LS	$5,000.00	$5,000.00
1-2	SPCC Plan	1	LS	$1,000.00	$1,000.00
1-3	Type B Progress Schedule	1	LS	$500.00	$500.00
1-4	Mobilization	1	LS	$70,000.00	$70,000.00
1-5	Project Temporary Traffic Control	1	LS	$57,600.00	$57,600.00
			Division 1 Total		$134,100.00

Division 2 - Earthwork

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
2-1	Clearing and Grubbing	1	LS	$1,000.00	$1,000.00
2-2	Removal of Structures and Obstructions	1	LS	$1,500.00	$1,500.00
			Division 2 Total		$2,500.00

Division 4 - Bases

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
4-1	Crushed Surfacing Base Course	427	CY	$40.00	$17,080.00
			Division 4 Total		$17,080.00

Division 5 - Surface Treatments and Pavements

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
5-1	HMA CL 1/2" PG 64-22	289	TN	$200.00	$57,800.00
5-2	Sawcut Asphalt Pavement	5,000	LF	$3.00	$15,000.00
			Division 5 Total		$72,800.00

Division 7 - Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits					
Item Number	**Item**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
7-1	Stormwater Treatment and Detention System??	1	EA	$100,000.00	$100,000.00
7-3	Corrugated Polyethylene Storm Sewer Pipe 12 inch Diameter	3,250	LF	$70.00	$227,500.00
7-4	Corrugated Polyethylene Storm Sewer Pipe 10 inch Diameter	1,230	LF	$60.00	$73,800.00
7-5	Area Drains	8	EA	$500.00	$4,000.00
7-6	Manhole 48 In. Diam. Type Storm	17	EA	$3,000.00	$51,000.00
7-7	Catch Basin	33	EA	$1,300.00	$42,900.00
7-8	Trench Safety	4,480	LF	$1.00	$4,480.00
7-9	Testing Storm Sewer Pipe	4,480	LF	$2.00	$8,960.00
			Division 7 Total		$512,640.00

Division 8 - Miscellaneous Construction					
Item Number	**Item**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
8-1	ESC Lead	150	Day	$50.00	$7,500.00
8-2	Silt Fence	500	LF	$4.00	$2,000.00
8-3	Inlet Protection	40	EA	$100.00	$4,000.00
8-4	Hydro Seeding	0.5	AC	$3,500.00	$1,750.00
			Division 8 Total		$15,250.00

Construction Subtotal	**$754,370.00**
Contingency - 50%	**$377,185.00**
Construction Total	**$1,131,555.00**

Design - 25%	**$282,888.75**

Project Total	**$1,414,443.75**

G-2 - WEST TERMINUS OF SW 10TH STREET STORM

Assumes a 1 acre pond.
Assumes 1 acre of wetland mitigation.
Assumes 60 working days.
Approximately 1100 LF mainline storm.
Contingency of 50% appied at conceptual level.
Design costs estimated at 25% of construction costs.
Minimal traffic control. Work is **outside of right of way.**

Division 1 - General Requirements

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
1-1	Surveying	1	LS	$5,000.00	$5,000.00
1-2	SPCC Plan	1	LS	$1,000.00	$1,000.00
1-3	Type B Progress Schedule	1	LS	$500.00	$500.00
1-4	Mobilization	1	LS	$69,000.00	$69,000.00
1-5	Project Temporary Traffic Control	1	LS	$500.00	$500.00
			Division 1 Total		$76,000.00

Division 2 - Earthwork

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
2-1	Clearing and Grubbing	1	LS	$6,000.00	$6,000.00
2-2	Common Borrow Incl Haul	3,900	CY	$15.00	$58,500.00
2-3	Pond Excavation	3,900	CY	$15.00	$58,500.00
			Division 2 Total		$123,000.00

Division 7 - Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
7-1	Corrugated Polyethylene Storm Sewer Pipe - 12" Diameter	100	LF	$70.00	$7,000.00
7-2	Cprrugated Polyethylene Storm Sewer Pipe - 42" Diameter	1,100	LF	$190.00	$209,000.00
7-3	Manhole 60" Diameter	4	EA	$5,000.00	$20,000.00
7-3	Flow Control Manhole 60" Diameter	1	EA	$6,500.00	$6,500.00
7-4	Testing Storm Pipe	1,200	EA	$1.00	$1,200.00
			Division 7 Total		$243,700.00

Division 8 - Miscellaneous Construction					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
8-1	ESC Lead	60	Day	$50.00	$3,000.00
8-2	Silt Fence	2,200	LF	$4.00	$8,800.00
8-3	Check Dams	50	LF	$5.00	$250.00
8-4	Inlet Protection	10	EA	$100.00	$1,000.00
8-6	Construction Entrance	2	EA	$1,500.00	$3,000.00
8-7	Hydro Seeding	1.0	AC	$3,500.00	$3,500.00
8-8	Chainlink Fencing	400	LF	$15.00	$6,000.00
			Division 8 Total		$25,550.00

Division X - Other					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
X-1	Wetland Delineation/Permitting	1	LS	$25,000.00	$25,000.00
X-2	Wetland Mitigation	1	AC	$225,000.00	$225,000.00
X-3	Archaeological Investigation	1	LS	$15,000.00	$15,000.00
X-4	Biological Assessment	1	LS	$25,000.00	$25,000.00
			Division X Total		$290,000.00

Construction Subtotal	**$758,250.00**
Sales Tax (8.4%)	**$63,693.00**
Contingency - 50%	**$410,971.50**
Construction Total	**$1,232,914.50**

Design - 25%	**$308,228.63**

Project Total	**$1,541,143.13**

TR-2 - SR503 CROSSING STORM

Assume 1,000 lf pipe from control manhole at SR503 back to east to Gardner Ditch.
Assume 1 acre clearing and grubbing.
Contingency of 50% appied at conceptual level.
Design costs estimated at 25% of construction costs.
No traffic control. Work is outside **of right of way.**

Division 1 - General Requirements

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
1-1	Surveying	1	LS	$5,000.00	$5,000.00
1-2	SPCC Plan	1	LS	$1,000.00	$1,000.00
1-3	Type B Progress Schedule	1	LS	$500.00	$500.00
1-4	Mobilization	1	LS	$16,000.00	$16,000.00
			Division 1 Total		$22,500.00

Division 2 - Earthwork

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
2-1	Clearing and Grubbing	1	LS	$10,000.00	$10,000.00
			Division 2 Total		$10,000.00

Division 7 - Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits

Number	Item	Quantity	Unit	Cost	Cost
7-1	Corrugated Polyethylene Storm Sewer Pipe - 18" Diameter	1,100	LF	$55.00	$60,500.00
7-3	Manhole 48" Diameter	4	EA	$3,000.00	$12,000.00
7-3	Flow Control Manhole 60" Diameter	1	EA	$6,500.00	$6,500.00
7-4	Testing Storm Pipe	1,100	EA	$1.00	$1,100.00
			Division 7 Total		$80,100.00

Division 8 - Miscellaneous Construction					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
8-1	ESC Lead	60	Day	$50.00	$3,000.00
8-2	Silt Fence	2,200	LF	$4.00	$8,800.00
8-3	Check Dams	50	LF	$5.00	$250.00
8-4	Inlet Protection	10	EA	$100.00	$1,000.00
8-6	Construction Entrance	2	EA	$1,500.00	$3,000.00
8-7	Hydro Seeding	1.0	AC	$3,500.00	$3,500.00
			Division 8 Total		$19,550.00

Division X - Other					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
X-1	Wetland Delineation/Permitting	1	LS	$25,000.00	$25,000.00
X-2	Wetland Mitigation	0.05	AC	$225,000.00	$11,250.00
			Division X Total		$36,250.00

Construction Subtotal	**$168,400.00**
Sales Tax (8.4%)	**$14,145.60**
Contingency - 50%	**$91,272.80**
Construction Total	**$273,818.40**

Design - 25%	**$68,454.60**

Project Total	**$342,273.00**

CS-1 - JEWEL CREEK BYPASS DRAINAGE IMPROVEMENTS

Division 1 - General Requirements

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
1-1	Surveying	1	LS	$1,500.00	$1,500.00
1-2	Minor Change	1	Calc	$2,500.00	$2,500.00
1-3	SPCC Plan	1	LS	$100.00	$100.00
1-4	Type B Progress Schedule	1	LS	$100.00	$100.00
1-5	Mobilization	1	LS	$13,000.00	$13,000.00
1-6	Project Temporary Traffic Control	1	LS	$640.00	$640.00
			Division 1 Total		$17,840.00

Division 2 - Earthwork

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
2-1	Excavation, Incl. Haul	260	CY	$22.00	$5,720.00
2-2	Clearing and Grubbing	1	LS	$500.00	$500.00
			Division 2 Total		$6,220.00

Division 7 - Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
7-1	3' x 6' Concrete Box Culvert	201	LF	$500.00	$100,500.00
7-2	Connect to Drainage Structure	1	EA	$500.00	$500.00
7-3	11.25º 3' x 6' Concrete Box Culvert Bend	1	EA	$3,000.00	$3,000.00
7-4	3' x 6' Concrete Headwall and Trash Rack	1	EA	$5,000.00	$5,000.00
7-5	Trench Safety System	201	LF	$1.00	$201.00
			Division 7 Total		$109,201.00

Division 8 - Miscellaneous Construction					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
8-1	Erosion Control	1	LS	$2,700.00	$2,700.00
8-2	Cement Concrete Sidewalk	2	SY	$100.00	$200.00
			Division 8 Total		$2,900.00

Construction Subtotal	**$136,161.00**
Sales Tax (8.4%)	**$11,437.52**
Contingency - 15%	**$22,139.78**
Construction Total	**$169,738.30**

SW-1, SW-2, CS-2 - PARKWAY ESTATES STORM

Division 1 - General Requirements

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
1-1	Surveying	1	LS	$5,000.00	$5,000.00
1-2	SPCC Plan	1	LS	$1,000.00	$1,000.00
1-3	Type B Progress Schedule	1	LS	$500.00	$500.00
1-4	Mobilization	1	LS	$30,000.00	$30,000.00
1-5	Project Temporary Traffic Control	1	LS	$57,600.00	$57,600.00
			Division 1 Total		$94,100.00

Division 2 - Earthwork

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
2-1	Clearing and Grubbing	1	LS	$500.00	$500.00
2-2	Removal of Structures and Obstructions	1	LS	$1,500.00	$1,500.00
			Division 2 Total		$2,000.00

Division 4 - Bases

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
4-1	Crushed Surfacing Base Course	299	CY	$40.00	$11,960.00
			Division 4 Total		$11,960.00

Division 5 - Surface Treatments and Pavements

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
5-1	HMA CL 1/2" PG 64-22	204	TN	$200.00	$40,800.00
5-2	Sawcut Asphalt Pavement	4,030	LF	$3.00	$12,090.00
			Division 5 Total		$52,890.00

Division 7 - Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits					
Item Number	**Item**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
7-1	Corrugated Polyethylene Storm Sewer Pipe 24 inch Diameter	890	LF	$80.00	$71,200.00
7-2	Corrugated Polyethylene Storm Sewer Pipe 18 inch Diameter	525	LF	$75.00	$39,375.00
7-3	Corrugated Polyethylene Storm Sewer Pipe 15 inch Diameter	600	LF	$70.00	$42,000.00
7-4	Manhole 48 In. Diam. Type Storm	7	EA	$3,000.00	$21,000.00
7-5	Trench Safety	2,015	LF	$1.00	$2,015.00
7-6	Testing Storm Sewer Pipe	2,015	LF	$2.00	$4,030.00
			Division 7 Total		$179,620.00

Division 8 - Miscellaneous Construction					
Item Number	**Item**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
8-1	ESC Lead	90	Day	$50.00	$4,500.00
8-2	Inlet Protection	30	EA	$100.00	$3,000.00
			Division 8 Total		$7,500.00

Construction Subtotal	**$348,070.00**
Contingency - 50%	**$174,035.00**
Construction Total	**$522,105.00**

Design - 25%	**$130,526.25**

Project Total	**$652,631.25**

DA-140 - EDGEBROOK SUBDIVISION STORM

Assumes backbone system.
Does not include pump station option.
Includes cost of catch basins, although initial system may only connect to existing ditches.
Includes $100,000 for stormwater treatment and detention if road is converted to full section and r**e-built completely.**
Contingency of 50% appied at conceptual level.
Design costs estimated at 25% of construction costs.
Traffic control assumes 2 flaggers, 90 days, 8 hours/day.

Division 1 - General Requirements

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
1-1	Surveying	1	LS	$5,000.00	$5,000.00
1-2	SPCC Plan	1	LS	$1,000.00	$1,000.00
1-3	Type B Progress Schedule	1	LS	$500.00	$500.00
1-4	Mobilization	1	LS	$42,000.00	$42,000.00
1-5	Project Temporary Traffic Control	1	LS	$57,600.00	$57,600.00
			Division 1 Total		$106,100.00

Division 2 - Earthwork

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
2-1	Clearing and Grubbing	1	LS	$1,000.00	$1,000.00
2-2	Removal of Structures and Obstructions	1	LS	$1,500.00	$1,500.00
			Division 2 Total		$2,500.00

Division 4 - Bases

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
4-1	Crushed Surfacing Base Course	165	CY	$40.00	$6,600.00
			Division 4 Total		$6,600.00

Division 5 - Surface Treatments and Pavements

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
5-1	HMA CL 1/2" PG 64-22	150	TN	$200.00	$30,000.00
5-2	Sawcut Asphalt Pavement	3,620	LF	$3.00	$10,860.00
			Division 5 Total		$40,860.00

Division 7 - Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits					
Item Number	**Item**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
7-1	Stormwater Treatment and Detention System??	1	EA	$100,000.00	$100,000.00
7-3	Corrugated Polyethylene Storm Sewer Pipe 12 inch Diameter	1,635	LF	$70.00	$114,450.00
7-4	Corrugated Polyethylene Storm Sewer Pipe 10 inch Diameter	340	LF	$60.00	$20,400.00
7-6	Manhole 48 In. Diam. Type Storm	7	EA	$3,000.00	$21,000.00
7-7	Catch Basin	17	EA	$1,300.00	$22,100.00
7-8	Trench Safety	1,975	LF	$1.00	$1,975.00
7-9	Testing Storm Sewer Pipe	1,975	LF	$2.00	$3,950.00
			Division 7 Total		$283,875.00

Division 8 - Miscellaneous Construction					
Item Number	**Item**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
8-1	ESC Lead	90	Day	$50.00	$4,500.00
8-2	Silt Fence	500	LF	$4.00	$2,000.00
8-3	Inlet Protection	25	EA	$100.00	$2,500.00
8-4	Hydro Seeding	0.5	AC	$3,500.00	$1,750.00
			Division 8 Total		$10,750.00

Construction Subtotal	**$450,685.00**
Contingency - 50%	**$225,342.50**
Construction Total	**$676,027.50**

Design - 25%	**$169,006.88**

Project Total	**$845,034.38**

DA-141 - NOWAK ADDITION STORM

Assumes backbone system.
Does not include pump station option.
Does not include LID options.
Includes cost of catch basins, although initial system may only connect to existing ditches.
Includes $100,000 for stormwater treatment and detention if road is c**onverted to full section and re-built completely.**
Contingency of 50% appied at conceptual level.
Design costs estimated at 25% of construction costs.
Traffic control assumes 2 flaggers, 8 hours/day, 90 days.

Division 1 - General Requirements

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
1-1	Surveying	1	LS	$5,000.00	$5,000.00
1-2	SPCC Plan	1	LS	$1,000.00	$1,000.00
1-3	Type B Progress Schedule	1	LS	$500.00	$500.00
1-4	Mobilization	1	LS	$51,000.00	$51,000.00
1-5	Project Temporary Traffic Control	1	LS	$57,600.00	$57,600.00
			Division 1 Total		$115,100.00

Division 2 - Earthwork

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
2-1	Clearing and Grubbing	1	LS	$1,000.00	$1,000.00
2-2	Removal of Structures and Obstructions	1	LS	$1,500.00	$1,500.00
			Division 2 Total		$2,500.00

Division 4 - Bases

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
4-1	Crushed Surfacing Base Course	251	CY	$40.00	$10,040.00
			Division 4 Total		$10,040.00

Division 5 - Surface Treatments and Pavements

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
5-1	HMA CL 1/2" PG 64-22	208	TN	$200.00	$41,600.00
5-2	Sawcut Asphalt Pavement	5,500	LF	$3.00	$16,500.00
			Division 5 Total		$58,100.00

Division 7 - Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits					
Item Number	**Item**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
7-1	Stormwater Treatment and Detention System??	1	EA	$100,000.00	$100,000.00
7-3	Corrugated Polyethylene Storm Sewer Pipe 12 inch Diameter	2,257	LF	$70.00	$157,990.00
7-4	Corrugated Polyethylene Storm Sewer Pipe 10 inch Diameter	480	LF	$60.00	$28,800.00
7-6	Manhole 48 In. Diam. Type Storm	9	EA	$3,000.00	$27,000.00
7-7	Catch Basin	24	EA	$1,300.00	$31,200.00
7-8	Trench Safety	2,737	LF	$1.00	$2,737.00
7-9	Testing Storm Sewer Pipe	2,737	LF	$2.00	$5,474.00
			Division 7 Total		$353,201.00

Division 8 - Miscellaneous Construction					
Item Number	**Item**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
8-1	ESC Lead	120	Day	$50.00	$6,000.00
8-2	Silt Fence	500	LF	$4.00	$2,000.00
8-3	Inlet Protection	30	EA	$100.00	$3,000.00
8-4	Hydro Seeding	0.5	AC	$3,500.00	$1,750.00
			Division 8 Total		$12,750.00

Construction Subtotal	**$551,691.00**
Contingency - 50%	**$275,845.50**
Construction Total	**$827,536.50**

Design - 25%	**$206,884.13**

Project Total	**$1,034,420.63**

DA-144 - PIPE PROJECT

Division 1 - General Requirements

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
1-1	Surveying	1	LS	$1,000.00	$1,000.00
1-2	SPCC Plan	1	LS	$500.00	$500.00
1-3	Type B Progress Schedule	1	LS	$500.00	$500.00
1-4	Mobilization	1	LS	$3,000.00	$3,000.00
			Division 1 Total		$5,000.00

Division 2 - Earthwork

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
2-1	Clearing and Grubbing	1	LS	$500.00	$500.00
2-2	Removal of Structures and Obstructions	1	LS	$1,500.00	$1,500.00
2-3	Embankment	250	CY	$25.00	$6,250.00
			Division 2 Total		$8,250.00

Division 7 - Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
7-1	Reinforced Concrete Storm Sewer Pipe 15 inch Diameter	160	LF	$75.00	$12,000.00
7-2	Area Drains	2	EA	$500.00	$1,000.00
7-3	Testing Storm Sewer Pipe	160	LF	$2.00	$320.00
7-4	Trench Safety	160	LF	$1.00	$160.00
			Division 7 Total		$13,480.00

Division 8 - Miscellaneous Construction					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
8-1	ESC Lead	30	Day	$50.00	$1,500.00
8-2	Inlet Protection	2	EA	$100.00	$200.00
8-3	Silt Fence	300	LF	$4.00	$1,200.00
			Division 8 Total		$2,900.00

Division X - Other					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
X-1	Wetlands Delineation/Permitting	1	LS	$5,000.00	$5,000.00
			Division X Total		$5,000.00

Construction Subtotal	**$34,630.00**
Sales Tax (8.4%)	**$2,908.92**
Contingency - 50%	**$18,769.46**
Construction Total	**$56,308.38**

Design - 25%	**$14,077.10**

Project Total	**$70,385.48**

DA-145 - BATTLE GROUND WEST SUBDIVISION STORM

Division 1 - General Requirements					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
1-1	Surveying	1	LS	$5,000.00	$5,000.00
1-2	SPCC Plan	1	LS	$1,000.00	$1,000.00
1-3	Type B Progress Schedule	1	LS	$500.00	$500.00
1-4	Mobilization	1	LS	$45,000.00	$45,000.00
1-5	Project Temporary Traffic Control	1	LS	$57,600.00	$57,600.00
			Division 1 Total		$109,100.00

Division 2 - Earthwork					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
2-1	Clearing and Grubbing	1	LS	$1,000.00	$1,000.00
2-2	Removal for Structures and Obstructions	1	LS	$1,500.00	$1,500.00
			Division 2 Total		$2,500.00

Division 4 - Bases					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
4-1	Crushed Surfacing Base Course	300	CY	$25.00	$7,500.00
			Division 4 Total		$7,500.00

Division 5 - Surface Treatments and Pavements					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
5-1	HMA CL 1/2" PG 64-22	200	TN	$200.00	$40,000.00
5-2	Sawcut Asphalt Pavement	5000	LF	$3.00	$15,000.00
			Division 5 Total		$55,000.00

Division 7 - Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
7-1	Stormwater Treatment and Detention System	1	EA	$100,000.00	$100,000.00
7-3	Corrugated Polyethylene Storm Sewer Pipe 12 inch Diameter	2,220	LF	$70.00	$155,400.00
7-4	Corrugated Polyethylene Storm Sewer Pipe 10 inch Diameter	400	LF	$60.00	$24,000.00
7-6	Manhole 48 In. Diam. Type Storm	11	EA	$5,000.00	$55,000.00
7-7	Catch Basin	19	EA	$1,300.00	$24,700.00
7-8	Trench Safety	2,620	LF	$1.00	$2,620.00
7-9	Testing Storm Sewer Pipe	2,620	LF	$2.00	$5,240.00
			Division 7 Total		$366,960.00

Division 8 - Miscellaneous Construction					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
8-1	ESC Lead	90	Day	$50.00	$4,500.00
8-2	Silt Fence	500	LF	$4.00	$2,000.00
8-3	Inlet Protection	25	EA	$100.00	$2,500.00
8-4	Hydro Seeding	0.5	AC	$3,500.00	$1,750.00
			Division 8 Total		$10,750.00

Construction Subtotal	**$551,810.00**
Contingency - 32%	**$260,905.00**
Construction Total	**$812,715.00**

Design - 25%	**$203,178.75**

Project Total	**$1,015,893.75**

15-01 - CHELATCHIE RAILS WITH TRAILS - STORM PORTION ONLY

Division 1 - General Requirements

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
1-1	Surveying	1	LS	$10,000.00	$10,000.00
1-2	SPCC Plan	1	LS	$1,000.00	$1,000.00
1-3	Type B Progress Schedule	1	LS	$1,500.00	$1,500.00
1-4	Mobilization	1	LS	$35,000.00	$35,000.00
1-5	Project Temporary Traffic Control	1	LS	$5,000.00	$5,000.00
			Division 1 Total		$52,500.00

Division 2 - Earthwork

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
2-1	Clearing and Grubbing	1	LS	$10,000.00	$10,000.00
2-2	Removal of Structures and Obstructions	1	LS	$15,000.00	$15,000.00
2-3	Gravel Borrow Incl. Haul	2,800	CY	$8.00	$22,400.00
			Division 2 Total		$47,400.00

Division 7 - Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
7-1	Schedule C Storm Sewer 48 In. Diam.	1,250	LF	$175.00	$218,750.00
7-2	Manhole 72 In. Diam. Type Storm	4	EA	$6,500.00	$26,000.00
7-3	Testing Storm Sewer Pipe	1,250	LF	$2.00	$2,500.00
7-4	Testing Storm Sewer Pipe - Exfiltration/Infiltration	1,250	LF	$2.00	$2,500.00
7-5	Trench Safety System	1	LS	$10,000.00	$10,000.00
7-6	Connection to Drainage Structure	2	EA	$2,000.00	$4,000.00
			Division 7 Total		$263,750.00

Division 8 - Miscellaneous Construction

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
8-0	Erosion Control	1	LS	$10,000.00	$10,000.00
			Division 8 Total		$10,000.00

Division X - Other					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
X-1	Wetland Delineation/Permitting	1	LS	$25,000.00	$25,000.00
X-2	Biological Assessment	1	LS	$25,000.00	$25,000.00
X-3	Archaeological Investigation	1	LS	$15,000.00	$15,000.00
X-4	Wetland Mitigation	1	AC	$225,000.00	$112,500.00
			Division X Total		$177,500.00

Construction Subtotal	**$551,150.00**
Contingency - 15%	**$82,672.50**
Construction Total	**$633,822.50**

Design	**$66,000.00**

Project Total	**$699,822.50**

15-02 - RAILROAD DTICH MAINTENANCE AND REGRADING

Assumes SE 5th St. to SE Eaton Blvd. (east side).
Assumes south of SE Eaton Blvd (east side).
Assumes SE Rasmussen Blvd to SE Eaton Blvd (west side).
Assumes railroad tracks to S Grace Ave - north side of SE Eaton Blvd.

Division 1 - General Requirements

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
1-1	Surveying	1	LS	$1,000.00	$1,000.00
1-2	SPCC Plan	1	LS	$1,000.00	$1,000.00
1-3	Type B Progress Schedule	1	LS	$500.00	$500.00
1-4	Mobilization	1	LS	$5,000.00	$5,000.00
1-5	Project Temporary Traffic Control	1	LS	$1,000.00	$1,000.00
			Division 1 Total		$8,500.00

Division 2 - Earthwork

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
2-1	Clearing and Grubbing	1	LS	$22,150.00	$22,150.00
2-2	Excavation of Ditches (Ditch Improvements) (North Side SE Eaton - SE Grace to Railroad Tracks)	1	LS	$2,500.00	$2,500.00
			Division 2 Total		$24,650.00

Division 8 - Miscellaneous Construction

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
8-1	Erosion Control	1	LS	$18,705.00	$18,705.00
			Division 8 Total		$18,705.00

Construction Subtotal	**$51,855.00**
Sales Tax (8.4%)	**$4,355.82**
Contingency - 15%	**$7,778.25**
Construction Total	**$63,989.07**

Design - 25%	**$15,997.27**

Project Total	**$79,986.34**

15-03 - DECANT FACILITY UPGRADE

Assumes two cores through existing structures and connection of new pipes to structures.
Assumes 1 standard manhole.
Does not include erosion control measures.
No traffic control. Project at Operations Center.

Division 1 - General Requirements

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
1-1	Surveying	1	LS	$750.00	$750.00
1-2	SPCC Plan	1	LS	$500.00	$500.00
1-4	Mobilization	1	LS	$500.00	$500.00
			Division 1 Total		$1,750.00

Division 7 - Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
7-1	Corrugated Polyethylene Storm Sewer Pipe 8 inch Diameter	20	LF	$40.00	$800.00
7-2	Manhole 48 In. Diam. Type Storm	1	EA	$3,000.00	$3,000.00
7-3	Testing Storm Sewer Pipe	20	LF	$4.00	$80.00
			Division 7 Total		$3,880.00

Division 8 - Miscellaneous Construction

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
8-1	Concrete Coring	2	EA	$250.00	$500.00
			Division 8 Total		$500.00

Construction Subtotal	**$6,130.00**
Sales Tax (8.4%)	**$514.92**
Contingency - 25%	**$3,193.73**
Construction Total	**$9,838.65**

Design - 75%	**$7,378.99**

Project Total	**$17,217.64**

15-04 - OPS WASH BAY

Assumes covered, open sided building 16'x35'
Concrete floor sloped to drain to Oil/Water Separator
Drain plumbed to Sanitary Sewer
Water service connection
No geotechnical investigation. Use geotechnical report for Decant Facility.
Contingency of 50% app**ied at conceptual level.**
Design costs estimated at 25% of construction costs.
Assume no traffic control. Project at Operations Center.

Division 1 - General Requirements

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
1-1	Surveying	1	LS	$1,000.00	$1,000.00
1-2	SPCC Plan	1	LS	$500.00	$500.00
1-3	Minor Change	1	Calc.	$2,500.00	$2,500.00
1-4	Type B Progress Schedule	1	LS	$500.00	$500.00
1-5	Mobilization	1	LS	$6,000.00	$6,000.00
			Division 1 Total		$10,500.00

Division 2 - Earthwork

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
2-1	Clearing and Grubbing	1	LS	$500.00	$500.00
2-2	Removal of Structures and Obstructions	1	LS	$1,500.00	$1,500.00
			Division 2 Total		$2,000.00

Division 4 - Bases

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
4-1	Crushed Surfacing Base Course	10	CY	$40.00	$400.00
			Division 4 Total		$400.00

Division 5 - Surface Treatments and Pavements

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
5-1	Concrete Pavement	45	SY	$100.00	$4,500.00
			Division 5 Total		$4,500.00

Division 7 - Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
7-1	Oil/Water Separator	1	EA	$3,000.00	$3,000.00
7-2	48" Manhole - Sanitary Type	1	EA	$3,000.00	$3,000.00
7-3	8" Sanitary Sewer Pipe	100	LF	$30.00	$3,000.00
7-4	Sanitary Sewer Connection	1	EA	$1,000.00	$1,000.00
7-5	Water Service Connection	1	EA	$5,000.00	$5,000.00
			Division 7 Total		$15,000.00

Division 8 - Miscellaneous Construction					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
8-1	ESC Lead	90	Day	$50.00	$4,500.00
8-2	Inlet Protection	2	EA	$100.00	$200.00
8-3	Silt Fence	200	LF	$4.00	$800.00
8-4	Covered Building (Assume 16'x35')	1	EA	$20,000.00	$20,000.00
			Division 8 Total		$25,500.00

Division X - Other					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
X-1	Building Permit	1	LS	$3,000.00	$3,000.00
X-2	Electrical Connection/Lights	1	LS	$3,000.00	$3,000.00
			Division X Total		$6,000.00

Construction Subtotal	**$63,900.00**
Sales Tax (8.4%)	**$5,367.60**
Contingency - 50%	**$34,633.80**
Construction Total	**$103,901.40**

Design - 25%	**$25,975.35**

Project Total	**$129,876.75**

15-05 - WOOD RECYCLING FACILITY - STORM

Assume loop road and outside bays from Storm Fund, interior bays from Transportation or Parks Fund.
Assumes no fire hydrants. There are existing FHs on the NW side of Operations.
Assume 500 CY of over excavation and 500 CY of Common Borrow backfill.
Assume adding water service from water line at NW corner of Operations.
Assume storm facility to north can be re-graded to accomodate runoff from this project.
Assume 2" top course, 4" base course and 6" quarry spalls for parking area section.
Assume stormwater facility 10% of project cost.
Project better defined. Assume 25% contingency and 25% design costs.
Assume no traffic control. Project at Operations Center.

Division 1 - General Requirements

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
1-1	Surveying	1	LS	$5,000.00	$5,000.00
1-2	SPCC Plan	1	LS	$1,000.00	$1,000.00
1-3	Type B Progress Schedule	1	LS	$500.00	$500.00
1-4	Mobilization	1	LS	$28,000.00	$28,000.00
			Division 1 Total		$34,500.00

Division 2 - Earthwork

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
2-1	Clearing and Grubbing	1	LS	$1,000.00	$1,000.00
2-2	Removal of Structures and Obstructions	1	LS	$1,500.00	$1,500.00
2-3	Excavation, Incl. Haul	1,700	CY	$22.00	$37,400.00
2-4	Unsuitable Foundatin Excavation, Incl. Haul	500	CY	$22.00	$11,000.00
2-5	Common Borrow, Incl. Haul	500	CY	$22.00	$11,000.00
			Division 2 Total		$61,900.00

Division 4 - Bases

Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
4-1	Crushed Surfacing Top Course	284	CY	$40.00	$11,360.00
4-2	Crushed Surfacing Base Course	244	CY	$40.00	$9,760.00
4-3	Quarry Spalls	853	CY	$40.00	$34,120.00
			Division 4 Total		$55,240.00

Division 5 - Surface Treatments and Pavements					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
5-1	HMA CL 1/2" PG 64-22	612	TN	$90.00	$55,080.00
			Division 5 Total		$55,080.00

Division 7 - Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
7-1	Stormwater Treatment and Detention System	1	EA	$33,000.00	$33,000.00
7-2	Corrugated Polyethylene Storm Sewer Pipe 12 inch Diameter	100	LF	$70.00	$7,000.00
7-3	Field Inlet	1	EA	$1,500.00	$1,500.00
7-4	Trench Safety	100	LF	$1.00	$100.00
7-5	Testing Storm Sewer Pipe	100	LF	$2.00	$200.00
7-6	Water Service	1	LS	$3,000.00	$3,000.00
			Division 7 Total		$44,800.00

Division 8 - Miscellaneous Construction					
Item Number	Item	Quantity	Unit	Unit Cost	Total Cost
8-1	ESC Lead	30	Day	$50.00	$1,500.00
8-2	Silt Fence	500	LF	$4.00	$2,000.00
8-3	Inlet Protection	2	EA	$100.00	$200.00
8-4	Hydro Seeding	0.5	AC	$3,500.00	$1,750.00
8-5	Ultra Blocks	420	EA	$60.00	$25,200.00
			Division 8 Total		$30,650.00

Construction Subtotal	**$282,170.00**
Sales Tax (8.4%)	**$23,702.28**
Contingency - 25%	**$76,468.07**
Construction Total	**$382,340.35**

Design - 25%	**$95,585.09**

Storm Total	**$477,925.44**

Appendix C—City of Battle Ground
2015 Stormwater Utility
Rate Study

FCS GROUP
Solutions-Oriented Consulting

Memorandum

To: Tim Kraft; Otak, Inc. **Date:** August 4, 2015

From: John Ghilarducci, Ryan Bert; FCS GROUP

RE: City of Battle Ground - 2015 Stormwater Utility Rate Study

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I. INTRODUCTION & BACKGROUND

In support of the City of Battle Ground (City) 2015 Stormwater Plan (SWP) update, Otak, Inc. contracted with Financial Consulting Solutions Group, Inc. (FCS GROUP) to complete a stormwater rate update. Specific tasks included developing an estimated revenue requirement and cash flow projection for the study period (2015-2024).

Section II of this memorandum focuses on the revenue requirement analysis and presents the analytical approach, supporting fiscal policies, methods, and assumptions used, along with the findings and recommendations.

Appendix A includes the detailed spreadsheets supporting the results.

II. REVENUE REQUIREMENTS

A. Approach

The revenue requirements analysis forecasts the amount of annual rate revenue needed to meet the financial obligations of providing stormwater services. The analysis incorporates operating revenues, operations and maintenance (O&M) expenses, debt service payments (if applicable), rate funded capital needs, any other identified revenues or expenses related to utility operations, and determines the sufficiency of the current level of rates. Revenue needs are also impacted by specific fiscal policies and financial goals of the utility, as described herein.

The analysis determines the amount of revenue needed in a given year to meet that year's expected financial obligations. For this analysis, two revenue sufficiency criteria have been developed to reflect the financial goals and constraints of the utility: (1) positive net cash flow must be met, and when applicable (2) revenue bond coverage requirements must be realized. In order to operate successfully with respect to these goals, both tests of revenue sufficiency must be met.

The net cash flow test identifies all known cash requirements for the utility in each year of the study period (2015-2024). First, capital needs are identified and a capital funding strategy is established. Typically, this may include the use of debt, cash reserves, grants, interfund transfers, and rate funding. Cash requirements *to be funded from rates* are then determined. Typically, these include O&M expenses, debt service payments, system replacement funding or directly funded capital outlays, and any additions to specified reserve balances. The total annual cash needs of the utility are then compared to projected cash revenues under current rates.

The revenue bond coverage test concurrently assesses the utility's ongoing ability to satisfy coverage requirements as delineated in any outstanding revenue bonds. The City's stormwater utility currently has no outstanding debt of any kind. When applicable however, this test takes into consideration the coverage requirement, allowable revenues, and expenses that are considered to be "operational."

The maximum projected revenue shortfall resulting from these two tests is identified and the rate increases necessary to make up the shortfall are then estimated.

B. Supporting Fiscal Policies

In concert with the revenue requirement analysis, fiscal policies are assumed to maintain the long-term financial health and performance of the utility. A brief summary of the key policies incorporated into the revenue requirement analysis is provided below.

Reserve Levels

Reserves are a key component of any utility financial strategy, as they provide the flexibility to manage variations in costs and revenues that could otherwise have an adverse impact on ratepayers. For the purpose of this analysis, the City's stormwater utility resources are separated into two funds:

- ***Operating Fund:*** Operating reserves provide a minimum unrestricted fund balance needed to accommodate the short-term cycles of revenues and expenses. These reserves are intended to address both anticipated and unanticipated changes in revenues and expenses by providing a "cushion" to cover cash balance fluctuations. Anticipated changes may include billing and receipt cycles, payroll cycles, and other payables; examples of unanticipated changes include the loss of a large customer or, as recently witnessed, sudden changes to the economy. The City charges monthly stormwater rates on an Equivalent Residential Unit (ERU) basis ($7.70 per ERU), in which one ERU is equal to one single-family residence (or 3,000 square feet of impervious surface area, depending on the customer type). Because the basis of charging changes very little from year to year, the stormwater utility generates relatively constant and predictable total rate revenue. We recommend that the City begin each year with at least one and a half months (45 days) of cash operating expenses. This analysis assumes a target minimum balance equal to 45 days of operating expenses for the City's stormwater utility, which equates to roughly $98,500 based on the operating expense projections included in the City's 2015 Budget. For purposes of this analysis, it is assumed that any funds in excess of the minimum operating balance may be used to fund capital projects.

- ***System Development Charge (SDC) Fund:*** The SDC Fund is a separate fund intended to house and distribute annual SDC revenues. Per City staff direction, the SDC Fund may only be used for funding capital projects which increase the capacity of the stormwater system. The City may not use annual SDC revenues to pay for ongoing maintenance/repair expenses; these capital expenses must be funded through other cash resources. This analysis assumes a target minimum balance equal to 1% of plant assets, which equates to roughly $82,000 in 2015 based on the plant assets noted in the 2014 financial statements.

C. Analyses, Findings, and Recommendations

Key Assumptions

The following assumptions were used in the analysis:

- O&M expense projections are based on the 2015 and 2016 proposed budgets. Beginning in 2016, the City is expected to employ two additional full time employees (FTEs) in response to the National Pollutant Discharge Elimination System (NPDES) Gap Analysis.
- Revenue projections are based on the assumption of 9,575 existing ERUs (beginning of 2015). Consistent with the City's recent account growth over the last five (5) years, customer account growth is assumed to remain constant at 1.41% per year for the duration of the study period.
- General cost inflation is assumed to escalate according to the average historical Consumer Price Index (5-year average, 20 City CPI) at 1.99% per year.
- Labor cost inflation is assumed to escalate at 4.00% per year, per City staff input.
- Benefit cost inflation is assumed to escalate at 6.00% per year, per City staff input.
- Capital construction cost inflation (for applicable capital projects) is assumed to escalate according to the average historical Engineering News Record Construction Cost Index (5-year average, 20 City ENR-CCI) at 2.73% per year.
- 2016 is the first year eligible for stormwater rate increases.

Capital Projects and Funding Strategy

The City has provided a schedule of capital improvement projects, in which this analysis assumes that all projects will be completed in the prioritized timeline. The financial forecast assumes the following conceptual capital funding hierarchy:

- Any available grant funds or developer contributions would be considered first, as they are generally restricted in use but could free up City funding resources for other purposes. The City has not factored in any grant funding to be available to fund stormwater capital projects for the foreseeable future.
- Cash resources would then be used, to the extent that they exceed the Operating Fund and SDC Fund minimum fund balances and policy restrictions.
- If available, low-cost loan programs (such as Public Works Trust Fund and State Revolving Fund loans) would then be used. The analysis does not assume any low-cost loans.
- Revenue bonds are assumed to be the last resort to cover capital costs in excess of other available resources. The analysis does not assume any revenue bond funding.

Evaluation of Revenue Sufficiency

The cash flow and coverage sufficiency tests each provide a different perspective on how much revenue is sufficient and in doing so helps ensure that appropriate rate adjustments, if any, fulfill the utility's near-term needs and long-term goals. Similarly, this multi-faceted approach reduces the utility's financial risk and increases financial stability – any near-term increases which result will help to ensure lower and more stable long-term rates.

It should be noted that it is relatively common for these benchmarks to overlap, ensuring in tandem that each separate objective is met at all times. For example, producing a coverage ratio of 1.50 times annual debt service may generate positive net cash flow, concurrently satisfying both sufficiency tests. As the stormwater utility does not have any outstanding revenue bonds now or in the future, the coverage test will not be a factor in determining the future revenue requirements.

As mentioned earlier, conceptually, the net cash flow test determines the amount of revenue the stormwater utility needs to generate in order to meet its cash obligations. The cash flow obligations relating to rates include:

- Operating, maintenance and administrative expenses
- Debt service payments (not applicable)
- Rate-funded capital expenditures (including capital related transfers)
- Depreciation or system reinvestment funding (not currently funded)
- Additions to operating reserves to meet minimum balance targets

Offsetting these obligations are various sources of revenue, including:

- Stormwater rate revenues
- Miscellaneous operating and non-operating revenues

To satisfy this test, stormwater rate revenue must be sufficient to meet the projected cash flow needs. Capital resources such as bond proceeds are not typically considered available for meeting these cash flow needs, but become part of the resources used for capital project funding.

Findings and Recommendations

The revenue requirement and capital funding summary is shown below in **Exhibit 1.** In summary, the stormwater utility will need to implement 13% annual rate increases in years 2016-2017, and 11.5% annual rate increases in years 2018-2020 in order to fund the proposed CIP while maintaining positive net cash flow and sufficient fund balance. This rate strategy would result in a 2020 stormwater rate of $13.63 per ERU. After 2020, no further rate increases are forecasted. It is recommended that the City monitor the utility's financial position regularly, adjusting the rate strategy as needed based on anticipated costs. The full revenue requirement analysis is provided in Appendix A.

Exhibit 1 - Revenue Requirement & Capital Funding Summary

Revenue Requirement	2015	2016	2017	2018	2019	2020
Revenues @ Existing Rates						
Rate Revenues Under Existing Rates	$ 868,920	$ 913,000	$ 925,893	$ 938,969	$ 952,229	$ 965,676
Non-Rate Revenues	3,200	855	1,021	1,053	1,087	1,105
Total Revenues	**$ 872,120**	**$ 913,855**	**$ 926,915**	**$ 940,022**	**$ 953,315**	**$ 966,781**
Expenses						
Cash Operating Expenses	$ 798,655	$ 953,665	$ 983,665	$ 1,014,802	$ 1,032,125	$ 1,065,883
Existing Debt Service	-	-	-	-	-	-
New Debt Service	-	-	-	-	-	-
Rate Funded System Reinvestment	-	-	-	-	-	-
Total Expenses	**$ 798,655**	**$ 953,665**	**$ 983,665**	**$ 1,014,802**	**$ 1,032,125**	**$ 1,065,883**
Net Surplus (Deficiency)	**$ 73,465**	**$ (39,810)**	**$ (56,751)**	**$ (74,780)**	**$ (78,809)**	**$ (99,102)**
Additions to Meet Coverage	-	-	-	-	-	-
Total Surplus (Deficiency)	**$ 73,465**	**$ (39,810)**	**$ (56,751)**	**$ (74,780)**	**$ (78,809)**	**$ (99,102)**
Annual Rate Increase	**0.00%**	**13.00%**	**13.00%**	**11.50%**	**11.50%**	**11.50%**
Cumulative Rate Increase	**0.00%**	**13.00%**	**27.69%**	**42.37%**	**58.75%**	**77.00%**
Rate Revenues After Rate Increase	$ 868,920	$ 1,031,690	$ 1,182,273	$ 1,336,851	$ 1,511,638	$ 1,709,279
Additional Taxes from Rate Increase	$ -	$ 1,780	$ 3,846	$ 5,968	$ 8,391	$ 11,154
Net Cash Flow After Rate Increase	**73,465**	**77,100**	**195,784**	**317,134**	**472,209**	**633,347**
Sample Residential Monthly Bill [a]	**$ 7.70**	**$ 8.70**	**$ 9.83**	**$ 10.96**	**$ 12.22**	**$ 13.63**
Monthly Average Increase ($)	$ -	$ 1.00	$ 1.13	$ 1.13	$ 1.26	$ 1.41

[a] per ERU

Fund Balance	2015	2016	2017	2018	2019	2020
OPERATING FUND						
Beginning Balance	$ 848,000	$ 131,286	$ 156,767	$ 161,698	$ 166,817	$ 169,664
Ending Balance	$ 131,286	$ 156,767	$ 161,698	$ 166,817	$ 169,664	$ 175,214
Minimum Target Balance	*$ 98,464*	*$ 117,575*	*$ 121,274*	*$ 125,113*	*$ 127,248*	*$ 131,410*
CAPITAL FUNDING (SDC Fund + Excess Operating Funds)						
Beginning Balance	$ 637,071	$ 1,224,237	$ 653,405	$ 794,302	$ 424,051	$ 452,585
Ending Balance	$ 1,224,237	$ 653,405	$ 794,302	$ 424,051	$ 452,585	$ 649,690
Minimum Target Balance	*$ 81,728*	*$ 88,664*	*$ 89,746*	*$ 97,181*	*$ 102,201*	*$ 107,144*

City of Battle Ground

Stormwater Rate Study

Summary

Revenue Requirement	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Revenues @ Existing Rates										
Rate Revenues Under Existing Rates	$ 868,920	$ 913,000	$ 925,893	$ 938,969	$ 952,229	$ 965,676	$ 979,313	$ 993,143	$ 1,007,168	$ 1,021,391
Non-Rate Revenues	3,200	855	1,021	1,053	1,087	1,105	1,141	1,179	1,218	1,258
Total Revenues	**$ 872,120**	**$ 913,855**	**$ 926,915**	**$ 940,022**	**$ 953,315**	**$ 966,781**	**$ 980,455**	**$ 994,322**	**$ 1,008,386**	**$ 1,022,650**
Expenses										
Cash Operating Expenses	$ 798,655	$ 953,665	$ 983,665	$ 1,014,802	$ 1,032,125	$ 1,065,883	$ 1,100,937	$ 1,137,340	$ 1,175,154	$ 1,214,439
Existing Debt Service	-	-	-	-	-	-	-	-	-	-
New Debt Service	-	-	-	-	-	-	-	-	-	-
Rate Funded System Reinvestment	-	-	-	-	-	-	-	-	-	-
Total Expenses	**$ 798,655**	**$ 953,665**	**$ 983,665**	**$ 1,014,802**	**$ 1,032,125**	**$ 1,065,883**	**$ 1,100,937**	**$ 1,137,340**	**$ 1,175,154**	**$ 1,214,439**
Net Surplus (Deficiency)	**$ 73,465**	**$ (39,810)**	**$ (56,751)**	**$ (74,780)**	**$ (78,809)**	**$ (99,102)**	**$ (120,482)**	**$ (143,019)**	**$ (166,768)**	**$ (191,789)**
Additions to Meet Coverage	-	-	-	-	-	-	-	-	-	-
Total Surplus (Deficiency)	**$ 73,465**	**$ (39,810)**	**$ (56,751)**	**$ (74,780)**	**$ (78,809)**	**$ (99,102)**	**$ (120,482)**	**$ (143,019)**	**$ (166,768)**	**$ (191,789)**
Annual Rate Increase	**0.00%**	**13.00%**	**13.00%**	**11.50%**	**11.50%**	**11.50%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**
Cumulative Rate Increase	**0.00%**	**13.00%**	**27.69%**	**42.37%**	**58.75%**	**77.00%**	**77.00%**	**77.00%**	**77.00%**	**77.00%**
Rate Revenues After Rate Increase	$ 868,920	$ 1,031,690	$ 1,182,273	$ 1,336,851	$ 1,511,638	$ 1,709,279	$ 1,733,417	$ 1,757,896	$ 1,782,721	$ 1,807,897
Additional Taxes from Rate Increase	$ -	$ 1,780	$ 3,846	$ 5,968	$ 8,391	$ 11,154	$ 11,312	$ 11,471	$ 11,633	$ 11,798
Net Cash Flow After Rate Increase	**73,465**	**77,100**	**195,784**	**317,134**	**472,209**	**633,347**	**622,310**	**610,263**	**597,152**	**582,919**
Sample Residential Monthly Bill [a]	**$ 7.70**	**$ 8.70**	**$ 9.83**	**$ 10.96**	**$ 12.22**	**$ 13.63**	**$ 13.63**	**$ 13.63**	**$ 13.63**	**$ 13.63**
Monthly Average Increase ($)	$ -	$ 1.00	$ 1.13	$ 1.13	$ 1.26	$ 1.41	$ -	$ -	$ -	$ -

[a] per ERU

Fund Balance	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
OPERATING FUND										
Beginning Balance	$ 848,000	$ 131,286	$ 156,767	$ 161,698	$ 166,817	$ 169,664	$ 175,214	$ 180,976	$ 186,960	$ 193,176
Ending Balance	$ 131,286	$ 156,767	$ 161,698	$ 166,817	$ 169,664	$ 175,214	$ 180,976	$ 186,960	$ 193,176	$ 199,634
Minimum Target Balance	*$ 98,464*	*$ 117,575*	*$ 121,274*	*$ 125,113*	*$ 127,248*	*$ 131,410*	*$ 135,732*	*$ 140,220*	*$ 144,882*	*$ 149,725*
CAPITAL FUNDING (SDC Fund + Excess Operating Funds)										
Beginning Balance	$ 637,071	$ 1,224,237	$ 653,405	$ 794,302	$ 424,051	$ 452,585	$ 649,690	$ 148,665	$ 738,474	$ 1,319,157
Ending Balance	$ 1,224,237	$ 653,405	$ 794,302	$ 424,051	$ 452,585	$ 649,690	$ 148,665	$ 738,474	$ 1,319,157	$ 1,201,760
Minimum Target Balance	*$ 81,728*	*$ 88,664*	*$ 89,746*	*$ 97,181*	*$ 102,201*	*$ 107,144*	*$ 118,992*	*$ 119,802*	*$ 120,633*	*$ 128,366*

City of Battle Ground
Stormwater Rate Study
Assumptions

Economic & Financial Factors	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Escalation Rates										
General Cost Inflation	1.99%	1.99%	1.99%	1.99%	1.99%	1.99%	1.99%	1.99%	1.99%	1.99%
Construction Cost Inflation	2.73%	2.73%	2.73%	2.73%	2.73%	2.73%	2.73%	2.73%	2.73%	2.73%
Labor Cost Inflation	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
Benefit Cost Inflation	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%
General Inflation + Growth	3.43%	3.43%	3.43%	3.43%	3.43%	3.43%	3.43%	3.43%	3.43%	3.43%
Account Growth	1.41%	1.41%	1.41%	1.41%	1.41%	1.41%	1.41%	1.41%	1.41%	1.41%
No Escalation	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
[Extra]										
Investment Interest	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%
Tax Rates										
Local / State Excise Tax										
State B&O Tax	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%
Utility Tax	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%

Accounting Assumptions	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
FISCAL POLICY RESTRICTIONS										
Min. Op. Fund Balance Target (days of O&M expense)	45	45	45	45	45	45	45	45	45	45
Max. Op. Fund Balance (days of O&M expense)	60	60	60	60	60	60	60	60	60	60
Minimum SDC Fund Balance Target										
Select Target Benchmark = 1	**Defined as % of Plant**									
1 - Defined as % of Plant										
Plant-in-Service in 2014 = $ 7,930,573										
Minimum SDC Fund Balance - % of plant assets	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
2 - Amount at Right ==>	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
RATE FUNDED SYSTEM REINVESTMENT										
Select Reinvestment Funding Strategy = 5	**System Reinvestment is not Funded**									
Amount of Annual Cash Funding from Rates										
1 - Annual Depreciation	$ 260,537	$ 274,409	$ 276,573	$ 291,444	$ 301,483	$ 311,369	$ 335,066	$ 336,685	$ 338,348	$ 353,814
2 - Annual Depreciation less Debt Principal Pmts	$ 260,537	$ 274,409	$ 276,573	$ 291,444	$ 301,483	$ 311,369	$ 335,066	$ 336,685	$ 338,348	$ 353,814
3 - 7-year Rolling Average CIP	$ 566,947	$ 543,917	$ 456,714	$ 551,721	$ 527,729	$ 486,448	$ 694,563	$ 554,769	$ 807,142	$ 817,597
4 - Phased Annual Depreciation	$ 52,107	$ 109,763	$ 165,944	$ 233,155	$ 301,483	$ 311,369	$ 335,066	$ 336,685	$ 338,348	$ 353,814
% of Annual Depreciation	20%	40%	60%	80%	100%	100%	100%	100%	100%	100%
5 - Do Not Fund System Reinvestment										

City of Battle Ground
Stormwater Rate Study
Assumptions

Capital Financing Assumptions		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
SYSTEM DEVELOPMENT CHARGES											
Annual Increase			2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
SDC per Connection		$ 370	$ 379	$ 389	$ 398	$ 408	$ 419	$ 429	$ 440	$ 451	$ 462
Total Stormwater ERUs (end of year)		9,670	9,836	9,975	10,116	10,259	10,404	10,551	10,700	10,851	11,004
Additional ERUs Per Year		95	167	139	141	143	145	147	149	151	153
Total SDC Revenue		**$ 35,015**	**$ 63,175**	**$ 53,997**	**$ 56,129**	**$ 58,344**	**$ 60,647**	**$ 63,042**	**$ 65,530**	**$ 68,117**	**$ 70,806**
FUNDING SOURCES											
Grants		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Additional Proceeds (Costs)											
[Extra line]		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
[Extra line]		-	-	-	-	-	-	-	-	-	-
[Extra line]		-	-	-	-	-	-	-	-	-	-
[Extra line]		-	-	-	-	-	-	-	-	-	-
[Extra line]		-	-	-	-	-	-	-	-	-	-
Total Additional Proceeds		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
REVENUE BONDS											
Term (years)		20	20	20	20	20	20	20	20	20	20
Interest Cost		5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Issuance Cost		1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
Coverage Requirement (w/ SDCs)	**1.25**										
Use Reserves to Pay for Last Payment?	**No**										
OTHER LOANS											
Term (years)		20	20	20	20	20	20	20	20	20	20
Interest Cost		1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
OTHER BONDS											
Term (years)		20	20	20	20	20	20	20	20	20	20
Interest Cost		2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%	2.55%
Issuance Cost		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

City of Battle Ground

Stormwater Rate Study

Operating Revenue and Expenditure Forecast

Revenues	Forecast Basis	Budget 2015	Budget 2016	Projection 2017	Projection 2018	Projection 2019	Projection 2020	Projection 2021	Projection 2022	Projection 2023	Projection 2024
Rate revenues											
Drainage Charges	*Account Growth*	$ 868,920	$ 913,000	$ 925,893	$ 938,969	$ 952,229	$ 965,676	$ 979,313	$ 993,143	$ 1,007,168	$ 1,021,391
[Extra]	*No Escalation*	-	-	-	-	-	-	-	-	-	-
Total Rate Revenue		**$ 868,920**	**$ 913,000**	**$ 925,893**	**$ 938,969**	**$ 952,229**	**$ 965,676**	**$ 979,313**	**$ 993,143**	**$ 1,007,168**	**$ 1,021,391**
Non-rate revenues											
Misc. Revenue	*No Escalation*	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interest Income	*No Escalation*										
[Extra]	*No Escalation*	-	-	-	-	-	-	-	-	-	-
Total Non-rate revenues		**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
TOTAL REVENUES		**$ 868,920**	**$ 913,000**	**$ 925,893**	**$ 938,969**	**$ 952,229**	**$ 965,676**	**$ 979,313**	**$ 993,143**	**$ 1,007,168**	**$ 1,021,391**

Expenses	Forecast Basis	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Excise Tax	*State B&O Tax*	*$ 13,034*	*$ 13,695*	*$ 13,888*	*$ 14,085*	*$ 14,283*	*$ 14,485*	*$ 14,690*	*$ 14,897*	*$ 15,108*	*$ 15,321*
Indirect to General Fund	*General Cost Inflation*	295,058	298,645	304,590	310,653	316,837	323,145	329,577	336,138	342,830	349,654
Regular Salaries & Wages	*Labor Cost Inflation*	$ 195,075	$ 199,000	$ 206,960	$ 215,238	$ 223,848	$ 232,802	$ 242,114	$ 251,798	$ 261,870	$ 272,345
Additional Staffing: NPDES Related [1]	*Labor Cost Inflation*	-	151,087	157,130	163,416	169,952	176,750	183,820	191,173	198,820	206,773
Part-time Salaries	*Labor Cost Inflation*	35,000	35,000	36,400	37,856	39,370	40,945	42,583	44,286	46,058	47,900
Overtime Wages	*Labor Cost Inflation*	-	-	-	-	-	-	-	-	-	-
Personnel Benefits	*Benefit Cost Inflation*	92,745	96,150	101,919	108,034	114,516	121,387	128,670	136,391	144,574	153,248
Office Supplies	*General Cost Inflation*	770	770	785	801	817	833	850	867	884	902
Operating Supplies	*General Cost Inflation*	10,000	10,000	10,199	10,402	10,609	10,820	11,036	11,255	11,480	11,708
Uniforms & Clothing	*General Cost Inflation*	1,155	1,155	1,178	1,201	1,225	1,250	1,275	1,300	1,326	1,352
Fuel	*General Cost Inflation*	7,800	7,800	7,955	8,114	8,275	8,440	8,608	8,779	8,954	9,132
Professional Services	*General Cost Inflation*	41,300	31,425	32,051	32,689	33,339	34,003	34,680	35,370	36,074	36,792
Street Sweeping	*General Cost Inflation*	12,000	6,000	6,119	6,241	6,366	6,492	6,621	6,753	6,888	7,025
Communication	*General Cost Inflation*	22,565	20,120	20,521	20,929	21,346	21,771	22,204	22,646	23,097	23,557
Training/Travel/Meetings	*General Cost Inflation*	1,790	1,340	1,367	1,394	1,422	1,450	1,479	1,508	1,538	1,569
Operating Rentals / Leases	*General Cost Inflation*	8,535	8,535	8,705	8,878	9,055	9,235	9,419	9,607	9,798	9,993
Insurance	*General Cost Inflation*	10,150	10,150	10,352	10,558	10,768	10,983	11,201	11,424	11,652	11,884
Repairs & Maintenance	*General Cost Inflation*	8,700	8,700	8,873	9,050	9,230	9,414	9,601	9,792	9,987	10,186
Vehicle Repair & Maintenance	*General Cost Inflation*	13,000	10,200	10,403	10,610	10,821	11,037	11,256	11,481	11,709	11,942
Dues, Subscriptions, Memberships	*General Cost Inflation*	315	190	194	198	202	206	210	214	218	222
Banking Services	*General Cost Inflation*	2,170	2,170	2,213	2,257	2,302	2,348	2,395	2,442	2,491	2,541
R&R Projects	*General Cost Inflation*										
Capital Projects	*General Cost Inflation*										
Machinery & Equipment	*General Cost Inflation*	-	-	-	-	-	-	-	-	-	-
Technology R&R	*General Cost Inflation*	1,710	1,750	1,785	1,820	1,857	1,894	1,931	1,970	2,009	2,049
Vehicle R&R	*General Cost Inflation*	14,783	14,783	15,077	15,377	15,684	15,996	16,314	16,639	16,970	17,308
Additional Costs: Material Costs	*General Cost Inflation*	11,000	25,000	25,000	25,000	10,000	10,199	10,402	10,609	10,820	11,036
Add'l O&M from CIP	*From CIP*	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TOTAL CASH OPERATING EXPENSES		**$ 798,655**	**$ 953,665**	**$ 983,665**	**$ 1,014,802**	**$ 1,032,125**	**$ 1,065,883**	**$ 1,100,937**	**$ 1,137,340**	**$ 1,175,154**	**$ 1,214,439**

City of Battle Ground

Stormwater Rate Study

Existing Debt Input

Existing Debt Service - Revenue Bonds	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TOTAL REVENUE BONDS										
Annual Interest Payment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Principal Payment	-	-	-	-	-	-	-	-	-	-
Total Annual Payment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Use of Debt reserve for Debt Service	-	-	-	-	-	-	-	-	-	-

Existing Debt Service - Other Loans	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TOTAL OTHER LOANS										
Annual Interest Payment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Principal Payment	-	-	-	-	-	-	-	-	-	-
Total Annual Payment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Existing Debt Service - Other Bonds	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TOTAL OTHER BONDS										
Annual Interest Payment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Principal Payment	-	-	-	-	-	-	-	-	-	-
Total Annual Payment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

City of Battle Ground
Stormwater Rate Study
Capital Improvement Program

Project Costs and O&M Impacts in Year: 2014

No	Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1	**Stormwater CIP - Design Costs**										
2	Chelatchie Rails with Trails (Storm)	$ 66,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3	SW-1, SW-2, CS-2 (Parkway Estates Storm)	-	-	-	-	-	-	-	65,263	65,263	-
4	CS-1 (Jewel Creek Bypass Drainage)	-	-	-	-	-	-	-	-	-	-
5	TR-2 (SR 503 Crossing Storm)	-	-	-	-	-	-	-	-	-	68,455
6	G-2 (West Terminus of SW 10th Street Storm)	-	-	-	-	-	-	-	-	-	-
7	WQ-1 (Mill and Woodin Creek Restorations)										
8	CS-B (Railroad Ditch Stormwater Facility)	-	-	-	106,000	-	-	-	-	-	-
9	Railroad Ditch Maintenance & Regrading	-	15,997	-	-	-	-	-	-	-	-
10	CS-D (SE Eaton Blvd Ditch Elimination)	-	-	-	-	-	-	-	-	-	-
11	CS-E (View Meadows Storm)	-	-	-	-	-	-	-	-	-	-
12	DA-145 (Battle Ground West Subdivision Drainage)	-	-	-	-	-	-	-	-	-	-
13	DA-140 Edgebrook Subdivision Storm	-	-	-	-	-	-	-	-	-	-
14	DA-141 (Nowak Addition Drainage)	-	-	-	-	-	-	-	-	-	-
15	Decant Facility Upgrade	-	7,379	-	-	-	-	-	-	-	-
16	Ops Wash Bay	-	-	25,975	-	-	-	-	-	-	-
17	DA-144 Pipe Project	-	-	-	14,077	-	-	-	-	-	-
18	Wood Recycling Facility (Storm)	-	-	-	95,585	-	-	-	-	-	-
19											
20	**Stormwater CIP - Construction Costs**										
21	Chelatchie Rails with Trails (Storm)	-	633,823	-	-	-	-	-	-	-	-
22	SW-1, SW-2, CS-2 (Parkway Estates Storm)	-	-	-	-	-	-	-	-	-	522,105
23	CS-1 (Jewel Creek Bypass Drainage)	169,738	-	-	-	-	-	-	-	-	-
24	TR-2 (SR 503 Crossing Storm)	-	-	-	-	-	-	-	-	-	-
25	G-2 (West Terminus of SW 10th Street Storm)	-	-	-	-	-	-	-	-	-	-
26	WQ-1 (Mill and Woodin Creek Restorations)										
27	CS-B (Railroad Ditch Stormwater Facility)	-	-	-	-	-	420,478	981,116	-	-	-
28	Railroad Ditch Maintenance & Regrading	-	-	63,989	-	-	-	-	-	-	-
29	CS-D (SE Eaton Blvd Ditch Elimination)	-	-	-	348,008	-	-	-	-	-	-
30	CS-E (View Meadows Storm)	-	-	-	-	-	-	-	-	-	-
31	DA-145 (Battle Ground West Subdivision Drainage)	-	-	-	-	-	-	-	-	-	-
32	DA-140 Edgebrook Subdivision Storm	-	-	-	-	-	-	-	-	-	-
33	DA-141 (Nowak Addition Drainage) (2035)	-	-	-	-	-	-	-	-	-	-
34	Decant Facility Upgrade	-	-	9,839	-	-	-	-	-	-	-
35	Ops Wash Bay	-	-	-	103,901	-	-	-	-	-	-
36	DA-144 Pipe Project	-	-	-	-	56,308	-	-	-	-	-
37	Wood Recycling Facility (Storm)	-	-	-	-	382,340	-	-	-	-	-
38											
138											
	TOTAL CAPITAL PROJECTS (unescalated)	**$ 235,738**	**$ 657,199**	**$ 99,803**	**$ 667,572**	**$ 438,649**	**$ 420,478**	**$ 981,116**	**$ 65,263**	**$ 65,263**	**$ 590,560**
	Total Growth Related Project Costs	$ 235,738	$ 633,823	$ -	$ 468,085	$ 56,308	$ 420,478	$ 981,116	$ 65,263	$ 65,263	$ 590,560
	Total Existing Needs Project Costs	-	23,376	99,803	199,486	382,340	-	-	-	-	-
	Projects by CIAC	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Projects by Enterprise Fund	235,738	657,199	99,803	667,572	438,649	420,478	981,116	65,263	65,263	590,560

City of Battle Ground
Stormwater Rate Study
CIP (Inflated Dollars)

No	Description	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
	Annual Escalation Rates	*2.73%*	*2.73%*	*2.73%*	*2.73%*	*2.73%*	*2.73%*	*2.73%*	*2.73%*	*2.73%*	*2.73%*
1	Stormwater CIP - Design Costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2	Chelatchie Rails with Trails (Storm)	67,803	-	-	-	-	-	-	-	-	-
3	SW-1, SW-2, CS-2 (Parkway Estates Storm)	-	-	-	-	-	-	-	80,968	83,181	-
4	CS-1 (Jewel Creek Bypass Drainage)	-	-	-	-	-	-	-	-	-	-
5	TR-2 (SR 503 Crossing Storm)	-	-	-	-	-	-	-	-	-	89,632
6	G-2 (West Terminus of SW 10th Street Storm)	-	-	-	-	-	-	-	-	-	-
7	WQ-1 (Mill and Woodin Creek Restorations)	-	-	-	-	-	-	-	-	-	-
8	CS-B (Railroad Ditch Stormwater Facility)	-	-	-	118,067	-	-	-	-	-	-
9	Railroad Ditch Maintenance & Regrading	-	16,883	-	-	-	-	-	-	-	-
10	CS-D (SE Eaton Blvd Ditch Elimination)	-	-	-	-	-	-	-	-	-	-
11	CS-E (View Meadows Storm)	-	-	-	-	-	-	-	-	-	-
12	DA-145 (Battle Ground West Subdivision Drainage)	-	-	-	-	-	-	-	-	-	-
13	DA-140 Edgebrook Subdivision Storm	-	-	-	-	-	-	-	-	-	-
14	DA-141 (Nowak Addition Drainage)	-	-	-	-	-	-	-	-	-	-
15	Decant Facility Upgrade	-	7,788	-	-	-	-	-	-	-	-
16	Ops Wash Bay	-	-	28,163	-	-	-	-	-	-	-
17	DA-144 Pipe Project	-	-	-	15,680	-	-	-	-	-	-
18	Wood Recycling Facility (Storm)	-	-	-	106,467	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-	-
20	Stormwater CIP - Construction Costs	-	-	-	-	-	-	-	-	-	-
21	Chelatchie Rails with Trails (Storm)	-	668,929	-	-	-	-	-	-	-	-
22	SW-1, SW-2, CS-2 (Parkway Estates Storm)	-	-	-	-	-	-	-	-	-	683,625
23	CS-1 (Jewel Creek Bypass Drainage)	174,376	-	-	-	-	-	-	-	-	-
24	TR-2 (SR 503 Crossing Storm)	-	-	-	-	-	-	-	-	-	-
25	G-2 (West Terminus of SW 10th Street Storm)	-	-	-	-	-	-	-	-	-	-
26	WQ-1 (Mill and Woodin Creek Restorations)	-	-	-	-	-	-	-	-	-	-
27	CS-B (Railroad Ditch Stormwater Facility)	-	-	-	-	-	494,287	1,184,847	-	-	-
28	Railroad Ditch Maintenance & Regrading	-	-	69,378	-	-	-	-	-	-	-
29	CS-D (SE Eaton Blvd Ditch Elimination)	-	-	-	387,626	-	-	-	-	-	-
30	CS-E (View Meadows Storm)	-	-	-	-	-	-	-	-	-	-
31	DA-145 (Battle Ground West Subdivision Drainage)	-	-	-	-	-	-	-	-	-	-
32	DA-140 Edgebrook Subdivision Storm	-	-	-	-	-	-	-	-	-	-
33	DA-141 (Nowak Addition Drainage) (2035)	-	-	-	-	-	-	-	-	-	-
34	Decant Facility Upgrade	-	-	10,667	-	-	-	-	-	-	-
35	Ops Wash Bay	-	-	-	115,730	-	-	-	-	-	-
36	DA-144 Pipe Project	-	-	-	-	64,432	-	-	-	-	-
37	Wood Recycling Facility (Storm)	-	-	-	-	437,502	-	-	-	-	-
38	-	-	-	-	-	-	-	-	-	-	-
138	-	-	-	-	-	-	-	-	-	-	-
	TOTAL CAPITAL PROJECTS (escalated)	**$ 242,179**	**$ 693,600**	**$ 108,209**	**$ 743,570**	**$ 501,934**	**$ 494,287**	**$ 1,184,847**	**$ 80,968**	**$ 83,181**	**$ 773,256**
	Total Growth Related Project Costs	$ 242,179	$ 668,929	$ -	$ 521,373	$ 64,432	$ 494,287	$ 1,184,847	$ 80,968	$ 83,181	$ 773,256
	Total Existing Needs Project Costs	-	24,671	108,209	222,197	437,502	-	-	-	-	-
	Projects by CIAC	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Projects by Enterprise Fund	242,179	693,600	108,209	743,570	501,934	494,287	1,184,847	80,968	83,181	773,256

City of Battle Ground
Stormwater Rate Study
Capital Funding Summary

Summary of Expenditures	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
CAPITAL PROJECTS										
Growth Related Project Costs	$ 242,179	$ 668,929	$ -	$ 521,373	$ 64,432	$ 494,287	$ 1,184,847	$ 80,968	$ 83,181	$ 773,256
Existing Needs Project Costs	-	24,671	108,209	222,197	437,502	-	-	-	-	-
TOTAL CAPITAL EXPENDITURES	**$ 242,179**	**$ 693,600**	**$ 108,209**	**$ 743,570**	**$ 501,934**	**$ 494,287**	**$ 1,184,847**	**$ 80,968**	**$ 83,181**	**$ 773,256**

Capital Financing Plan	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Additional Proceeds (Costs)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Project Specific CIAC	-	-	-	-	-	-	-	-	-	-
Project to be Funded	**$ 242,179**	**$ 693,600**	**$ 108,209**	**$ 743,570**	**$ 501,934**	**$ 494,287**	**$ 1,184,847**	**$ 80,968**	**$ 83,181**	**$ 773,256**
OTHER FUNDING SOURCES										
Other Outside Sources	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Rate Funded System Reinvestment	-	-	-	-	-	-	-	-	-	-
SDC Revenue Towards Capital	242,179	404,419	-	101,608	53,325	55,705	51,193	64,720	67,285	63,073
Revenue Bond Proceeds	-	-	-	-	-	-	-	-	-	-
Other Loan Proceeds	-	-	-	-	-	-	-	-	-	-
Other Bond Proceeds	-	-	-	-	-	-	-	-	-	-
Cash Balances	-	289,181	108,209	641,962	448,609	438,583	1,133,654	16,248	15,895	710,183
TOTAL CAPITAL RESOURCES	**$ 242,179**	**$ 693,600**	**$ 108,209**	**$ 743,570**	**$ 501,934**	**$ 494,287**	**$ 1,184,847**	**$ 80,968**	**$ 83,181**	**$ 773,256**
Info: Working Capital Contingency Deficit	-	-	-	-	-	-	-	-	-	-

New Debt Computations	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
REVENUE BONDS										
Amount to Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Issuance Costs	-	-	-	-	-	-	-	-	-	-
Reserve Required	-	-	-	-	-	-	-	-	-	-
Amount of Debt Issue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
OTHER LOANS										
Amount to Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
OTHER BONDS										
Amount to Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Issuance Costs	-	-	-	-	-	-	-	-	-	-
Amount of Debt Issue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

City of Battle Ground

Stormwater Rate Study

Capital Funding Summary

Debt Service Summary	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
EXISTING DEBT SERVICE										
Annual Interest Payments	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Principal Payments	-	-	-	-	-	-	-	-	-	-
Total Debt Service Payments	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Revenue Bond Payments Only	-	-	-	-	-	-	-	-	-	-
NEW DEBT SERVICE										
Annual Interest Payments	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Principal Payments	-	-	-	-	-	-	-	-	-	-
Total Debt Service Payments	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Revenue Bond Payments Only	-	-	-	-	-	-	-	-	-	-
TOTAL DEBT SERVICE PAYMENTS	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Total Interest Payments	-	-	-	-	-	-	-	-	-	-
Total Principal Payments	-	-	-	-	-	-	-	-	-	-
Total Revenue Bond Payments Only	-	-	-	-	-	-	-	-	-	-
Use of Debt Reserve for Debt Service	-	-	-	-	-	-	-	-	-	-

City of Battle Ground
Stormwater Rate Study
Revenue Requirements Analysis

Cash Flow Test	Include	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
EXPENSES											
Cash Operating Expenses		$ 798,655	$ 953,665	$ 983,665	$ 1,014,802	$ 1,032,125	$ 1,065,883	$ 1,100,937	$ 1,137,340	$ 1,175,154	$ 1,214,439
Existing Debt Service		-	-	-	-	-	-	-	-	-	-
New Debt Service		-	-	-	-	-	-	-	-	-	-
Rate Funded System Reinvestment		-	-	-	-	-	-	-	-	-	-
Total Expenses		$ 798,655	$ 953,665	$ 983,665	$ 1,014,802	$ 1,032,125	$ 1,065,883	$ 1,100,937	$ 1,137,340	$ 1,175,154	$ 1,214,439
REVENUES											
Rate Revenue		$ 868,920	$ 913,000	$ 925,893	$ 938,969	$ 952,229	$ 965,676	$ 979,313	$ 993,143	$ 1,007,168	$ 1,021,391
Other Non Rate Revenue		-	-	-	-	-	-	-	-	-	-
Interest Earnings: Operating & Debt Reserve Funds		3,200	855	1,021	1,053	1,087	1,105	1,141	1,179	1,218	1,258
Total Revenue		$ 872,120	$ 913,855	$ 926,915	$ 940,022	$ 953,315	$ 966,781	$ 980,455	$ 994,322	$ 1,008,386	$ 1,022,650
NET CASH FLOW (DEFICIENCY)		**$ 73,465**	**$ (39,810)**	**$ (56,751)**	**$ (74,780)**	**$ (78,809)**	**$ (99,102)**	**$ (120,482)**	**$ (143,019)**	**$ (166,768)**	**$ (191,789)**

Maximum Revenue Deficiency	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Sufficiency Test Driving the Deficiency	*None*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*	*Cash*
Maximum Revenue Deficiency (Surplus)	$ -	$ 39,810	$ 56,751	$ 74,780	$ 78,809	$ 99,102	$ 120,482	$ 143,019	$ 166,768	$ 191,789
plus: Additional Tax Expense	-	606	864	1,139	1,200	1,509	1,835	2,178	2,540	2,921
less: Incremental Revenue From Prior Rate Increases	-	-	(120,366)	(260,000)	(403,501)	(567,310)	(754,104)	(764,753)	(775,553)	(786,505)
Net Revenue Deficiency (Surplus)	$ -	$ 40,416	$ (62,751)	$ (184,082)	$ (323,491)	$ (466,698)	$ (631,787)	$ (619,557)	$ (606,245)	$ (591,796)

City of Battle Ground

Stormwater Rate Study

Revenue Requirements Analysis

Rate Increases	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Rate Revenue @ Existing Rates	$ 868,920	$ 913,000	$ 925,893	$ 938,969	$ 952,229	$ 965,676	$ 979,313	$ 993,143	$ 1,007,168	$ 1,021,391
Revenues from Prior Rate Increases	-	-	120,366	260,000	403,501	567,310	754,104	764,753	775,553	786,505
Rate Revenue Before Rate Increase (Incl. previous increases)	868,920	913,000	1,046,259	1,198,969	1,355,729	1,532,986	1,733,417	1,757,896	1,782,721	1,807,897
Required Annual Rate Increase	0.00%	4.43%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Number of Months New Rates Will Be In Effect	12	12	12	12	12	12	12	12	12	12
Info: Percentage Increase to Generate Required Revenue	*0.00%*	*4.43%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Policy Induced Rate Increases	0.00%	13.00%	13.00%	11.50%	11.50%	11.50%	0.00%	0.00%	0.00%	0.00%
ANNUAL RATE INCREASE	**0.00%**	**13.00%**	**13.00%**	**11.50%**	**11.50%**	**11.50%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**
CUMULATIVE RATE INCREASE	**0.00%**	**13.00%**	**27.69%**	**42.37%**	**58.75%**	**77.00%**	**77.00%**	**77.00%**	**77.00%**	**77.00%**

Impacts of Rate Increases	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Rate Revenues After Rate Increase	$ 868,920	$ 1,031,690	$ 1,182,273	$ 1,336,851	$ 1,511,638	$ 1,709,279	$ 1,733,417	$ 1,757,896	$ 1,782,721	$ 1,807,897
Full Year Rate Revenues After Rate Increase	*868,920*	*1,031,690*	*1,182,273*	*1,336,851*	*1,511,638*	*1,709,279*	*1,733,417*	*1,757,896*	*1,782,721*	*1,807,897*
Partial Year Adjustment	-	-	-	-	-	-	-	-	-	-
Additional Taxes Due to Rate Increases	-	1,780	3,846	5,968	8,391	11,154	11,312	11,471	11,633	11,798
Net Cash Flow After Rate Increase	**$ 73,465**	**$ 77,100**	**$ 195,784**	**$ 317,134**	**$ 472,209**	**$ 633,347**	**$ 622,310**	**$ 610,263**	**$ 597,152**	**$ 582,919**
Coverage After Rate Increase: w/ SDCs	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
Coverage After Rate Increase: w/o SDCs	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**

City of Battle Ground
Stormwater Rate Study
Fund Activity

Funds	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
OPERATING FUND *Excess to Fund Capital?*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Beginning Balance	$ 848,000	$ 131,286	$ 156,767	$ 161,698	$ 166,817	$ 169,664	$ 175,214	$ 180,976	$ 186,960	$ 193,176
plus: Net Cash Flow after Rate Increase	73,465	77,100	195,784	317,134	472,209	633,347	622,310	610,263	597,152	582,919
less: Transfer of Surplus for Capital Funding	(790,179)	(51,619)	(190,852)	(312,015)	(469,362)	(627,797)	(616,548)	(604,279)	(590,936)	(576,461)
Ending Balance	**$ 131,286**	**$ 156,767**	**$ 161,698**	**$ 166,817**	**$ 169,664**	**$ 175,214**	**$ 180,976**	**$ 186,960**	**$ 193,176**	**$ 199,634**
Minimum Target Balance	$ 98,464	$ 117,575	$ 121,274	$ 125,113	$ 127,248	$ 131,410	$ 135,732	$ 140,220	$ 144,882	$ 149,725
Maximum Funds to be Kept as Operating Reserve	$ 131,286	$ 156,767	$ 161,698	$ 166,817	$ 169,664	$ 175,214	$ 180,976	$ 186,960	$ 193,176	$ 199,634
Info: No of Days of Cash Operating Expenses	60	60	60	60	60	60	60	60	60	60
SDC FUND										
Beginning Balance	$ 637,071	$ 429,907	$ 88,664	$ 142,661	$ 97,181	$ 102,201	$ 107,144	$ 118,992	$ 119,802	$ 120,633
plus: SDC Revenue	35,015	63,175	53,997	56,129	58,344	60,647	63,042	65,530	68,117	70,806
less: Transfer of Funds for Capital Use	(242,179)	(404,419)	-	(101,608)	(53,325)	(55,705)	(51,193)	(64,720)	(67,285)	(63,073)
Ending Balance	**$ 429,907**	**$ 88,664**	**$ 142,661**	**$ 97,181**	**$ 102,201**	**$ 107,144**	**$ 118,992**	**$ 119,802**	**$ 120,633**	**$ 128,366**
Minimum Target Balance	$ 81,728	$ 88,664	$ 89,746	$ 97,181	$ 102,201	$ 107,144	$ 118,992	$ 119,802	$ 120,633	$ 128,366
DEBT RESERVE FUND										
Beginning Balance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
plus: Reserve Funding from New Debt	-	-	-	-	-	-	-	-	-	-
less: Use of Reserves for Debt Service	-	-	-	-	-	-	-	-	-	-
Ending Balance	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Minimum Target Balance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Capital Funding Summary	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Beginning Balance	$ -	$ 794,329	$ 564,742	$ 651,642	$ 326,869	$ 350,384	$ 542,547	$ 29,673	$ 618,673	$ 1,198,523
plus: Rate Funded System Reinvestment	-	-	-	-	-	-	-	-	-	-
plus: Transfers from Operating Fund	790,179	51,619	190,852	312,015	469,362	627,797	616,548	604,279	590,936	576,461
plus: Transfers from SDC Fund	242,179	404,419	-	101,608	53,325	55,705	51,193	64,720	67,285	63,073
plus: Grants/ Donations/ CIAC	-	-	-	-	-	-	-	-	-	-
plus: Additional Proceeds (Costs)	-	-	-	-	-	-	-	-	-	-
plus: Revenue Bond Proceeds	-	-	-	-	-	-	-	-	-	-
plus: Other Loan Proceeds	-	-	-	-	-	-	-	-	-	-
plus: Other Bond Proceeds	-	-	-	-	-	-	-	-	-	-
plus: Interest Earnings	4,150	7,975	4,256	5,174	2,762	2,948	4,232	968	4,811	8,593
Total Funding Sources	**$ 1,036,508**	**$ 1,258,342**	**$ 759,850**	**$ 1,070,439**	**$ 852,318**	**$ 1,036,834**	**$ 1,214,520**	**$ 699,641**	**$ 1,281,704**	**$ 1,846,651**
less: Capital Projects - Upgrade/Expansion	*(242,179)*	*(668,929)*	-	*(521,373)*	*(64,432)*	*(494,287)*	*(1,184,847)*	*(80,968)*	*(83,181)*	*(773,256)*
less: Capital Projects - Replacement	-	*(24,671)*	*(108,209)*	*(222,197)*	*(437,502)*	-	-	-	-	-
Capital Funding Surplus (Deficit)	**$ 794,329**	**$ 564,742**	**$ 651,642**	**$ 326,869**	**$ 350,384**	**$ 542,547**	**$ 29,673**	**$ 618,673**	**$ 1,198,523**	**$ 1,073,394**
Minimum Target Balance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -